Startling Risk of Heart Attack In Women

Report from World Stem Cell Conference

Magnesium Slashes Sudden Cardiac Death

Improve Muscle Recovery After Exercise

PLUS—
Olive Leaf Protects Endothelial Function
Mediterranean Diet Lowers Cardiac Risk
Vitamin D Slows Parkinson’s Progression
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, the price is reduced to $17.25 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, the price is reduced to $14.63 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.

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

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
28 CARDIO-PROTECTIVE EFFECTS OF OLIVES
Scientists have isolated a unique molecule in olive oil that provides its cardio-protective benefits. Known as oleuropein, this powerful polyphenol helps lower blood pressure, prevents formation of arterial plaques, and combats endothelial dysfunction.

38 FORGOTTEN BENEFITS OF TAURINE
High dietary intake of taurine is one of the factors responsible for the remarkable longevity of Okinawans. Taurine plays an important role in restoring insulin sensitivity, preventing obesity, and inhibiting arterial thickening. Many Americans, however, are deficient in this low-cost amino acid.

50 IMPROVE MUSCLE RECOVERY AFTER EXERCISE
Studies show that the compounds found in tart cherries can deliver anti-inflammatory activity comparable to ibuprofen (Advil®) and naproxen (Aleve®). In addition to reducing daily aches and pains, tart cherries help muscle recover faster after exercise.

64 CONFERENCE REPORT: WORLD STEM CELL SUMMIT
Stem cell therapy is on the verge of transforming medicine from just treating symptoms to restoring youthful cellular health. At the World Stem Cell Summit in West Palm Beach, Florida, scientists report on innovations that include bioengineering of artificial organs and novel stem-cell treatments for heart, spinal cord, and ovarian tissue.

74 UNIQUE PEPTIDE REJUVENATES SKIN
Researchers have discovered a restorative peptide called acetyl tetrapeptide-2 that triggers reparative processes and cellular reactions usually seen in younger skin. Early in-vitro studies have shown that acetyl tetrapeptide-2 increased cellular growth by 51% in just 5 days! In addition, it increased keratin production by 75%. The result was noticeable skin regeneration.

7 ON THE COVER
LETHAL MISCONCEPTIONS
Heart disease kills more women than men, yet most females remain unaware of blood markers that assess their risk of cancer and vascular disease. Maturing women require proper blood tests to identify these reversible risk factors before heart attack, stroke, or malignancy strikes. Find out about other fallacies that result in millions of needless deaths each year.

DEPARTMENTS
21 IN THE NEWS
Green tea and coffee protect against stroke; olive leaf polyphenols boost pancreatic beta-cell responsiveness; magnesium inhibits ischemic heart disease; prenatal folic acid lowers autism risk; green tea compound helps prevent non-alcoholic fatty liver disease (NAFLD); and more.

83 SUPER FOODS
Oranges provide a rich supply of hesperidin, naringin, and 60 other flavonoids, as well as pectin fiber, making them nutrition powerhouses. Research demonstrates that oranges and their compounds powerfully boost eye, heart, kidney, and immune health.

91 AUTHOR INTERVIEW
Over 30 million Americans are nutritionally deficient and aging prematurely. Marilyn Diamond and Dr. Donald Schnell discuss how to combat genetic aging in their new book Young for Life.

97 ASK THE PHARMACIST
Long-term use of proton pump inhibitors, commonly prescribed for acid reflux, has been shown to increase the risk of fractures, infections, and nutritional deficiencies. Learn how you can prevent the dangers of excess stomach acid and avoid these medicines through lifestyle and nutritional changes.
Super Potent Multi-Nutrient Formula

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.

Commercial 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, the price is reduced to $13.50 per bottle. (Item #01714) A bottle containing 120 capsules of Two-Per-Day Capsules retails for $22. If a member buys four bottles, the price is reduced to $15 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 $6.75 per month.

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.
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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 biodentical 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.
MAGNESIUM Reduces Risk of Sudden Death

Up to 69% of women have no clinically recognized heart disease before sudden death occurs. This means a huge percentage of heart attack victims die before finding out they are at risk.

Primary preventive strategies are urgently needed to reduce the incidence of sudden cardiac death. The good news is that blood test prices are dropping, enabling more people to identify their cardiac risk factors before suffering a fatal heart attack.

Sudden cardiac arrest occurs when the electrical system to the heart malfunctions. The heart beat becomes irregular and dangerously fast, which can result in the lower chambers quivering and not pumping blood to the body. Magnesium is unique in that it helps maintain healthy electrical balance required for normal heart rhythm.

Many factors contribute to coronary artery blockage such as elevated glucose, triglycerides, C-reactive protein, and LDL.

All of these major causations of coronary atherosclerosis can be measured in the blood.

When it comes to sudden death heart arrhythmias, however, a large study shows a strong protective effect for magnesium. This study looked at 88,000 women and followed them for 26 years. Women with the highest blood levels of magnesium had a 77% lower risk of sudden cardiac death compared to women in the lowest range.

In 2005-2006, the estimated magnesium intake for US adults from food sources was 261 mg in women and 347 mg in men. This is below the Recommended Dietary Allowance (RDA), which is 310-320 mg for adult women and 400-420 mg for adult men. Most Americans do not meet the RDA, even with the use of magnesium-containing supplements. This is not surprising considering the low potency of commercial products.

Magnesium is not an expensive nutrient. Americans can obtain 500 mg of magnesium for less than 10 cents a day!

As blood test costs fall, men and women can affordably identify reversible risk factors before heart attack or stroke strikes.

References
I’ll never forget a call I received from the coroner’s office in 1981 questioning how a 17-year-old boy could have died of colon cancer. The county Medical Examiner stated to me that this was “impossible.”

I told the Medical Examiner that while I had never heard of anyone this young dying of colon cancer, this is what the records reflected. The Medical Examiner insisted on talking to the treating physician. A few hours later, the Medical Examiner called me back apologizing for his error.

Recent studies now show increasing rates of colon cancer in young adults—higher than anyone had ever expected.1-4 The reason so many of these young people die is their doctors do not consider colon cancer as a cause of their symptoms and thus fail to initiate timely diagnosis and treatment.1,3

Move forward to year 2013, and physicians continue to wallow in a sea of unawareness when it comes to understanding common diseases. The tragic result is failure to implement changes that would prevent adverse outcomes for millions of Americans every year.

One critical mission of Life Extension is to break down barriers of medical ignorance that cause humans to senselessly suffer and die. >
Heart Attacks Kill More Women than Men

Heart disease is often thought of as a problem that primarily affects men. The reality since 1984 is that more women die from heart disease than men. According to a prominent Los Angeles heart surgeon, the most common way a woman presents with heart disease is dead on arrival at the hospital.

Women often downplay their symptoms and wait longer before going to the emergency room. Women also present with different symptoms than men, causing doctors to overlook many cases of heart disease.

