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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.
26 IMPACT OF AFTER-MEAL GLUCOSE ON ARTERIAL FUNCTION
A major contributor to heart attack risk is after-meal blood sugar surges that inflict acute and long-term damage to the inner arterial lining. A new study documented that human subjects given an oral glucose challenge test suffer a 30-44% decrease in endothelial function. This kind of inner arterial wall (endothelial) injury is the underlying cause of coronary artery occlusion and ischemic stroke. Remarkable new findings show that people supplementing with gamma tocopherol before the glucose challenge had virtually no loss of endothelial function.

38 BREAST CANCER AND GLUCOSE: THE SURPRISING CONNECTION
A review of published scientific studies strongly implicates high-normal blood glucose with increased breast cancer risk. A striking study in 2012 links high-normal glucose to brain shrinkage and cognitive decline. The take home message is to initiate aggressive actions to maintain glucose blood levels at the low end of normal range.

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New research documents the ability of hawthorn and arjuna to improve cardiac health. The benefits of these botanicals are enhanced heart muscle function and increased coronary blood flow, making them of particular interest to those concerned about congestive heart failure.

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7 PREPARE YOUR BODY TO EAT
Aging humans with high-normal blood sugar face increased risks of virtually every degenerative disorder. By ingesting compounds before meals that impede sugar absorption and reduce the creation of surplus glucose in their liver, people today can enjoy significantly improved fasting and after-meal glucose levels.

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**References**


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Gustavo Tovar Baez, MD, operates the Life Extension Clinic in Caracas, Venezuela. He is the first physician in Caracas to specialize in anti-aging medicine.

Ricardo Bemales, MD, is a board-certified pediatrician and general practitioner in Chicago, IL, focusing on allergies, bronchial asthma, and immunodeficiency.

Thomas F. Crais, MD, FACS, is a board-certified plastic surgeon, was medical director of the microsurgical research and training lab at Southern Baptist Hospital in New Orleans, LA, and currently practices in Sun Valley, ID.

William Davis, MD, is a preventive cardiologist and author of Wheat Belly: Lose the Wheat, Lose the Weight and Find Your Path Back to Health. He is also medical director of the online heart disease prevention and reversal program, Track Your Plaque (www.trackyourplaque.com).

Martin Dayton, MD, DO, practices at the Sunny Isles Medical Center in North Miami Beach, FL. His focus is on nutrition, aging, chelation therapy, holistic medicine, and oxidative medicine.

John DeLuca, MD, DC, is a 2005 graduate of St. George’s University School of Medicine. He completed his Internal Medicine residency at Monmouth Medical Center in Long Branch, New Jersey, in 2008 and is board certified by the American Board of Internal Medicine. Dr. DeLuca is a Diplomate of the American Academy of Anti-Aging Medicine and has obtained certifications in hyperbaric medicine, pain management, nutrition, strength and conditioning, and manipulation under anesthesia.

Sergey A. Dzugan, MD, PhD, was formerly chief of cardiovascular surgery at the Donetsk Regional Medical Center in Donetsk, Ukraine. Dr. Dzugan’s current primary interests are anti-aging and biological therapy for cancer, cholesterol, and hormonal disorders.

Patrick M. Fratellone, MD, RH, is the founder and executive medical director of Fratellone Associates. He completed his Internal Medicine and Cardiology Fellowship at Lenox Hill Hospital in 1994, before becoming the medical director of the Atkins Center for Complementary Medicine.

Carmen Fusco, MS, RN, CNS, is a research scientist and clinical nutritionist in New York City who has lectured and written numerous articles on the biochemical approach to the prevention of aging and degenerative diseases.

Norman R. Gay, MD, is proprietor of the Bahamas Anti-Aging Medical Institute in Nassau, Bahamas. A former member of the Bahamian Parliament, he served as Minister of Health and Minister of Youth and Sports.

Mitchell J. Ghem, DO, PhD, holds a doctorate in holistic health and anti-aging and serves on the faculty of medicine at the Benemerita Universidad Autonoma De Puebla, Mexico, as a professor of cellular hemapoetic studies.

Gary Goldfaden, MD, is a clinical dermatologist and a lifetime member of the American Academy of Dermatology. He is the founder of Academy Dermatology of Hollywood, FL, and COSMESIS Skin Care.

Miguelangelo Gonzalez, MD, is a certified plastic and reconstructive surgeon at the Miguelangelo Plastic Surgery Clinic, Cabo San Lucas.

Garry F. Gordon, MD, DO, is a Payson, AZ-based researcher of alternative approaches to medical problems that are unresponsive to traditional therapies. He is president of the International College of Advanced Longevity Medicine.

Richard Heifetz, MD, is a board-certified anesthesiologist in Santa Rosa, CA, specializing in the delivery of anesthesia for office-based plastic/cosmetic surgery, chelation therapy, and pain management.

Roberto Marasi, MD, is a psychiatrist in Brescia and in Piacenza, Italy. He is involved in anti-aging strategies and weight management.

Maurice D. Marholin, DDC, DO, is a licensed osteopathic physician and chiropractor. He completed a NIH Fellowship in nutrition at UAB. Board certified in family medicine with a CNS in nutrition, he is currently the medical director at Leon County Jail. He is responsible for 1,100–1,200 inmates’ medical needs.

Prof. Francesco Marotta, MD, PhD, gastroenterologist and nutrigenomics expert with extensive international university experience. Consulting Professor, WHO-affiliated Center for Biotech & Traditional Medicine, University of Milano, Italy. Hon. Res. Professor, Human Nutrition Dept, TWU, USA. Author of over 130 papers and 400 congress lectures.

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

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

Herbert Pardell, DO, FAAIM, practices internal medicine at the Emerald Hills Medical Center in Hollywood, FL. He is a medical director of the Life Extension Foundation.

Lambert Titus K. Parker, MD, practices internal medicine at the Integrative Longevity Institute of Virginia in Virginia Beach, VA.

Ross Pelton, RPh, PhD, CCN, is director of nutrition and anti-aging research for Intramedicine, Inc.

Patrick Quillin, PhD, RD, CNS, is a clinical nutritionist in Carlsbad, CA, and formerly served as vice president of nutrition for Cancer Treatment Centers of America, where he was a consultant to the National Institutes of Health.

Allan Rashford, MD, graduated from the University of Iowa Medical School. Upon completing medical training, he became chief of medicine at St. Francis Hospital in South Carolina, and he was later named president of the Charleston Medical Society.

Marc R. Rose, MD, practices ophthalmology in Los Angeles, CA, and is president of the Rose Eye Medical Group. He is on the staffs of Pacific Alliance Medical Center, Los Angeles, and other area hospitals.

Michael R. Rose, MD, is a board-certified ophthalmologist with the Rose Eye Medical Group in Los Angeles, CA, is on the staffs of the University of Southern California and UCLA.

Ron Rothenberg, MD, is a full clinical professor at the University of California San Diego School of Medicine and founder of California HealthSpan Institute in San Diego, CA.

Roman Rozencwaig, MD, is a pioneer in research on melatonin and aging. He practices in Montreal, Canada, as research associate at Montreal General Hospital, Department of Medicine, McGill University.

Carol Ann Ryser, MD, FAAP, is medical director of Health Centers of America in Kansas City, MO, and focuses on pediatrics and mental health.

Michael D. Seidman, MD, is the regional coordinator of otolaryngology-head and neck surgery for the Bloomfield satellite of Henry Ford Health System (HFHS), Detroit, MI, co-director of the Tinnitus Center, and co-chair of the Complementary/Alternative Medicine Initiative for HFHS.

Ronald L. Shuler, BS, DDS, CCN, LN, is involved in immunonutrition for the prevention and treatment of cancer, human growth hormone secretagogues, and osteoporosis. Board certified in Anti-Aging medicine.

Herbert R. Slavin, MD, is medical director of the Institute of Advanced Medicine in Laderaider, FL, specializing in anti-aging medicine, disease prevention, chelation therapy, and natural hormone replacement therapy.

Stephen L. Smith, MD, Richland, WA, focuses on treating allergies and is a member of the American Society for Lasers in Medicine and Surgery.

Stephen 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.

Javier Torres, MD, is a member of the American Academy of Physical Medicine and Rehabilitation and is on the medical staffs of Sunrise Hospital, Desert Springs Hospital, Valley Hospital, and Mountain View Hospital, all in Las Vegas, NV.

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

Charles E. Williamson, MD, Boca Raton, FL, 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.
Aubrey de Grey, PhD, is a biomedical gerontologist and Editor-in-Chief of Rejuvenation Research, the world’s highest-impact peer-reviewed journal focused on intervention in aging. He received his BA and PhD from the University of Cambridge in 1985 and 2000 respectively. Dr. de Grey is a Fellow of both the Gerontological Society of America and the American Aging Association, and sits on the editorial and scientific advisory boards of numerous journals and organisations.

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 Foods.

Russell L. Blaylock, MD, is a board-certified neurosurgeon, author, and lecturer. He 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 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 anticancer 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, his Cum Laude/Phi Beta Kappa and completed his MD from New York University Medical School with honors. He is the author of Younger You (2006) and Younger Thinner You (2009) and has published over 100 research papers and three clinical assistant professor of integrative medicine in the Department of Neurosurgery at Cornell Well 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 Casingius, 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 Cenegro certifications in age management medicine. She is a faculty member of the 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, cryotherapy, 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, DScI, 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 Coenzyme 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 PBS documentary “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, FACP, 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.
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**Ashwagandha** inhibits an enzyme (acetylcholinesterase) that breaks down acetylcholine in the brain.

**Phospholipid grape seed extract** improves blood vessel tone and elasticity, thus boosting cerebral oxygen flow.

**Pregnenolone** is a hormone involved in synchronization of brain cells that declines in normal aging brains.

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References for most can be found at: http://www.lef.org/magazine/mag2007/feb2007_report_cognitex_03.htm

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To order Cognitex® with NeuroProtection Complex, call 1-800-544-4440 or visit www.LifeExtension.com
As the New Year commences, millions of Americans resolve to lose weight.

This desire extends beyond cosmetic appearance as the public learns that surplus body fat markedly shortens longevity.

What’s missing is a before-meal strategy that enables people to eat sensibly without every excess calorie converting to stored fat.

In 2012, a study was published showing that people consuming 350 mg of green coffee bean extract before meals lost an average of 17.6 pounds while reducing body fat.¹

What few comprehend is that the glucose-lowering effect of green coffee bean extract not only facilitates weight loss, but may lower vascular risks as well.

By way of example, another 2012 study found that heart attack risk increased 69% in a risk group who had only modestly elevated after-meal blood glucose levels.²

No one disputes that diabetics suffer higher incidences of virtually every disease. What researchers are confirming is that even non-diabetics with high normal glucose face shortened life spans.³

The encouraging news is that the obesity-inducing impact of after-meal glucose surges can be mitigated if one commits to “preparing their body to eat” before each meal. >
In 1950, Americans spent an average of 30% of their income on food. Food cost outlays have since dropped to 10% as more efficient ways of growing and processing foods have evolved. This makes excess calorie consumption affordable to most everyone in modern societies.

A consequence of food becoming so cheap is that people eat too much, causing obesity rates to explode.

One can easily draw a correlation to the reduction in food costs as a percentage of average income and the increased amounts of body fat people carry. There is more to the story, however.

Tobacco use has plummeted from over 45% in the 1950s to around 19% today. People who smoke cigarettes weigh less because they usually consume fewer calories. Nicotine also boosts metabolic rate which facilitates burning of body fat.

For decades, nicotine was the drug of choice for large segments of society. Nicotine was smoked throughout the day to induce pleasurable effects in the brain. As smoking rates decline, consumption of high-glycemic calories has become a drug substitute, as people turn to “feel good” food to replace the brain chemical alteration that previous generations derived from nicotine (tobacco).

Obesity-related disease has now overcome the epidemic ill effects caused by cigarette smoking. Just think, while 19% of the population still smokes, almost 70% are now overweight or obese, placing them at sharply higher risks of degenerative disease.

Unless aggressive interventions are instituted, a public health disaster of unprecedented magnitude is upon us.

The Oslo Study indicated that the risk of fatal stroke in diabetic patients increased by 13% for each 18 mg/dL elevation in after-meal glucose. This is corroborated by a 2012 study showing a 69% increase in heart attack risk in a risk group based on after-meal glucose levels that were only 18 mg/dL above healthy ranges.

In an interesting study where after-meal glucose spikes were impeded, heart attack rates dropped an astounding 91%. Even when someone suffers a heart attack, the amount of damage to the heart muscle is significantly reduced when steps are taken ahead of time to reduce post-meal glucose surges.

The consistent finding from the scientific literature is that people with higher glucose levels suffer sharply higher vascular disease rates.

Critical Need to Impede Calorie Absorption

Doctors are so used to seeing elevated blood sugar that they seldom comment when fasting glucose levels approach or modestly exceed 100 mg/dL. Not only do these slightly higher blood glucose levels increase disease risk,
but they contribute to excess storage of body fat. There is a tiny percentage of the population that practices rigid calorie restriction. These individuals maintain fasting glucose under 86 mg/dL and meticulously guard against after-meal meal glucose surges. Their reward for eating around 1,500-1,800 calories a day is reductions in almost every disease risk and a probable reversal of certain aging processes. Calorie restriction favorably restores gene expression that promotes youthful cellular function.

Life Extension® has advocated moderate to intense calorie restriction since its inception in 1980. We are well aware, however, that even dedicated health-conscious individuals cannot consistently under-eat. So to achieve some of the benefits of calorie restriction without suffering chronic hunger, most aging people should “prepare their body to eat” by ingesting compounds before meals that impede sugar absorption and reduce the creation of surplus glucose in their liver from other foods.

Your Liver Converts Protein Into Glucose

Animal and human studies show that those who chronically under-eat have markedly lower blood glucose and insulin levels. Excess insulin contributes to the same degenerative diseases as does high glucose. High insulin also causes excess storage of cellular fat that precludes successful long-term weight loss.

People who consistently overeat often have chronically elevated blood glucose, which results in the pancreas secreting a continuous flow of insulin. Even when one reduces consumption of high-glycemic carbohydrates (sugars and starches), the liver continues to synthesize glucose from the protein-based foods one eats. The pancreas of course steps up insulin production to reduce levels of this liver-generated glucose in the blood.

The vast majority of aging people thus suffer chronically elevated glucose and insulin blood levels. The tragic result can be seen in today’s soaring epidemic of obesity.

The take-home lesson is that to achieve health benefits associated with low glucose-insulin blood levels, one must reduce after-meal surges of glucose into the bloodstream AND suppress the synthesis of glucose by the liver (gluconeogenesis).

Fortunately, a variety of nutrients and/or drugs (when taken before meals) can both impede glucose absorption and slash the amount of glucose synthesized in the liver. A further benefit to these nutrients (and/or drugs) is improvement in muscle cell insulin sensitivity, thus further reducing blood glucose/insulin levels.

Confirmation of Sugar’s Lethal Danger

A headline 2012 news story reported that if a person drinks just one 12-ounce sugar-sweetened beverage a day, their risk of having a heart attack increases by 20%. This consistent stream of published data is telling us to avoid any kind of sweetened beverage. This includes naturally sweetened drinks like orange juice that provide little in the way of beneficial polyphenols (like those found in pomegranate), but cause glucose blood levels to spike.

Anti-Diabetic Effects of Coffee

Extensive epidemiological evidence shows that a high level of coffee consumption lowers the risk of type II diabetes by 67%. This anti-diabetic effect appears to result from reduced levels of blood glucose, increased insulin sensitivity, and decreased storage of fat.
came in at 81 mg/dL, and I’ve shed considerable abdominal fat.

I cannot emphasize enough, based on the totality of the scientific evidence, the critical need to protect your bloodstream before meals against deadly glucose surges.

Drugs That Safely Lower Blood Glucose

For those who prefer to have their doctors prescribe them medications, there are two with proven blood glucose lowering effects.

The first is the glucosidase-inhibiting drug called acarbose.

Acarbose is one of the digestive enzymes that converts ingested sugars into glucose. Taking 25-100 mg of acarbose immediately before one eats will reduce the post-meal glucose surge. Some people complain about intestinal upset with acarbose. It should also be used with caution in those who are hypoglycemic, but otherwise is safe.

The second prescription drug to lower glucose is metformin. By inhibiting gluconeogenesis in the liver, metformin lowers blood glucose-insulin levels. Metformin also functions by other beneficial mechanisms. For three decades, Life Extension® provided evidence that metformin is a broad-spectrum anti-aging drug, yet most doctors are ignorant of its multiple benefits and often refuse to prescribe it to non-diabetics.

Metformin can be safely used by virtually everyone as long as they don’t have significant impairment of heart, kidney, or liver function and are not hypoglycemic.

Metformin and acarbose are sold as low-cost generic drugs, but many consumers are wary of prescription drugs and choose natural approaches instead. Fortunately, there are affordable nutrients that function in analogous ways to acarbose and metformin.

Natural Glucose Lowering Agents

Human clinical trials show markedly lower increases in after-meal blood glucose when green coffee berry extract is taken before an oral glucose loading test.

One compelling study showed that people not taking green coffee extract had glucose levels of 130 mg/dL one hour after sugar

What to Do If You Can’t Resist Sweets

Diets comprising of starches and simple sugars cause the majority of the population to suffer dangerously high glucose-insulin levels.

As we age, even carbohydrate restriction does not always get us to optimal fasting glucose levels (under 86 mg/dL) because we tend to convert other foods into sugar (via gluconeogenesis).

For the past four years, I have made it a strict habit to take several glucose regulating agents before virtually every meal. The result is that a recent fasting glucose test came in at 81 mg/dL, and I’ve shed considerable abdominal fat.

I cannot emphasize enough, based on the totality of the scientific evidence, the critical need to protect your bloodstream before meals against deadly glucose surges.

Deadly Impact of Obesity

According to the World Health Organization, some 1.5 billion people are obese or overweight.

Each of these obese individuals runs up to a three times increased risk of death compared to normal-weight people.

Obesity results in shortening of the life span by an average of eight to 10 years compared with people at normal weight. For every 33 extra pounds, risk of early death increases by around 30%.

Healthcare costs associated with obesity are exceeding those associated with smoking.

Beyond just looking good, shedding extra pounds is a proven life-saving strategy.
ingestion. In study subjects taking 400 mg of green coffee extract, glucose levels dropped to 93 mg/dL after sugar ingestion. The difference between having a post-load glucose reading of 93 mg/dL compared to 130 mg/dL is about a 70% reduction in heart attack risk.

Green coffee bean extract lowers blood glucose by inhibiting carbohydrate digestive enzymes (similar to the drug acarbose) and suppressing the creation of glucose in the liver (like metformin).

For many aging people, taking a green coffee bean extract capsule before each meal may be all they need to achieve healthier fasting and after-meal glucose levels.

Those seeking to reduce glucose readings down to those who practice aggressive calorie restriction should seek a green coffee extract supplement that also provides chromium, green tea extract, and Irvingia.

**Unique Weight-Loss Mechanisms**

Chlorogenic acid in green coffee extract antagonizes glucose absorption. It apparently does so by shifting the glucose uptake to more distal regions of the small intestine. It also seems to inhibit amylase, the enzyme that breaks down starch into sugar.

What makes chlorogenic acids in green coffee extract particularly unique is that they inhibit glucose-6-phosphatase, an enzyme that promotes glucose synthesis and release in the liver (gluconeogenesis). This lowers blood sugar levels and helps promote weight loss.

Chlorogenic acid has been shown to specifically reduce after-meal glucose peaks associated with carbohydrate ingestion. This lowers insulin activity and reduces fat accumulation—both associated with favorable body mass changes.

Additional research has confirmed that compounds in coffee decrease adipose (fat) tissue. Together, these glucose-lowering and anti-adipose mechanisms make green coffee extracts an exciting natural way to help combat unwanted body fat.

**Preliminary Findings on Green Coffee Extract**

A human study showed that daily consumption of coffee rich in the compounds that are found abundantly in green coffee beans resulted in a lower calorie intake—which caused reduced weight and body fat.

In a 12-week, placebo-controlled study, scientists tested the efficacy of green coffee bean extract. Thirty overweight or obese human volunteers took either the extract or a placebo, dissolved in instant coffee. The extract produced an average 11
pound weight loss. This was paralleled by a decrease in glucose absorption and an increase in glucose utilization. The researchers reported that the lower availability of glucose that results from these effects would cause the body to increase the metabolism of fat reserves, which would eventually decrease body fat and mass.66

A 2011 analysis of published and unpublished clinical human studies on green coffee bean extract concluded that there was an overall significant decrease in body weight. However, the scientists concluded that further rigorous research was needed to conclusively establish the weight-loss efficacy of the extract.67

Dynamic Weight Loss Results

To determine conclusively whether green coffee bean extract has an anti-obesity benefit, scientists set up a randomized, double-blind, placebo-controlled, linear dose, crossover study on humans.1

In a crossover study, participants are cycled through different phases of treatment and placebo. In this case, subjects took a high dose of green coffee bean extract for 6 weeks, a lower dose of green coffee bean extract for 6 weeks, and a placebo for 6 weeks in a randomized, double-blind manner. Between phases, there was a 2-week “washout” period, making the entire study 22 weeks long.1

Crossover studies are considered sound, because each person in the test group serves as his or her own control. This improves the chances of getting an accurate result, because it eliminates the possibility of the outcome reflecting a difference between the active and control groups. To ensure the findings were more representative, the investigation enlisted both men and women.

Participants were restricted to those who were classified as obese or pre-obese, because people who have these conditions are subject to obesity’s metabolic effects and find weight loss difficult to achieve.

To further ensure that any effect on weight, body fat or BMI could be solely attributed to the extract, there were no significant changes in dietary calories or in the dietary percentages of carbohydrates, fat, and proteins at any time during the study. There were also no significant changes in exercise. The daily 350 mg capsules of green coffee bean extract were the only intervention, although in a non-study situation, people seeking weight reduction would ideally combine green coffee bean extract with lower calorie consumption and greater physical activity to promote maximum weight loss.

During the high-dose phase, subjects took 350 mg of extract, three times daily. The lower dose phase included 350 mg of extract, taken twice daily.1 The placebo phase involved a 350 mg dose three times daily of an inert capsule containing an inactive substance.1

The striking results were published in January 2012.1

Over the 22-week trial, investigators found that all subjects experienced a reduction in body weight, BMI, and body fat during both the high-dose and low-dose phases of the study, but not in the placebo phase!

After 12 weeks of administering 350 mg green coffee bean extract three times a day the scientists found that:1

• Weight decreased by over 17.6 pounds on average—with some subjects losing more than 22.7 pounds!
• BMI decreased by an average of 2.92!
Body fat percentage decreased by an average of 4.44%, with some subjects dropping their body fat percentage by 6.44%!

Heart rate decreased by a significant average of 2.56 beats per minute!

The substantial anti-obesity impact was clearly reflected in the finding that a remarkable 37% of participants who were assessed as having pre-obesity (25-30 BMI) at the start of the study had their condition reversed to the normal-weight range!¹

A study follow-up showed that, contrasting with food-restriction diets, a surprising 87.5% of the test subjects were able to maintain their weight loss after completing the study.¹ No side effects were observed.

This and other studies demonstrate the importance of “preparing your body to eat” by taking green coffee bean extract before each meal. The dual effects of reducing after-meal glucose and inducing meaningful weight loss make it a supplement that virtually every aging person should take before eating.

Novel Approach to Reverse Fat Accumulation

Reversing obesity requires attacking it on several fronts, including exercise, diet, and novel interventions such as aggressively lowering glucose and insulin blood levels.

The good news is that scientists have confirmed that green coffee bean extract can inhibit certain obesity-inducing processes. Coffee compounds can reduce body fat, improve lipid profiles, reduce blood glucose, and can decrease the absorption of calories!⁶⁴,⁶⁶,⁷²

There are many diet plans that people are involved with right now. By taking 350 mg of green coffee bean extract before each meal, the fat loss effects may be augmented.¹

In the study showing weight loss of 17.6 pounds after 12 weeks, the human subjects were not told to make any significant changes in calorie composition, calorie intake, or exercise habits!¹ It is important to understand, however, that people who take the time to participate in weight loss studies want to see results, and may instinctively cut some calories and become more active even when they are told not to.

To optimize this natural approach, overweight and obese individuals should take green coffee bean extract and other nutrients like chromium and green tea extract before each meal.

Save Money While Supporting Research

Every time you purchase a Life Extension® product, you contribute to research aimed at extending healthy human life span. Life Extension continues to fund a record number of scientific projects, while battling incompetent bureaucrats who seek to suffocate medical innovation.

An article in this issue by Dr. Mike West describes how $2 million of funding from the Life Extension Foundation® has accelerated a program by which engineered stem cells may someday reverse degenerative aging processes.

During our 24th annual winter Super Sale, all Life Extension formulas are discounted so that members can obtain up-to-date versions at the lowest prices of the year.

Until January 31, 2013, members take advantage of Super Sale discounts to stock up on cutting-edge formulas designed to circumvent the underlying mechanisms of aging—including deadly surplus storage of fat pounds.

For longer life,

William Faloon
References


Remarkable Weight Reduction with

CoffeeGenic™

Green Coffee Bean Extract (GCA™)

In a placebo-controlled, human study, subjects took 350 mg of green coffee extract three times daily (before meals).

Study subjects were not asked to change their calorie intake or exercise level, but people participating in weight loss trials often do make lifestyle changes in order to increase their odds of shedding body fat.

The impressive findings, published in January 2012, noted that men and women lost an average of 17.6 pounds—over 10% of body weight—after 12 weeks of green coffee extract supplementation! There was also an average 4.44% reduction in body fat percentage!

The conclusion is that green coffee extract supports the ability to lose weight. The form of green coffee bean extract used in this successful weight loss study is CoffeeGenic™ Green Coffee Extract (GCA™).

How CoffeeGenic™ Works

The active ingredient in green coffee bean extract is chlorogenic acid.

Published studies on chlorogenic acid demonstrate a wide range of supportive properties related to insulin sensitivity and to glucose formation and absorption.

Clinical research has shown that chlorogenic acid helps limit dangerous after-meal glucose surges, supporting healthy blood sugar levels for those already within the normal range.

CoffeeGenic™ Green Coffee Extract (GCA™) provides a standardized dose of chlorogenic acid extracted from green coffee beans.

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.
**New Comprehensive Formula**

The standardized green coffee extract in the new CoffeeGenic™ Weight Management™ formula has been enhanced with the following nutrients to reinforce the ability to support weight-loss:

1. **Green Tea Decaffeinated Extract**
   
   Green tea contains health-promoting polyphenols, including epigallocatechin-3-gallate (EGCG). A number of studies suggest it helps support healthy metabolic rate—which affects the body's rate of calorie burn.

2. **Iodine**
   
   This trace element is involved in the production of thyroid hormones that regulate the basal metabolic rate—which affects the body's rate of calorie burn.

3. **Chromium**
   
   Chromium plays an important role in glucose utilization and is required for the release of energy from glucose. It is now generally recognized as helping maintain healthy blood sugar levels for those already in the normal range.