Women historically receive less aggressive heart disease prevention and treatment. As a result, when women are finally diagnosed, they usually have more advanced heart disease and their prognosis is poorer.

Startling Statistics

Right now, more than 1 in 3 female adults in the United States has some form of cardiovascular disease.

Cardiovascular disease of all forms killed 419,730 women in 2008, while all forms of cancer combined caused 270,210 female deaths that year.

While women justifiably fear breast cancer (in recent years, it has killed more than 40,000 females a year), cardiovascular disease claims the lives of more than ten times more women.

Women over age 40 are diligently having mammograms in an attempt to detect breast cancer at an early curable stage. Most are overlooking important blood tests that can be used to slash far more prevalent cardiovascular risk factors.

Not only do blood test results enable women to prevent heart attack and stroke, they also reveal correctable factors that can reduce cancer risk.

Mammograms only detect the presence of lesions that may be malignant. Comprehensive blood tests, on the other hand, enable women to protect themselves against virtually every disease associated with aging...including breast cancer in some instances!

Blood Markers of Impending Heart Attack and Stroke

Almost half of all American women have blood cholesterol levels over 200 mg/dL, yet only the minority knows this.

Similar to men, women with elevated LDL, glucose, triglycerides, and C-reactive protein, (and low HDL) have sharply higher vascular disease risks. Some studies show that high glucose and triglyceride blood levels in women create a greater vascular impact than in men.

Heart disease accounts for more than a third of all female deaths in the United States, yet the vast majority do not know what their cardiovascular disease blood markers are. The consequence of this misconception is that heart failure and stroke are leading causes of disability and death of American women.

Females over age 35-40 should have comprehensive blood tests annually to identify proven heart attack/stroke risk factors and take corrective actions when any marker is out of optimal range.
**DHEA Blood Levels and Coronary Deaths**

A number of studies associate low DHEA blood levels with higher rates of endothelial dysfunction and heart attack.33-35 In 2010, a study showed that women with the lowest DHEA more than doubled their rate of dying from coronary artery disease compared to women with higher DHEA blood levels.36

This six-year study showed more than twice as many women with low DHEA died from all-causes compared to women with higher DHEA blood readings.

The take-home lesson from this and similar studies is for aging humans to know their DHEA blood levels and take the appropriate DHEA dose to achieve youthful levels shown to protect against mortality.

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**Polycystic Ovary Syndrome…An Underdiagnosed Problem**

Some women suffer excess accumulation of body fat caused not by overeating, but from a disorder called polycystic ovary syndrome that is characterized by out-of-balance hormones.37,38 The drug that can be highly effective in treating this hormone imbalance is metformin. It reduces excess insulin39-43 and testosterone levels,39,40,44 while helping women shed fat pounds.39,45

In one study, 22 morbidly obese women with polycystic ovary syndrome were treated with metformin. After 24 weeks, they lost an average of 6% of their body weight (18 pounds). In the same study, women who continued on metformin after one year maintained their weight loss while those who stopped regained 50% of their weight.46

Those suffering from polycystic ovary syndrome have higher rates of diabetes,47-52 coronary blockage,47,52-56 and metabolic syndrome.47,54,57-59

For women suffering from frank polycystic ovary syndrome, or just too much insulin-testosterone, low-cost blood tests can identify the underlying problem and enable a physician to properly prescribe metformin and other therapies to safely induce weight loss and reduce cardiovascular risks.

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**Blood Glucose and Cancer Risk**

Those with higher glucose and insulin suffer greater rates of all cancers.60,61 Gestational diabetes is a temporary state of glucose intolerance associated with pregnancy. Its long-term effect in women, however, is a 7-fold increase in pancreatic cancer.62

A 13.5-year study showed that women in the highest glucose quartile were 63% more likely to develop breast cancer.63 Another study that included 33,293 women measured fasting and post-load glucose and found those in the highest ranges were 75% more likely to develop cancer.64

Diabetics have higher cancer risks. One analysis of diabetic women showed a 22% increased breast cancer risk, but even those...
with impaired glucose metabolism develop breast cancer with greater frequency. The researcher who conducted this study concluded that increased cancer risk occurred even when glucose levels were “below the diagnostic threshold for diabetes.”

Keeping glucose in the low ranges protects against cardiovascular disease, helps shed fat pounds, and reduces cancer risk.

Cancer Patients Especially Vulnerable to High Glucose

The impact of elevated blood glucose on cancer patients is devastating.

The body responds to higher glucose levels by secreting more insulin (which promotes tumor growth). A study of 1,695 non-diabetic men and women found that, of the participants that developed cancer, there was a 37% increase in all-cause mortality for those in the highest quartile of fasting insulin.

A study of newly diagnosed non-small cell lung cancer patients showed a 69% increased risk of all-cancer mortality when fasting glucose was over 126 mg/dL.

An interesting analysis was done on diabetic and non-diabetic breast cancer patients. There was no difference in overall survival between the two groups, but elevated glucose in either group was associated with poorer outcomes and an elevated risk of death. This study supports previous findings that high blood glucose is associated with poor response to breast cancer treatment.

In a decade-long study of 3,003 breast cancer survivors, risk of all-cause mortality was twice as high in women with a hemoglobin A1c reading greater than 7% compared to women with less than 6.5%. Hemoglobin A1c is a blood test that measures average glucose levels over the previous approximately three months.

These findings together support the role of a healthy diet and lifestyle in the overall treatment of cancer.

Since people often make too much glucose in their liver (gluco-neogenesis), even those who avoid glucose-spiking carbohydrates and starches need to take additional steps to keep their glucose/insulin levels low. The drug metformin and nutritional supplement green coffee bean extract inhibit glucose production in the liver, thus lowering blood glucose to safer ranges.

Cancer patients should insist on regular blood tests to check their fasting glucose, fasting insulin, and after-meal glucose.

C-Reactive Protein: A New Cancer Blood Marker?

Inflammation is an underlying cause of virtually all degenerative disorders, including vascular disease, cancer, and dementia. The C-reactive protein (CRP) blood test is a general measurement of inflammation in the body.

In a general population study, individuals with the highest CRP levels had a 1.3-fold increased risk of cancer of any type, and a 2-fold increased risk of lung cancer. Among individuals diagnosed with cancer during the study period, individuals with a high baseline CRP (over 3 mg/L) had an 80% greater risk of early death compared to those with low CRP levels (<1 mg/L).

This corroborates numerous other studies showing greater cancer risk, incidence, and mortality.

Lung Cancer Kills Many Non-Smokers

Lung cancer kills so many cigarette smokers that many people mistakenly believe that non-smokers don’t develop it. The facts are that lung cancer kills around 24,000 non-smokers each year in the United States, making it among the top 10 most lethal cancers in the US. Additionally, lung cancer in people who’ve never smoked is on the rise. In the US, 17.5% of lung cancers occur in this group, and among women the figure is even higher. In some areas of the world, such as Southeast Asia, as many as 50% of female lung cancer cases are found in women that have never smoked.

What is particularly regrettable is that many of these non-smokers are victimized by second-hand smoke, a carcinogen that I was forcibly exposed to in my early life.

The carnage caused by second-hand smoke, which adds up to millions of disabled and dead innocent Americans, is one of the great medical travesties of the past 100 years. The dangers of second-hand smoke are still not fully appreciated, as millions of children are exposed each year in the home environment while society prioritizes far less important issues.

Scientific research has shown that a blood marker of cardiovascular risk (C-reactive protein) is also elevated in lung and colon cancer patients. What is encouraging about this is that the steps people take to reduce vascular disease (such as lowering C-reactive protein) might help protect against common malignancies.
in those with elevated CRP blood test readings.°9-108

A study was done with cancer survivors to measure fatigue and other common side effects of conventional therapy. Survivors with high CRP had 1.8 times greater odds of fatigue after adjusting for all other factors. This study showed that higher ingestion of omega-6 fats relative to omega-3 fats was associated with higher C-reactive protein levels.109

A wealth of data shows that a high-sensitivity CRP blood test may become a new marker in identifying those at greater risk for developing cancer and dying from it.110-112 Ideal CRP levels in women are less than 1.0 mg/L.113 If your blood test result shows CRP readings over 1.5 mg/L, there are a number of proven ways to lower it to safer ranges.

While CRP testing is done today primarily to identify those at higher risk for stroke, heart attack, diabetes, and dementia, it may also turn out to be a useful tool in the prevention and treatment of common cancers.

Don’t Be a Victim of Deadly Misconceptions

The incidence of type II diabetes and related disorders such as obesity, vascular disease, and cancer is skyrocketing, yet comprehensive blood testing can identify underlying factors that if corrected in time, can prevent an epidemic of tragic outcomes.

Most of you reading this have been victimized by second-hand cigarette smoke, yet controlling your C-reactive protein and glucose blood levels may lower your risk of lung cancer.

So many female Life Extension members have been helped when their hormone levels are checked and balanced. Not only do they feel better when all their blood markers are restored to youthful ranges, but their risk of degenerative disease is substantively reduced.

The high cost and inconvenience of today’s broken sick-care system prevents most healthy people from having their blood thoroughly analyzed. Life Extension broke down these barriers 17 years ago by offering a broad range of blood tests for far less than what commercial labs charge.

Instead of having to make a doctor’s appointment, most of our members walk in at their convenience to a blood drawing station in their neighborhood.

Once-A-Year Blood Test Super Sale

The comprehensive Female or Male Blood Test Panels contain more specialized blood measurements than virtually any standard battery of tests. Commercial labs often charge a king’s ransom to perform ALL of these tests.

Yet until June 3, 2013, Life Extension members can order the Female or Male Blood Test Panel for only $199.

This year we were able to add the hemoglobin A1c test to the Male and Female Panels at no extra charge. The next page describes the many tests included in the comprehensive Male or Female Panels. At the discounted price of $199, these blood tests are the best investment you may ever make in your health and longevity.

If you’re reading this and are not already a Life Extension member, please join today. The huge savings on the Female and/or Male Panel more than covers the $75 membership fee.

To order your blood tests and/or join the Foundation, call 1-800-841-5433 (24 hours).

For longer life,

William Faloon
References


**MALE PANEL**

**LIPID PROFILE**
- Total Cholesterol
- LDL (low-density lipoprotein)
- HDL (high-density lipoprotein)
- Triglycerides

**CARDIAC MARKERS**
- C-Reactive Protein (high sensitivity)
- Homocysteine

**HORMONES**
- Free and Total Testosterone
- DHEA-S
- Estradiol (an estrogen)
- TSH (thyroid function)
- Vitamin D (25-hydroxyvitamin D)

**METABOLIC PROFILE**
- Glucose
- Kidney function tests: creatinine, BUN, uric acid, BUN/creatinine ratio
- Liver function tests: AST, ALT, LDH, GGT, bilirubin, alkaline phosphatase
- Blood minerals: calcium, potassium, phosphorus, sodium, chloride, iron
- Blood proteins: albumin, globulin, total protein, albumin/globulin ratio
- Hemoglobin A1c

**COMPLETE BLOOD COUNT (CBC)**
- Red Blood Cell count including: hemoglobin, hematocrit, MCV, MCH, MCHC, RDW
- White Blood Cell count including: lymphocytes, monocytes, eosinophils, neutrophils, basophils
- Platelet count

**CANCER MARKER**
- PSA (Prostate Specific Antigen)

**FEMALE PANEL**

**LIPID PROFILE**
- Total Cholesterol
- LDL (low-density lipoprotein)
- HDL (high-density lipoprotein)
- Triglycerides

**CARDIAC MARKERS**
- C-Reactive Protein (high sensitivity)
- Homocysteine

**HORMONES**
- Progesterone
- DHEA-S
- Free and Total Testosterone
- Estradiol (an estrogen)
- TSH (thyroid function)
- Vitamin D (25-hydroxyvitamin D)

**METABOLIC PROFILE**
- Glucose
- Kidney function tests: creatinine, BUN, uric acid, BUN/creatinine ratio
- Liver function tests: AST, ALT, LDH, GGT, bilirubin, alkaline phosphatase
- Blood minerals: calcium, potassium, phosphorus, sodium, chloride, iron
- Blood proteins: albumin, globulin, total protein, albumin/globulin ratio
- Hemoglobin A1c

**COMPLETE BLOOD COUNT (CBC)**
- Red Blood Cell count including: hemoglobin, hematocrit, MCV, MCH, MCHC, RDW
- White Blood Cell count including: lymphocytes, monocytes, eosinophils, neutrophils, basophils
- Platelet count

Non-member retail price: $400 • Special Member Discount Price: $199

**Blood Test Super Sale – April 1 through June 3, 2013.**

To obtain these comprehensive Male or Female Panels at these low prices, call 1-800-208-3444 to order your requisition forms.

Then—at your convenience—you can visit one of the blood-drawing facilities provided by LabCorp in your area. (Restrictions apply in NY, NJ, RI, MA, MD)


44. Velazquez EM, Mendoza S, Hamer T, Sosa F, Glueck CJ. Metformin therapy in women with polycystic ovary syndrome reduces hyperinsulinemia, insulin resistance, hyperandrogenemia, and systolic blood pressure, while facilitating menstrual regularity and pregnancy. *Metabolism*. 1994 May;43(5):647-54.


The reason for many circulatory problems is the breakdown of endothelial function and structure.