4. **Integra-Lean® African Mango IGOB-131®**
   
   Fat cells secrete leptin, a hormone that signals our brain that we’ve eaten enough. But some individuals have become resistant to leptin, resulting in added pounds. An extract from an African mango called Irvingia gabonensis has been shown to support leptin sensitivity—followed by weight loss and a slimming of the waistline. African mango also helps the body control the rate of carbohydrate absorption from the intestines, and therefore, the caloric impact of starchy and sugary foods. And this extract supports healthy levels of adiponectin, a hormone that regulates metabolism of lipids and glucose. Research indicates it has the ability to promote weight loss.

To order CoffeeGenic™ Weight Management™ with Green Coffee Extract (GCA™), call 1-800-544-4440 or visit www.LifeExtension.com

Based on the latest research, **CoffeeGenic™ Weight Management™ with Green Coffee Extract** provides in each capsule:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green Tea decaffeinated extract</td>
<td>50 mg</td>
</tr>
<tr>
<td>CoffeeGenic™ Green Coffee Bean Extract</td>
<td>350 mg</td>
</tr>
<tr>
<td>Integra-Lean® African Mango IGOB-131®</td>
<td>100 mg</td>
</tr>
<tr>
<td>Chromium (as Crominex® 3+ chromium stabilized with Capros®) proprietary extract (seed)</td>
<td>150 mcg</td>
</tr>
<tr>
<td>Iodine (as potassium iodide)</td>
<td>100 mcg</td>
</tr>
</tbody>
</table>

The suggested dose is just one capsule before each meal.

A bottle of 90 vegetarian capsules of CoffeeGenic™ Weight Management™ with Green Coffee Extract (GCA™) retails for $48. If a member buys four bottles during Super Sale, the price is reduced to $28.35 per bottle.

**Caution:** This product may lower blood glucose; consult your healthcare provider before taking this product if you are taking blood glucose-lowering medication.

This supplement should be taken in conjunction with a healthy diet and regular exercise program. Results may vary.

Integra-Lean® Irvingia is protected by U.S. Patent No. 7,537,790. Other patents pending.

IGOB-131® proprietary extract is a registered trademark of Gateway Health Alliances, Inc.

CoffeeGenic™ contains GCA™ which is a registered trademark of Applied Food Sciences, Inc.

**References**

**Bone Restore** combines critical bone boosting nutrients into one superior formula. Bone Restore includes highly absorbable forms of calcium and boron, along with vitamin D3, magnesium, zinc, manganese, and silicon. Bone Restore is now available with or without vitamin K2 (MK-7).

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

The retail price for 150 capsules of Bone Restore is $26. If a member buys four bottles during Super Sale, the price is reduced to $15.53 per bottle. (Item# 01711)

The same Bone Restore formula without vitamin K2 (MK-7) is available as well. The retail price for 150 capsules is $22.50. If a member buys four bottles during Super Sale, the price is reduced to $13.16 per bottle. (Item# 01611)

**Note:** Those who take Super Booster or Super K usually do not need additional vitamin K2. They should order Bone Restore without vitamin K2. Those taking the anti-coagulant drug Coumadin® (warfarin) should use Bone Restore without vitamin K2.

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### Just five capsules of Bone Restore provide:

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Amount</th>
</tr>
</thead>
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<tr>
<td>Highly Absorbable Calcium (as DimaCal® dicalcium malate, TRAACS® calcium glycinate chelate, calcium fructoborate)</td>
<td>1,200 mg</td>
</tr>
<tr>
<td>Vitamin D3</td>
<td>1,000 IU</td>
</tr>
<tr>
<td>Vitamin K2 (as menaquinone-7)</td>
<td>200 mcg</td>
</tr>
<tr>
<td>Magnesium (as magnesium citrate)</td>
<td>100 mg</td>
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<tr>
<td>Boron (calcium fructoborate as patented FruiteX B® OsteoBoron®)</td>
<td>3 mg</td>
</tr>
<tr>
<td>Zinc (as TRAACS® zinc glycinate chelate)</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>

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

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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.
**Higher CoQ10 and B6 Levels Linked to Reduced Coronary Artery Disease Risk**

A recent study performed by scientists at the School of Nutrition, Chung Shan Medical University, Taichung, Taiwan, investigated the relationship between plasma levels of coenzyme Q10 and vitamin B6 and the risk of coronary artery disease.*

The study was comprised of a control group of healthy people with normal blood biochemistry and a case group comprised of patients with at least 50% stenosis of one major coronary artery identified by cardiac catheterization.

The scientists discovered that there was a correlation between higher plasma levels of coenzyme Q10 and vitamin B6 and a reduced risk of coronary artery disease. Further study is needed to examine the benefits of administering coenzyme Q10 in combination with vitamin B6 to coronary artery disease patients, especially those with low coenzyme Q10 levels.

—M. Richmond  

**One Soda a Day May Raise Prostate Cancer Risk**

In a recent study published in the *American Journal of Clinical Nutrition*, Swedish scientists investigated the association between sugar-sweetened beverage consumption and prostate cancer in 8,128 men during a 15-year time span.*

In an interview with the *Agence France-Press*, Isabel Drake, a PhD student at Lund University said, “Among the men who drank a lot of soft drinks or other drinks with added sugar, we saw an increased risk of prostate cancer of around 40%.”

Those who ate a diet heavy on rice and pasta increased their risk of getting milder forms of prostate cancer, which often required no treatment, by 31%, while a high intake of sugary breakfast cereals raised the incidence of milder forms of the cancer to 38%, Drake told *AFP*.

In an editorial for the *American Journal of Clinical Nutrition* about the study, author Dagfinn Aune concludes that, taken together, these studies add to a growing body of observational evidence that soft drink consumption is related to a variety of health concerns, but further prospective studies are needed to assess the real risks that may or may not be involved.

**Editor's Note:** This study helps corroborate the danger of consuming beverages and foods that spike blood glucose levels.

—M. Richmond  
Insufficient Vitamin D Levels Associated with Knee Arthritis Pain

Findings reported in *Arthritis & Rheumatism* suggest a protective effect for increased vitamin D levels against knee osteoarthritis pain, which is greater in African Americans compared to those of European ancestry. African Americans have, on average, lower vitamin D levels compared to Caucasians, which may help explain some of the health disparities observed between these populations.

Forty-five African Americans and 49 Caucasians with osteoarthritis of the knee completed questionnaires concerning knee symptoms and underwent tests of heat and pain sensitivity. Blood samples were analyzed for serum 25-hydroxyvitamin D levels.

African American participants reported more pain in comparison with Caucasian subjects. While half of the Caucasian participants had vitamin D levels that were lower than 30 ng/mL, these insufficient levels occurred in 84% of the African Americans. Average Caucasian vitamin D levels were 28.2 ng/mL, in contrast with 19.9 ng/mL among African Americans.

*Editor's Note:* “Chronic pain is a disease,” explained lead author Toni L. Glover, MSN, ARNP and her associates. “The triage theory, proposed by Ames, hypothesizes long-term micronutrient deficiencies trigger chronic inflammation. In turn, chronic inflammation leads to chronic health conditions, many of which are characterized by pain as a disabling symptom. Recent research by Lee et al. supports the hypothesis that the etiology of osteoarthritis includes a systemic inflammatory component.”

—D. Dye

*Arthritis & Rheumatism. 2012 Nov 7.*

**Study Finds No Association Between Calcium Intake and Arterial Calcification**

Research described in a report published in the *American Journal of Clinical Nutrition* failed to establish a relationship between greater calcium intake and increased calcification of the coronary artery, a condition that characterizes heart disease. The finding contradicts the conclusions of a recent study which suggested that calcium supplements might increase heart attack risk.

Researchers analyzed data from 588 men and 690 women enrolled in the Framingham Offspring Study, which includes children of participants in the Framingham Heart Study. Responses to questionnaires completed between 1998 and 2001 were analyzed for calcium intake from food and supplements. Computed tomography scans conducted between 2002 and 2005 evaluated coronary artery calcification, an indication of calcified plaque in the heart’s arteries.

Adjusted analysis of the data failed to find a significant association between total calcium intake and coronary artery calcification. Similar findings were obtained in separate analyses of calcium supplements and calcium from food.

*Editor’s Note:* The authors note that the Institute of Medicine recently concluded that evidence from clinical trials currently does not support an effect of calcium intake on cardiovascular disease risk.

—D. Dye


**N-Acetylcysteine Could Make Lung Cancer Screening Safer**

The results of a study reported in *Carcinogenesis* suggest that administration of the antioxidant N-acetylcysteine (NAC) could help protect men and women at risk of lung cancer from the cancer-promoting effects of computed tomography (CT) screening.

Researchers at Wake Forest School of Medicine treated male and female mice with a carcinogen found in tobacco smoke and exposed them to varying doses of either whole body CT radiation or no radiation weekly for four weeks. A separate group of female mice was given a diet enhanced with N-acetylcysteine beginning three days before irradiation, and continuing for the four-week radiation treatment period. Some females that did not undergo radiation also received a diet enhanced with NAC.

Eight months following the final radiation treatment, the mice were examined for lung tumors. Treatment with NAC resulted in an amount of tumor formation in irradiated mice comparable to that of animals that were not irradiated.

*Editor’s Note:* Annual CT screening of heavy current and former smokers who are at high risk of developing lung cancer was found to reduce lung cancer mortality by 20% in comparison with screening with chest X-rays in a recent trial. However, a concern has been raised regarding the risks associated with the relatively high amount of radiation delivered by CT scans, which could induce cancer in normal cells or promote the growth of precancerous cells.

—D. Dye

*Carcinogenesis. 2012 Oct 26.*
Diabetes Rates Skyrocket in Southern US

According to a recent report by the Centers for Disease Control and Prevention, between 1995 and 2010 there has been a staggering 82% increase in the rate of diabetes diagnosis among US adults. Diagnosed cases of diabetes increased by at least 50% in 42 US states, of these, 18 experienced increases of 100% or more. The trend is particularly alarming in Southern US states like Oklahoma, where a 226% increase was reported, Kentucky, where rates increased 158%, Georgia, increased 145%, and Alabama up 140%. Appalachian states such as West Virginia also saw an astounding 131% increase.*

CDC scientists speculate that the reason for the increase in people diagnosed with diabetes is due to more people developing the condition. However, the study states that there were fewer deaths due to diabetes indicating that improvements in diabetes treatment may mean that more people are living longer with the disease. According to the Director of the CDC’s Division of Diabetes Translation, “These rates will continue to increase until effective interventions and policies are implemented to prevent both diabetes and obesity.”

—A. Pryce


Compound in Grapes, Red Wine Could be Key to Fighting Prostate Cancer

Resveratrol, a compound found commonly in grape skins and red wine, has been shown to have several beneficial effects on human health, including cardiovascular health and stroke prevention. A University of Missouri researcher has discovered that the compound can make prostate tumor cells more susceptible to radiation treatment, increasing the chances of a full recovery from all types of prostate cancer, including aggressive tumors.*

Prostate tumor cells contain very low levels of two proteins, perforin and granzyme B, which can function together to kill cells. However, both proteins need to be highly “expressed” to kill tumor cells. In the study, Michael Nicholl, an assistant professor of surgical oncology in the MU School of Medicine said that when he introduced resveratrol into the prostate tumor cells, the activity of the two proteins increased greatly. Following radiation treatment, Nicholl found that up to 97% of the tumor cells died, which is a much higher percentage than treatment with radiation alone.

If additional studies, including animal studies, are successful within the next few years, MU officials will request authority from the federal government to begin human drug development. After this status has been granted, researchers may conduct human clinical trials with the hope of developing new treatments for cancer.

—M. Richmond

New Vitamin D3 Softgels
For Superior Absorption

Study after study confirms the vital importance of maintaining optimal levels of vitamin D. Research often indicates that a blood level between 50–80 ng/mL of 25-hydroxyvitamin D is ideal. Because people have individual requirements, Life Extension® has created a large selection of vitamin D supplements 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 formulas. A new vitamin D is now available in superior absorbing softgels. A recent study demonstrated that the use of one 5,000 IU vitamin D softgel daily resulted in a near 30% increase in vitamin D levels in just 60 days.

Vitamin D3 1,000 IU
250 softgels
Retail: $12.50
Four-bottle during Super Sale Member Price: $7.59 ea.
Commercial companies offered only 400 IU vitamin D products when Life Extension long ago introduced a 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 # 01751

Vitamin D3 5,000 IU
60 softgels
Retail: $11
Four-bottle during Super Sale Member Price: $6.68 ea.
For those already obtaining 1,000–3,000 IU of vitamin D in their multi-nutrient formulas, this 5,000 IU potency is what many need to achieve optimal vitamin D blood levels.

Item # 01713

Vitamin D3 7,000 IU
60 softgels
Retail: $14
Four-bottle during Super Sale Member Price: $8.51 ea.
Some individuals (such as those weighing more than 180 pounds) may require higher potencies of vitamin D. When combined with 1,000–3,000 IU obtained from multi-nutrient formulas, this 7,000 IU vitamin D3 softgel should enable these individuals to attain 25-hydroxyvitamin D blood levels above the desired range of 50 ng/mL.

Item # 01718

Vitamin D3 5,000 IU
60 capsules (non-softgel)
Retail: $14
Four-bottle during Super Sale Member Price: $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 # 01573

Vitamin D3 Liquid Emulsion 2,000 IU
1 ounce
Retail: $28
Four-bottle during Super Sale Member Price: $16.88 ea.
For those rare individuals who have difficulty absorbing enough vitamin D3 from softgels, 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

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 high blood calcium levels.

*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.
Advanced RESVERATROL Formula

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 botanical 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 $27.90 per bottle. The suggested dose of one capsule a day provides:

- Trans-Resveratrol 250 mg
- Grape-Berry Actives 85 mg
- Quercetin 60 mg
- Trans-Pterostilbene 0.5 mg
- Fisetin 10 mg

To order Optimized Resveratrol with Synergistic Grape-Berry Actives, call 1-800-544-4440 or visit www.LifeExtension.com

References
10. Xenobiotica. 2000 Sep;30(9):857-66

CAUTION: If you are taking anti-coagulant or anti-platelet medications or have a bleeding disorder, consult your healthcare provider before taking this product.
Preserve Youthful Cellular ENERGY with Next-Generation LIPOIC ACID

Published studies have shown the critical importance of lipoic acid in supporting healthy mitochondrial function. Unlike other forms of lipoic acid, SUPER R-Lipoic Acid is more bioavailable, stable, and potent, achieving 10-30 times higher peak blood levels than pure R-lipoic acid. This unique sodium-R-lipoate can help you reach peak plasma concentrations within just 10-20 minutes of supplementation. Super R-Lipoic Acid provides more of the active “R” form of lipoic acid than any other supplement.

A bottle of Super R-Lipoic Acid containing 60 vegetarian capsules retails for $49. If a member buys four bottles during Super Sale, the cost is only $30.38 per bottle. Each capsule contains 300 mg of stabilized, Bio-Enhanced® Super R-lipoic acid supplying 240 mg of R-lipoic acid. Suggested dose is one capsule daily.

References:

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

Items # 01208

To order Super R-Lipoic Acid, 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.
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 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.

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

- **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.

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

**JUST ONE SOFTGEL OF SUPER BOOSTER SUPPLIES:**

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamin K2 (as menaquinone-7)</td>
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<tr>
<td>Vitamin K2 (as menaquinone-4)</td>
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<tr>
<td>Vitamin K1 (as phytonadione)</td>
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<td>Sesame lignans</td>
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<tr>
<td>Lycopene</td>
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<td>Lutein</td>
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<td>Vitamin B12</td>
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<td>Vitamin C</td>
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A bottle of 60 Super Booster softgels retails for $42. If a member buys four bottles during Super Sale, the price is reduced to $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 soybeans.

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

Tomat-O-Red® is a registered trademark of LycoRed, Ltd.

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.
BREATHROUGH in Protecting Arteries Against After-Meal Glucose Spikes

Did you know that your risk of suffering from cardiovascular death is the greatest in the **two-hour time period** after you eat a meal? That’s partly because during that time, you can experience dangerous **blood sugar spikes** that **acutely** impair blood flow through vital arteries, ultimately leading to a heart attack or stroke.

And while you may not entirely eliminate these **after-meal** blood sugar surges, you can build up your body’s defenses against those spikes to protect your cardiovascular system.

In a study that may represent a breakthrough in the **prevention of heart attack**, the proper intake of **gamma tocopherol** was shown to limit the artery damaging impact of an **after-meal** glucose burst.

This human study, published in **July 2012**, showed an expected **30-44%** decrease in **endothelial function** (as measured by arterial blood flow) in men after consuming 2.5 ounces of pure **glucose**. Men who took **gamma tocopherol** five days before the **glucose** challenge, however, showed no significant loss of **endothelial function**.¹
This well-designed study showed how gamma tocopherol, functioning via several proven pathways, prepared the arterial endothelium to cope with the attack of after-meal glucose.

Foundation members have supplemented with gamma tocopherol since as early as 1996. This article describes the ways gamma tocopherol builds strong countermeasures into blood vessels, preparing them to survive and thrive even after a spike in blood sugar.²
After-Meal Blood Sugar Spikes Increase Heart Attack Risk

When your heart muscle calls for more blood to sustain a strong pumping action, it needs it now. Under normal circumstances, the coronary arteries—those vessels that provide blood to the heart muscle—respond by dilating and increasing blood flow accordingly. When that response fails, heart muscle cells can begin to die within minutes.1

The *after-meal* blood sugar surge directly impairs your arteries’ ability to respond to that immediate demand for increased blood flow.4,5 That’s one of the reasons why diabetics have such a high rate of heart attacks and other cardiovascular disorders.6

But even if you don’t have diabetes, a “normal” *fasting* blood sugar measurement does not protect you against the harmful effects of the *after-meal* spike in blood glucose.4,5,8 Studies show that the risk of cardiovascular death increases in the two-hour time period after you eat a meal, when blood sugar exceeds just 90 mg/dL—a number well below the definition of diabetes.9

People who have normal fasting glucose but who fail a glucose tolerance test (blood sugar measured 2 hours after a test “meal” of glucose) are said to have “impaired glucose tolerance.” Their risk for cardiovascular disease raises sharply, the direct consequence of their arteries’ inability to dilate appropriately.3,9,10

In fact, many studies now show that the 2-hour glucose tolerance test is a more telling predictor of heart attacks than the much-touted fasting glucose test.11

How After-Meal Blood Sugar Impacts Your Cardiovascular Risk

Your risk for heart attacks, strokes, and other forms of cardiovascular disease rises dramatically when your after-meal glucose spikes.

One study showed that people who have elevated after-meal glucose levels have a 40% higher risk for cardiovascular disease in general, and a 56% greater risk for coronary artery disease, compared with normal levels.7

Another study found that men with the highest after-lunch blood sugar levels were more than twice as likely to have a “cardiovascular event” compared with those who had the lowest levels. In women that figure rose to an ominous 4.5-fold increase.11

In a study of non-diabetic people with metabolic syndrome, each increase in after-meal blood sugar of 18 mg/dL raised the risk of cardiovascular death by 26%.12

How does the after-meal burst of glucose cause such devastation?

Glucose has a powerful oxidizing effect on the arterial lining (the endothelium) that governs blood flow through the arteries.4,13 Oxidation products interfere with the production and bioavailability of nitric oxide, the signaling molecule that triggers arteries to dilate or constrict in response to changes in demand for blood flow.14-18

Worse, oxidation speeds the destruction of existing nitric oxide molecules, further impairing the endothelium’s ability to regulate blood flow in major arteries, including the coronaries.19
Together, these effects mean that a surge in blood sugar rapidly impairs your arteries’ ability to respond to your heart muscle’s immediate needs for more blood flow.\(^\text{14}\) To make matters worse, glucose surges raise levels of “adhesion molecules” that make both arteries and platelets “stickier,” increasing the risk of a fatal clot in a coronary artery.\(^\text{20}\)

The stakes couldn’t be higher: Failure to protect your arteries from glucose spikes will starve your heart of blood flow, resulting, at best in an attack of angina, and at worst in a fatal heart attack.

You can’t completely avoid the spike in glucose that occurs after you eat. However, you can prepare your endothelial cells to cope with the after-meal surges in blood sugar with gamma tocopherol.

### Unique Property of Gamma Tocopherol

**Alpha tocopherol** is the form of vitamin E used most commonly in commercial supplements. However, studies indicate that it’s the **gamma tocopherol** form of vitamin E that is more ideally suited for protecting your heart from after-meal glucose surges.

Studies show that levels of **gamma tocopherol** are a better predictor of lower heart attack risk than **alpha tocopherol**.\(^\text{21-25}\) Gamma tocopherol is a superior antioxidant that traps reactive **oxygen** species, reactive **nitrogen** species, and other dangerous molecules triggered by the after-meal glucose burst.\(^\text{21,22,26,27}\) If these dangerous molecules go unopposed, they attack fats in your artery linings, depressing nitric oxide levels and promoting atherosclerosis.\(^\text{28,29}\)

Gamma tocopherol also provides anti-inflammatory effects that fight atherosclerosis induced by elevated after-meal glucose spikes.\(^\text{27,28,30-33}\) Gamma tocopherol is converted in your body to **gamma-CEHC**, a metabolite that helps shed excessive sodium; that’s a potential benefit for those whose mealtime sodium intake is higher than desirable.\(^\text{21,22,26}\)

Finally, compared with alpha tocopherol, **gamma tocopherol** appears to be more readily absorbed into **endothelial cells**, where it can exert its antioxidant effects to protect endothelial health.\(^\text{34}\)

Unfortunately, studies show that high intakes of alpha tocopherol suppress blood and tissue levels of the more important gamma tocopherol. This finding explains some of the apparently contradictory findings in studies done on vitamin E supplementation (see the SIDEBAR on the next page for other factors).\(^\text{21,15,36}\)

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**What You Need to Know**

**Fortify Your Arteries Against Damage Caused by Post-Meal Glucose Surges**

- The burst of glucose release that follows an hour or two after a meal is one of the most deadly risk factors for heart attacks.\(^\text{11,12}\)
- The oxidative effect of after-meal glucose spikes impairs your arteries’ ability to deliver blood flow to meet demand.\(^\text{4,5,14}\)
- That impairment is itself the result of reduced availability of nitric oxide, your body’s arterial signaling mechanism.\(^\text{14-18}\)
- Gamma tocopherol, a member of the vitamin E family, directly counteracts oxidant damage to nitric oxide signaling between endothelial (artery lining) cells and arterial muscles that control blood flow.\(^\text{14}\)
- Human studies now demonstrate that gamma tocopherol supplementation preserves endothelial function, allowing arteries to deliver their blood flow unimpaired, even following a glucose-rich meal.\(^\text{1,2}\)
- Gamma tocopherol supplements are an essential part of your campaign to prepare your body before a meal for the inevitable blood sugar spike that follows it.\(^\text{1}\)
Taken together, these factors led researchers at the University of Connecticut to explore the effects of gamma tocopherol on preventing the decline in endothelial function that accompanies the after-meal sugar spike. Let’s now examine their findings.

Gamma Tocopherol Protects Against Blood Sugar Surges

In the year 2000, a study was published demonstrating that:

1. After-meal blood sugar spikes in non-diabetic patients cause an immediate decline in endothelial function, and
2. A combination of antioxidant vitamins could reverse that decline.8

This information remained dormant for more than a decade—until researchers in Connecticut and Korea rediscovered and amplified the findings. These scientists had already discovered that an after-meal glucose surge raised the levels of methylglyoxal, a destructive byproduct of glucose metabolism that’s increased by oxidant stress.2

Suspecting that a powerful antioxidant such as gamma tocopherol could reduce the production of methylglyoxal following a glucose challenge, they supplemented 12 healthy young men with 500 mg/day of gamma tocopherol.2 As expected, methylglyoxal levels skyrocketed in the unsupplemented group following the glucose challenge.

Those supplemented with gamma tocopherol, on the other hand, had completely eliminated the rise of methylglyoxal, while markers of total antioxidant capacity rose substantially.

That study clearly proved that short-term gamma tocopherol supplementation could counteract one major oxidative effect of the glucose surge. Armed with this information, the researchers turned their focus to the next major consequence of the glucose surge, namely, impaired endothelial function. They designed a study that would reveal any changes in endothelial function and nitric oxide activity that might result from gamma tocopherol supplementation.1

The Breakthrough Gamma Tocopherol Study

In this study published in July 2012, fifteen young men underwent a baseline ultrasound test to detect how well their arteries would respond to blood flow changes. Blood tests were also performed.

The men then received a 5-day supplement with a mixture containing 500 mg of gamma tocopherol, 60 mg of alpha tocopherol, and small amounts of beta-and delta tocopherols. The ultrasound blood flow test and blood work were then repeated.1

Next the subjects received 2.5 ounces of pure glucose, and their endothelial function was monitored by ultrasound regularly for 3 hours.

The findings were remarkable.

Blood levels of gamma tocopherol rose 3-fold. Levels of the active metabolite, gamma-CEHC, rose 9-fold—all without affecting alpha tocopherol levels at all.1

Following the glucose “meal,” endothelial function, as measured by enlargement of blood vessels due to increases in blood flow, declined 30-44% in the unsupplemented state. But with supplementation, there was no significant loss of endothelial function.1

Gamma Tocopherol: Resolving a Scientific Paradox

Vitamin E has long posed a paradox to scientists.

Large epidemiological studies repeatedly show that a high intake of vitamin E-rich foods is protective against heart disease, but studies using vitamin E (alpha tocopherol) supplements have sometimes failed to show a protective effect.32

Studies of gamma tocopherol suggest a resolution to that paradox. Gamma tocopherol is the major form of vitamin E in natural foods; it has antioxidant, anti-inflammatory, and sodium-excreting properties.21,22,31 That explains the positive results in studies of natural vitamin E intake from food.

But alpha tocopherol is the vitamin E form used in virtually all previous supplementation studies. Its spectrum of effects is narrower and weaker than gamma tocopherol, explaining the failure of those studies to show benefit.26,32,38 Compounding the problem, alpha tocopherol lowers gamma tocopherol levels in blood and tissues, further reducing any potential benefit of alpha tocopherol supplementation.21,32,36

These studies were simply done with the wrong form of vitamin E!

With the vitamin E paradox resolved, we can expect to see even greater benefits from supplementation with gamma tocopherol, one of the more potent forms of the vitamin.32
Gamma tocopherol suppressed the after-meal increase in fat oxidation products and the nitric oxide disruption they caused.

In short, this well-designed study showed that supplementation with 500 mg/day of gamma tocopherol along with smaller amounts of other forms of vitamin E prepared arterial endothelium to cope with the attack of after-meal glucose. Supplementation didn’t change the fact of the surge; rather, it provided endothelial cells with the defense mechanisms they needed in order to survive it.

Most Life Extension® members take over 200 mg a day of gamma tocopherol. Considering the many other similar nutrients they take like pomegranate and lycopene, they may not need to take any additional gamma tocopherol. For those choosing to capitalize on the added benefits of gamma tocopherol, supplementing approximately 12 hours before glucose consumption is advisable because studies show it takes 12 hours for maximal blood levels of the active metabolite gamma-CEHC to be reached.

Summary

After you eat a meal—even a healthy meal—your arteries and their delicate endothelial linings are subject to a short but dangerous rise in blood sugar. That blood sugar surge directly impairs your ability to regulate blood flow, raising your risk for a heart attack or other cardiovascular disaster.