Today, there are nutrients that have been clinically shown to help maintain healthy endothelial function and arterial circulation. **Endothelial Defense™ with GliSODin®** provides potent nutrients to support endothelial health: *standardized pomegranate* and an orally active form of *superoxide dismutase*.

While both of these components have been clinically shown to help with blood flow and age-related changes in endothelial function, Life Extension® has made the best endothelial product even more powerful by adding **Full-Spectrum Pomegranate™**, which includes active constituents from the *seed* and *flower* in addition to the *pomegranate fruit*.1-7

### Next-Generation Pomegranate Power

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

A bottle containing 60 softgels of **Endothelial Defense™ with Full-Spectrum Pomegranate™** retails for $56. If a member buys four bottles, the price is reduced to just $39 per bottle.

### The daily serving of 2 softgels of Endothelial Defense™ with Full-Spectrum Pomegranate™ Contains:

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

POMELLA® Extract is covered under U.S. Patent 7,638,640. POMELLA® Extract is a registered trademark of Verdure Sciences, Inc. Isocell SA, France is the owner of US Patents Nos. 6,045,809 and 6,426,068B1 and the registered trademark of GliSODin®.

Contains soybeans and wheat.
Top Off Your TESTOSTERONE Naturally

Low Testosterone Levels May Lead to:
Reduced Sex Drive • Less Energy
Cloudy Thinking • Weight Gain
Cardiovascular Issues

Maintaining healthy testosterone levels is one of the most important steps you can take to regain your health and improve your performance.

With research showing that by the time a man is 60 years old, he may produce 60% less testosterone than he did in his 20s, the time is now to add Life Extension®’s Super MiraForte with Standardized Lignans to your supplement regimen.

Each daily dose of Super MiraForte with Standardized Lignans contains the following testosterone supporting ingredients:

- 1500 mg Chrysin
- 15 mg Bioperine®
- 850 mg Muira puama
- 282 mg Nettle root
- 15 mg Chelated elemental zinc
- 320 mg Maca
- 33.4 mg HMRlignan™
- Norway Spruce lignan extract

The retail price for a bottle of 120 capsules of Super MiraForte with Standardized Lignans is $62. If a member buys four bottles, the price is reduced to $42 per bottle.

To order Super MiraForte with Standardized Lignans call 1-800-544-4440 or visit www.LifeExtension.com


Caution: If you are taking any medication, use only under physician supervision. Men with existing prostate cancer may not be able to use this product.

Elevations in free testosterone can unmask an occult (hidden) prostate cancer. Anyone with this concern should have a baseline PSA prior to using this product and a follow-up PSA test 60 days later. If a significant elevation of PSA is found, discontinue this product and advise physician. Do not take more than 15 mg per day of Bioperine®.

Bioperine® is a registered trademark of Sabinsa Corp. HMRlignan™ is a registered trademark used under sublicense from Linnea S.A.

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.
Life Extension® members are well aware that vegetable soups sold by processed food companies are loaded with high-glycemic carbohydrates—rice, potatoes, or pasta—and inexpensive ingredients such as corn, sugar, and even omega-6 fats such as cottonseed oil. In other words, they provide virtually no health benefits.

That’s why they’ve come to rely on the vegetable soups from Life Extension that contain only healthy ingredients—loads of garden-fresh vegetables, mushrooms, heart-healthy extra-virgin olive oil, and a host of other beneficial plant foods. These soups are made with no saturated fat, cholesterol, trans fat, or dairy.

The newest addition to this family of nutritionally-rich soups is Rich Rewards™ Black Bean Vegetable Soup. It delivers the same healthy vegetable ingredients—but with the additional health benefits of black beans and barley and is an excellent source of fiber.
**BLACK BEANS AND BARLEY**

Extensive documentation demonstrates that the black beans:

- Significantly support **blood sugar** levels that are already within the normal range \(^1\) — even over a prolonged period \(^2\) — and even when combined with higher-glycemic foods. \(^3\)
- Provide significant support for the DNA integrity of bone marrow and peripheral blood cells. \(^4\)
- Are associated with support for cardiovascular health. \(^5\)
- Improve short-term satiety and **weight loss**, when combined with a reduced calorie diet. \(^6\)
- Promote healthy **gastrointestinal function**, providing healthy colonic bacteria with the perfect mixture of compounds to promote the production of **butyric acid**, which is used by colon-lining cells to keep the lower digestive tract functioning smoothly. \(^7\)

**Barley scientifically shown to:**

- Support the colonic fermentation of indigestible or **insoluble** carbohydrates. \(^8\)
- Provide a rich source of **soluble fiber**, \(^9\) which promotes bowel function and metabolic health. \(^10\)
- Support blood sugar and insulin levels that are already in the normal range \(^11\) — which it does better than other grains. \(^12\)
- Help maintain levels of total **cholesterol**, \(^13\) **LDL cholesterol**, \(^14\) and **blood pressure** \(^15\) already in the normal range.
- Support weight control through increased satiety and decreased overall caloric ingestion. \(^16\)

Suitable for vegans, each serving of Rich Rewards™ Black Bean Vegetable Soup offers impressive nutrition: **52%** of your daily fiber value, **28%** of your daily protein value, and a rich supply of vegetables, all in just **180 calories**.

The entire container supplies about **3.5 servings**. And while the FDA says the BPA lining in most soup cans is safe, we at Life Extension have always used BPA-free containers.

A 32-ounce container of 3.5 servings of Rich Rewards™ Black Bean Vegetable Soup retails for $13. If a member buys 6 containers, the price is reduced to **$9.19** per container.

To order Rich Rewards™ Black Bean Vegetable Soup, call 1-800-544-4440 or visit www.LifeExtension.com

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**Nutrition Facts**

<table>
<thead>
<tr>
<th>Serving Size 1 cup (245g)</th>
<th>Servings Per Container about 3.5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Amount Per Serving</strong></td>
<td></td>
</tr>
<tr>
<td>Calories</td>
<td>180</td>
</tr>
<tr>
<td>Calories from Fat</td>
<td>30</td>
</tr>
<tr>
<td>% Daily Value *</td>
<td></td>
</tr>
<tr>
<td>Total Fat</td>
<td>3g 5%</td>
</tr>
<tr>
<td>Saturated Fat</td>
<td>0g 0%</td>
</tr>
<tr>
<td>Trans Fat</td>
<td>0g</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>0mg 0%</td>
</tr>
<tr>
<td>Sodium</td>
<td>25mg 1%</td>
</tr>
<tr>
<td>Total Carbohydrate</td>
<td>25g 8%</td>
</tr>
<tr>
<td>Dietary Fiber</td>
<td>13g 52%</td>
</tr>
<tr>
<td>Sugars</td>
<td>6g</td>
</tr>
<tr>
<td>Protein</td>
<td>14g 28%</td>
</tr>
<tr>
<td>Vitamin A</td>
<td>40%</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>40%</td>
</tr>
<tr>
<td>Calcium</td>
<td>8%</td>
</tr>
<tr>
<td>Iron</td>
<td>25%</td>
</tr>
</tbody>
</table>

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs: Calories: 2,000, 2,500.