You need to defend yourself against that after-meal blood sugar escalation, in order to protect your arteries and preserve their ability to deliver blood to your laboring heart muscle.

Gamma tocopherol has now been shown in a human study to block glucose-induced impairment of nitric oxide and to sustain endothelial function following a meal.

Supplementation with gamma tocopherol, therefore, allows you to prepare your body for the harmful after effects of a meal.

Since higher gamma tocopherol levels are associated with lower risk of coronary heart disease, gamma tocopherol supplementation may reduce your risk, and restore your arteries’ natural abilities to manage the effects of deadly after-meal glucose surges.

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

References


7. FEBRUARY 2013


**Unleash the Power of the Milk Thistle Seed**

Milk thistle extract has long been thought of as one of nature’s most potent weapons to support human health, but until recently, the technology hasn’t been available to fully harness this plant’s potential. Among the compounds waiting to be unlocked are a slew of nourishing antioxidants and flavonolignans valued for their role in ensuring healthy liver function.*

Life Extension® has uncovered an advanced extraction technology that has enabled scientists to isolate silymarin constituents and to test their efficacy against various cell lines. Among the compounds tested, silymarin constituents **isosilybin A and B** proved to be the most efficient in maintaining healthy cell division.²

**Certified European Milk Thistle** is the first milk thistle extract to contain standardized, high potencies of silymarin, silibinins, and **isosilybin A and B**—providing the full spectrum of milk thistle’s liver and prostate protective compounds. Each capsule of this advanced formula provides:

- **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 60 vegetarian capsule bottle of **Certified European Milk Thistle** retails for $34. If a member buys four bottles during Super Sale, the cost is reduced to only $20.25 per bottle—a savings of nearly one third!

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!

Reference

*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.
Tender, sensitive joints can limit everyday activities. As you age and continue to put stress on your joints, you can compromise joint cartilage—which exposes small collagen fibers. Your body’s immune system mistakenly identifies these collagen fibers as “foreign cells.” This triggers an inflammatory response against the collagen-containing cartilage in your own joints. Inflammation and joint discomfort can soon follow.

Data shows that a patented collagen provides targeted support for the immune issues related to joint discomfort. To meet this urgent need, Life Extension® now offers Bio-Collagen with Patented UC-II®—a novel form of undenatured type II collagen from chicken cartilage.

Taken orally, UC-II® travels to the intestinal tract where it “introduces” the immune system to the same type of collagen molecules found in joint cartilage.

**Advanced Molecular Structure**

Not just any form of collagen will do. Normally, when chicken collagen is processed, its molecular shape is changed. It loses bioactivity and becomes denatured—which researchers found has no beneficial effect on the immune system.

Fortunately, a unique processing technique preserves the correct molecular shape of the collagen and preserves its bioactivity—producing a form known as undenatured collagen.

The result of this innovative process is an undenatured chicken collagen called Bio-Collagen with Patented UC-II®.

**Scientifically Validated**

Scientific studies have found that UC-II® reduced sensitive joint discomfort and eased joint function. One double-blind, placebo-controlled study on patients found that UC-II® provided relief by 33%, and decreased joint discomfort scores by a remarkable 40%—in just 90 days!

**Convenient One-Per-Day Dose**

The suggested daily serving of one capsule of Bio-Collagen with Patented UC-II® supplies 40 mg of this proprietary blend. The retail price of a bottle of 60 capsules of Bio-Collagen with Patented UC-II® is $36. If a member buys four bottles during Super Sale, the price is reduced to $21.60 per bottle or just $12 a month.

To order Life Extension® Bio-Collagen with Patented UC-II®, 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.
ARE YOU TAKING THE OPTIMAL FORMS OF VITAMIN E?

According to the *Proceedings of the National Academy of Sciences*, alpha tocopherol (regular vitamin E) displaces critically important gamma tocopherol in the cells. While alpha tocopherol inhibits free-radical production, gamma tocopherol is required to trap and neutralize existing free radicals.

Prestigious scientific journals have highlighted gamma tocopherol as one of the most critically important forms of vitamin E for those seeking optimal health benefits.

Most commercial vitamin E supplements contain little, if any, gamma tocopherol. They instead rely on alpha tocopherol as the primary ingredient. However, it is gamma tocopherol (not the alpha form) that quenches peroxynitrite, the free radical that plays a major role in the development of age-related decline.

**SESAME LIGNANS: THE NATURAL VITAMIN E BOOSTER**

Life Extension® has uncovered research suggesting that adding sesame lignans to gamma tocopherol may significantly enhance its beneficial effects. Sesame and its lignans have been shown to boost antioxidant levels and help maintain already-normal blood pressure.

In a human study that combined gamma tocopherol with sesame lignans, gamma tocopherol/sesame was 25% more effective than gamma tocopherol/tocotrienols in suppressing tissue measurements for free-radical and inflammatory damage. Since tocotrienols are considered nature's most potent antioxidants, the fact that low-cost gamma tocopherol with sesame is more effective is a remarkable finding.

Life Extension fortified the popular Gamma E Tocopherol supplement with standardized sesame lignans long ago. Consumers thus obtain superior benefits at a much lower cost.

**WORLD’S MOST COMPREHENSIVE VITAMIN E FORMULA!**

The Gamma E Tocopherol with Sesame Lignans formula provides potent doses of critically important gamma vitamin E along with sesame lignans to augment its antioxidant effects. Suggested dose is one softgel daily.

The retail price for 60 softgels of Gamma E Tocopherol with Sesame Lignans is $32. If a member buys four bottles during Super Sale, the price is reduced to only $19.58 per bottle.

Each softgel of Gamma E Tocopherol with Sesame Lignans provides:

- Gamma tocopherol 215.4-244.12 mg
- Delta tocopherol 89.75-125.65 mg
- Alpha tocopherol 30.51-35.9 mg
- Beta tocopherol 0-7.18 mg
- Sesame seed 20 mg

(Sesamum indicum) lignan extract

Contains soybeans.

Antioxidant Vitamins & Cancer. Some scientific evidence suggests that consumption of antioxidant vitamins may reduce the risk of certain forms of cancer. However, the FDA does not endorse this claim because this evidence is limited and not conclusive.

NOTE: Those taking Super Booster do not usually require additional gamma tocopherol.

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

**References**


To order Gamma E Tocopherol with Sesame Lignans, 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.
Commercial “one-a-day” supplements provide very low potencies.

The box to the left reveals how much more potent Two-Per-Day is compared to the leading commercial multi-vitamin.

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 available in tablet or capsule form.

Commerical supplements often contain the cheapest form of nutrients that don’t provide optimal benefits. For example, the 50 IU of synthetic vitamin E contained in Centrum® Silver® Adults 50+ may provide relatively little vitamin E to the bloodstream compared to the 100 IU of natural vitamin E in Two-Per-Day.

Two-Per-Day provides the three most effective forms of selenium which are sodium selenite, L-selenomethionine, and Se-methyl L-selenocysteine.

A bottle containing 120 tablets of 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. (Item #01714) A bottle containing 120 capsules of Two-Per-Day Capsules retails for $22. If a member buys four bottles during Super Sale, the price is reduced to $13.50 per bottle. (Item #01715)

Each bottle of Two-Per-Day lasts 60 days, so members can obtain the benefits of this high-potency formula for as little as $6.07 per month during Super Sale.

Contains soybeans. Due to the source of the kelp, this product may contain fish and shellfish.

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.
YOU MAY BE ONE OF THEM.

Optimal uptake of magnesium may now be obtained in a highly absorbable form called **Neuro-Mag™** available in capsules or tasty natural lemon-flavored powder.

---

**A Critical Brain Booster. . .**

Magnesium is needed for more than 300 biochemical reactions in the body.²

Long known for its role in cardiovascular³⁴ and bone health,⁵ researchers are now focusing intensely on magnesium’s benefits for **cognitive function.**² It is very hard for your body to maintain optimal levels of magnesium in the brain.¹ This is of special concern for maturing individuals, as magnesium deficiency increases over time.¹

**Absorbs Into the Brain**

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, magnesium L-threonate contained in **Neuro-Mag™** boosted magnesium levels in spinal fluid by an impressive 15% compared to no increase with conventional magnesium.²

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.²

**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 same brain health-supporting magnesium is also available in a good tasting powder mix called **Neuro-Mag™** Magnesium L-Threonate Powder. In addition to its appealing natural 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.

A bottle containing 90 vegetarian capsules of **Neuro-Mag™** Magnesium L-Threonate or 30 scoops of **Neuro-Mag™** Magnesium L-Threonate Powder retails for $40. If a member buys four bottles during **Super Sale**, the price is reduced to $24.30 per bottle. Contains corn.

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**References**

Breast cancer is the disease women fear most.\textsuperscript{1} Even though radiation emitted from mammograms causes some breast cancers, 39 million women undergo mammography\textsuperscript{2} each year in an attempt to detect tumors at an early, curable stage. The consensus is more lives are saved with mammograms than are killed by the radiation.\textsuperscript{3,4}

In the United States, over 200,000 women are diagnosed with some form of breast cancer each year and around 40,000 die from it.\textsuperscript{5} This means that most victims’ lives are spared, but at the cost of surgical mutilation, radiation injury to the chest cavity, systemic damage by chemotherapy, and acute menopause by estrogen-blocking drugs.

With 12\% of all American women destined to develop a breast tumor,\textsuperscript{6} taking preventative steps makes sense, especially if the same approach also slashes risk of dementia and heart attack…and helps shed fat pounds.

An abundance of published research links high-normal blood glucose levels to increased breast cancer risk.\textsuperscript{7-11} This article reviews the evidence and emphasizes the importance of maintaining glucose at safe low-normal ranges.
In response to reports showing higher rates of breast cancer amongst type II diabetics, Life Extension researchers conducted an analysis of the scientific literature to ascertain if there was a connection between higher “normal” blood glucose and breast cancer risk.

We identified 12 separate studies that examined blood glucose levels in relationship to incidence of breast cancer. Out of these 12 studies, 9 showed an association of higher fasting glucose or other indicators of poor glycemic control with increased cancer risks.

The take-home message in examining these 12 independent studies is to initiate steps to lower glucose (which also reduces insulin) in order to help prevent the most prevalent malignancy striking women today.

While glucose provides fuel for rapidly dividing cancer cells, insulin is a hormonal stimulator for cellular proliferation. The role of elevated blood glucose and insulin on cancer incidence and progression is being increasingly recognized and was the subject of a recent report on the CBS news magazine show 60 Minutes.
Compelling Findings

Life Extension®’s analysis of 12 independent studies identified strong data suggesting increased breast cancer risk amongst women with so-called “normal” blood glucose levels. For example, premenopausal women with a blood sugar above 84 mg/dL had more than two-times the risk of developing breast cancer compared to those with a blood sugar below 84 mg/dL.7

Another study compared women with a fasting glucose under 100 mg/dL with those whose blood glucose was between 100-125 mg/dL. Women with the higher glucose readings had a 23% increased risk of breast cancer after multivariate analysis.8

A study of 10,633 women from Italy found significant relationships between blood sugar levels and breast cancer risk.9 In this study, women in the highest glucose quartile (median 96 mg/dL) had a 63% increased risk for breast cancer compared to those in the lowest quartile (median 73 mg/dL) after being “fully adjusted” for multiple variables. The authors stated in the discussion:

“...we found that elevated fasting glucose levels were significantly associated with subsequent occurrence of breast cancer. The association was significant both in pre and postmenopausal women.”

Glucose: Our Modern Day Enemy

High-normal blood glucose is a leading cause of premature death overlooked by mainstream doctors today.

Not only do we eat too many starches and simple sugars, but our aging liver synthesizes too much glucose internally via a process known as gluconeogenesis.

More than 80% of the adult population has glucose levels that are too high.26 Most of these people are not diagnosed with diabetes, but just by having high-normal fasting glucose (over 85 mg/dL), risk of death from cardiovascular disease increases by 40% according to a long-term study conducted on close to 2,000 people.27

This and other studies show that even in otherwise healthy people, those with high-normal glucose are at increased risk of vascular death. For example, those with higher after-meal glucose (for example, 101 mg/dL compared to 83 mg/dL) had a 27% increased risk of death from stroke.28

A large body of published scientific research documents that people with higher after-meal glucose spikes have sharply increased risks for most of the diseases we associate with aging, such as cancer, Alzheimer’s, kidney failure, retinal damage, and vascular blockages.29-42
ELEVATED GLUCOSE INCREASES INCIDENCE OF BREAST CANCER AND BRAIN SHRINKAGE

Chart 1 on this page shows the horrific consequences when glucose levels are elevated above optimal ranges. (We classify optimal fasting glucose in aging humans as under 86 mg/dL).

High-Normal Blood Sugar Harms Brain

In September 2012, Australian researchers published findings showing that blood glucose at the high end of normal resulted in significant brain shrinkage.47,48

The shrinkage occurred in regions of the brain (hippocampus and amygdala) involved in memory and other critical functions. Atrophy (shrinkage) in these brain areas worsens memory.47,48

For this study, neuroscientists at Australian National University in Canberra studied 249 people in their early 60s. Each of them had blood sugar levels in the normal range. The study subjects’ brains were scanned at the beginning of the study, and again four years later.

Comparing the before and after images, the researchers found significant brain shrinkage among those whose blood sugar levels were high but still below the World Health Organization’s threshold for pre-diabetes (fasting glucose under 110 mg/dL). The researchers report that these high normal levels may account for a 6% to 10% decrease in the volume of the hippocampus and amygdala regions of the brain.

The lead researcher stated, “It is this chronic exposure to high glucose levels that is more likely to lead to poorer brain health.” He cautioned that these findings should not be taken “lightly,” as the association between high-normal blood sugar and brain shrinkage was “robust.”47,48

What Should People Do To Reduce Their Blood Glucose Level?

Reducing ingestion of simple sugars and starches helps, but as people age, most of them produce excess glucose in their liver (gluconeogenesis) that causes higher glucose levels no matter how many carbohydrates they restrict.

The key is to inhibit intestinal absorption of carbohydrates, suppress excess production of glucose in the liver, and improve glucose utilization in tissues through enhanced insulin sensitivity.

Proven Methods To Lower Blood Glucose

Severely restricting calorie consumption will sharply lower glucose and insulin.50,51 Life Extension has published articles over the years about the glucose-insulin lowering effects of following low calorie diets.32-54 Few people, however, can adhere to this strict regimen. At a minimum, reducing the amount of starches and simple sugars in the diet will help reduce blood glucose.

**CHART 1: Increased Health Risks in People with “Normal” Glucose Levels**

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>GLUCOSE LEVELS (MG/DL)</th>
<th>INCREASED RISK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing Type II Diabetes</td>
<td>100-104</td>
<td>Up to 283%43</td>
</tr>
<tr>
<td>Stomach Cancer</td>
<td>95-105</td>
<td>Up to 130%44</td>
</tr>
<tr>
<td>First-time Heart Attack</td>
<td>Above 88</td>
<td>242%45</td>
</tr>
<tr>
<td>Need for Coronary Bypass or Stent Procedure</td>
<td>Above 95</td>
<td>73%46</td>
</tr>
</tbody>
</table>
ELEVATED GLUCOSE INCREASES INCIDENCE OF BREAST CANCER AND BRAIN SHRINKAGE

What You Need to Know

Preserve Brain Health and Reduce Cancer Risk by Controlling Sugar Spikes

- In the United States, over 200,000 women are diagnosed with some form of breast cancer each year and around 40,000 die from it.
- An abundance of published research links high-normal blood glucose levels to increased breast cancer risk.
- Fasting glucose above 84 mg/dL results in over a 150% increase in breast cancer incidence compared to those with lower levels.
- Recent findings show blood glucose at the high end of normal resulted in significant brain shrinkage particularly in the regions of the brain (hippocampus and amygdala) involved in memory and other critical functions.
- More than 80% of the adult population has glucose levels that put them at increased risk of heart disease, stroke, dementia, and cancer.
- Reducing ingestion of simple sugars and starches helps control blood sugar levels, but as people age, most of them produce excess glucose in their liver (gluconeogenesis) that causes higher glucose levels no matter how many carbohydrates they restrict.
- The key is to inhibit intestinal absorption of carbohydrates, suppress excess production of glucose in the liver, and improve glucose utilization in tissues through enhanced insulin sensitivity.

More people are asking their doctors to prescribe an anti-diabetic drug called metformin to be taken before most meals, even if they are not medically classified as diabetic. Metformin functions via several mechanisms to lower blood glucose levels including impeding excess production of glucose in the liver (gluconeogenesis) and improving insulin sensitivity.55

While metformin has incredible health benefits for non-diabetics, most doctors won’t prescribe it to healthy people. The good news is that standardized green coffee bean extract works in similar ways as metformin and can be obtained without a prescription. A number of published studies show that green coffee bean extract lowers after-meal glucose surges to safe ranges that have been shown to protect against heart attack. One study showed that standardized green coffee extract reduced after-meal glucose by 32%.56

Ensuring adequate intake of nutrients like chromium,57 lipoic acid,58 and green tea extract59-63 improves insulin sensitivity, as does ensuring that you maintain youthful blood levels of hormones like DHEA.64-65

Heavy Coffee Drinkers Benefit

If one drinks lots of black coffee before meals, they can lower their blood sugar levels and reduce their risk of diabetes, heart disease, and certain cancers. A study that received a lot of publicity showed that people who drink 12 cups of coffee daily lower their diabetes risk by 67%. Since heart attack is the leading killer of diabetics, preventing diabetes also prevents heart attack.66

The problem is that heavily roasted coffee destroys the primary ingredient (chlorogenic acid) thought to protect against disease—which is why it takes so much coffee to produce a substantive effect. Most people find it easier to take a standardized green coffee extract capsule before each meal to help protect against high blood glucose levels, or drink chlorogenic-fortified coffee.

Why Aren’t Doctors Taking Steps To Lower Blood Glucose Levels?

Doctors rely on outdated reference ranges, meaning they accept dangerously high glucose levels as being normal. Yet more than 80% of the adult population has glucose levels that put them at increased risk of heart disease, stroke, dementia, and cancer.26,67-69 The bottom line is that doctors are not lowering their patient’s glucose levels enough to prevent these needless diseases.
As tens of millions of Americans become “newly insured” because of the Affordable Care Act, doctors will have less time to scrutinize their patients’ glucose levels.

To put it bluntly, while demand for health care will skyrocket because of the federal government’s new mandate for virtually everyone to have health insurance, there is no corresponding increase in the supply of doctors. So expect delays in getting appointments, long waits at medical offices, and even less individual attention paid to you by physicians.

**Taking Charge of Your Blood Glucose**

For more than 30 years, the Life Extension Foundation® has advocated members keep their fasting glucose in low normal ranges, and an abundance of peer-reviewed published research findings validates this long-standing position.27,70-90

A priority at Life Extension is to review member’s blood test results and recommend aggressive steps to get glucose levels to the ultra-safe low ranges that published studies show protects against heart attack and other common diseases.26-27,91

What you do to achieve optimal fasting glucose of less than 86 mg/dL is less important than what your blood test results reveal.

If your last blood test showed fasting glucose of 86 mg/dL or higher, cut back on carbs, take 350 mg of green coffee extract before each meal, and initiate other proven strategies to suppress glucose absorption, inhibit gluconeogenesis, and improve insulin sensitivity.

**Summary**

*High-normal* blood glucose is a leading cause of premature death overlooked by mainstream doctors today. More than 80% of the adult population has glucose levels that are too high. An abundance of published research links high-normal blood glucose levels to increased breast cancer risk. New research links even high-normal blood sugar levels to brain shrinkage in key areas involved with memory. Reducing ingestion of simple sugars and starches helps, but as people age, most of them produce excess glucose in their liver (gluconeogenesis) that causes higher glucose levels no matter how many carbohydrates they restrict. The key is to inhibit intestinal absorption of carbohydrates, suppress excess production of glucose in the liver, and improve glucose utilization in tissues through enhanced insulin sensitivity. A number of published studies show that green coffee extract lowers after-meal glucose surges to ultra-safe ranges, and nutrients like chromium, lipoic acid, and green tea extract all work to support healthy insulin sensitivity that can slash the risk for most of the diseases we associate with aging, such as heart attack, cancer, Alzheimer’s, kidney failure, retinal damage and vascular blockages.

The next two pages are scientific summaries of the 12 studies evaluated by Life Extension, 9 of which strongly associate higher than optimal blood glucose with increased breast cancer risk.

If you have any questions on the scientific content of this article, please call a Life Extension® Health Advisor at 1-866-864-3027.
These pages represent a summary of the findings from 12 separate studies that evaluate blood glucose levels and breast cancer risk:

- Between 1987 and 1992, 10,786 women ages 35–69 were recruited in a prospective case controlled study in Italy.
- At recruitment, fasting blood glucose samples were collected.
- After 5.5 years, 144 breast cancer cases were identified among the participants of the cohort. Four matched controls were chosen for each breast cancer case from members of the cohort who did not develop breast cancer during the follow-up period.
- In premenopausal women, glucose was associated with breast cancer risk: the age, body mass index, and reproductive variable adjusted relative risk (RR) for the highest quartile of serum glucose versus the lowest which was 2.8.
- In premenopausal women, those with a blood sugar of >84 mg/dL had more than 150% increase in breast cancer incidence compared to those with lower levels.

*Editor’s Note:* Fasting glucose above 84 mg/dL resulted in over a 150% increase in breast cancer incidence compared to those with lower levels.

- The authors examined the association of breast cancer incidence with serum levels of insulin and glucose in a cohort of 7,894 women aged 45–64 years from four US communities. Anthropometric factors and fasting levels of insulin and glucose were measured at baseline (1987–1989).
- Over an average follow-up period of 7.1 years (1987–1995), 187 breast cancer cases were ascertained.
- Compared to those with a fasting glucose <100 mg/dL, a blood glucose of 100-125 mg/dL was associated with a 23% increased risk of breast cancer after multivariate analysis.
- Multivariate analysis:
  - Age-, race-, and center-adjusted relative risks of breast cancer were 1.32 for fasting glucose levels of 100-125 mg/dL and 1.60 for diabetic women in comparison with the normal level (<100 mg/dL).
  - After adjustment for age, race, and study center the relative risk for the association between diabetes and breast cancer decreased from 1.60 to 1.48 after additional adjustment for body mass index. The risk was further attenuated to 1.39.
  - After adjustments for age, race, study center, body mass index, age at menarche, age at menopause, age at first live birth, family history of breast cancer in a mother or sister, number of sisters, alcohol intake, and pack-years of smoking the RR dropped to 1.23 in the 100-125 mg/dL blood glucose group.

*Editor’s Note:* Fasting glucose at or above 100 mg/dL was associated with a 23% increase in breast cancer incidence compared to those with lower levels. If threshold had been reduced to under 86 mg/dL, the magnitude of the increase may have been much greater.

- A prospective cohort study of 10,633 women from Italy (the ORDET study) found significant relationships between blood sugar levels and breast cancer risk.
  - Women with the highest glucose quartile (median 96 mg/dL) had a 63% increased risk for breast cancer compared to those in the lowest quartile (median 73 mg/dL) after being “fully adjusted” for multiple variables.
  - Women in the highest fasting serum glucose quartile (median = 96 mg/dL) had a significantly greater risk of breast cancer than those in the lowest glucose quartile (median = 73 mg/dL). The results were adjusted for age, education, age at first birth, age at menarche, parity, family history of breast cancer, oral contraceptive use, breastfeeding, alcohol intake and smoking.

*Editor’s Note:* Fasting glucose median of 96 mg/dL resulted in 63% increase in breast cancer incidence compared to median fasting glucose of 73 mg/dL. This shows the benefit of keeping glucose at the low range of “normal.”

- Longitudinal study of postmenopausal breast cancer risk using a 6% sample of women in the Women’s Health Initiative trial whose fasting blood samples provided at baseline and at years 1, 2, and 6 were analyzed for glucose and insulin.
- Mean serum glucose and insulin levels were higher in breast cancer cases compared to non-cases at baseline and at years 1 and 3, but the differences were not statistically significant.
- Although there was little to no association between blood glucose and breast cancer risk in most of the data analysis, two aspects of the analysis did show a significant relationship:
  - In an analysis of “all available measurements (but excluding measurements made within 1 year of diagnosis)” there was a significant relationship when examining all participants. Compared to participants with a glucose of <89.5 mg/dL, those with glucose levels of 89.5-99.4 mg/dL had a 44% increased risk of breast cancer, and those with >99.5 mg/dL had a 66% increase in breast cancer risk.
  - Women who were past users of hormone replacement therapy and who had a blood glucose of >98.5 had 3 times the risk of breast cancer compared to past hormone replacement therapy users with blood glucose levels of <89.5. (This finding indicates even unnatural-to-the-body estrogen and progestin drugs require higher glucose levels to induce breast tumors.)

*Editor’s Note:* Fasting glucose over 89.5 mg/dL resulted in a 44% increase in breast cancer incidence and fasting glucose over 99.5 mg/dL resulted in a 66% increased breast cancer risk compared to those with lower fasting glucose levels.
ELEVATED GLUCOSE INCREASES INCIDENCE OF BREAST CANCER AND BRAIN SHRINKAGE


- Calculated relative risk of cancer for fasting glucose levels.
- Examined fasting glucose and post load glucose concentrations for 33,293 women and 31,304 men.
- Among women, relative risks of developing cancer (all sites) were statistically significantly increased with elevated plasma glucose concentrations with a relative risk of 1.26 and 1.31 for the top versus bottom quartile of fasting and postload glucose, respectively.
- Among women <49 years, relative risk (RR) of developing breast cancer was increased with fasting glucose (RR 2.13), for the top versus bottom quartile.*
  - *Cut points for fasting glucose quartiles were not provided in the full text
- Conclusion: "The association of hyperglycemia with total cancer risk in women and men, independent of obesity, provides further evidence for an association between abnormal glucose metabolism and cancer."

**Editor’s Note:** Women under age 49 with higher fasting glucose were 113% more likely to contract breast cancer compared to those with the lowest levels.


- Examined the association between metabolic syndrome factors and risk of breast cancer incidence and mortality.
- Data on 288,834 European (Austria, Norway, Sweden) women enrolled during 1974-2005 was examined. Relative risk of breast cancer was estimated for BMI, blood pressure, glucose levels, cholesterol and triglycerides.
- The authors state: “Despite the inverse association of most MetS components with breast cancer before age 50, glucose was positively associated with risk. In women above age 60, blood pressure and glucose were associated with increased risk of breast cancer mortality.”

**Editor’s Note:** Women over age 60 with higher glucose and blood pressure were more likely to die from breast cancer.


- 171 pre and post-menopausal Chilean women ages 33-86.
- *Insulin resistance* was independently associated with breast cancer in postmenopausal women, but not in pre-menopausal women.
- Among all women, there were slightly increased odds of breast cancer with elevated plasma glucose level.

**Editor’s Note:** Postmenopausal women with insulin resistance were 170% more likely to contract breast cancer than those without insulin resistance.


- Investigation between fasting blood glucose and the incidence of cancer. A population-based cohort of more than 140,000 Austrian adults (63,585 men, 77,228 women) was followed over an average of 8.4 years.
- They found no increase in risk for breast cancer until blood glucose was >126 mg/dL.

**Editor’s Note:** Breast cancer incidence did not increase until fasting glucose reached newly defined diabetic levels of over 126 mg/dL.


- Studied the relationship between breast cancer and obesity, hypertension, dyslipidemia, and glucose levels.
- Premenopausal women—Fasting glucose and relative risk (RR) of breast cancer by quartiles:
  - <79 mg/dL, RR 1.0
  - >79 – 85 mg/dL, RR 1.10
  - >85 – 90 mg/dL, RR 1.24
  - >90 mg/dL, RR 1.03
- No significant differences in breast cancer risk were found for women from different quartiles of body mass index, blood pressure, serum triglycerides or blood glucose levels.

**Editor’s Note:** Breast cancer incidence was relatively unaffected by glucose mostly within normal ranges.

- Examined the relationship between fasting serum glucose and diabetes and risk of all cancers and specific cancers in men and women in Korea. The main outcome measures were death from cancer and registry-documented incident cancer or hospital admission for cancer.
- Ten-year prospective cohort study of 1,298,385 Koreans (829,770 men and 468,615 women) aged 30 to 95 years.
- The highest fasting serum glucose (>140 mg/dL) had higher death rates from all cancers combined compared with the stratum with the lowest level (<90 mg/dL).
- By cancer site, the association was strongest for pancreatic cancer, comparing the highest and lowest strata in men and women.
- Significant associations were also found for cancers of the esophagus, liver, and colon/rectum in men and of the liver and cervix in women, and there were significant trends with glucose levels for cancers of the esophagus, colon/rectum, liver, pancreas, and bile duct in men and of the liver and pancreas in women.

Age-adjusted mortality rate per 100,000 women due to breast cancer by fasting serum glucose level in Korean women, 1993-2002 is described below.

- Blood glucose <90 mg/dL, death rate 6 per 100,000
- Blood glucose 90-109 mg/dL, death rate 7.5 per 100,000
- Blood glucose 110-125 mg/dL, death rate 5.2 per 100,000
- Blood glucose 126-140 mg/dL, death rate 6.1 per 100,000

Age-adjusted incidence rate of breast cancer per 100,000 women in relationship to blood glucose levels (1993-2002) is described below.

- Blood glucose <90 mg/dL, incidence rate 60.2 per 100,000
- Blood glucose 90-109 mg/dL, incidence rate 63.8 per 100,000
- Blood glucose 110-125 mg/dL, incidence rate 68.7 per 100,000
- Blood glucose 126-139 mg/dL, incidence rate 65.2 per 100,000
- Blood glucose >140 mg/dL, incidence rate 55.4 per 100,000

*Editor’s Note:* Breast cancer incidence was unaffected by glucose within normal ranges. The reduced breast cancer rate in women in the highest glucose category may have been because the diabetic women were taking metformin, which is known to reduce breast cancer rates by 25% in a recent meta-analysis when used over 3 years.25


- Objective: To assess the association between fasting insulin levels and breast cancer.
- Participants: 3,868 women aged 60–79 years.
- There was a trend toward a higher fasting blood glucose level in women with breast cancer (109.73 mg/dL) vs. those without breast cancer (106.13 mg/dL).
- The authors state in the discussion: “…although some estimates were imprecise, fasting glucose, HOMA score [a measure of insulin resistance], diabetes and gestational glycosuria or diabetes were also positively associated with breast cancer risk, suggesting that previous exposure to high circulating insulin levels, as well as contemporary exposure, is related to increased risk of breast cancer. There was a positive linear association across the distribution of fasting insulin and diabetes with breast cancer.”

*Editor’s Note:* Breast cancer incidence increased with poor glycemic control, possibly high levels of insulin and insulin resistance syndrome.


- Evaluated the relationship between the presence of metabolic syndrome and the incidence of cancer in the general Japanese population. This was a retrospective cohort study among 8,329 males and 15,386 females between 1992 and 2000.
- A high glucose level, rather than metabolic syndrome, was the significant associated factor for overall cancer and liver cancer development, whereas the metabolic syndrome was a significant associated factor for breast cancer, even after adjusting for other components.
- Breast cancer was not associated with high glucose levels.

*Editor’s Note:* The study found higher breast cancer in women with metabolic syndrome, higher overall cancer incidence associated with higher fasting glucose, but lower breast cancer incidence associated with higher glucose, possibly indicative of the breast cancer preventing effects of metformin prescribed to those with the highest fasting glucose.


The Healthy Gourmet Choice

Not all coffee provides the same powerful protection.1-12 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.

Among the most beneficial of these polyphenols is chlorogenic acid, a potent inhibitor of the glucose-6-phosphatase enzyme that stimulates excess gluconeogenesis.

A Patented Organic Roast

Life Extension’s Rich Rewards™ Breakfast Blend and Decaffeinated Roast are made using a patented, 100% natural process called Healthy-Roast™. 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% USDA certified organic arabica coffee beans, gently roasted in small batches and ground for easy brewing.

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 Rich Rewards™ coffees give you a uniquely beneficial brew with superior flavor. The Rich Rewards™ Breakfast Blend contains up to 87% more chlorogenic acid than conventional caffeinated coffees. Rich Rewards™ Decaffeinated Roast contains up to 187% more chlorogenic acid than conventional decaffeinated coffees.

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

<table>
<thead>
<tr>
<th>Chlorogenic Acid (Caffeinated)</th>
<th>Chlorogenic Acid (Decaffeinated)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional Coffee</td>
<td>92 mg</td>
</tr>
<tr>
<td>Conventional Coffee</td>
<td>46 mg</td>
</tr>
<tr>
<td>Rich Rewards™ Coffee Blend</td>
<td>172 mg</td>
</tr>
<tr>
<td>Rich Rewards™ Coffee Blend</td>
<td>132 mg</td>
</tr>
</tbody>
</table>

This chart shows Life Extension’s Rich Rewards™ Breakfast Blend contains up to 87% more chlorogenic acid than conventional caffeinated coffees and the Rich Rewards™ Decaffeinated Roast contains up to 187% more chlorogenic acid than conventional decaffeinated coffees. This enables one to obtain the benefits of heavy coffee drinking in about half the number of cups.

References

To order either of the Rich Rewards™ Antioxidant Coffees call 1-800-544-4440 or visit www.LifeExtension.com
Scientists have identified multiple mechanisms by which green tea extract helps protect against LDL oxidation, neuronal oxidation, and a host of other structural and functional age-related changes. LIFE EXTENSION MIX™ provides more green tea extract than found in commercial formulations.

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 an olive extract standardized to provide the best-documented olive polyphenols and their beneficial effects.

Luteolin 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, luteolin proved one of the most beneficial at maintaining healthy DNA. Luteolin also suppresses excess levels of interleukin-6 and interleukin-1β. LIFE EXTENSION MIX™ contains a standardized dose of 8 mg of luteolin.

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.

Lutein is found in spinach and collard greens and has been shown to help maintain eye macula pigment structure.

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, including gamma tocopherol, and inhibit the formation of an inflammatory precursor called arachidonic acid.

Wild blueberry extract, 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.

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.
The Most Complete Multivitamin Available Today

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 provides a broad array of vegetable/fruit extracts.

Life Extension Mix™ now contains the sodium selenite form of selenium in addition to L-selenomethionine and Se-methyl-L-selenocysteine.

Fat-Soluble Vitamins

<table>
<thead>
<tr>
<th>Vitamin</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamin A (90% Betatene® beta-carotene + 10% acetate)</td>
<td>5,000 IU</td>
</tr>
<tr>
<td>Vitamin D3 (cholecalciferol)</td>
<td>2,000 IU</td>
</tr>
<tr>
<td>Vitamin C (as calcium ascorbate, ascorbic acid, ascorbyl palmitate, magnesium ascorbate, niacinamide ascorbate, acerola extract)</td>
<td>2,000 mg</td>
</tr>
<tr>
<td>Ascorbyl palmitate (fat-soluble vitamin C)</td>
<td>250 mg</td>
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<tr>
<td>Vitamin E (natural alpha-tocopherol succinate and omega tocopherol)</td>
<td>100 IU</td>
</tr>
<tr>
<td>Natural mixed tocopherols (providing gamma, delta, alpha, and beta tocopherol)</td>
<td>60 mg</td>
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</tbody>
</table>

Amino Acid Complex

<table>
<thead>
<tr>
<th>Amino Acid</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>N-acetyl-L-cysteine</td>
<td>600 mg</td>
</tr>
<tr>
<td>Taurine</td>
<td>200 mg</td>
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Mineral Complex

<table>
<thead>
<tr>
<th>Mineral</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selenium (from Se-methyl L-selenocysteine)</td>
<td>100 mcg</td>
</tr>
<tr>
<td>Selenium (from L-selenomethionine—SelenoPure™)</td>
<td>50 mcg</td>
</tr>
<tr>
<td>Selenium (from sodium selenite)</td>
<td>50 mcg</td>
</tr>
<tr>
<td>Zinc (monomethionine) (OptiZinc®)</td>
<td>20 mg</td>
</tr>
<tr>
<td>Zinc (sucinate)</td>
<td>15 mg</td>
</tr>
<tr>
<td>Boron (as boron citrate/aspartate/glycinate)</td>
<td>3 mg</td>
</tr>
<tr>
<td>Calcium</td>
<td>218 mg</td>
</tr>
<tr>
<td>Copper (as copper glycinate chelate TRAACS®)</td>
<td>1 mg</td>
</tr>
<tr>
<td>Chromium (as Crominex® 3+ chromium stabilized with Capros® and PrimaVie® Shilajit)</td>
<td>500 mcg</td>
</tr>
<tr>
<td>Potassium chloride (37.4 mg elemental)</td>
<td>71.3 mg</td>
</tr>
<tr>
<td>Molybdenum (sodium molybdate)</td>
<td>125 mcg</td>
</tr>
<tr>
<td>Manganese (gluconate)</td>
<td>1 mg</td>
</tr>
<tr>
<td>Iodine (potassium iodide)</td>
<td>150 mcg</td>
</tr>
<tr>
<td>Magnesium oxide (335.96 mg elemental)</td>
<td>560 mg</td>
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<tr>
<td>Magnesium citrate (35.28 mg elemental)</td>
<td>261.3 mg</td>
</tr>
<tr>
<td>Magnesium glycinate (11.74 mg elemental)</td>
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</tr>
<tr>
<td>Magnesium taurinate (7.83 mg elemental)</td>
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</tr>
<tr>
<td>Magnesium arginate (5.87 mg elemental)</td>
<td>100 mg</td>
</tr>
<tr>
<td>Magnesium ascorbate (3.40 mg elemental)</td>
<td>58.1 mg</td>
</tr>
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Cholinergic Complex

<table>
<thead>
<tr>
<th>Choline</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choline (from bitartrate)</td>
<td>120 mg</td>
</tr>
<tr>
<td>Phosphatidylcholine (from soya)</td>
<td>150 mg</td>
</tr>
<tr>
<td>Inositol</td>
<td>250 mg</td>
</tr>
</tbody>
</table>

Each one of these selenium compounds provides unique biological benefits. The new Life Extension Mix™ also provides a small amount of gamma tocopherol (40 mg) as a part of natural mixed tocopherols which includes natural vitamin E. Most members take an additional 200 mg of gamma tocopherol in other supplements. During Super Sale, the full daily dose of Life Extension Mix™ can be obtained for as little as $1.34 per day.

Vitamin D3 helps maintain healthy bone density and DNA. There is five times more vitamin D in LIFE EXTENSION MIX™ compared to conventional multivitamins.

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

Life Extension Mix™ contains the sodium selenite, selenomethionine, and Se-methyl L-selenocysteine forms of selenium. 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 poorly absorbed, but LIFE EXTENSION MIX™ provides two of the most bioavailable forms of zinc.

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

LIFE EXTENSION MIX™ provides a high amount of an optimal form of chromium to help maintain arterial wall structure and already normal glucose levels.

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.

Maintaining high levels of acetylcholine in the brain helps support cognitive function and memory.

Contains soybeans.

References


To order call toll-free 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 ingredients that have been scientifically substantiated to protect the prostate gland and maintain its healthy function.*

The latest addition to this 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 is included in 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™ and Standardized Lignans** 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.**

*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.*

**The daily dose of two softgels of Ultra Natural Prostate Formula with AprèsFlex™ and Standardized Lignans Formula provides:**

- **USPlus® Saw Palmetto** (C02 DeepExtract™) (std to 85%-95% total fatty acids and sterols) **320 mg**
- **Graminex® Flower Pollen Extract™** **252 mg**
- **AprèsFlex™** (*Boswellia serrata*) extract **70 mg**
- **Pumpkin seed oil** (*Cucurbita pepo*) extract (standardized to 85% total fatty acids) **200 mg**
- **Stinging nettle root extract** (*Urtica dioica*) **240 mg**
- **Pygeum extract** **100 mg**
- **Lycopene** **10 mg**
- **Phytosterol complex** (standardized to 26.6% free beta-sitosterol) **678 mg**
- **Proprietary blend of HMRlignan™** **20.15 mg**
- **Norway Spruce and ActiFlax™ Flax Lignan extracts**
- **Boron** **3 mg**

To order Ultra Natural Prostate Formula with AprèsFlex™, call 1-800-544-4440 or visit www.LifeExtension.com
Importance of Taking Calorie Control Weight Management Formula Before Heavy Meals

Once we accept the fact that weight loss requires more than diet and exercise alone, it becomes easy to understand the importance of taking the Calorie Control Weight Management formula before two heaviest meals of the day to help neutralize the unwanted effects of caloric excess. Those seeking to emulate the dose used in the 2012 study that induced an average 17.6 pounds of weight loss might want to also take a 200 mg capsule of standardized green coffee bean extract along with a serving of Calorie Control Weight Management Formula with CoffeeGenic™ Green Coffee Extract before meals.

Each appetizing blueberry flavored stick pack or scoop of the Calorie Control Weight Management Formula with CoffeeGenic™ Green Coffee Extract, 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</td>
</tr>
<tr>
<td>LuraLean® propolmannan (Amorphophallus konjac K. Koch, ssp. Amorphophallus japonica) fiber extract (root)</td>
<td>2,000 mg</td>
</tr>
<tr>
<td>Phase 2*S Phaseolus vulgaris white kidney (bean) extract</td>
<td>445 mg</td>
</tr>
<tr>
<td>Integra-Lean® African Mango (Irvingia gabonensis) proprietary extract (seed)</td>
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<tr>
<td>Tea Slender™ Green Tea Phytosome</td>
<td>150 mg</td>
</tr>
<tr>
<td>Green Tea (Camellia sinensis) Phytosome decaffeinated extract (leaf) bound to phosphatidylcholine (from lecithin)</td>
<td></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 boxes during Super Sale, the price is reduced to just $40.50 per box. Item # 01694*

Contains soybeans. Contains corn.

References

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. Phase 2* is used under license. LuraLean® is a registered trademark of AHD International LLC.

*These supplements should be taken in conjunction with a healthy diet and regular exercise program. Results may vary.

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.
What you are about to read is a blueprint by which newly developing technologies may be used to induce biological immortality in human beings.

This research goes far beyond what is normally published in *Life Extension Magazine®*. When perfected, the discoveries you are about to learn may enable doctors to inject *progenitor cells* that will regenerate every tissue in your body, thus restoring you to youthful health and vigor.

Some readers will find this article challenging to comprehend, but we encourage everyone to review it several times to understand how close scientists may be to achieving meaningful reversal of degenerative aging processes.

This article also contains new findings about how easy it is to *increase* your *telomere length*, which has been shown to confer longevity and protect against age-related disease.
Targeting the Clockwork of Cell Immortality: A PROGRESS REPORT

There appears to be a consensus among gerontologists that a significant extension of the healthy human life span will require targeting of the clockwork mechanisms that cause aging. We will therefore attempt to explain what this means and what the implications may be for reversing biological aging.

Modern gerontology research can be divided into two camps. In the first camp, researchers are on a quest to understand and control the central mechanisms of the aging “clockwork.” This molecular machinery should be thought of as upstream central regulators (like telomeres) that subsequently trigger mechanisms further downstream. It is these downstream pathological mechanisms, such as chronic inflammation, that inflict age-related changes in specific tissues.1-3

The second camp of researchers is focused on targeting molecules involved in these downstream mechanisms, as these factors (such as pro-inflammatory cytokines) are the “hatchet men” that directly trigger disease processes.4,5

If we were to think of the individual mortal human as a ticking time bomb, the upstream mechanisms would be the clocking mechanism of the bomb, perhaps a ticking alarm clock or a burning fuse, and the downstream mechanisms would be the dynamite that is the most direct cause of the damage that follows. The first camp’s approach would therefore be to prevent the explosion itself by stopping the clock, whereas the second camp’s solution would be to let it explode but blunt the force of the explosion by covering it with a dump truck full of sand. >
In humans, an example of an upstream clockwork mechanism would be the telomere clock of cellular aging, which counts off how many times a cell has divided and hence determines how old a cell really is. An example of a downstream mechanism would be an inflammatory process that leads to activation of damaging molecules in the coronary arteries as seen in atherosclerosis.6-8

Many of the downstream processes are those typically addressed in Life Extension articles. This emphasis on the downstream may in part reflect the fact that our current understanding of many of the downstream mechanisms predates our understanding of the “upstream” clocking mechanisms. In addition, interventions into these downstream events have favorably impacted the severity of age-related diseases.

However, most gerontologists agree that targeting the downstream mechanisms will not sufficiently extend human life expectancy to meet the objectives of those who seek aggressive solutions to pathological aging. By targeting upstream-biology—never before attempted in the practice of medicine—we could potentially create the most powerful impact on the aging process.

But first we should consider the basis for assuming that such a central clockwork exists, or that it would even be feasible to intervene in the inexorable progress of this ticking clock.

In this brief progress report, we will attempt to describe the shortest path to a proof-of-principle by referring to a natural type of cellular immortality recently captured in the laboratory dish. This line of reasoning is now taking off in the scientific community.

We will then describe research funded in part by the Life Extension Foundation® that has potential clinical application to combat the deadliest manifestation of cell mortality in the United States, namely, coronary artery disease...the leading cause of heart attack.

The Facts of Life

Let’s begin with the facts of life and remember how an individual human being comes to exist in the first place. The union of a sperm and egg cell leads to a unified cell commonly called a zygote, which then divides into two cells, then four, and so on, until a small cluster of cells form, each of which has the power to become any of the cell types in the human body.

Cells that have this power are said to be pluripotent, meaning they have power (-potent) to become a variety (plurality or pluri-) of cell types. These cells commit to the cell type they will eventually become, that is, each cell will commit to becoming a reproductive (sperm or egg) cell, or one of the body’s many life-functioning cell types such as muscle, blood, or brain cells. This process of cellular commitment is called differentiation.

If pluripotent cells differentiate into sperm or egg cells, scientists say they are remaining in the germ-line. The germ-line is that lineage of cells that connects the generations and is the biological basis of the
immortality of the species. They are the cells whose continuous proliferation ensures there are always zebras in Africa. They are the reason why you can go to a local greenhouse and buy fresh young petunias to plant in your garden every spring, year after year. Germ-line cells have the amazing ability to spin off new individuals forever, without the limitations of aging.

When pluripotent germ-line cells commit to become one of the cell types of the body, we say they have differentiated into somatic cells. This differentiation seals their fate. These somatic cells are now mortal, even though, up to this point, they have been proliferating continuously for billions of years as germ-line cells. They will now become part of the body that is programmed to die usually within 100 years. Those cells that went the germ-line route have the potential (though not certainty) that they may continue in future generations indefinitely. Because they are not committed to a mortal fate, scientists say the cells are immortal. The use of this term does not mean that the individual cells are indestructible, nor does it mean anything in a religious sense. Instead, the term simply refers to the lack of commitment to the mortality that occurs when these cells differentiate into somatic (functional) cells that have finite life spans, sometimes measured in maximum amount of doubling times before they die.

For the past few decades, scientists have focused on deciphering the molecular mechanisms of the immortality of germ-line cells in order to find a means of using those insights to restore health to aging somatic (life-sustaining functional) cells. In other words, we have attempted to find a means to rewind the clock of the “ticking time bomb” in our cells back to the beginning of life.

In the past few years, we have learned that, when cells make the decision to become somatic (that is, cells that enable the body to function as opposed to reproductive germ-line cells) they turn off telomerase, an enzyme that synthesizes a repeated sequence of DNA over and over again at the end of DNA strands needed to maintain cellular viability.8,12 These regions of the DNA at the chromosome ends are called telomeres.

Most somatic cells lack sufficient telomerase, and so every time somatic cells replicate, they progressively shorten their telomeres. This functions as a clock mechanism not unlike the burning of a fuse and we refer to it in this article as the “telomere clock of cellular aging.” However, in contrast to somatic cells, germ-line cells retain telomere length appropriate for the beginning of life, due to an abundance of telomerase activity.

Scientists Discover Novel Way to Reset Cellular Aging Clock

- **Pluripotent** cells have the power to become a variety of cell types.
- Most somatic cells lack sufficient telomerase, and so every time somatic cells replicate, they progressively shorten their telomeres.
- Germ-line cells retain telomere length appropriate for the beginning of life, due to an abundance of telomerase activity.
- Telomerase, is an enzyme that synthesizes telomeres, a repeated sequence of DNA over and over again at the end of DNA strands needed to maintain cellular viability.
- Although telomeres typically shorten with aging, shortening is not inevitable and telomeres can also lengthen.
- Recent scientific studies have shown that reduced plasma levels of omega-6 fats coupled with increased omega-3s resulted in an increase in telomere lengths.
- It is possible to utilize these advances to not only revert a cell in the body (somatic cell) back to the all-powerful pluripotent stem cell state, but also to activate telomerase and reset the clock of cell aging all the way back to the very beginning of life.
Since there is currently no known way to fully extend telomere length in the body to youthful levels, our researchers have instead sought means to mimic the natural immortality of germ-line cells in the laboratory dish to make young and healthy cells of all kinds that could potentially be injected into the body. Using this approach, we might be able to repair tissues afflicted with age-related degenerative diseases. The good news is that this technology is now very much operational, at least on the lab bench, and is a focus of intensive research around the world.

**Embryonic Stem Cells**

The first step in understanding how germ-line cell immortality could be used to regenerate aging tissues in the human body was to capture the cells in the laboratory dish. In the mid 1990s, in collaboration with Drs. James Thomson, Roger Pedersen, and John Gearhart, some of us at Geron Corporation launched a project to isolate these cells and grow them as stable cell lines. These cells, called human embryonic stem cells, were the first naturally immortal human cells ever isolated due to their abundant natural expression of telomerase. They had the wonderful property of being able to generate each and every cell type of the human body. For the first time in history, medicine had in its hands a pluripotent stem cell to make every cellular component of the human body. (Pluripotent stem cells are capable of differentiation into any other functional (somatic) cell the body needs.)

These cells generated considerable excitement since they were a means of mass-producing replacement cells for the treatment of a host of degenerative diseases involving the loss or dysfunction of cells, including those in osteoarthritis, macular degeneration, diabetes, heart failure, Parkinson’s disease, and numerous other disorders. The first report of the isolation of these cells marked the birth of the new field called regenerative medicine. When perfected, this technology offered the theoretical potential of regenerating tissues in the human body back to a youthful state.

**Cloning – A Cellular Time Machine**

In 1997, Dolly the sheep was cloned. The way cloning works is that the DNA of a somatic cell is transplanted into an egg (germ-line) cell, whose own DNA has been removed to create a pluripotent cell. This “cloned” cell is capable of differentiating into a new individual with the DNA from an existing individual.

Thus, cloning is an artificial means of generating identical twins differing in age. In the case of nuclear transfer, the DNA in the somatic cells is reprogrammed, meaning its memory of being a skin cell has been erased by a cellular “time machine,” and that cell has now been returned to the germ-line state capable again of making individuals of the same genetic constitution, over and over again... potentially forever.

But one may ask, in the case of cloning, what happens to the aging process of the body cell? Is aging of the cell really reversed, or do we somehow get an embryo and resulting cloned animal that looks young, but is really born old, a kind of “fountain of old age”? At first, the group that cloned Dolly reported that
she was born with short telomeres, and cloning had not reversed the aging process. Dolly was therefore thought to be “born old;” she was a sheep in lamb’s clothing, so to speak.

However, in 2000, our group published a report demonstrating that, in the case of cow cloning, the telomere clock of cell aging is reset back to the beginning of life. Today, the consensus view is that cloning is capable of reversing cell aging, so animals cloned from aged animals are born young again. If you think about these results, they logically lead to the next question: Would cloning work in humans—not necessarily to make copies of them, but rather as means of reversing the aging of human cells?

Thus, cloning (somatic cell nuclear transfer) could potentially be used to reverse the developmental aging of a human cell. It became a topic of considerable controversy that, for example, a mature skin cell could possibly be transported back in time to the beginning of life. Some of us believe that such a cellular time machine could be used to make copies of them, but rather as means of reversing the aging of human cells?

Induced Pluripotent Stem (iPS) Cells

Today, the controversy over therapeutic cloning has largely dissipated due to the discovery that the use of just a handful of molecules can effectively replace the use of a whole egg cell in restoring aged somatic cells back to pluripotency (youthful cells capable of differentiation into any other functional [somatic] cell).

In other words, we can take human somatic cells back to the embryonic germ-line state of immortal pluripotency without cloning or ever making an embryo. Since such cells are not isolated from embryos, they are called induced pluripotent stem (iPS) cells, in order to distinguish them from embryonic stem cells.

Most significantly, as previously reported in Life Extension Magazine, we demonstrated that it is possible to utilize these advances to not only revert a cell in the body back to the all-powerful pluripotent stem cell state, but also to activate telomerase and reset the clock of cell aging all the way back to the very beginning of life.

As a result, the stage is now set to lift some cell from the body—perhaps from a sliver of skin, from blood cells, or from a hair pulled from the head—and then genetically manipulate that cell, returning (converting) it to a continuously proliferating youthful line of stem cells. These rejuvenated cells we believe will be identical to the individual cell they had developed from decades earlier. Since these iPS cells are now reverted back to the germ-line state, they can spin off new somatic cells of all types for an indefinite period of time.

A thoughtful person would recognize within these advances the powerful means to potentially regenerate aged tissues with young cells, and a means to do so for periods that extend the normal lifespan of human body cells. All of this new technology targets the upstream clockwork mechanisms of aging. This is possible because life is, in a sense, naturally immortal in that each species has cells capable of regenerating new individuals continuously and for an indefinite period of time.
Applying Regenerative Medicine to Heart Disease

In thinking about where such technologies could be applied, we first considered cardiovascular disease, heart failure, and stroke since they are among the top causes of death in the United States. Although epidemiological studies have demonstrated that abnormal lipid profile, diabetes, sedentary lifestyle, and genetic susceptibility are risk factors for coronary disease, congestive heart failure, and stroke, advancing age is unequivocally the major risk factor for these diseases. Therefore, we seek a means to target the upstream mechanisms of vascular aging by replacing aged coronary artery cells with the young cells we were born with. This approach could become the most effective means of intervening in heart disease, stroke, and other cardiovascular diseases.