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**One Smart Bowl of Soup™**

Contains about 3.5 servings of black beans, barley, mushrooms, and vegetables per bottle.

**Only 180 calories per serving**

- Very low sodium and low fat
- No added starches or sugars!
- Excellent source of fiber and protein
- Og trans fat. No saturated fat or cholesterol

---

**References**

SHIELD YOUR PRECIOUS EYESIGHT

AT FANTASTICALLY DISCOUNTED PRICES!

Shield your eyes from destructive ultraviolet sun rays is one of the most effective means of protecting against ocular disease.

Consumers often spend hundreds of dollars on just one pair of so-called “designer” sunglasses. Life Extension® members can obtain superior protection against damaging solar radiation at a fraction of the price of commercially sold sunglasses.

SolarShield® sunglasses are recognized as the number-one doctor-recommended sunglass in the world, with more than 50 million pairs sold to date. Patented SolarShield® sunglasses with durable polycarbonate lenses and 100% UV protection fit comfortably over prescription eyewear, providing convenient protection from the harmful effects of ultraviolet radiation.

For those who desire the added benefit of lenses that reduce distracting glare, OveRxCast sunglasses come with polarized gray lenses that provide natural color definition with 100% UV protection. Like the SolarShield® sunglasses, OveRxCast polarized sunglasses are designed to be worn over your prescription eyeglasses.

SolarShield® sunglasses retail for $12.99 for one pair, and the member price is $9.74. If a member buys two pairs, the price is reduced to only $8.63 a pair. One pair of OveRxCast sunglasses retails for $27, and the member price is $20.25. If a member orders two pairs, the price is reduced to just $15.75 per pair.

Compare these low prices to sunglasses sold in stores and see savings exceeding 90%!

SolarShield® is a registered trademark Dioptics, Inc.

To order SolarShield® or OveRxCast sunglasses, call 1-800-544-4440 or visit www.LifeExtension.com
Reduced Urinary Magnesium Levels Linked to Elevated Ischemic Heart Disease Risk

An article published online in the *American Journal of Clinical Nutrition* reports the finding of an association between higher urinary magnesium levels and a lower risk of ischemic heart disease.*

The study included 7,664 men and women enrolled in the Prevention of Renal and Vascular End-Stage Disease (PREVEND) study, which is a prospective investigation of albuminuria and renal and cardiovascular disease. Urinary magnesium excretion levels from samples obtained upon enrollment from 1997 to 1998 were utilized as a marker of magnesium intake. The subjects were followed for a median of 10.5 years, during which 462 ischemic heart disease events occurred.

Men and women whose urinary magnesium was among the lowest 20% of subjects had an increase in the risk of ischemic heart disease that was 60% higher than the remainder of the participants, and a risk of fatal ischemic heart disease that was 70% higher.

**Editor’s Note:** Authors Michel M. Joosten and his colleagues remark that reduced magnesium intake can result in cardiac arrhythmias that can cause sudden cardiac death. Additionally, magnesium helps inhibit platelet aggregation and enhances the synthesis of nitric oxide, which helps relax the blood vessels. Furthermore, increased magnesium intake has been associated with a lower risk of diabetes—a disease that significantly elevates the risk of cardiovascular disease.

—D. Dye


Mediterranean Diet Lowers Cardiovascular Events in Clinical Trial

The results of a trial described in the *New England Journal of Medicine* indicate a protective effect for a Mediterranean diet against the risk of experiencing heart attack, stroke, or death from cardiovascular causes among older adults at high cardiovascular risk.*

The study included 7,447 men and women age 55-80 with no cardiovascular disease upon enrollment who had either type II diabetes or at least three cardiovascular risk factors including smoking, hypertension, elevated LDL cholesterol levels, low HDL cholesterol levels, overweight or obesity, or a family history of premature coronary heart disease. Participants were randomized to a Mediterranean diet supplemented with extra-virgin olive oil, a Mediterranean diet supplemented with nuts, or a low-fat control diet.

The trial was concluded after a median follow-up of 4.8 years. In comparison with participants who adhered to the control diet, the average adjusted risk of experiencing a cardiovascular event was 29% lower for those who followed a Mediterranean diet plan. The findings were similar when the two Mediterranean diets were separately evaluated.

**Editor’s Note:** A Mediterranean diet, which is high in fruit, vegetables, fish, legumes, nuts, and olive oil, has been associated with a lower risk of cardiovascular disease and premature death in several studies of its adherents.

—D. Dye

*NEJM.* 2013 Feb 25.
**Prenatal Folic Acid Supplementation Shows Protective Effect Against Autism**

The Journal of the American Medical Association reported the finding of Norwegian researchers showing that supplementing with folic acid early in pregnancy helps reduce the risk of giving birth to a child with autism.*

The study included 85,176 children born between 2002 and 2008 who were followed through March 2012. Mothers were queried concerning their intake of vitamins and other supplements, particularly between 4 weeks prior to conception and week 8 of pregnancy. Over the follow-up period, 114 children were diagnosed with autistic disorder, 56 with Asperger syndrome, and 100 with pervasive developmental disorder—not otherwise specified, all of which fall under the umbrella of autism spectrum disorders.

Mothers who consumed folic acid supplements during the period from four weeks prior to conception to their eighth week of pregnancy had a 39% lower risk of giving birth to a child diagnosed with autistic disorder in comparison with mothers who did not use the supplements.

*JAMA. 2013 Feb 13;309(6):570-7.*

**Supplementation Improves Vitamin D Levels and Influences Widespread Gene Expression in White Blood Cells**

A team of researchers at Boston University Medical Center recently published results of a small clinical trial in the journal *PLoS One* that found that increasing blood levels of vitamin D through supplementation had far-reaching effects on the overall gene expression of white blood cells.*

The team conducted a randomized, double-blind pilot study comparing vitamin D supplementation with either 400 or 2,000 IU vitamin D3 daily for 2 months during the winter on broad gene expression in the white blood cells of healthy adults. Over half of the study participants had baseline vitamin D levels that were classified as insufficient or deficient.

Supplementation with vitamin D3 resulting in improved serum vitamin D3 concentrations was associated with at least a 1.5 fold alteration in the expression of 291 genes. In subjects with a baseline vitamin D level of less than 20 ng/mL, there was a significant difference in the expression of 66 genes versus subjects whose baseline vitamin D3 levels were over 20 ng/mL. After supplementing with vitamin D3 for 2 months, expression of these same 66 genes was similar for both groups.