Life Extension’s Contribution to This Research

In late December 2010, I approached the Life Extension Foundation® about the opportunity to accelerate the pace of research that could lead to the reversal of vascular aging using technologies described in this article. Recognizing the potential to cure the most common problem afflicting aging humans, the Life Extension Foundation® provided $2 million of initial funding.

These funds were used to help launch ReCyte Therapeutics, which is focused on regenerating aged vascular function by developing clinical applications based on several of the technologies we have been discussing. The mission is to reverse the developmental aging of a person’s cells and then turn those reprogrammed and rejuvenated cells into primitive vascular progenitors useful in “re-plumbing” an aged vascular system.

ReCyte’s scientists are particularly interested in a cellular component of blood vessels called endothelial cells that reside on the inner lining of the blood vessel. Normal endothelial function and endothelial health are adversely affected by the aging process, presumably due to telomere attrition23-26 (and other factors). An aged vasculature is therefore more prone to develop plaques, inflammation, and atherosclerosis. Therefore, myocardial infarction is really not the problem of the heart per se, but rather a problem with the vasculature’s supply of blood to the heart. The goal of ReCyte is to manufacture young vascular progenitor cells capable of repairing aged blood vessels, to target the upstream biology of the aging artery, not the downstream events of inflammation or cholesterol accumulation, arterial calcium deposits, and the formation of atherosclerotic plaques.

Where Are We Today?

With financial help from the Life Extension Foundation®, we have been able to improve the efficiency of reprogramming cells using technology licensed from the Wistar Institute in Philadelphia, Pennsylvania, with whom we now collaborate. Wistar scientists discovered that by turning off a gene called SP100, differentiated cells became more susceptible to re-expressing genes normally expressed only in pluripotent stem cells.28

Second, we have formed a similar collaboration agreement with scientists at Cornell Weill College of Medicine in New York City who are focused on the development of vascular endothelium. In collaboration with that group, we have successfully generated purified populations of embryonic vascular cells from induced pluripotent stem cells.29

As a result, we believe the pieces are in place to reverse the developmental aging of an aged person’s cells and then to turn these rejuvenated pluripotent stem cells into young vascular progenitors that should be useful in restoring normal youthful function to the aged vasculature of the heart, brain, and other tissues. Such cells would also be histocompatible with individual patients, meaning that there would be no need for immunosuppressive drugs. We have already derived
these endothelial cells from multiple human embryonic cell lines at a clinically applicable scale consistent with Good Manufacturing Practices (GMP).

Fortuitously, at the same moment when we see an aging population placing a strain on our healthcare system and our national budget, we also see the rise of a new technology facilitating the manufacture, on a clinically-feasible scale, of young cells of all types that may allow us to regenerate tissues afflicted with age-related degenerative disease.

About BioTime

At BioTime we are utilizing these breakthroughs in regenerative medicine to target several major diseases. BioTime can be thought of as the hub of a wheel with several subsidiaries focused on different medical specialties such as orthopedics, cardiovascular disease, neuroscience, and so on. ReCyte Therapeutics is one of those subsidiaries.

BioTime (NYSE MKT: BTX), both as a company and as individuals, are determined to find the means of rapidly translating this bench-top science into life-saving clinical reality. We are thankful for the support of the Life Extension Foundation® for their vision and commitment to advancing human health. We look forward to the day when we can report in Life Extension Magazine the outcomes of the first patients to be treated with reprogrammed young vascular progenitor cells as a novel therapy for cardiovascular disease, the number one cause of mortality in aging humans.

Stem Cell Pioneers Awarded Nobel Prize

On October 9, 2012, two scientists who helped lay the foundation for regenerative medicine were awarded the Nobel Prize in Physiology or Medicine.

The shared Nobel Prize was given to Dr. John B. Gurdon of the University of Cambridge in England and Dr. Shinya Yamanaka of Kyoto University in Japan for their work on induced pluripotent stem cells (iPS).27

In granting the award, the Nobel Prize Assembly stated:

“Research during recent years has shown that iPS cells can give rise to all the different cell types of the body... and led to remarkable progress in many areas of medicine. For instance, skin cells can be obtained from patients with various diseases, reprogrammed, and examined in the laboratory to determine how they differ from cells of healthy individuals. Such cells constitute invaluable tools for understanding disease mechanisms and so provide new opportunities to develop medical therapies.”
TARGETING THE CLOCKWORK OF CELL IMMORTALITY

Summary

Very early in the course of human development, a small cluster of cells form, each of which has the power to become any of the cell types in the human body. Cells that have this power are said to be pluripotent, meaning they have power (-potent) to become a variety (plurality or pluri-) of cell types. These cells commit to the cell type they will eventually become, that is, each cell will commit to becoming a reproductive (sperm or egg) cell, or one of the body’s many somatic or life-functioning cell types such as muscle, blood, or brain cells. If pluripotent cells differentiate into sperm or egg cells, they are remaining in the germ-line, that lineage of cells that connects the generations and is the biological basis of the immortality of the species. When cells make the decision to become somatic, they turn off telomerase, an enzyme that synthesizes a repeated sequence of DNA over and over again at the end of DNA strands needed to maintain cellular viability. A recent discovery showed that the use of just a handful of molecules can effectively restore aged somatic cells back to pluripotency. It is possible to utilize these advances to not only revert a cell in the body back to the all-powerful pluripotent stem cell state, but also to activate telomerase and reset the clock of cell aging all the way back to the very beginning of life.

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

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.1-5

- **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.6-10

- **BENEFOTIAMINE**: 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 antioxidant capacity and supports DNA function.19

- **PYRIDOXAL 5'-PHOSPHATE**: The active form of vitamin B6 that has been shown to protect against both destructive free-radical activity in the mitochondria and sugar to form 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.15

- **Acetyl-L-carnitine arginate**: 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.15

- **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.

To order Mitochondrial Energy Optimizer with BioPQQ™, call 1-800-544-4440 or visit www.LifeExtension.com

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**References**

Diminished cellular energy production is an inevitable consequence of aging. As adults mature, the cellular power plants known as the mitochondria become dysfunctional. The resulting slowdown in energy production manifests in numerous health problems.

Nutritional researchers have discovered that the amino acid carnitine promotes the burning of fat for fuel in the mitochondria, thus promoting youthful levels of cellular energy production.* Researchers have now identified several optimized, next-generation forms of carnitine that not only help boost cellular energy production, but also may confer targeted benefits for the brain, heart, muscles, and central nervous system.

**Optimized Carnitine with GlycoCarn®** combines these advanced forms of carnitine—acetyl L-carnitine, glycine propionyl L-carnitine, and acetyl L-carnitine arginate—in a single formula that provides balanced, broad-spectrum support for cellular energy production throughout the body.

**Acetyl L-carnitine** readily crosses the blood-brain barrier to combat oxidative stress and promote energy production in critical brain and central nervous system tissues.³ Acetyl L-carnitine also supports healthy brain function by stimulating the release of acetylcholine and dopamine, two neurotransmitters that play vital roles in brain health and communication.*

**Acetyl L-carnitine arginate** has an added molecule of arginine that enables it to augment the effects of acetyl L-carnitine, promoting the growth of neurites that facilitate communication among nerve cells in the brain.²

**GlycoCarn®** is a patented form of glycine propionyl L-carnitine that quickly penetrates into heart, endothelial, and muscle cells, with effects that range from protecting heart muscle from lack of blood flow to combating muscle fatigue by increasing muscle energy stores of glycogen.³

Two capsules of **Optimized Carnitine with GlycoCarn®** provide:

- Acetyl L-carnitine HCl 800 mg
- ArginoCarn® Acetyl L-carnitine Arginate Di-HCl 300 mg
- GlycoCarn® Glycine Propionyl L-Carnitine HCl 300 mg

A bottle of 60 vegetarian capsules of **Optimized Carnitine with GlycoCarn®** retails for $36. If a member buys four bottles during **Super Sale**, the price is reduced to only **$21.60 per bottle.**

**References**


**CAUTION:** For some people, L-carnitine, especially acetyl-L-carnitine, may have a stimulating effect. Therefore, it may be unwise to take it in the evening.

*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.
**World’s Most Comprehensive**

**ANTI-AGING SKIN SERUM**

**SAVE 60% DURING SUPER SALE!**

Rejuvenex® Factor provides 28 active ingredients in a deep-penetrating serum. To get these skin protecting and rejuvenating compounds elsewhere, you’d need to layer on a dozen expensive creams—each providing only 2 or 3 of these active ingredients.

The good news is that—for a fraction of the cost—Rejuvenex® Factor Firming Serum delivers optimal dosages of the full range of clinically proven technologies… to promote the appearance of youthful, firmer, and more vibrant skin.

**SERUM VS. CREAM**

Rejuvenex® Factor is a serum—a more concentrated format that is thinner than a cream and ensures superior absorption of its 28 skin enhancing compounds. Rejuvenex® Factor Firming Serum comes in an airless pump to protect the integrity of the bioactives, and utilizes a patented deep-layer delivery system that provides sustained release for 6 to 8 hours! Rejuvenex® Factor Firming Serum is uniquely free of paraben, irritants, estrogenic chemicals, mineral oil, and synthetic fragrances.

**HUGE SAVINGS DURING SUPER SALE**

A 1.7 oz bottle of Rejuvenex® Factor Firming Serum retails for $65. If a member buys two bottles during Super Sale, the price is reduced to $34.20 a bottle. If six bottles are purchased during Super Sale, the price is only $26 a bottle. Each bottle will last two months which brings the cost for Rejuvenex® Factor Firming Serum to as low as $13 per month when purchased during the annual Super Sale!

Rejuvenex® Factor Firming Serum Provides 28 Active Compounds:

<table>
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<th>Active Ingredient</th>
<th>Function</th>
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<td>Taurine</td>
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<tr>
<td>Salicylic acid</td>
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<td>Ceramide-2</td>
<td>Promotes the shedding of old skin cells and helps retain moisture.</td>
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<td>Thioctic acid (alpha lipoic acid)</td>
<td>Supports the skin’s normal antioxidant protection.</td>
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<td>Lactic acid</td>
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<td>Vitamin C (ascorbyl phosphate)</td>
<td>Helps strengthen the skin barrier and promote collagen production.</td>
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<td>Hylasome® EG10 (hyaluronate crosspolymer)</td>
<td>Holds more moisture in skin cells and targets free radicals.</td>
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<td>Glycerin</td>
<td>Minimizes the appearance of wrinkles by supporting elasticity and moisture retention.</td>
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<td>Botanimoist® AMS (Pyrus malus)</td>
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</tr>
<tr>
<td>Botanistat® PF-64</td>
<td>Helps preserves serum against environmental toxins (avoiding the preservative paraben).</td>
</tr>
<tr>
<td>Pomegranate (Punica granatum) extract</td>
<td>Reduces visible signs of aging by promoting skin cell turnover.</td>
</tr>
<tr>
<td>Green tea (Camellia sinensis) extract</td>
<td>Provides antioxidant support to help prevent signs of premature aging.</td>
</tr>
<tr>
<td>White tea (Camellia sinensis) extract</td>
<td>Protects the skin from visible signs of UV exposure.</td>
</tr>
<tr>
<td>QuSome® delivery system</td>
<td>Breakthrough delivery system delivers maximum active ingredients directly into the skin.</td>
</tr>
<tr>
<td>Matrixyl® synthe’6™</td>
<td>Helps minimize the appearance of fine lines and wrinkles.</td>
</tr>
<tr>
<td>Vegetal Filling Spheres™</td>
<td>Helps strengthen and firm, and helps prevent breakouts.</td>
</tr>
<tr>
<td>PolyP (sodium polyphosphate)</td>
<td>Supports production of collagen.</td>
</tr>
<tr>
<td>Pichia-fermented Resveratrol extract</td>
<td>Increases hydration, diminishing the appearance of lines.</td>
</tr>
<tr>
<td>Tocopherol (vitamin E)</td>
<td>Superior penetration helps reduce the appearance of fine lines and wrinkles.</td>
</tr>
<tr>
<td>Tocopheryl acetate (vitamin E)</td>
<td>Promotes skin repair and natural defenses against premature skin aging.</td>
</tr>
<tr>
<td>Beta-glucan</td>
<td>Supports collagen formation, defense against UV exposure, and healthy skin.</td>
</tr>
<tr>
<td>RNA</td>
<td>Promotes production and turnover of new skin cells.</td>
</tr>
<tr>
<td>Sodium PCA</td>
<td>Helps skin stay moisturized, soft, supple, and firm, and helps prevent breakouts.</td>
</tr>
<tr>
<td>Hydroxydecyl ubiquinone (CoQ10)</td>
<td>Supports collagen and elastin for smoother, younger-looking skin.</td>
</tr>
</tbody>
</table>

To order Rejuvenex® Factor Firming Serum call 1-800-544-4440 or visit www.LifeExtension.com

QuSome® and Advanced Efficacy are registered trademarks of BioZone Laboratories, Inc. US Patent No. 6,610,322, 6,958,160, 7,150,883, 6,998,421. Hylasome™ is a trademark of Genzyme Corporation, the use of which is licensed to HylaMed Research Inc.
The older eyes get, the more susceptible they become to an array of debilitating issues that can hamper eyesight and cripple quality of life. With just a few drops of the proper eye lubricant, eye irritation stemming from dryness may be alleviated. Brite Eyes by Life Extension® provides a powerful dose of two well-established lubricants in every drop, soothing eye discomfort without irritation. Hydroxymethylcellulose and glycerin are FDA-approved for ophthalmic use and are uniquely preserved with potent antioxidants and anti-glycating agents.

The Brite Eyes formula is buffered in a way to make it soothing to the eye. The suggested use of Brite Eyes III is to apply 1 to 2 drops in each eye every day.

Each box of Brite Eyes III contains two individual vials that provide 5 mL each. The reason for putting Brite Eyes into individual vials is to reduce the risk of bacterial contamination. Having small vials also makes it convenient for consumers to keep Brite Eyes readily accessible at home, the office, in one’s purse or pocket, and other places where access to a soothing eye drop is needed.

The retail price for a box containing two 5 mL vials of Brite Eyes III is $34. If a member buys four boxes during Super Sale, the price is reduced to $21.60 per box.

To order Brite Eyes III, call 1-800-544-4440 or visit www.LifeExtension.com
The Next-Generation Pomegranate Formula

Life Extension® offers an advanced, cutting-edge pomegranate formula that brings together novel phytonutrients for the first time in a unique, high-potency blend. Full-Spectrum Pomegranate™ combines standardized extracts from the whole fruit and flower, along with pomegranate seed oil, to support system-wide health. In addition to the highly absorbable antioxidant powerhouses found in pomegranate fruit,2-4 Full-Spectrum Pomegranate™ augments these polyphenols with newly discovered biologically active compounds from other parts of the pomegranate plant.

These little-known nutrients include: punicanolic acid, a member of the triterpene family of essential oils that provides cellular support to help with inflammation,5 and pomegranatate, to combat age-related metabolic changes.6

This superior formula supplies the complete nutritional profile of the pomegranate plant. Just one softgel of Full-Spectrum Pomegranate™ contains a proprietary blend of seed oil and flower extract.

One softgel of Full-Spectrum Pomegranate™ contains:

POMELLA® Pomegranate............................... 400 mg
(Punica granatum) Extract (fruit) [std. to 30% punicalagins (120 mg)]
PomComplete™ Pomegranate ......................... 137.5 mg
(Punica granatum) Blend [flower extract and seed oil (standardized to 22% (30 mg) puninic acid)]

Full-Spectrum Pomegranate™
A bottle containing 30 softgels of Full-Spectrum Pomegranate™ retails for $24. If a member buys four bottles during Super Sale, the price is reduced to $14.18 per bottle. Item # 01423

Contains soybeans.

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.
We are losing the battle against the leading preventable cause of premature death: **heart disease**.

In 2005, **one in eight** death certificates—representing 292,214 deceased Americans—mentioned heart failure.¹

Prescription drugs and surgery are routine treatments, but there remains a need for agents that modulate **multiple** cardiac risk factors.

The term **cardiotonic** refers to any compound that bolsters normal heart function even under less-than-ideal conditions. Scientists have identified **two** botanical extracts that deliver this cardiotonic protection!²-⁴

Extracts from the **hawthorn** leaf and flower and those from an Indian shrub called **arjuna** have long been used in traditional medical systems for heart and circulatory conditions.⁴-⁹

Scientific studies now demonstrate that these extracts generate a **dual effect**: they help to **prevent**—and **reverse** the indicators of **existing cardiovascular disease**.²,¹⁰-¹³
Hawthorn: New Efficacy Data

Hawthorn (Crataegus) is a genus of small, flowering trees in the rose family, closely related to apples and pears. For centuries, traditional medical systems have used the fruit, leaves, and bark for various applications on heart health.

Hawthorn extracts are widely prescribed in Europe for managing mild heart failure, either alone or as add-on therapy with standard drugs. In Germany, hawthorn extracts are recognized as drugs. Hawthorn extracts are referred to as a cardiotonic because of their ability to increase the heart’s muscle tone.

Hawthorn extracts contain dozens of biologically active molecules including flavonoids and polyphenols. The hawthorn polyphenol most thoroughly studied in humans is oligomeric procyanidins. A typical hawthorn dose provides between 30 mg and about 340 mg a day of procyanidins.
In addition, arjuna extracts enhance heart muscle tone, improving its “squeeze” and increasing the amount of blood it can pump each second without exhaustion.\textsuperscript{13,20,21}

Like hawthorn, arjuna is also considered cardio- tonic, that is, it bolsters normal heart function even under less-than-ideal conditions.

**Coronary Artery Disease**

Coronary heart disease results from narrowing of the main arteries that supply blood to the heart muscle itself. Those arteries, over time, become oxidant-damaged, chronically inflamed, and lipid-laden until their smaller diameter reduces the amount of blood that can flow to the laboring heart muscle.

That restricted blood flow impairs heart muscle cells’ pumping ability. Coronary artery occlusion is also painful, producing the symptom we call “angina,” or pain in the chest, abdomen, and/or left arm. Many people, especially women with cardiac ischemia, feel no clear symptoms at all, however.

### TABLE 1: The Toll of Cardiovascular Disease in the US\textsuperscript{1,52}

<table>
<thead>
<tr>
<th>Coronary Heart Disease</th>
<th>Congestive Heart Failure</th>
</tr>
</thead>
<tbody>
<tr>
<td>One in 5 deaths in the US</td>
<td>Cited on 1 in 8 death certificates</td>
</tr>
<tr>
<td>Total mortality/year: 445,687</td>
<td>Contributing cause of death: 292,214</td>
</tr>
<tr>
<td>New heart attacks/year: 785,000</td>
<td>New diagnoses/year: 670,000</td>
</tr>
<tr>
<td>Additional new “silent” attacks/year: 195,000</td>
<td>Prevalence: 5.8 million</td>
</tr>
<tr>
<td>Recurrent heart attacks/year: 470,000</td>
<td>Total cost: $39.2 billion</td>
</tr>
</tbody>
</table>
When a tiny blood clot blocks a jagged-narrowed coronary artery, the result is often a full-blown heart attack, with complete loss of blood flow to an area of heart muscle. If the damaged area is large enough, the victim dies or becomes a cardiac cripple.

If the area damaged by a coronary artery occlusion is small enough or if sufficient blood flow is restored from adjoining areas of heart muscle, the victim survives, but with scar tissue.

If oxygenated blood flow is renewed, which is essential to survival, the result is a new surge of pro-oxidant damage to already weakened muscle. This "ischemia-reperfusion injury" can complicate recovery and induce arrhythmias that take the lives of those who, with a stronger heart at baseline, might have survived the original attack.

**Hawthorn extracts** rich in oligomeric procyanidins have multiple direct actions on the heart before, during, and even after an ischemic event. These beneficial actions, even under challenging laboratory conditions, enhance survival.

Hawthorn scavenges reactive oxygen species (ROS) while enhancing heart muscle cells' natural antioxidant defenses. Animal studies reveal that hawthorn extracts **boost coronary blood flow by up to 70%**.

When ischemia occurs, hawthorn extracts prevent ischemia-reperfusion injury to heart muscle cells both through antioxidant effects and by changing how protective genes are expressed in response to the threat. Ischemic hearts pre-treated with hawthorn show improved function and smaller areas of dying tissue, reducing the mortality rate in animal studies **five-fold**.

Despite some theoretical interactions with cardiovascular drugs, none have been reported in the thousands of patients who have used hawthorn extracts for heart health.

**Arjuna Complements Hawthorn**

**Arjuna extracts** can amplify and complement the properties of hawthorn in prevention of coronary artery disease. They were shown to have modest lipid-lowering effects at doses used in ancient Indian medicine. In animal studies, arjuna reduces total and LDL cholesterol, as well as triglycerides, raises protective HDL, and limits the size and number of atherosclerotic lesions in the aorta.

Humans treated with 500 mg daily of arjuna tree bark powder experienced a total cholesterol drop of 9.7%. The same dose of an extract from the bark, given every 8 hours, improved **endothelial function**, the ability of vital arteries to dilate and increase
blood flow, by 9.3% in smokers, who typically have terrible endothelial function.37

Arjuna has exceptional efficacy in reducing episodes of angina, both alone and in combination with standard anti-angina drugs such as isosorbide mononitrate, in patients with stable angina (chest pain induced by activity with absence of prolonged pain at rest). Reductions in anginal frequency of 50% or more have been noted in patients taking 200 to 500 mg of arjuna daily.10,38-40

Studies also reveal a prolongation of exercise time before echocardiogram abnormalities on the treadmill test in subjects supplementing with arjuna extracts; all patients remained on their regular cardiac medications as well.38,39 One dramatic study demonstrated that both arjuna and the drug, isosorbide reduced anginal attacks significantly, but only arjuna-supplemented patients had significant improvement in their hearts’ blood pumping abilities.10

Like hawthorn, arjuna extracts possess powerful cardio-protective characteristics that can save heart muscle cells during ischemia or ischemia-reperfusion injury.18

Multiple human trials with arjuna have demonstrated no serious side effects or drug interactions.38,39
Chronic Heart Failure

Heart failure describes a condition in which the heart lacks the ability to deliver sufficient blood flow to meet existing needs, both at rest and during exertion.

As the failing heart works harder and harder, it grows in size, but its muscle stretches eventually to the point at which it can no longer keep up with the blood returning from the circulation. That produces “congestion,” blood backing up into the liver and other organs (right-sided heart failure), or into the lungs (left-sided heart failure). These conditions are often referred to as congestive heart failure.

Symptoms of heart failure vary greatly, but may include fluid retention, swelling of the extremities, difficulty breathing, and, importantly, reduction in exercise tolerance. Table 2 shows the standard classifications of heart failure according to the New York State Heart Association’s definitions.41

Numerous clinical studies demonstrate hawthorn’s effectiveness alone or as add-on therapy to regular drugs, especially for mild (Class II) heart failure.

Hawthorn extracts improve a host of objective measures of heart failure, including cardiac oxygen consumption, blood pressure, heart rate, percent of blood pumped per heartbeat, percent of heart muscle contracting (as seen on echocardiograms).42-46 Placebo recipients in these studies often suffer deterioration during the study period.43

Dramatic improvements in exercise tolerance on bicycle or treadmill testing are attributed to hawthorn supplementation. Patients experience increased exercise time until ECG abnormalities, increased maximal workload, fewer arrhythmias, and fewer extra heartbeats.44-48

Patients with Class II heart failure who supplement with hawthorn can also expect improvements in their symptoms; they have less shortness of breath, ankle swelling, fatigue, and palpitations, while enjoying improved overall quality of life.43-44,47-49

In one study, 83% of patients taking hawthorn had less ankle swelling, and 50% had a reduced need to urinate at night (a common complaint in heart failure).44 That study also showed that nearly 66% of patients felt better after 24 weeks of supplementation.

Perhaps the most compelling data come from a study showing a 41% reduction in the risk of sudden cardiac death among heart failure patients, with the best baseline heart performance among those who were taking hawthorn.50 Sudden death is the most-feared and unpredictable consequence of chronic heart failure.

In evaluating dosing of hawthorn extracts, it’s important to compare not only the dose in milligrams in the supplement, but also the total amount of the vital oligomeric polyphenols (OPC) that’s delivered.

Typical doses of hawthorn extracts to achieve these effects range from 80 to 450 mg twice daily, which deliver 30 to 169 mg/day of oligomeric polyphenols, though one study of 1,800 mg/day (providing 338 mg/day of OPC) demonstrated safety and improved patient symptom ratings in a group of people with Class III (moderate severity) heart failure.42,44

Hawthorn’s effects are so powerful that theoretical concerns have been raised about its interactions with other heart medications, especially the “cardiac glycosides” such as digitalis and digoxin. A human volunteer trial, however, demonstrated no detectable interactions after 3 weeks of treatment with digoxin 0.25 mg/day and hawthorn 900 mg/day (delivering OPC at 169 mg/day).51

### TABLE 2: New York Heart Association Classification of Heart Failure41

<table>
<thead>
<tr>
<th>Class</th>
<th>Patient Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class I (Mild)</td>
<td>No limitation of physical activity. Ordinary physical activity does not cause undue fatigue, palpitation, or shortness of breath.</td>
</tr>
<tr>
<td>Class II (Mild)</td>
<td>Slight limitation of physical activity. Comfortable at rest, but ordinary physical activity results in fatigue, palpitation, or shortness of breath.</td>
</tr>
<tr>
<td>Class III (Moderate)</td>
<td>Marked limitation of physical activity. Comfortable at rest, but less than ordinary activity causes fatigue, palpitation, or shortness of breath.</td>
</tr>
<tr>
<td>Class IV (Severe)</td>
<td>Unable to carry out any physical activity without discomfort. Symptoms of cardiac insufficiency (fatigue, palpitations, shortness of breath) at rest. If any physical activity is undertaken, discomfort is increased.</td>
</tr>
</tbody>
</table>
Arjuna extracts produce even more remarkable improvements in chronic heart failure patients. One study evaluated arjuna at a dose of 500 mg every 8 hours in patients with severe, Class IV heart failure, not responding to standard medications, which were continued throughout the study. Supplemented patients, but not controls, had improvement in all clinical signs of heart failure, and had better objective outcomes on echocardiograms, including reductions in heart volume and pressures, and increases in the amount and percent of blood pumped with each beat.

In that study, 100% of arjuna-supplemented patients improved from Class IV (basically bedridden) to Class III (moderate) heart failure, an enormous change. Perhaps even more compelling is the finding that, by the study's 4th month, 75% of the arjuna-supplemented patients had moved down to Class II (from Class III). No patients in the placebo group experienced such remarkable progress.

In another trial, Class III patients on the same dose of arjuna achieved similar echocardiogram results. In this study, all arjuna-supplemented patients improved all the way to Class I heart failure, which is defined as having no symptoms of heart failure at all.

None of these studies detected meaningful side effects from the use of arjuna as an add-on therapy.

Summary

Tens of millions of Americans suffer coronary artery blockage, arrhythmia, and/or congestive heart failure. Most don't know they are slowly developing these problems as a consequence of normal aging. Life Extension® members take nutrients like CoQ10, PQQ, carnitine, lipoic acid, and fish oil to help protect against the epidemic of heart disease (and stroke) that strikes so many maturing humans.