**Green Tea Compound May Help Prevent Certain Liver Diseases**

In order to investigate the protective mechanisms of an 85% pure extract of the green tea compound epigallocatechin gallate (EGCG) in the development of fibrosis, oxidative stress, and inflammation in a recently developed dietary-induced animal model of non-alcoholic fatty liver disease (NAFLD), a group of scientists from China fed female Sprague-Dawley rats either a normal rat diet or high-fat diet for 8 weeks to develop NAFLD.*

For both treatments, rats were treated with or without EGCG (administered by injection, 3 times per week). At the end, blood and liver tissue samples were obtained for histology, molecular, and biochemical analyses.

Epigallocatechin gallate (EGCG) reduced the severity of liver injury in an experimental model of NAFLD associated with lower concentration of pro-fibrogenic, oxidative stress, and pro-inflammatory mediators. Therefore, they concluded that green tea polyphenols and EGCG are useful supplements in the prevention of NAFLD.

Vitamin D Slows Parkinson’s Progression

The results of a trial reported in the American Journal of Clinical Nutrition reveal a benefit for vitamin D supplementation in men and women with Parkinson’s disease.*

One hundred fourteen Parkinson’s disease patients were randomized to receive 1,200 IU vitamin D3 per day or a placebo for twelve months. Hoehn and Yahr stage, Unified Parkinson’s Disease Rating Scale, and other tests were administered to assess disease status before and after treatment. Blood samples collected at enrollment were analyzed for factors that included 25-hydroxyvitamin D and calcium levels, and variations in genes associated with vitamin D binding protein and vitamin D receptor.

By the end of the study, Parkinson’s disease stage worsened on average among those who received the placebo, but was essentially unchanged among those who received vitamin D. United Parkinson’s Disease Rating Scale scores were similarly unchanged among vitamin D-supplemented participants, but worsened in the placebo group.

Editor’s Note: A significant benefit for vitamin D3 was observed among subjects with either of two vitamin D receptor FokI genotypes, but not among those with a third FokI genotype.

—D. Dye


Insufficient Sleep Can Make Our Genes Less Active

Recent research conducted at the University of Surrey, England, and published by Proceedings of the National Academy of Sciences has revealed that insufficient sleep—less than six hours a night—affects the activity of over 700 of our genes.*

Insufficient sleep and circadian rhythm disruption are associated with negative health outcomes, including obesity, cardiovascular disease, and cognitive impairment, but the mechanisms involved remain largely unexplored.

In order to study this process, 26 participants were exposed to 1 week of insufficient sleep (sleep-restriction condition 5.70 hours per 24 hours) and 1 week of sufficient sleep (control condition 8.50 hours of sleep per 24 hours). Immediately following each condition, ten whole-blood RNA samples were collected from each participant, while controlling for the effects of light, activity, and food, during a period of total sleep deprivation.

The data showed that one week of insufficient sleep alters gene expression in human blood cells, reduces the amplitude of circadian rhythms in gene expression, and intensifies the effects of subsequent acute total sleep loss on gene expression.

—M. Richmond

* Available at: http://www.pnas.org/content/early/2013/02/20/1217154110.

Stroke Risk Lower in Coffee and Tea Drinkers

An article published in the journal Stroke reveals a protective effect for green tea and coffee against stroke in middle-aged men and women.*

Yoshiro Kokubo, MD, PhD, and associates analyzed data from 82,369 participants in the Japan Public Health Center-Based Study Cohort I and II. Questionnaires administered at enrollment provided information on green tea and coffee consumption. The subjects were followed for an average of 13 years, during which 3,425 strokes occurred.

In comparison with those whose tea drinking was categorized as seldom at less than once per month, drinking two to three cups of green tea per day was associated with a 14% lower risk of stroke and drinking at least four cups per day with a 20% reduction. Among coffee consumers, drinking the beverage three to six times per week was associated with an 11% lower risk and consuming it once per day was associated with a 20% decrease compared to seldom drinkers.

Editor’s Note: “The regular action of drinking tea and coffee largely benefits cardiovascular health because it partly keeps blood clots from forming,” Dr. Kokubo noted. Other possible mechanisms cited by the authors include the ability of compounds found in tea to protect against oxidative stress and inflammation and for those in coffee to improve blood glucose levels.

—D. Dye

Green Vegetables Improve Intestinal Health

Researchers from the Walter and Eliza Hall Institute of Medical Research have recently discovered that an immune cell population essential for intestinal health could be controlled by leafy greens in your diet.*

The immune cells, named innate lymphoid cells (ILCs), are found in the lining of the digestive system and protect the body from “bad” bacteria in the intestine. They are also believed to play an important role in controlling food allergies, inflammatory diseases, and obesity, and may even prevent the development of bowel cancers.

Dr. Gabrielle Belz, Ms. Lucie Rankin, Dr. Joanna Groom, and colleagues have discovered the gene T-bet is essential for producing a population of these critical immune cells and that the gene responds to signals in the food we eat.

Dr. Belz said that the proteins in green leafy (cruciferous) vegetables are known to interact with a cell surface receptor that switches on T-bet and might play a role in producing these critical immune cells. “Proteins in these leafy greens could be part of the same signaling pathway that is used by T-bet to produce ILCs,” Dr. Belz said. “We are very interested in looking at how the products of these vegetables are able to talk to T-bet to make ILCs, which will give us more insight into how the food we eat influences our immune system and gut bacteria.”

—M. Richmond

Olive Leaf Polyphenols Improve Insulin Sensitivity in Middle-Aged Overweight Men

Olive plant leaves (*Olea europaea* L.) have been used for centuries in folk medicine to treat diabetes, but there are very limited data examining the effects of olive polyphenols on glucose homeostasis in humans.*

To assess the effects of supplementation with olive leaf polyphenols on insulin action and cardiovascular risk factors in middle-aged overweight men, a research team from Liggins Institute, University of Auckland, Auckland, New Zealand, set up a randomized, double-blinded, placebo-controlled, crossover trial involving 46 participants (aged 46.4±5.5 years and BMI 28.0±2.0 kg/m). The participants were randomized to receive capsules with olive leaf extract (OLE) or placebo for 12 weeks, crossing over to other treatment after a 6-week washout period.

The researchers concluded that in overweight middle-aged men at risk of developing metabolic syndrome, supplementation with olive leaf polyphenols for 12 weeks resulted in a 15% improvement in insulin sensitivity and 28% improvement in pancreatic-cell responsiveness versus placebo.

—M. Richmond

Higher Vitamin D Levels Associated with Reduced Risk of Dying

Findings from Germany’s ESTHER study reveal a lower risk of dying from cardiovascular disease, cancer, respiratory disease or any cause in men and women with higher serum levels of vitamin D.*

Reporting in the *American Journal of Clinical Nutrition*, Ben Schöttker and his colleagues describe the results of their study of 9,578 subjects between the ages of 50 to 74 upon enrollment in ESTHER. Vitamin D levels were measured upon enrollment and at a five-year follow-up visit. Subjects were followed for a median of 9.5 years, during which 1,083 deaths occurred.