Hawthorn and arjuna extracts function via novel cardio-protective mechanisms that have demonstrated remarkable efficacy in the clinical setting. These extracts, alone or as add-on therapy to existing heart medications, have proven safe and effective in slowing and even reversing the deadly progress of angina, heart attack, and chronic heart failure. Those with preexisting cardiovascular health issues should consider supplementing with these botanical agents, after consultation with their healthcare provider.

References


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:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Dosage</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.

Two capsules a day of CR Mimetic Longevity Formula provide:

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</table>

To order CR Mimetic Longevity Formula
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. This product is not intended to diagnose, treat, cure, or prevent any disease.

Cardiotonics have traditionally been used to improve heart function and vitality. Formulated for optimum heart muscle health, Cardio Peak™ with Standardized Hawthorn and Arjuna provides dual cardiotonic support.

Extensive research demonstrates that the botanical extracts Hawthorn and Arjuna deliver optimum support for normal heart muscle function and coronary artery health.1-17

Hawthorn: Peak Cardiotonic Support

Used for centuries in Europe for heart health, the cardiotonic effects of Hawthorn extract have been well documented in numerous clinical trials.1-9,12

Hawthorn contains specific bioflavonoid complexes targeted to help promote normal circulation and efficient heart muscle function.2,5,12

Studies indicate that the constituents in Hawthorn powerfully support:

- Strong contractile force of human heart muscle.3
- Protection for heart muscle cells from oxidant damage.1,2
- Normal gene expression to promote cardiovascular health.2,3,5
- Improved cardiovascular performance.11

Arjuna: Boosting Heart-Health Benefits

Traditionally used for cardiovascular health, arjuna extract complements the effects of hawthorn in support of enhanced heart function.16,17 A number of scientific studies have shown that arjuna delivers strong support for:

- Enhanced heart muscle tone, improving its “squeeze” and increasing the amount of blood it can pump each second without exhaustion.16
- Healthy endothelial function.8
- Improved exercise endurance.17

A comprehensive program that includes diet, exercise, and lifestyle changes is important to your cardiovascular health. For unique cardiotonic support for a strong and healthy heart, Cardio Peak™ with Standardized Hawthorn and Arjuna may become a key element in your daily regimen!

To order Cardio Peak™ with Standardized Hawthorn and Arjuna, call 1-800-544-4440 or visit www.LifeExtension.com

The suggested twice daily dosage of 2 capsules of Cardio Peak™ with Standardized Hawthorn and Arjuna provides:

- Rejuna™ Arjuna (Terminalia arjuna) 1,500 mg
  10:1 extract (bark) [std. to 40% polyphenols (600 mg)]
- Hawthorn-Derived Oligomeric Proanthocyanidins (OPCs) 60 mg
  [from standardized Hawthorn (Crataegus monogyna and Crataegus laevigata) extract (leaf and flower)]

A bottle of 120 vegetarian capsules of Cardio Peak™ with Standardized Hawthorn and Arjuna retails for $36. If a member buys four bottles during Super Sale, the price is reduced to $21.60 per bottle.

References

Rejuna™ is a trademark of Verdure Sciences, Inc.
**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 **discounts** available to Foundation members enable them to purchase premium-quality supplements at prices 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><strong>SUPER SALE</strong> 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></td>
<td>$32</td>
<td><strong>$16.81</strong> (ten-bottle purchase)</td>
</tr>
<tr>
<td>120 softgels, Item # 01482</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Super purified EPA/DHA fish oil plus sesame lignans and potent olive fruit extract</td>
<td></td>
<td></td>
</tr>
<tr>
<td>to provide critical omega-3 fatty acids and essential components of the Mediterranean</td>
<td></td>
<td></td>
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<tr>
<td>diet.</td>
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<td></td>
</tr>
<tr>
<td><strong>Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™</strong></td>
<td>$62</td>
<td><strong>$35.10</strong> (ten-bottle purchase)</td>
</tr>
<tr>
<td>100 mg, 60 softgels, Item # 01426</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The superior ubiquinol form of CoQ10 plus a natural compound (shilajit) shown to</td>
<td></td>
<td></td>
</tr>
<tr>
<td>double mitochondrial CoQ10 levels.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CoffeeGenic™ Weight Management™ with Green Coffee Extract • 90 capsules,</strong> Item #</td>
<td>$48</td>
<td><strong>$28.35</strong> (four-bottle purchase)</td>
</tr>
<tr>
<td>01707</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green Coffee Extract (GCA™) (350 mg) plus irvingia, chromium, and green tea extract.*</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Vitamin D3 • 5,000 IU, 60 softgels,</strong> Item # 01713</td>
<td>$11</td>
<td><strong>$6.68</strong> (four-bottle purchase)</td>
</tr>
<tr>
<td>High-potency vitamin D in a new softgel to provide greater absorption into the</td>
<td></td>
<td></td>
</tr>
<tr>
<td>bloodstream.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ultra Natural Prostate Formula with AprèsFlex™ &amp; Standardized Lignans</strong></td>
<td>$38</td>
<td><strong>$21.60</strong> (twelve-bottle purchase)</td>
</tr>
<tr>
<td>60 softgels, Item # 01695</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comprehensive prostate protection utilizing nettle, pygeum, saw palmetto, boswellia,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>and other botanical extracts plus boron.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Super K with Advanced K2 Complex • 90 softgels,</strong> Item # 01724</td>
<td>$30</td>
<td><strong>$18.23</strong> (four-bottle purchase)</td>
</tr>
<tr>
<td>More potent formula now includes 200 mcg of long-acting MK-7 form of vitamin K2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>plus 1,000 mcg of K1 and 1,000 mcg of the MK-4 form of vitamin K2.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PQQ Caps with BioPQQ™ • 10 mg, 30 vegetarian capsules,</strong> Item # 01500</td>
<td>$24</td>
<td><strong>$14.85</strong> (four-bottle purchase)</td>
</tr>
<tr>
<td>Promotes mitochondrial biogenesis (generation of new mitochondria) in aging cells.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>DHEA (Dehydroepiandrosterone) • 25 mg, 100 capsules,</strong> Item # 00335</td>
<td>$18</td>
<td><strong>$10.13</strong> (four-bottle purchase)</td>
</tr>
<tr>
<td>A hormone that declines with aging, benefits overall health.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mitochondrial Energy Optimizer with BioPQQ™ • 120 capsules,</strong> Item # 01568</td>
<td>$94</td>
<td><strong>$56.70</strong> (four-bottle purchase)</td>
</tr>
<tr>
<td>To maintain healthy cellular function, protein structural integrity, and mitochondrial biogenesis.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Super Bio-Curcumin® • 400 mg, 60 vegetarian capsules,</strong> Item # 00407</td>
<td>$38</td>
<td><strong>$23.63</strong> (four-bottle purchase)</td>
</tr>
<tr>
<td>Super-absorbable formulation promotes healthy lipids, joint function, and healthy DNA.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Absorbs up to seven times greater than conventional curcumin.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Super Zeaxanthin with Lutein, Meso-Zeaxanthin, and C3G</strong></td>
<td>$22</td>
<td><strong>$13.37</strong> (four-bottle purchase)</td>
</tr>
<tr>
<td>60 softgels, Item # 01685</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supports night vision and macular density.</td>
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<tr>
<td><strong>Optimized Resveratrol with Synergistic Grape-Berry Actives</strong></td>
<td>$46</td>
<td><strong>$27.90</strong> (four-bottle purchase)</td>
</tr>
<tr>
<td>250 mg, 60 vegetarian capsules, Item # 01430</td>
<td></td>
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</tr>
<tr>
<td>High potency trans-resveratrol with quercetin, plus trans-pterostilbene and fisetin to support DNA “longevity genes.” One per day resveratrol formula.</td>
<td></td>
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</tr>
<tr>
<td><strong>Life Extension Mix™ • 315 tablets,</strong> Item # 01755</td>
<td>$98</td>
<td><strong>$46.91</strong> (ten-bottle purchase)</td>
</tr>
<tr>
<td>High-potency multi-nutrient formula now with the sodium selenite form of selenium in addition to L-selenomethionine and Se-methyl L-selenocysteine.</td>
<td></td>
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</tr>
</tbody>
</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.*
## Bone Restore with Vitamin K2 • 150 capsules, Item # 01711
High-potency bone protection formula with FruiuteX B® OsteoBoron®, Magnesium citrate, and now K2. Available with or without vitamin K2.  

Our Low Retail Price: $26  
Member-Volume Discount Price Per Bottle: $15.53 (four-bottle purchase)

## Cognitex with NeuroProtection Complex • 90 softgels, Item # 01697
Optimal support for the brain. Includes glyceryl-phosphoryl-choline, vinpocetine, phosphatidylserine, Sharp-PS® GOLD PS-DHA, uridine 5'-monophosphate, and others. Available with or without pregnenolone.  

Our Low Retail Price: $74  
Member-Volume Discount Price Per Bottle: $43.20 (twelve-bottle purchase)

## Cardio Peak with Standardized Hawthorn and Arjuna
120 vegetarian capsules, Item # 01700
Powerful cardiotonic botanical extracts modulate a broad spectrum of cardiovascular risk factors.  

Our Low Retail Price: $36  
Member-Volume Discount Price Per Bottle: $21.60 (four-bottle purchase)

## Reishi Extract Mushroom Complex • 60 vegetarian capsules, Item # 01708
Standardized mushroom extract to restore and regulate immune system function.  

Our Low Retail Price: $30  
Member-Volume Discount Price Per Bottle: $18.23 (four-bottle purchase)

## Triple Action Cruciferous Vegetable Extract
60 vegetarian capsules, Item # 01468
Comprehensive cruciferous plant extract formulation, with IBC, DIM, apigenin, and other DNA-protecting vegetable concentrates.  

Our Low Retail Price: $24  
Member-Volume Discount Price Per Bottle: $14.85 (four-bottle purchase)

## Prelox® Natural Sex for Men® • 60 tablets, Item # 01373
Supports healthy endothelial function and blood flow for maximum male performance.  

Our Low Retail Price: $52  
Member-Volume Discount Price Per Bottle: $32.40 (four-bottle purchase)

## Super R-Lipoic Acid • 300 mg, 60 vegetarian capsules, Item # 01208
Superior efficacy compared to alpha-lipoic acid—supplies 240 mg of stabilized R-lipoic acid.  

Our Low Retail Price: $49  
Member-Volume Discount Price Per Bottle: $30.38 (four-bottle purchase)

## ArthroMax™ Advanced with UC-II® and AprèsFlex™ • 60 capsules, Item # 01618
Promotes joint health and may promote comfortable joint structure and function.  

Our Low Retail Price: $36  
Member-Volume Discount Price Per Bottle: $21.60 (four-bottle purchase)

## Extraordinary Enzymes • 60 capsules Item # 01706
Powerful digestive support to promote nutrient absorption while minimizing breakdown of starches into sugar.  

Our Low Retail Price: $26  
Member-Volume Discount Price Per Bottle: $16.20 (four-bottle purchase)

## Krill Healthy Joint Formula • 30 softgels, Item # 01600
Healthy joint formula provides targeted support for aging joints through a proprietary blend of krill oil, hyaluronic acid, and astaxanthin. One softgel a day formula.  

Our Low Retail Price: $32  
Member-Volume Discount Price Per Bottle: $19.58 (four-bottle purchase)

## Natural Stress Relief • 30 vegetarian capsules, Item # 00987
With lemon balm extract to help relieve stress and sleeplessness, and pure L-theanine to promote relaxation without drowsiness.  

Our Low Retail Price: $28  
Member-Volume Discount Price Per Bottle: $16.20 (four-bottle purchase)

## Gamma E Tocopherol with Sesame Lignans • 60 softgels, Item # 00759
Provides the critical gamma tocopherol form of vitamin E plus sesame lignans to enhance the free radical scavenging benefits of alpha and gamma tocopherols.  

Our Low Retail Price: $32  
Member-Volume Discount Price Per Bottle: $19.58 (four-bottle purchase)

## Black Cumin Seed Oil with Bio-Curcumin® • 60 softgels Item # 01710
Dual support for a balanced immune and inflammation response.  

Our Low Retail Price: $32  
Member-Volume Discount Price Per Bottle: $20.25 (four-bottle purchase)

## Super Booster Softgels with Advanced K2 Complex • 60 softgels, Item # 01680
A convenient once per day softgel that includes optimal potencies of gamma-tocopherol, sesame lignans, lycopene, lutein, ginkgo, chlorophyllin, and both forms of vitamin K2.  

Our Low Retail Price: $42  
Member-Volume Discount Price Per Bottle: $25.65 (four-bottle purchase)

## Neuro-Mag™ Magnesium L-Threonate • 90 vegetarian capsules Item# 01603
Optimal form of magnesium to protect synaptic density of neurons.  

Our Low Retail Price: $40  
Member-Volume Discount Price Per Bottle: $24.30 (four-bottle purchase)
How *Reishi* Combats Aging

Over the past several decades, research has focused on analyzing the hundreds of unique compounds found in the Reishi mushroom. Just this year alone, three new compounds were discovered. With each new finding, intriguing medical applications for Reishi have emerged.

There is now a wealth of impressive data that demonstrates Reishi’s life-extending properties, its ability to stimulate brain neurons, search and destroy cancer cells, and prevent the development of new fat cells in obese individuals. As an example of growing science supporting Reishi, researchers using laboratory mice have detailed life span extension of 9% to more than 20%—the equivalent of 7 to nearly 16 years in human terms.

As if these targeted benefits were not sufficient, Reishi’s bioactive compounds show a therapeutic effect on asthma, allergies, autoimmune diseases, Alzheimer’s and Parkinson’s diseases, diabetes, liver failure, and more.

Given Reishi’s complex composition of bioactive compounds, there is still more to discover. In this report, we will bring you up to date on how Reishi successfully targets a broad spectrum of factors involved in pathological aging.
Multiple Components Target Aging Mechanisms

Reishi mushrooms have been used for medicinal purposes for at least 2,000 years.\textsuperscript{37} The mushrooms were known to the ancients as “the mushroom of immortality”\textsuperscript{37}—and for good reason. They had the reputation of promoting health and longevity, boosting the immune system, and reducing the risk of life-shortening conditions such as cardiovascular disease and cancer.\textsuperscript{38-41} Science has finally validated this traditional wisdom.

Originally, Reishi mushrooms were rare and expensive,\textsuperscript{38,42} but now advances in cultivation techniques have made these medicinal mushrooms more available, which has led to an explosion of research on their properties and components.\textsuperscript{38,42}

Studies have shown that Reishi mushrooms can contribute to longer life spans.\textsuperscript{1,2} They can help manage some of today’s most troubling age-related conditions, including autoimmune diseases, neurodegenerative disorders, diabetes, liver disease, cancer, and more.

How is it that this simple mushroom can have such wide-ranging health effects? Keep in mind that there isn’t one single cause of aging and disease. Numerous factors contribute to these conditions—meaning that in order to combat them, you need to fight them from a multi-targeted approach. That’s exactly what makes Reishi mushrooms so powerful. The mushroom itself contains hundreds of biologically active molecules—all of which work together to have such broad-reaching health benefits.\textsuperscript{37}
Researchers have identified three specific compounds that are essential to Reishi’s powerful antioxidant and antiaging effects:

1. **Polysaccharides** have anticancer effects based on their ability to prevent abnormal blood vessel formation and to boost immune system function.40,42

2. **Triterpenes** protect the liver, lower blood pressure and cholesterol, prevent platelet clumping that leads to heart attack and stroke, fight allergic responses triggered by histamine, and also possess anticancer activity.42

3. **Ganoderma lucidum peptide** is a unique protein that has remarkably potent antioxidant characteristics that are still being unraveled.43

But what makes Reishi mushroom beneficial to so many varied aspects of your health are its actions on different targets in your body. The actions triggered by Reishi mushrooms produce important changes that may contribute to their promotion of longevity. Reishi extracts are known to:

- Protect cellular DNA from oxidant damage that contributes to aging and cancer.44
- Protect mitochondrial DNA and the mitochondria themselves from oxidant damage that weakens their energy-producing abilities and makes them inefficient, another major cause of aging.45-47
- Increase levels and activity of a large suite of natural intracellular antioxidant molecules, resulting in reduced oxidation of cell membranes that lead to aging and its related diseases.38,48
- Protect tubule cells from oxidant damage that leads to kidney failure.49
- Increase expression of a key longevity gene and promote an increased life span in species ranging from yeasts, to primitive worms, to mammals such as mice.1,2,50,51

Several studies have shown that Reishi is one of the most powerful mushrooms with regard to antioxidant characteristics.52,53 Reishi mushrooms boost total antioxidant capacity, an important measure of the vigor with which they fight oxidant damage.52,54

In a human study, Reishi mushrooms were given to healthy volunteers as a single 1,100 mg dose.54 Plasma antioxidant capacity rose rapidly to a peak at 90 minutes, while urine antioxidant capacity (a measure of what has been in the body) rose by 29% after 3 hours. Neither study showed any evidence of toxicity or side effects.59

Reishi’s many mechanisms of action are what allow it to have such a robust impact on such a wide array of age-related health threats. Let’s now look at some of the most promising areas of research.

**Breaking News on Reishi Mushrooms and Cancer Prevention**

New compounds are being discovered within extracts of Reishi mushroom on a regular basis. At least 3 were identified in late 2012 alone.55 These discoveries are shedding light on Reishi extracts’ multi-targeted anti-cancer properties.

Most intriguing are findings that add to our knowledge about Reishi and the phenomenon of immune surveillance. New cancer cells appear in your body every day, but your healthy immune system normally searches these out, quickly activating killer cells to destroy developing cancers before they can form tumors.

Advancing age, coupled with the onset of other chronic illnesses and exposure to various environmental toxins (and even some medications), means that your immune system’s ability to carry out immune surveillance wanes. And if just one abnormal, cancer-prone cell escapes detection and destruction, it can develop into a full-blown malignancy with tremendous swiftness.

There’s an abundance of data on ways that Reishi extracts boost immune surveillance and enhance detection and elimination of emerging cancer cells from the body.56 And in late 2012, several new studies revealed that these mushrooms have substantially deeper and more advanced mechanisms than had been previously suspected. The mechanisms of how Reishi identifies and then attacks cancer cells are extremely sophisticated and effective. We know that cancer cells evade immune system surveillance by “hiding” their abnormal surface markers.4 These types of molecular changes not only permit primary cancer to arise, but also contribute to relapses of cancer following chemotherapy.57

Reishi extracts force cancer cells to reveal their telltale markers, flagging them for destruction by immune killer cells.4 At the same time, Reishi extracts induce the production of specific molecules that the immune system needs to complete the killing process.4 Ultimately, Reishi extracts enhance the killing of cancer cells by normal immune killer cells and reduce the amount of chemotherapy drugs required to finish the job.57,58
In addition to their impressive immune-surveillance-boosting properties, Reishi extracts have numerous other ways of attacking cancer:

- Reishi compounds, particularly the triterpenes and polysaccharides, limit tumors’ growth rate by blocking the abnormal reproductive cycles of cancer cells.59
- Some of these compounds are directly toxic to cancer cells, while sparing healthy tissue.60,61
- Reishi compounds inhibit metastatic processes and decrease the expression of genes involved in cancer cell survival, proliferation, invasion, and metastasis.61
- Reishi compounds also trigger the programmed cell death called apoptosis that’s suppressed in malignant cells.55,60-62

Together, all of these effects of Reishi mushrooms are shown to reduce the size and growth rates of human tumors, both in animals and in human clinical trials.

The most dramatic impact has been shown in colorectal cancer, which is the second leading cause of cancer death among cancers that affect both men and women.63

Clinical studies show that Reishi extracts suppress the development of adenomas, which are pre-malignant masses found in the large intestine.64

**Remarkable Benefits of Reishi**

- Recent studies show that Reishi mushrooms have hundreds of components in three distinct classes of bioactive molecules, making them ideal for combating the complex and multifactorial diseases we face with advancing age.
- Reishi extracts prolong life spans in animal experiments by 9% to more than 20%.
- Reishi boosts the immune system’s vigilance against cancer cells, potentially reducing the risk of developing a detectable and deadly tumor.
- Reishi extracts can suppress an overly vigorous immune response, helping to quell symptoms of allergies, asthma, and autoimmune diseases.
- Independent of their immune-modulating effects, Reishi mushrooms’ active molecules are showing promise in the battle against neurodegenerative diseases, obesity and diabetes, and liver disease.
- If there is such a thing as the “ideal” supplement, capable of attacking multiple complex diseases each with multiple causative factors, Reishi mushrooms are an outstanding candidate.

**Meta-Analysis Conducted on Reishi for Cancer Treatment**

An evaluation of all available clinical trials on the use of Reishi in cancer treatment was published in June 2012.

While there was insufficient data to demonstrate efficacy Reishi by itself, when Reishi was given alongside radiation and/or chemotherapy, patients were 50% more likely to respond positively compared to those given chemo/radiation alone. The results in cancer patients receiving Reishi showed the expected increases in immune cells known to enhance tumor response and stimulate host immunity.82

We at Life Extension® look forward to better quality methodological trials to clarify the value of Reishi in adjunctive cancer treatment.
Reishi Balances the Immune System

Reishi mushrooms have a well-known ability to beneficially modulate the immune system. The mushrooms’ ability to boost immunity is the source of their advanced cancer- and infection-fighting properties. But it is equally important to keep your immune system from overreacting or turning on itself, as is the case with autoimmune diseases and allergies. Reishi mushrooms have demonstrated the ability to modulate the delicate balance necessary for a healthy immune system. Studies have shown that Reishi mushrooms can reduce the overactive immune response that occurs in conditions such as allergies, asthma, and autoimmune diseases.

The polysaccharides and triterpenes found in Reishi mushrooms act at multiple targets in the cascade of events leading to inflammation and excessive immune response.

Reishi extracts inhibit the release of histamine from specialized immune cells called “mast cells.” They have the ability to reduce the activity in nerves that transmit the itch sensation to the brain after a mosquito bite or similar itchy stimulus.

In animal models, Reishi extracts were able to sharply reduce the symptoms associated with allergies, such as rhinitis (watery, itchy nose) and mosquito bites. Studies also show that Reishi extracts can reduce “airway hyper-responsiveness,” the “twitchy” smooth muscle responses in the lung bronchi that trigger an asthma attack.

Reishi extracts also show promise for the management of the underlying immune imbalance that leads to autoimmune diseases.

Reishi Promotes Neuroprotection

Reishi extracts were found to stimulate the production of nerve growth factor, which in turn supports the rapid development of healthy neurons and enhances their mitochondrial function.

Reishi’s powerful antioxidant and anti-inflammatory properties make these mushrooms attractive candidates for preventing neurodegenerative diseases such as Alzheimer’s and Parkinson’s. Both of these diseases are driven by oxidative stress and inflammation.

The triterpenes and polysaccharides from the mushrooms reduce the oxidative impact of destructive proteins such as Abeta, the chief trigger of Alzheimer’s disease, and they protect brain cells from the inflammation known to cause Parkinson’s disease.

Studies reveal that supplementing with Reishi mushrooms has beneficial effects for stroke victims. First, it can limit the size of the stroke-damaged area in the brain, which helps limit behavioral and functional damage caused by the stroke. Second, Reishi mushrooms protect brain tissue from hypoxia/reperfusion injury, the “one-two” punch of oxygen starvation followed by excessive oxidation that produces most of the damage in the brains of stroke victims.
But as valuable as these benefits are, nowhere are the effects of Reishi mushroom extracts more clear than in their impact on diabetes-related cognitive disorders. In animal studies, Reishi spores alleviated diabetes-induced oxidative stress and mitochondrial dysfunction in the hippocampus, one of the brain’s chief memory-processing areas.22

**Reishi and Diabesity**

Obesity is a health hazard sweeping the globe in epidemic proportions—and chief among its complications is type II diabetes. The conditions are so often found hand-in-hand that researchers refer to them as a single disease called “diabesity.” Reishi mushrooms are especially valuable in the fight against this epidemic because they’ve been shown to have benefits across the entire spectrum of diabesity.23-26

Laboratory studies show that the polysaccharides and triterpenes in Reishi extracts can prevent the development of new fat cells from pre-adipocytes, helping to limit excessive fat storage seen in obese people.5 The extracts also have favorable effects on lipid profiles (cholesterol and triglycerides), which are frequently elevated in those with obesity and/or diabetes—and are risk factors for cardiovascular disease.23

Reishi extracts work to lower blood sugar by several different mechanisms.5,23,24,72-76 Reishi inhibits alpha-glucosidase, the chief enzyme responsible for digesting starches into sugars.77 This inhibition prevents the sharp after-meal spike in glucose that is so dangerous as we age.78 They also limit the destruction caused by advanced glycation end products (AGEs), the proteins whose malfunction promotes aging and inflammation.79

Studies have shown that reducing blood sugar and glycation with Reishi supplements reduces diabetic consequences like kidney disease.80 Reishi extracts also speed wound healing in diabetic individuals, the result of enhanced antioxidant function.81

**Reishi Safeguards Liver Function**

Your liver is the direct recipient of toxic threats both from the environment and from destructive molecules produced within your body. While it is well protected with its own antioxidant and detoxification systems, oxidation and inflammation eventually take their toll, leaving the aging liver at risk for decreased function, increased accumulation of toxic injury, fibrosis, and cancer. Fortunately, Reishi mushrooms offer direct protection against such threats.27

Studies show, for instance, that pre-treating animals with Reishi spores can protect them when they’re exposed to cadmium, a highly toxic metal capable of causing massive liver failure.28 Researchers found the spores decreased the cadmium accumulation in the liver, while “pushing” the toxic metal into the liquid matrix of the cells. Once there, the mushroom spores increased the production of a cadmium-binding protein that removes the toxin from the body.28

Reishi mushroom extracts similarly protect liver tissue from the toxic effects of certain bacterial infections. In animals with such infections, Reishi polysaccharides inhibit inflammation in liver cells.29 Other studies reveal that Reishi polysaccharides restore natural liver antioxidant systems to normal function following an infection, while inhibiting liver enzymes that produce excessive oxidative stress.30,31 Reishi mushrooms limit the activity of beta-glucuronidase, an enzyme that is elevated in many liver conditions, including inflammation, cirrhosis, and jaundice.31,32

One of the most exciting potential applications for Reishi mushrooms in liver disease is in the condition called liver fibrosis, which is the final stage of non-alcoholic fatty liver disease. Statistics have shown that non-alcoholic fatty liver disease is the most
common form of liver disease, ultimately affecting 20 to 30% of the population. In an animal model of toxin-induced liver fibrosis, treatment with Reishi extract reversed the fibrosis even after it was well-established. This is an exceptional result, because in most cases, liver disease that has advanced to the stage of fibrosis is considered irreversible.

**Summary**

Reishi mushrooms provide a broad-spectrum approach to the treatment and prevention of many of today’s age-related problems. With their diverse molecular makeup, they offer a wide range of actions that attack aging at its root.

This is seen in research demonstrating Reishi’s ability to prolong the life spans of laboratory mice by 9% to more than 20%—the equivalent of 7 to nearly 16 years in human terms.

This is corroborated by research that has uncovered its powerful anti-cancer activity. Reishi mushrooms contribute to enhanced immune surveillance that can seek and destroy cancer cells before they can form threatening tumors.

Finally, studies have shown that Reishi extracts have a role in the prevention or mitigation of asthma, allergies, and autoimmune disorders, while offering protection against neurodegeneration, obesity and diabetes, and liver diseases of many kinds.

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**


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.1–9

To ensure the purest, most stable, and easy-to-tolerate fish oil supplement, SUPER OMEGA-3 EPA/DHA is molecularly distilled. This proprietary technology ensures any environmental pollutants are reduced to extremely low 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 ranking 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.10

To further emulate the benefits of a Mediterranean diet, Super Omega-3 delivers standardized, high-potency olive fruit extract. Research shows that fish oil combined with olive oil helps with inflammation better than fish oil alone.11

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.12–15

Super Omega-3 (4 regular size softgels) supplies the equivalent content of 6 tablespoons 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 $18.90 per bottle. If 10 bottles are purchased during Super Sale, the cost is $16.81 per bottle. (Item # 01482)

Some members have requested we make Super Omega-3 available in a smaller capsule for easier swallowing. We have accomplished this by making half-size softgels available. A bottle containing 240 half-size 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 $18.90 per bottle. If 10 bottles are purchased during Super Sale, the cost is $16.81 per bottle. (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 during Super Sale, the price is reduced to $20.93 per bottle. If 10 bottles are purchased during Super Sale, the cost is $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.

REFERENCES
Human studies suggest that supplementary enzymes may improve digestion and help minimize post-meal glucose surges.\textsuperscript{1,2}

Since proteins, plant fibers, and fats are broken down differently, one needs the proper spectrum of enzymes for optimal digestion.\textsuperscript{3}

A new multi-enzyme formula facilitates both optimal nutrient absorption and broad relief from digestive discomforts without promoting after-meal glucose surges.\textsuperscript{2,3}

**TWELVE PREMIUM ENZYMES**

*Extraordinary Enzymes* provides a potent array of protease, cellulase, and lipase enzymes specially formulated to adapt to a variety of stomach acid pH conditions and powerfully support digestion.

With a total of twelve different enzymes, this unique formula supports the digestion of just about any food that may pose a problem for you—whether a protein, fiber, or fat. *Extraordinary Enzymes* provides a blend of powerful enzymes to help your system convert a variety of foods to energy and readily absorb the nutrients in the foods you consume. This formulation may enhance protein content in your body and allow for better fat utilization.\textsuperscript{4,5}

Together, these enzymes work by an all-natural, synergistic process to help provide nutritional support for a healthy digestive system.

The twelve enzymes in value-priced *Extraordinary Enzymes* are:

- **Protease SP** (Bacillus sp., Aspergillus oryzae) 97,000 HUT
- **Protease S** (Aspergillus melleus) 10,500 PC
- **Acid Protease** (Aspergillus niger) 10 SAPU
- **Lipase** (Candida rugosa, Rhizopus oryzae, Aspergillus niger) 4,000 FIP
- **Cellulase** (Trichoderma longibrachiatum) 2,400 CU
- **Trypsin** (Porcine) 20,000 USP
- **Chymotrypsin** (Porcine) 3,336 USP
- **Phytase** (Aspergillus niger) 20 FTU
- **Beta-Glucanase** (Trichoderma longibrachiatum) 30 BGU
- **Hemicellulase** (Aspergillus niger) 4,000 HCU
- **Pectinase** (Aspergillus niger) 50 endo-PGU
- **Xylanase** (Trichoderma longibrachiatum) 600 XU

**Total Nutrient Absorption Blend** 200 mg

**WHAT’S NOT IN EXTRAORDINARY ENZYMES?**

Unlike commercial digestive enzyme supplements, amylase is intentionally left out of *Extraordinary Enzymes*. The reason is that amylase breaks down starches into glucose that is rapidly absorbed into the bloodstream.\textsuperscript{2}

*Extraordinary Enzymes* facilitates the healthy breakdown of plant fibers that cause people to avoid healthy vegetables because of digestive discomforts.

Most people will take one capsule before the two heaviest meals, which provides 400 mg of natural digestive enzymes each day.

A bottle of 60 capsules of *Extraordinary Enzymes* retails for $26. If a member buys four bottles during Super Sale, the price is reduced to $16.20 per bottle.

Contains milk, soybeans, tree nuts (coconut), and wheat.

**References**

Reishi mushroom has been traditionally used to boost immune system vitality. Its broad-spectrum benefits have been demonstrated in thousands of studies.  

An advanced extraction technology has resulted in a new Reishi extract that make its active compounds even more bio-available.

**REISHI SUPPORTS A HEALTHY IMMUNE SYSTEM**

An abundance of evidence demonstrates that Reishi constituents enhance the protective activity of the body’s hematopoietic stem cells, T-cells, and other crucial immune factors.  

Reishi’s immune-supporting compounds include an array of unique polysaccharides, triterpenes, and other constituents, many of which assist activation of the cell surface receptors that modulate normal immunity.

The Reishi mushroom also supports the body’s production of endogenous antioxidant enzymes—such as superoxide dismutase (SOD), catalase, and glutathione—which, in turn, support the body’s natural immune defenses against free radical damage.

**ADVANCED EXTRACTION TECHNOLOGY**

Reishi Extract Mushroom Complex delivers powerful compounds and represents the next generation of natural immune support. Reishi extracts standardized to polysaccharides have been available for years, but most do not standardize for triterpenes and include the spores. This full-spectrum extract has multiple components that have shown to support healthy immune function and enhanced longevity in a natural experimental aging model.

The suggested 2 capsules a day of Reishi Extract Mushroom Complex provide:

- **Reishi mushroom (Ganoderma lucidum) extract (Fruit body)** 980 mg
  [standardized to 13.5% polysaccharides (132.3mg) and 6% triterpenes (58.8mg)]
- **Reishi mushroom (Ganoderma lucidum) spore** 150 mg

A bottle containing 60 vegetarian capsules of Reishi Extract Mushroom Complex retails for $30. If a member buys four bottles during Super Sale, the price reduced to $18.23.

** References**

15. FASEB. 2012;26:375.2.
**Maintain Macular Density**

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.

Falling down is responsible for 70% of accidental deaths in older people.1 Poor lighting conditions are often the culprit.

Fortunately, C3G derived from black currant extract supports eyesight in dark conditions by promoting the healthy function of delicate structures within the retina that support night vision.2

**Super Zeaxanthin** contains a potent dose of C3G to nourish cells throughout the body.

---

**Comprehensive Ocular Protection in One Daily Softgel**

The **Super Zeaxanthin** formula provides ingredients that have been shown to promote healthy eyesight. Just one softgel of **Super Zeaxanthin with Lutein, Meso-Zeaxanthin and C3G** provides:

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<tr>
<th>Ingredient</th>
<th>Description</th>
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<tr>
<td>Optilut®, Lutein Plus® and MZ®</td>
<td>38 mg Marigold (Tagetes erecta) extract (flower) [free lutein equivalent 10 mg]</td>
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<tr>
<td>Zeaxanthin &amp; Meso-zeaxanthin blend</td>
<td>3.75 mg Paprika (capsicum annuum) extract (fruit), Optilut®, Lutein Plus® and MZ® Marigold Extract (flower)</td>
</tr>
<tr>
<td>C3G (Cyanidin-3-glucoside)</td>
<td>2.2 mg from European black currant (Ribes nigrum) extract (fruit)</td>
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The retail price for a bottle containing 60 softgels of **Super Zeaxanthin with Lutein, Meso-Zeaxanthin and C3G** is $22. If a member buys four bottles during **Super Sale**, the price is reduced to $13.37 per bottle.

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The Great Cholesterol Myth:
Why Lowering Your Cholesterol Won’t Prevent Heart Disease—And the Statin-Free Plan That Will

Heart disease is the #1 killer. However, traditional heart disease protocols have gotten it all wrong. Science is showing that cholesterol and saturated fat are not a direct path to heart disease—and that the standard prescription of low-fat diets and statin drugs are contributing to a health crisis of monumental proportions.

The Great Cholesterol Myth reveals the shoddy science, manipulated research, and corporate greed that has perpetuated the myth and displays the true culprits of heart disease—including sugar (not fat), inflammation, stress, and high-carb diets full of processed foods.

LE: Big Pharma has spent tens of millions of advertising dollars to create the $30 billion-a-year industry of cholesterol-lowering drugs. What is the most disturbing fallout from this misinformation campaign?
TGCM: The real tragedy is that by putting all of our attention on cholesterol, we’ve virtually ignored the real causes of heart disease: inflammation, oxidation, sugar, and stress.

LE: And sadly, the government has gone in lockstep with this false narrative.

TGCM: Many of the general dietary guidelines accepted and promoted by the government and by major health organizations such as the American Heart Association are either directly or indirectly related to cholesterol phobia. As you’ll learn in our book, cholesterol numbers are a pretty poor predictor of heart disease; more than half the people hospitalized with heart attacks have perfectly normal cholesterol levels, and about half the people with elevated cholesterol levels have perfectly normal, healthy tickers.

LE: The book references a report in the *New England Journal of Medicine* about the Nurses’ Health study involving 120,000 women since the 1970s. Their findings support your research.

TGCM: The authors of that study wrote, “Eighty-two percent of coronary events in the study... could be attributed to lack of adherence to (these five factors).” One, don’t smoke. Two, drink alcohol in moderation. Three, engage in moderate-to-vigorous exercise for at least half an hour a day on average. Four, maintain a healthy weight (BMI under 25). Five, eat a wholesome, low-glycemic (low-sugar) diet with plenty of omega-3 fats and fiber. Where’s the part about lowering cholesterol? It’s not there.

TGCM: The real tragedy is that by putting all of our attention on cholesterol, we’ve virtually ignored the real causes of heart disease: inflammation, oxidation, sugar, and stress.

LE: Another myth you tackle is the idea of “good” and “bad” cholesterol.

TGCM: Knowing you have a “high” LDL level is pretty much a useless piece of information unless you know how much of that LDL is the small, dense kind (harmful) and how much is the big, fluffy kind (not harmful in the least). Unfortunately, most doctors are behind the times on this one. They look at that total LDL number – not the size and type – and if that number is even slightly higher than the lab says it should be, out comes the prescription pad. LDL, the imprecisely named “bad” cholesterol, has several different subtypes, and not all of them are bad at all – quite the contrary. Sadly, most doctors do not perform the easily available tests (such as VAP or NMR LipoProfile blood tests)—often covered by insurance—that determine the size and type of your LDL.

LE: Since cholesterol so often plays “the bad guy,” how do we benefit from cholesterol?

TGCM: Cholesterol is a hormone factory. Cholesterol is used by the body to synthesize bile acids. Cholesterol is an essential component of all the cell membranes in the body. Cholesterol is important for the immune system.

LE: You write about how strong the cholesterol-vitamin D connection is and even mention a Life Extension Foundation® study from 2010 about the level of vitamin D in our members. Can you elaborate?

TGCM: It’s impossible to overstate how important the cholesterol-vitamin D connection is. There is compelling research that links less than optimal levels of vitamin D with heart disease, poor physical performance, osteoporosis, depression, cancer, difficulty in losing weight, and even all-cause mortality.

LE: Switching gears, your book labels sugar “the real demon in the diet.” What led you to that conclusion?

TGCM: Sugar is a far greater danger to your heart than fat ever was. Sugar is directly responsible for one of the most damaging processes in the body, something called glycation. Glycation is what happens when sticky sugar molecules glom onto structures where...
they don’t belong, essentially gumming up the works. What does this have to do with cholesterol and heart disease? Everything. [In our book] we discuss one primary way in which LDL cholesterol gets damaged – through oxidative stress generated by free radicals. Can you guess the other way it gets damaged? Glycation. Sugar is at the scene of several crimes, all related to heart disease. A 1992 study examined the blood work of healthy centenarians in an effort to find out whether there were any commonalities among the members of this unusually long-lived demographic. It found three: low triglycerides, high HDL cholesterol, and—wait for it—low fasting insulin. Your diet affects two of these blood measures—triglycerides and fasting insulin—and both measures will fall like a rock when you reduce or eliminate sugar and processed carbs in your diet.

LE: Why has “fat” been taking the fall for so many years while “sugar” has been skating by without much coverage?

TGCM: Well, there’s no political lobby for “fat”, but there’s a powerful one for sugar. In 2003, the World Health Organization published a conservative, reasonable report called *Diet, Nutrition and the Prevention of Chronic Diseases*. In it, the WHO made a statement that it would be a good idea for people to derive no more than 10 percent of their daily calories from added sugars. The report suggested that people could lower their risk of obesity, diabetes, and heart disease simply by curbing some of the sugar they were consuming. Following the report, a reporter for the *Washington Post* quoted a letter from the Sugar Association’s president, Andrew Briscoe, to the general director of WHO in which he stated, “We will expose every avenue available to expose the dubious nature of the *Diet, Nutrition and the Prevention of Chronic Diseases* report.” Two senators wrote a letter to the then Health and Human Services Secretary Tommy G. Thompson, stating that, “evidence that soft drinks are associated with obesity is not compelling.”

LE: And that’s where the danger of high fructose corn syrup comes in.

TGCM: In humans, a high-fructose diet raises triglycerides almost instantly. Fructose found in whole foods, such as in fruits, however, is a different story. There’s not all that much fructose in, for example, an apple. But fructose extracted from fruit, concentrated into a syrup, and then inserted into practically every food we buy at the supermarket, that’s a whole different animal. If you want a bunch of lab animals to become insulin resistant, all you have to do is feed them fructose.

LE: What are some supplements that you feel can have a heart-protecting effect?

TGCM: CoQ10 is a kind of “energy fuel” for the heart. Magnesium relaxes the artery walls, reduces blood pressure, and makes it easier for the heart to pump blood and for the blood to flow freely. Niacin will lower both triglycerides and the “bad” kind of LDL cholesterol. Other supplements worth considering include vitamin C, curcumin, resveratrol, and cocoa flavanols. D-ribose is one of the components of the energy molecule ATP, which the body uses to power all activity.

Stephen Sinatra, MD, FACC, is an internationally known and sought-after cardiologist, educator, and author who created the Manchester, CT-based Heart MD Institute as an educational platform focused on prevention and proactive lifestyle changes to live a healthier life.

For more information visit www.heartmdinstitute.com.

Jonny Bowden, PhD, CNS, a best-selling nutritionist with a master’s degree in psychology, is a nationally known expert on nutrition, weight loss, and health. He is the author of several bestselling titles.

For more information visit www.jonnybowden.com.

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

To order Super K with Advanced K2 Complex or Super Booster, call 1-800-544-4440 or visit www.LifeExtension.com

Each bottle of Super K lasts 90 days, so members pay as little as $6.08 a month for this high-potency blend of all three active forms of vitamin K. The retail price for a bottle containing 90 softgels is $30. If a member buys four bottles during Super Sale, the price is reduced to $18.23 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 with Advanced K2 Complex softgels.)

Warning to Coumadin® (warfarin) Drug Users
Patients prescribed vitamin K-antagonist anti-coagulant prescription 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.

References
“The breaking point for me was that I’d always been a thin, healthy, well-dressed man. When I got obese, it came on slowly. I smoked. I drank a little alcohol. Then, all of a sudden, I was obese. I had to start wearing custom clothes. I went out and bought so-called fat clothes and when I saw myself in the mirror I started crying. It just wasn’t me. At the time, I had two young daughters. I was too exhausted to play with them. I thought, ‘If I can’t get off of the couch, and I’m exhausted, and if someone came in to kidnap my daughters, I couldn’t do anything about it.’ I had to change.”

With cases of diabetes and obesity reaching epidemic proportions across the United States, the above quote could be from any man who ignores his health and over time becomes tragically overweight. In this case, however, the words come from Frederic J. Vagnini, MD, FACS, a board-certified cardiovascular surgeon, bestselling author, and the director of the Heart, Diabetes, and Weight Loss Centers of New York.
Georgia, where I did general and vascular surgery. After that I got involved in non-invasive vascular studies and I wanted to learn everything.”

The reason for Dr. Vagnini’s excitement was because he was about to open a small practice in Long Island to treat vascular disease.

“I had to retrain myself,” he says. “I didn’t know anything about drugs since I was a surgeon. I had to learn blood pressure medications and lipid disorders. And over the last twenty years, I saw more and more people with visceral obesity, high blood pressure, high cholesterol, metabolic syndrome, elevated uric acid, elevated homocysteine, low HDL, and on and on. I knew this was becoming a real problem and I became obsessed with learning how to stop it.”

Recognizing a Deadly Connection

“Throughout the years of my practice, I started to notice that many people with heart problems had this glucose-heart disease connection,” Dr. Vagnini explains.

<table>
<thead>
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“Oftentimes, when someone gets their heart checked, the doctor will check EKG, blood pressure, cholesterol, etc. But they don’t check your blood glucose. Some people have elevated levels without being overweight, but most who have them are overweight.”

Since Dr. Vagnini was a heart surgeon and had trained himself in the use of blood pressure medications, he knew that in so many of his patients there was much more going on than just a heart issue, but in the beginning, people weren’t willing to listen.

“On top of being a heart surgeon, I knew the nutrients because I was interested in nutrition and supplements because many of my patients were as well,” he says. “But back then they called me a ‘fringe’ doctor because I incorporated vitamins and other supplements into my practice.”

Dr. Vagnini was ahead of his time in recognizing the importance of supplements to a healthy lifestyle.
Using Everything in His Arsenal

These days, when a new patient walks into Dr. Vagnini’s office, he or she can expect to leave with a fully individualized program, not simply a prescription and a follow-up appointment. Diet advice, exercise plans, stress reduction techniques, meditation techniques, medical nutritionist advice, and much more are now part of a standard heart health improvement plan.

“The V Protocol is doing all of what I just described, but that’s after our initial analysis,” Dr. Vagnini says. “The first time I see a patient, I give them the whole array of the protocol. I administer a variety of stress tests, including echo, echo stress, and possible nuclear stress. We check for a coronary calcium score and endothelial dysfunction. Everyone who comes in gets a three-hour glucose tolerance test, a BMI test, total body water test, and lean body mass test. I want to know everything about my patient so I can use everything in my arsenal to help them lose weight and improve their health. I also include many general anti-aging strategies as well.”

With a lab on the premises, all the tests can be administered and the results can be revealed in a shorter time frame than some other facilities, making the time between a diagnostic work-up and the creation of a treatment program as streamlined as possible. A big part of the program involves supplements.

Supplementation is Key

With the growing body of knowledge about supplements and nutrients expanding every day, each patient gets a nutraceutical program geared directly toward their own problems.

“Almost everyone gets vitamin D3,” Dr. Vagnini says. “Some start at 5,000 units, some higher. Many are very vitamin D deficient, which can increase the risk for cardiovascular disease. I’ve even prescribed 50,000 units of vitamin D a week for 12 weeks and seen excellent results.” In addition to vitamin D, Dr. Vagnini often recommends that his patients take up many supplements that are familiar to Life Extension readers.

“I often recommend resveratrol for a variety of reasons,” Dr. Vagnini says. “It is a powerful antioxidant, it helps with insulin resistance, and it helps you lose weight. I like to suggest pomegranate be taken with it as well. And of course, it has many anti-aging benefits.”

Omega-3s are also often involved in the V Protocol and Dr. Vagnini refers to them as “miracle nutrients.”

“Omega-3s may cut diabetes risk, but they also help regulate blood pressure and lower homocysteine,” he says. “CoQ10 is another critical nutrient that helps with insulin resistance, cardiac performance, and many more issues. If a patient is suffering from fatigue, I’ll tell them about the energy benefits of D-Ribose. There are so many supplements out there that are helpful.”

Aged garlic extract is also something that Dr. Vagnini mentions he recommends patients use to help with cholesterol levels, blood pressure, and arterial wall support.

“Too many physicians see a problem and go right for the drugs,” Vagnini says. “I go natural as much as I can. I’ll use statin drugs or something if I have to, but I have no hesitation to try red yeast rice, green tea extract, rutin, carnitine, whatever I find my patients are having success with.”

Open-minded doctors like Dr. Vagnini are a rare presence in medicine, but thanks to his pioneering spirit and his willingness to recognize the value of nutraceuticals, there should soon be more doctors following his, and Life Extension’s footsteps.

For more information on Dr. Vagnini or the V Protocol, visit: www.vagnini.com

If you have any questions on the scientific content of this article, please call a Life Extension® Health Advisor at 1-866-864-3027.
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.6

In an unprecedented breakthrough, a compound called PQQ (pyrrolo-quinoline 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 life span. 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.
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. 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.

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.

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 unique fermentation process. The result is the highest quality PQQ available on the market today called BioPQQ™.

A bottle containing 30 mg of PQQ Caps with BioPQQ™ retails for $40. If a member buys four bottles during Super Sale, the price is reduced to $24.30 per bottle. The recommended daily dose for PQQ is 20 mg. Those taking Mitochondrial Energy Optimizer or Mitochondria Basics only require an additional 10 mg of PQQ since these formulas already provide 10 mg of PQQ. The retail price for 30 mg of PQQ caps is $24. If a member buys four bottles during Super Sale, the price is reduced to only $14.85 per bottle. (Item #01500)

BioPQQ™ is a trademark of MGC (Japan).

References
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 9900 North Federal Highway, Ft. Lauderdale, FL 33308-2633.

Blood Testing
The Ultimate Information

MOST POPULAR PANELS
Life Extension Member Pricing

<table>
<thead>
<tr>
<th>Panel Description</th>
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<td>MALE LIFE EXTENSION PANEL</td>
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**FEMALE LIFE EXTENSION PANEL**
(LC322535)
Chemistry Profile includes glucose, cholesterol, LDL, HDL, triglycerides, liver and kidney function tests PLUS 20 additional tests. CBC includes immune (white) cell count, red blood cell count and platelet count. Also includes:
- C-Reactive Protein
- Homocysteine
- Free Testosterone
- Estradiol
- Vitamin D 25-hydroxy
- PSA (prostate-specific antigen)

**MALE WEIGHT LOSS PANEL**
(LCWLML)
Chemistry Profile includes glucose, cholesterol, LDL, HDL, triglycerides, liver and kidney function tests PLUS 20 additional tests. CBC includes immune (white) cell count, red blood cell count and platelet count. Also includes:
- C-Reactive Protein
- Insulin
- Free Testosterone
- Estradiol
- TSH
- PSA (prostate-specific antigen)

**MALE HORMONE ADD-ON PANEL**
(LCADDM)
Prepregenone 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.

**FEMALE HORMONE ADD-ON PANEL**
(LCADDF)
Prepregenone 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.

**LIFE EXTENSION THYROID PANEL**
(LC304131)
- TSH, Free T4
- Free T3
- Free T4

**COMPREHENSIVE PANELS**
(LC322582)
Chemistry Profile includes glucose, cholesterol, LDL, HDL, triglycerides, liver and kidney function tests PLUS 20 additional tests. CBC includes immune (white) cell count, red blood cell count and platelet count. Also includes:
- C-Reactive Protein
- Homocysteine
- Free Testosterone
- Total Testosterone
- Estradiol
- Vitamin D 25-hydroxy
- PSA (prostate-specific antigen)

**FEMALE LIFE EXTENSION PANEL**
(LC322535)
Chemistry Profile includes glucose, cholesterol, LDL, HDL, triglycerides, liver and kidney function tests PLUS 20 additional tests. CBC includes immune (white) cell count, red blood cell count and platelet count. Also includes:
- C-Reactive Protein
- Homocysteine
- Free Testosterone
- Total Testosterone
- PSA (prostate-specific antigen)

**MALE HORMONE ADD-ON PANEL**
(LCADD)
Prepregenone 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.

**MALE HORMONE ADD-ON PANEL**
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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.

**LIFE EXTENSION THYROID PANEL**
(LC304131)

**FEMALE COMPREHENSIVE PANEL**
(LC100011)
CBC/Chemistry Profile
- Total Cholesterol
- HDL Cholesterol
- LDL Cholesterol
- Triglycerides
- AST (SGOT)
- ALT (SGPT)
- Alkaline Phosphatase
- LDH
- Creatinine

**LIVER FUNCTION PANEL**
- Total Bilirubin
- Albumin

**BLOOD PROTEIN LEVELS**
- Total Protein
- Globulin
- Albumin
- Albumin/Globulin Ratio
- BUN
- Creatinine
- Uric Acid

**BLOOD COUNT/RED AND WHITE BLOOD CELL PROFILE**
- Red Blood Cell Count
- Monocytes
- White Blood Cell Count
- Lymphocytes
- Platelet Count
- Eosinophils
- Basophils
- Basophil (Absolute)
- Eosinophil
- Neutrophil
- Neutrophil (Absolute)
- Lymphocytes
- Absolute
- Monocytes (Absolute)
- MCH
- MCHC
- Baso (Absolute)
- Polynuclear Cells
- RBC

**BLOOD MINERAL PANEL**
- Calcium
- Sodium
- Potassium
- Chloride
- Phosphorus
- Iron

**HOMOLOGIC GASTRIC PANEL**
(LC081453)
Hemoglobin A1C evaluates long-term blood sugar control. Serum glucose sometimes reacts with important proteins in the body rendering them nonfunctional. Since this process, known as glycation is one of the leading theories of aging, Life Extension® believes everyone should check their A1C level.

**VITAMIN D (25OH)**
(LC081950)
This test is used to rule out Vitamin D deficiency as a cause of bone disease. It can also be used to identify hypercalcemia.

**FOOD SAFE ALLERGY TEST**
(LCM73001)
This test measures delayed (iG) food allergies for 95 common foods.

**ASPIRIN WORKS**
(LC501620)
Taking aspirin to prevent heart attack? Is it working? This is a random urine test used to measure your resistance to aspirin.

**OMEGA SCORE**
(LC304131)
Provides valuable information on your risk of developing heart disease, sudden heart attack, and cardiac death. The Omega Score™ also includes your AA/EPA ratio, allowing you to determine and track a major factor in total body inflammation.

**COQ10* (COENZYME Q10)**
(LC120251)
This test is used to check the blood level of CoQ10 and will enable more precise dosing for anyone seeking to achieve and maintain high levels of this critical antioxidant.

* 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.
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**CORTISOL**
This test is used to measure adrenal function.

**DHEA-SULFATE**
This test shows if you are taking the proper amount of DHEA. This test normally costs $100 or more at commercial laboratories.

**DIHYDROTESTOSTERONE (DHT)**
Measures serum concentrations of DHT.

**ESTRADIOL**
For men and women. Determines the proper amount in the body.

**INSULIN FASTING**
Can predict those at risk of diabetes, obesity, and heart and other diseases.

**PREGNENOLONE**
Used to determine ovarian failure, hirsutism, adrenal carcinoma, and Cushing’s syndrome.

**PROGESTERONE**
Primarily for women. Determines the proper amount in the body.

**SEX HORMONE BINDING GLOBULIN (SHBG)**
This test is used to monitor SHBG levels which are under the positive control of estrogens and thyroid hormones, and suppressed by androgens.

**SOMATOMEDIN C (IGF-1)**
Indicates growth hormone secretion levels. Low levels have been associated with atherosclerosis as well as all-cause mortality.