Men and women whose vitamin D levels were classified as insufficient (between 12 and 20 ng/mL) had a 17% higher risk of dying from any cause in comparison with those whose levels were categorized as sufficient. Compared to those with sufficient levels, those with deficient levels (less than 12 ng/mL) had a 71% increased risk of dying.

Editor’s Note: Life Extension® suggests 50–80 ng/mL as an optimal range of serum 25-hydroxyvitamin D to protect against disease.

—D. Dye


SUPER OMEGA-3 WITH SESAME LIGNANS AND OLIVE FRUIT EXTRACT

To ensure the purest, most stable, and easy-to-tolerate fish oil, Super Omega-3 EPA-DHA is molecularly distilled. It enjoys the highest 5-star rating for purity, quality, and concentration from the renowned International Fish Oil Standards program. The sesame lignans not only direct the omega-3s toward more effective pathways in the body, but guard the delicate fish oil from oxidation.

A bottle containing 120 softgels of Super Omega-3 EPA/DHA with Sesame Lignans and Olive Fruit Extract retails for $21. If a member buys four bottles, the price is reduced to $20 per bottle. If 10 bottles are purchased, the cost is $18.68 per bottle. (Item #01482)

SUPER OMEGA-3 WITH SESAME LIGNANS AND OLIVE FRUIT EXTRACT

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

The daily dose (four regular size softgels) of Super Omega-3 EPA/DHA with Sesame Lignans & Olive Fruit Extract provides:

- EPA (eicosapentaenoic acid) 1,400 mg
- DHA (docosahexaenoic acid) 1,000 mg
- Olive Fruit Extract (std. to 6.5% polyphenols (39 mg), 1.73% hydroxytyrosol/tyrosol (10.4 mg), 0.5% verbascoside/oleuropein (3 mg)) 600 mg
- Sesame Seed Lignan Extract 20 mg

VASCULAR BENEFITS OF A Mediterranean Diet VALIDATED IN HUGE NEW STUDY

A large, rigorous study published in the New England Journal of Medicine confirmed the health benefits of those who switch to a Mediterranean diet rich in omega-3 fish oil as well as protective nutrients called polyphenols found in olive oil, fruits, vegetables, nuts like walnuts, and wine. The study ended early because the benefits were so overwhelming, with startling benefits for vascular health, that it was considered unethical to continue to deprive the control group.

In addition to the health-promoting benefits of vegetables and fruits with their abundance of polyphenol nutrients, the Mediterranean Diet group took at least 4 to 6 tablespoons of polyphenol-rich extra-virgin olive oil a day.

LIFE EXTENSION® MEMBERS LONG AGO BENEFITED

Starting in 2005, Life Extension members began taking a supplement (Super Omega-3) that provided potent concentrations of fish oil and olive polyphenols like hydroxytyrosol and oleuropein. This supplement also provided standardized sesame lignans to support the beneficial effect of omega-3 fatty acids in the body.

Olive oil contains polyphenol nutrients that have demonstrated wide-ranging health benefits. The recommended twice daily dose of Super Omega-3 supplies a similar polyphenol content to that found in 4 to 6 tablespoons of olive oil.

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.

Supportive but not conclusive evidence shows that consumption of EPA and DHA omega-3 fatty acids may reduce the risk of coronary heart disease. IFOS® certification mark is a registered trademark of Nutrasource Diagnostics, Inc. These products have been tested to the quality and purity standards of the IFOS® program conducted at Nutrasource Diagnostics, Inc.

These statements have not been evaluated by the Food and Drug Administration. 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 young skin naturally produces to retain its supple appearance are identical to those present in wheat! Wheat-derived oils have been used topically for centuries as a natural moisturizer. But you can’t get enough ceramides from topically applied wheat oil to have a long-term impact on your skin’s appearance. And they don’t appear in sufficient concentration in your diet. That’s why Life Extension® brought together these skin-nourishing oils in a 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. 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 vegetarian liquid capsules of Skin Restoring Phytoceramides with Lipowheat™ retails for $25. If a member buys four bottles, the price is reduced to $17.25.

Contains wheat.
Lipowheat™ is a trademark of LAVIPHARM Group of Companies.

To order Skin Restoring Phytoceramides with Lipowheat™ call 1-800-544-4440 or visit www.LifeExtension.com

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

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
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
Member Price: $8.44 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
Member Price: $7.43 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 5,000 IU
60 softgels
Retail: $11
Four-bottle
Member Price: $9.38 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 7,000 IU
60 softgels
Retail: $14
Four-bottle
Member Price: $9.45 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 Liquid Emulsion 2,000 IU
1 ounce
Retail: $28
Four-bottle
Member Price: $18.75 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

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.

To order any of these high-potency vitamin D3 supplements, 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.
Unexpected Benefits of Olive Leaf Extract

Scientists have isolated the unique molecule that provides olive oil with its multitude of health and life-extending benefits. Known as oleuropein, it is the polyphenol that can help lower bad cholesterol and blood pressure, prevent cancer, protect against oxidative damage, and help guard against cognitive decline.\(^1\,^2\) Oleuropein provides the distinctive tangy, pungent, almost bitter flavor found in high quality extra virgin olive oils.\(^2\) It’s also responsible for most of olive oil’s antioxidant, anti-inflammatory, and disease-fighting characteristics.\(^2\,^4\) In fact, when oleuropein was given to animals with tumors, the tumors completely regressed and disappeared in 9 to 12 days!\(^5\)

The olive tree (Olea europaea) produces oleuropein abundantly in its leaves as well as in the olive fruit itself, and special processing techniques now allow for the extraction of a stable, standardized form of oleuropein. That means that consumers can have access to one of the most beneficial components of olive oil without the necessity of consuming excessive amounts of olive oil.
Olive leaf extracts and their oleuropein constituents are best known for their blood pressure-lowering effects, but the latest studies reveal their health benefits extend well beyond that. Additional anti-inflammatory and antioxidant properties offer promise in fighting atherosclerosis, diabetes, cancer, neurodegenerative diseases, and even arthritis.
**Blood Pressure**

Animal studies demonstrate that olive leaf extracts lead to significant drops in elevated blood pressure.\(^6,7\) Remarkably, these effects are evident when supplementation occurs either before or after the animals develop hypertension. This means that the extracts have the ability to both prevent and treat high blood pressure.\(^8\)

The drop in blood pressure is accompanied by reduced pressure in the heart’s left ventricle. This results in improved blood flow to the heart’s own coronary blood vessels. Additional human studies demonstrate the ability of olive leaf extracts to significantly reduce blood pressure measurements.\(^9\)

One particularly fascinating study was conducted among identical twins with borderline hypertension (blood pressure in the range of 120-139 mmHg over 80-89 mmHg).\(^10\) Studies of identical twins virtually eliminate genetic variations which may impact study results. After 8 weeks, placebo recipients showed no change in blood pressure from baseline, but patients supplemented with 1,000 mg/day of olive leaf extract dropped their pressures by a mean of 11 mmHg systolic and 4 mmHg diastolic.\(^10\) The supplemented patients experienced significant reductions in LDL cholesterol.