---

**CARDIOVASCULAR RISK**
Lp-PLA2 (PLAC TEST) (LC123240)
This test is used to aid in predicting risk for coronary heart disease, and ischemic stroke associated with atherosclerosis. Lp-PLA2 is a cardiovascular risk factor that provides unique information about the stability of the plaque inside your arteries.

**C-REACTIVE PROTEIN (HIGH-SENSITIVITY)** (LC120766)
Measures inflammation factors in arteries. Recent studies indicate that C-reactive protein may be the most accurate risk factor for predicting heart attack and stroke.

**CARDIOVASCULAR RISK**
Cardiac Plus’ (LC100008)
Cardiovascular profile (see description) of triglycerides, total cholesterol, HDL, and LDL. This test normally costs $100 or more at commercial laboratories.

**VAP PLUS** (LC100009)
VAP, C-Reactive Protein (high sensitivity), Homocysteine, Fibrinogen, Antithrombin III, Antithrombin III activity, D-Dimer.

**FIBRINOGEN** (LC001610)
High levels of this blood-clotting factor increase the risk of heart attack and stroke.

**HOMOCYSTEINE** (LC708994)
Can indicate if you are likely to have a heart attack or stroke. Even if you take folic acid, you still may have dangerously high levels of this artery-clotting metabolic debris that can be lowered with high doses of folic acid, vitamin B6, and vitamin B12.

**VAP™ TEST** (LC804500)
The VAP cholesterol test provides a more comprehensive coronary heart disease (CHD) risk assessment than the conventional lipid profile. Direct measurements, not estimations, are provided for total cholesterol, LDL, HDL, VLDL, and cholesterol subclasses.

**MALE HEALTH**
PSA (Prostate-Specific Antigen) (LC01322)
Can provide an early warning sign for prostate disorders and possible cancer.

**FREE-PSA (INCLUDES TOTAL PSA)** (LC480780)
Recommended to determine if an elevated PSA is indicative of prostate cancer.

**BONE HEALTH**
OSTECALCIN (LC010249)
Osteocalcin is often used as a biochemical marker, or biomarker, for the bone formation process. It has been repeatedly observed that higher serum osteocalcin levels are relatively well correlated with bone diseases characterized by increased bone turnover, especially osteoporosis.

**DPD CROSS LINK URINE TEST** (LC511105)
The deoxypyridinoline (DPD) urine test can be used to measure bone re-absorption rates in healthy individuals and in those with enhanced risk of developing metabolic bone diseases. Deoxypyridinoline can be used to monitor therapy (which may include bisphosphonate drugs) in people diagnosed with osteoporosis.

---

**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

---

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

---

Free credit card orders only. Order form must be faxed to 1-866-728-1050 or mailed 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

---

Blood tests available only in the continental United States. Not available in Maryland.

---

ORDER LIFE-SAVING BLOOD TESTS FROM VIRTUALLY ANYWHERE IN THE US!
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**SUB-TOTAL OF COLUMN 1**

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**SUB-TOTAL OF COLUMN 2**

**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

---

**FEBRUARY 2013**

LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS.
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**SUB-TOTAL OF COLUMN 5**

**SUB-TOTAL OF COLUMN 6**

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

**SUPER SALE SAVINGS ON ALL PRODUCTS**

**DEDUCT AN ADDITIONAL 10% ON ALL PRODUCTS DURING SUPER SALE**
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**SUB-TOTAL OF COLUMN 9**

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**SUB-TOTAL OF COLUMN 10**

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
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<td>01227</td>
<td>LIVER FORCE - 60 veg. caps</td>
<td>34.95</td>
<td>26.21</td>
<td>Buy 4 bottles, price each</td>
<td>22.00</td>
</tr>
<tr>
<td>01639</td>
<td>5-LOX INHIBITOR W/ ARAFLEX™ - 100 mg, 60 veg. caps</td>
<td>20.00</td>
<td>15.00</td>
<td>Buy 4 bottles, price each</td>
<td>8.00</td>
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<tr>
<td>01678</td>
<td>L-LYSINE - 620 mg, 100 veg. caps</td>
<td>9.00</td>
<td>6.75</td>
<td>Buy 4 bottles, price each</td>
<td>8.00</td>
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<tr>
<td>00129</td>
<td>L-LYSINE POWDER - 300 gr</td>
<td>16.00</td>
<td>12.00</td>
<td>Buy 4 bottles, price each</td>
<td>13.75</td>
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<tr>
<td>01470</td>
<td>LURALEAN® CAPS SPECIAL PROPOLMANNIAN PARTICLE SIZE - 120 veg. caps</td>
<td>28.00</td>
<td>21.00</td>
<td>Buy 4 bottles, price each</td>
<td>25.00</td>
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<tr>
<td>00455</td>
<td>Lycopene Extract (Mega) - 15 mg, 90 softgels</td>
<td>35.00</td>
<td>26.25</td>
<td>Buy 4 bottles, price each</td>
<td>30.00</td>
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<tr>
<td>01369</td>
<td>Magnesium Caps - 500 mg, 100 veg. caps</td>
<td>$10.00</td>
<td>$7.50</td>
<td>Buy 4 bottles, price each</td>
<td>9.00</td>
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<tr>
<td>01682</td>
<td>Magnesium Citrate - 160 mg, 100 veg. caps</td>
<td>9.00</td>
<td>6.75</td>
<td>Buy 4 bottles, price each</td>
<td>7.50</td>
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<tr>
<td>00704</td>
<td>MAITAKE™ SX-FRACTION - 90 veg. tablets</td>
<td>49.95</td>
<td>37.46</td>
<td>Buy 4 bottles, price each</td>
<td>5.75</td>
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<tr>
<td>00547</td>
<td>MELATONIN – 300 mcg, 100 caps</td>
<td>5.75</td>
<td>4.31</td>
<td>Buy 4 bottles, price each</td>
<td>5.00</td>
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<tr>
<td>01083</td>
<td>MELATONIN – 500 mcg, 200 veg. caps</td>
<td>18.00</td>
<td>13.50</td>
<td>Buy 4 bottles, price each</td>
<td>16.00</td>
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<tr>
<td>00329</td>
<td>MELATONIN – 1 mg, 60 caps</td>
<td>5.00</td>
<td>3.75</td>
<td>Buy 4 bottles, price each</td>
<td>4.62</td>
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<tr>
<td>00330</td>
<td>MELATONIN – 3 mg, 60 caps</td>
<td>8.00</td>
<td>6.00</td>
<td>Buy 4 bottles, price each</td>
<td>6.88</td>
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<tr>
<td>01086</td>
<td>MELATONIN – 3 mg, 60 time-release veg. caps</td>
<td>10.50</td>
<td>7.88</td>
<td>Buy 4 bottles, price each</td>
<td>9.38</td>
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<td>00331</td>
<td>MELATONIN – 10 mg, 60 caps</td>
<td>28.00</td>
<td>21.00</td>
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<tr>
<td>00332</td>
<td>MELATONIN – 3 mg, 60 lozenges</td>
<td>8.00</td>
<td>6.00</td>
<td>Buy 4 bottles, price each</td>
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<td>01087</td>
<td>MELATONIN TIME RELEASE – 300 mcg, 100 veg. caps</td>
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<tr>
<td>01088</td>
<td>MELATONIN TIME RELEASE – 750 mcg, 60 veg. caps</td>
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<td>Buy 4 bottles, price each</td>
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<tr>
<td>01009</td>
<td>MEMORY UPGRADE™- 600 grams powder</td>
<td>26.95</td>
<td>20.21</td>
<td>Buy 4 bottles, price each</td>
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<tr>
<td>01536</td>
<td>METHYLCOBALAMIN – 1 mg, 60 lozenges (vanilla)</td>
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<td>7.46</td>
<td>Buy 4 bottles, price each</td>
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<tr>
<td>01537</td>
<td>METHYLCOBALAMIN – 5 mg, 60 lozenges (vanilla)</td>
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<tr>
<td>00709</td>
<td>MIGRA-EZE™ (BUTTERNUT) - 60 softgels</td>
<td>29.50</td>
<td>22.13</td>
<td>Buy 4 bottles, price each</td>
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<tr>
<td>01522</td>
<td>MILK THISTLE (CERTIFIED EUROPEAN) - 750 mg, 60 veg. caps</td>
<td>34.00</td>
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<td>Buy 4 bottles, price each</td>
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<tr>
<td>01517</td>
<td>MILK THISTLE (CERTIFIED EUROPEAN) - 120 veg. caps</td>
<td>52.00</td>
<td>39.00</td>
<td>Buy 4 bottles, price each</td>
<td>48.00</td>
</tr>
</tbody>
</table>
### Buyers Club Order Form

**FEBRUARY 2013 LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS**

**SUPER SALE SAVINGS ON ALL PRODUCTS**

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

<table>
<thead>
<tr>
<th>No.</th>
<th>Retail Each</th>
<th>Member Each</th>
<th>Qty</th>
<th>Total</th>
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<tr>
<td>01603</td>
<td>$40.00</td>
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<td>Buy 4 bottles, price each 36.00</td>
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<td>01602</td>
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<tr>
<td>00373</td>
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<td>14.25</td>
<td>Buy 4 bottles, price each 17.00</td>
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<tr>
<td>01035</td>
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<td>19.46</td>
<td>-</td>
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<tr>
<td>01623</td>
<td>$22.00</td>
<td>$16.50</td>
<td>Buy 4 bottles, price each 20.00</td>
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<tr>
<td>01463</td>
<td>18.00</td>
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<td>Buy 4 bottles, price each 16.00</td>
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<tr>
<td>01462</td>
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<tr>
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<tr>
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<td>18.00</td>
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<tr>
<td>01633</td>
<td>24.00</td>
<td>18.00</td>
<td>Buy 4 bottles, price each 22.00</td>
<td>16.50</td>
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<td>01701</td>
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<tr>
<td>01328</td>
<td>15.00</td>
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<td>Buy 4 bottles, price each 12.50</td>
<td>9.38</td>
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<tr>
<td>00915</td>
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<td>4.46</td>
<td>Buy 4 bottles, price each 5.00</td>
<td>3.75</td>
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<td>34.99</td>
<td>26.24</td>
<td>Buy 4 bottles, price each 25.00</td>
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<td>00107</td>
<td>$15.42</td>
<td>$11.57</td>
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<td>Buy 4 bottles, price each 12.12</td>
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<td>01323</td>
<td>59.00</td>
<td>44.25</td>
<td>Buy 4 bottles, price each 56.00</td>
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<td>00342</td>
<td>99.95</td>
<td>74.96</td>
<td>Buy 4 bottles, price each 95.70</td>
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<tr>
<td>01080</td>
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<td>Buy 4 bottles, price each 65.95</td>
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<td>00873</td>
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<td>Buy 4 bottles, price each 32.95</td>
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<td>00865</td>
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<td>Buy 4 bottles, price each 27.00</td>
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<td>01676</td>
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<tr>
<td>01390</td>
<td>39.95</td>
<td>26.96</td>
<td>Buy 4 bottles, price each 39.95</td>
<td>26.96</td>
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**SUB-TOTAL OF COLUMN 13**

**SUB-TOTAL OF COLUMN 14**

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

<table>
<thead>
<tr>
<th>No.</th>
<th>Product Description</th>
<th>Retail Each</th>
<th>Member Each</th>
<th>Qty</th>
<th>Total</th>
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<tbody>
<tr>
<td>01030</td>
<td>RED YEAST RICE (Bluesbonnet) - 600 mg, 60 veg. caps</td>
<td>17.50</td>
<td>13.13</td>
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<tr>
<td>00979</td>
<td>RED YEAST RICE (Nature’s Plus) - 600 mg, 60 veg. caps</td>
<td>23.95</td>
<td>17.96</td>
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<tr>
<td>00060</td>
<td>RED YEAST RICE EXTENDED RELEASE - 30 veg. tablets</td>
<td>21.50</td>
<td>16.13</td>
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<tr>
<td>00605</td>
<td>REGIMINT - 60 enteric-coated caps</td>
<td>19.95</td>
<td>14.96</td>
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<tr>
<td>01708</td>
<td>RESHI EXTRACT MUSHROOM COMPLEX - 60 veg. caps</td>
<td>30.00</td>
<td>22.50</td>
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<tr>
<td>01448</td>
<td>REJUVENEX® BODY LOTION - 6 oz</td>
<td>24.00</td>
<td>18.00</td>
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<tr>
<td>00918</td>
<td>REJUVENEX® FACTOR - 1.7 oz airless pump</td>
<td>65.00</td>
<td>48.75</td>
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<td>01621</td>
<td>REJUVENEX® FACTOR Firming Serum - 1.7 oz</td>
<td>65.00</td>
<td>48.75</td>
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<tr>
<td>01413</td>
<td>RESVERATROL W/PTEROSTILBENE - 20 mg, 60 veg. caps</td>
<td>24.00</td>
<td>18.00</td>
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<tr>
<td>01410</td>
<td>RESVERATROL W/PTEROSTILBENE - 100 mg, 60 veg. caps</td>
<td>36.00</td>
<td>27.00</td>
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<tr>
<td>01430</td>
<td>RESVERATROL W/SYNERGISTIC GRAPE-BERRY ACTIVES (OPTIMIZED) - 250 mg, 60 veg. caps</td>
<td>46.00</td>
<td>34.50</td>
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<tr>
<td>00669</td>
<td>RHODIOLA EXTRACT - 250 mg, 60 veg. caps</td>
<td>11.75</td>
<td>8.81</td>
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<tr>
<td>00972</td>
<td>(D) RIBOSE POWDER - 150 grams</td>
<td>27.50</td>
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<td>01473</td>
<td>(D) RIBOSE TABLETS - 100 veg. tabs</td>
<td>32.00</td>
<td>24.00</td>
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<tr>
<td>01609</td>
<td>RICH REWARDS™ BREAKFAST GROUND COFFEE - 12 oz. bag</td>
<td>13.00</td>
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<tr>
<td>01610</td>
<td>RICH REWARDS™ DECAF/GROUND ROAST GROUND COFFEE - 12 oz. bag</td>
<td>14.00</td>
<td>10.50</td>
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<tr>
<td>01530</td>
<td>RICH REWARDS™ CRUCIFEROUS VEGETABLE SOUP - 32 oz. bottle</td>
<td>11.25</td>
<td>8.44</td>
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<tr>
<td>01531</td>
<td>RICH REWARDS™ (SPICY) CRUCIFEROUS VEGETABLE SOUP - 32 oz. bottle</td>
<td>11.25</td>
<td>8.44</td>
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<tr>
<td>01705</td>
<td>RICH REWARDS™ LENTIL VEGETABLE SOUP - 32 oz. bottle</td>
<td>13.00</td>
<td>9.75</td>
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<tr>
<td>01208</td>
<td>R-LIPIDIC ACID (SUPER) - 300 mg, 60 veg. caps</td>
<td>49.00</td>
<td>36.75</td>
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<tr>
<td>00070</td>
<td>RNA CAPSULES - 500 mg, 100 caps</td>
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<td>13.46</td>
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<td>00917</td>
<td>ROSMARINIC ACID EXTRACT - 60 veg. caps</td>
<td>59.00</td>
<td>44.25</td>
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</table>

**SUB-TOTAL OF COLUMN 15**

**SUB-TOTAL OF COLUMN 16**

**O R E N D S J A N U A R Y 3 1, 2013**

To order online visit www.LifeExtension.com/SuperSale
<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>
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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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<td>00133</td>
<td>TAURINE POWDER - 300 grams</td>
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<tr>
<td>01304</td>
<td>THEAFLAVIN STANDARDIZED EXTRACT - 30 veg. caps</td>
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<tr>
<td>00555</td>
<td>(L) THEANINE - 100 mg, 60 caps</td>
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<td>00039</td>
<td>TIMG POWDER - 50 grams</td>
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<tr>
<td>00359</td>
<td>TIMG - 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>01400</td>
<td>TOCOTRIENOLS (SUPER-ABSORBABLE) - 60 softgels</td>
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<td>TOOTHPASTE - 4 oz (Mint)</td>
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<td>01274</td>
<td>TOTAL SUN PROTECTION CREAM W/BETA GLUCAN - 4 oz</td>
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<tr>
<td>01468</td>
<td>TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT - 60 veg. caps</td>
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<td>TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT W/REVERATROL - 60 veg. caps</td>
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<td>01386</td>
<td>TRUFIBER® - 180 grams</td>
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<td>01389</td>
<td>TRUPROLA PROBIOTICS &amp; ENZYMES - 32 veg. caps</td>
<td>42.95</td>
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<td>01716</td>
<td>TWO-PER-DAY - 60 tablets</td>
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<td>TWO-PER-DAY - 120 tablets</td>
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<td>TWO-PER-DAY - 120 caps</td>
<td>22.00</td>
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</table>

**SUB-TOTAL OF COLUMN 17**

**SUB-TOTAL OF COLUMN 18**

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

**SUPER SALE SAVINGS ON ALL PRODUCTS**

**DEDUCT AN ADDITIONAL 10% ON ALL PRODUCTS DURING SUPER SALE**
To order online visit: www.LifeExtension.com

<table>
<thead>
<tr>
<th>No.</th>
<th>Retail Each</th>
<th>Member Each</th>
<th>Qty</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>01686</td>
<td>ZEAXANTHIN w/LUTEIN &amp; MESO-ZEAXANTHIN PLUS ASTAXANTHIN and C3G (SUPER) - 60 softgels</td>
<td>$42.00</td>
<td>$31.50</td>
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<td></td>
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<tr>
<td>Buy 4 bottles, price each</td>
<td>38.00</td>
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<tr>
<td>01685</td>
<td>ZEAXANTHIN w/LUTEIN &amp; MESO-ZEAXANTHIN PLUS ASTAXANTHIN and C3G (SUPER) - 60 softgels</td>
<td>22.00</td>
<td>16.50</td>
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<td>ZYFLAMEND® TINY CAPS® - 180 softgels</td>
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**SUB-TOTAL OF COLUMN 19**

* These products are not 25% off retail price.
**Not eligible for member discount or member renewal product credit.
***Due to license restrictions, this product is not for sale to customers outside of the USA.
†Member pricing not valid on this item.

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CHECK HERE FOR UPS RED LABEL (OVERNIGHT)

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ORDER TOTALS

Sub-Total A (Sub-total of Columns 1 through 19)
SUPER SALE DEDUCT 10% (Subtotal x 10%) Ends 01/31/13

Postage And Handling (Any size order, continental U.S.) $5.50
C.O.D.s (Add $7 for C.O.D. orders)
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SIGNATURE

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# Buyers Club Order Form

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<th>Title</th>
<th>Author(s)</th>
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<td>$9.60</td>
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- Your Guide to Healthy Skin the Natural Way * | Gary Goldblum, MD | 2012 | $26.00       | $15.00       |     |       |
- Wheat Belly * | William Davis, MD | 2011 | $25.99       | $19.49       |     |       |
- The Life Plan * | Jeffry S. Life, MD, PhD | 2011 | $26.00       | $19.50       |     |       |
- Your Bones * | Lara Fizzorno, MA, LMT | 2011 | $12.00       | $9.00        |     |       |
- The Immortality Edge * | Michael Fossel, MD, PhD, Greta Blackburn, David Wojnarowski, MD | 2011 | $25.95       | $18.17       |     |       |
- The Empowered Patient * | Elizabeth Cohen | 2011 | $15.00       | $10.50       |     |       |
- Vitamin D Solution * | Michael F. Holick, PhD, MD | 2010 | $25.95       | $18.17       |     |       |
- Breakthrough: Eight Steps to Wellness * | Suzanne Somers (paperback) | 2010 | $15.00       | $10.50       |     |       |
- Weight Loss Guide | Steven V. Joyal, MD and William Falcon (hardcover) (3rd Edition) | 2010 | $29.95       | $9.89        |     |       |
- FDA Failure, Deception, Abuse | Life Extension Foundation | 2010 | $20.00       | $15.00       |     |       |
- Stay Young & Sexy with Bio-Identical Hormone Replacement * | Jonathan Wright, MD | 2010 | $19.95       | $14.96       |     |       |
- Knockout * | Suzanne Somers | 2009 | $25.99       | $17.00       |     |       |
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- Life Over Cancer | Keith Block, MD (hardcover) | 2009 | $25.00       | $17.50       |     |       |
- The Great American Heart Hoax * | Michael Ozner, MD, FACC, FAHA | 2009 | $24.95       | $17.47       |     |       |
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- Breakthrough: Eight Steps to Wellness * | Suzanne Somers | 2008 | $25.95       | $18.17       |     |       |
- Younger You | Eric Braverman, MD | 2008 | $24.95       | $15.75       |     |       |
- Disease Prevention and Treatment, Expanded Fourth Edition * | Jonathan Wright, MD | 2003 | $49.95       | $37.46       |     |       |

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- Life Extension Revolution * | Philip Lee Miller, MD (paperback) | --- | $16.00       | $12.00       |     |       |
- Miami Mediterranean Diet with 300 Recipes * | Michael Ozner, MD, FACC, FAHA (hardcover) | 2008 | $24.95       | $16.25       |     |       |
- The Migraine Cure * | Sergey Dzugan, MD, PhD | 2006 | $24.00       | $15.60       |     |       |
- Prescription for Disaster DVD * | Gary Null | 2005 | $18.00       | $12.00       |     |       |
- A Primer on Prostate Cancer (2nd edition) | Stephen B. Strum, MD, and Donna Pogliano | 2005 | $28.95       | $21.71       |     |       |
- Save Your Sight * | Marc Rose, MD/Michael Rose, MD | 2005 | $13.99       | $8.35        |     |       |
- The G4 Way * | Paul McGothin and Meredith Averill | 2005 | $15.95       | $11.25       |     |       |
- The Sexy Years * | Suzanne Somers (paperback) | 2004 | $15.00       | $10.50       |     |       |
- We Become Silent * | Kevin Miller | 2004 | $24.95       | $18.74       |     |       |
- What Your Doctor May Not Tell You About Diabetes * | Steven V. Joyal, MD | 2008 | $24.95       | $18.49       |     |       |
- John Abo’s No Excuses Workout DVD | --- | --- | $30.00       | $9.98        |     |       |
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**Not a Member? Join Today!**

- I want to join the Life Extension Foundation.

Enclosed is $75 for annual membership. Canadians add $30, all others outside the U.S. add $35. Send me: Disease Prevention & Treatment Protocol Book
Maintaining healthy, flexible joints is essential to quality of life. Joint stiffness and discomfort can stand in the way of performing even simple everyday tasks.

Most people do not obtain critical nutrients shown to support youthful joint function and mobility.

To meet this urgent need, Life Extension introduced Krill Healthy Joint Formula, a patent-pending blend of deep-sea whole krill oil sourced in Antarctica, combined with hyaluronic acid and astaxanthin.

In a recent clinical trial involving over 100 maturing individuals, a 55% reduction in joint discomfort was observed in less than three months, with 63% of participants maintaining ease of motion.1

THREE SYNERGISTIC COMPOUNDS FOR SUPERIOR BENEFIT

The data reveals that the fatty acids found in krill oil are particularly effective for joint health.2 These unique fatty acids have been shown to specifically target joint tissue.2,3

Hyaluronic acid occurs naturally in the joints,4 where it acts to lubricate and cushion against repeated physical impacts.5 Because it forms a major component of cartilage and soft tissue,4 it is widely used to promote joint health.4-8

The difficulty has been that hyaluronic acid is a large molecule not well absorbed by the body. When combined with krill oil, it has been shown to reach significantly higher levels in the bloodstream than in standalone form.8

Krill oil is a natural source of the antioxidant carotenoid astaxanthin. Astaxanthin works in multiple ways, including suppression of free radical activity and enhanced mitochondrial function.9 It also maintains krill oil’s molecular stability.

Most commercially available krill oils do not contain significant amounts of astaxanthin because it is nearly eliminated during processing. Krill Healthy Joint Formula is fortified with astaxanthin, for maximum stability and superior benefit.

JUST ONE SOFTGEL DAILY

The suggested daily serving of one Krill Healthy Joint Formula softgel daily supplies 353 mg of this proprietary blend.

A bottle containing 30 softgels of Krill Healthy Joint Formula retails for $32. If a member buys four bottles during Super Sale, the price is reduced to $19.58 per bottle. Just one softgel a day of Krill Healthy Joint Formula duplicates a successful human clinical trial.

References

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 crustacean shellfish (krill).
Licensed from Valensa International.
Zanthin® is a registered trademark of Valensa International, Inc.

To order Krill Healthy Joint 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.
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 your 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 concentrated oral formula called Skin Restoring Phytoceramides 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 by using Skin Restoring Phytoceramides with Lipowheat™.

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

Lipowheat™ is a trademark of LAVIPHARM Group of Companies.

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.
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, 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 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),7 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.7 It interacts synergistically with Pycnogenol® to sustain nitric oxide levels sufficient for healthy sexual function.

3. **ICARIN**—from a natural botanical 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.8 Prelox® Natural Sex for Men® contains a standardized extract providing a proprietary form of high-quality icarin.

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

<table>
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<tr>
<th>Prelox® Proprietary Blend</th>
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<tr>
<td>L-Arginine HCl, Aspartic Acid, Pycnogenol®</td>
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<tr>
<td>Dried French Maritime Pine (Pinus pinaster) Extract (bark)</td>
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<tr>
<td>Icariin [Natural Sex® Epimedium sagittatum Extract (aerial parts)]</td>
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A 60-tablet bottle of Life Extension® Prelox® Natural Sex for Men® retails for $52. If a member buys four bottles during Super Sale, the price is reduced to just $32.40 per bottle.

References


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.
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 phytoneutrients called curcuminoids and sesquiterpenoids to attain peak concentrations.

Life Extension’s Super Bio-Curcumin® derives from turmeric that is grown with organic practices, 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:

- 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 Absorubility 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 up to 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.


To order Super Bio-Curcumin®
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.
38 BREAST CANCER AND GLUCOSE: THE SURPRISING CONNECTION
Scientific studies strongly implicate high-normal blood glucose with increased incidences of breast cancer and cognitive decline. These findings provide strong incentive to maintain glucose blood levels at the low end of normal range.

68 IMPROVE HEART MUSCLE FUNCTION
New research shows how hawthorn and arjuna botanicals improve heart muscle function and increase coronary blood flow. These discoveries are of particular interest to those concerned with congestive heart failure.

7 SHED BODY FAT BY PREPARING YOURSELF TO EAT
Aging humans with high-normal blood sugar face increased risks of virtually every degenerative disorder. By ingesting compounds before meals that reduce surplus glucose, you can slash disease risk while helping to shed pounds of body fat.

26 IMPACT OF AFTER-MEAL GLUCOSE ON ARTERIAL FUNCTION
Heart attack risk is greatest two hours after a meal. The major cause is after-meal blood sugar surges that damage our arterial lining. A breakthrough study reveals gamma tocopherol offers near 100% protection against this type of endothelial dysfunction.

54 TOWARD BIOLOGICAL IMMORTALITY
Life Extension has funded over $2 million aimed at enabling doctors to inject progenitor (stem) cells that will regenerate our aging bodies. New findings reveal that what most Foundation members already do can increase telomere length and promote healthy longevity.

80 ANTI-AGING PROPERTIES OF REISHI
Reishi medicinal mushroom has long been known to boost immune surveillance. New research demonstrates it provides broad-spectrum protection against a host of chronic disorders.