A human study measured olive leaf extract against captopril, one of the conventional drugs used for treating hypertension.\(^11\) In this study, patients with stage-1 hypertension (140-159 mmHg over 90-99 mmHg) took either 500 mg of olive leaf extract twice daily, or 12.5 mg of captopril twice daily, which was increased as needed to 25 mg twice daily. After 8 weeks of treatment, both groups experienced a drop in mean blood pressure from baseline (11.5 and 13.7 mmHg systolic; 4.8 and 6.4 mmHg diastolic, respectively), with no significant difference between the two groups. In other words, the olive leaf extract performed as well as the prescription drug. A closer look in the laboratory reveals the reason for this equivalence. Although they utilize different mechanisms of action (oleuropein acts as a natural calcium channel blocker and captopril is a well-known ACE-inhibitor), both oleuropein and captopril function inside the vasculature to decrease the tension in the walls of blood vessels and promote widening of the vessels (vasodilation), ultimately lowering blood pressure.\(^12-15\)

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**Arterial Health**

Blood pressure is only one measure of cardiovascular health; arterial health is equally important. The endothelial cells that line arterial walls play a key role in maintaining blood flow and pressure; they also regulate the distribution of smooth muscle cells and sustain an even flow of blood through vessels. Endothelial dysfunction is one of the earliest stages in hardening of the arteries (atherosclerosis), which occurs when plaques build up in the arterial walls. These plaques eventually block blood flow and can trigger a heart attack or stroke.

Olive leaf extracts fight endothelial dysfunction at multiple levels. They increase the production of nitric oxide, a signaling molecule that helps relax blood vessels.\(^16,17\) They reduce the production and activity of a class of molecules known as matrix metalloproteinases, or MMPs.\(^18-20\) Excessive MMP activity literally dissolves the gel-like matrix that holds cells together,
making vessel linings increasingly vulnerable to plaque damage. They also help prevent the oxidation of LDL-cholesterol, which is one of the earliest events in developing atherosclerosis. Oxidized LDL triggers inflammation, further damaging arteries, and olive leaf extract has multi-targeted anti-inflammatory effects.

Polyphenol compounds found in olive leaves have been shown to help directly prevent the formation of arterial plaques (and thereby reduce the risk of heart attack and stroke) in two ways. First, they reduce the production and activity of a series of “adhesion molecules.” These substances cause white blood cells and platelets to stick to arterial walls, resulting in early plaque formation. Second, they reduce platelet aggregation (clumping) by multiple mechanisms, which reduces the risk that tiny clots will form at sites of plaque to produce a stroke or heart attack.

### Diabetes

The diabetic (and pre-diabetic) state of chronic blood sugar elevation imposes substantial oxidative stress throughout the body, triggering inflammation and tissue damage that rapidly accelerates aging. Treatments for diabetes have two main goals: 1) lowering blood glucose to normal levels and 2) limiting the damage done by the inevitable blood sugar spikes that still occur.

Olive leaf extracts are showing real promise in both of these areas. In animal and basic lab studies, olive leaf extracts and oleuropein have been found to lower blood sugar through several mechanisms. They slow the digestion of starches into simple sugars, slow absorption of those sugars from the intestine, and increase the uptake of glucose into tissues from the blood. They protect tissues from the oxidant damage caused when glucose binds to proteins in the process called glycation. They also increase levels of other natural antioxidant systems in the body, broadening the degree of protection.

These mechanisms have directly observable benefits. Studies show that diabetic animals supplemented with olive leaf extracts experience significant reductions in blood sugar and cholesterol. In a dramatic head-to-head study, diabetic rats were treated with either olive leaf extract or glyburide (Diabeta®), a common glucose-lowering drug. By the end of the study, the antidiabetic effects of the extract proved superior to those of the drug.

One intriguing study showed that when lab rats were fed a high-fat, high-carbohydrate diet, they developed all the signs of metabolic syndrome (excessive abdominal fat, hypertension, abnormal lipid levels, etc.).
profile, and impaired glucose tolerance.\textsuperscript{36} But when animals were fed that unhealthy diet along with olive leaf extracts, virtually all of the metabolic abnormalities improved or, in some cases, normalized.\textsuperscript{36}

Human studies reveal that supplementing with \textbf{500 mg of olive leaf extract} once daily resulted in significant reductions in \textit{hemoglobin A1c} levels, the standard marker of long-term exposure to elevated blood sugar in diabetic people.\textsuperscript{31} Supplementation also lowered fasting plasma insulin levels, an important point because chronic insulin elevations may contribute to diabetics’ higher cancer risks.\textsuperscript{31,37}

\section*{Cancer}

The Mediterranean diet is renowned for its ability to reduce the risk of cancer.\textsuperscript{38,39} While numerous aspects of the diet contribute to this risk reduction, there’s growing evidence that olive oil—and specifically its \textit{oleuropein} content—are key components of the diet’s anti-cancer effects.

Studies show that oleuropein’s antioxidant effects help it battle cancer formation at its earliest stages. Olive leaf extracts inhibit DNA damage from reactive oxygen species, which is the very first step in development of malignant cells.\textsuperscript{40} Once cells become cancerous, they rely on a host of chemical signaling factors that promote their growth and organization into tumors. Olive leaf compounds are known to inhibit growth factors and disrupt signalling pathways.\textsuperscript{41-43} Oleuropein also suppresses an enzyme cancer cells rely on to derive and store energy from dietary carbohydrates.\textsuperscript{44}

Oleuropein and olive leaf extracts have numerous other mechanisms of action against cancer:

- They help prevent inflammation, another major promoter of tumor growth.\textsuperscript{41}
- In breast cancer cells specifically, oleuropein reduces malignant cells’ ability to respond to estrogen, the female hormone that many breast cancer cells depend on for their survival.\textsuperscript{43}
- Oleuropein inhibits the production of the “protein-melting” enzymes that cancer cells need in order to invade healthy tissues and metastasize to distant parts of the body.\textsuperscript{19}

These mechanisms have now been shown in laboratory and animal studies to reduce the rates of occurrence, and subsequent development, of a broad variety of cancers, including those of the brain, head and neck, breast, liver, bladder, prostate, and skin, as well as leukemia.\textsuperscript{42,43,45-49}

In one especially vivid study, mice with a high spontaneous cancer rate were orally supplemented with oleuropein.\textsuperscript{5} The tumors completely regressed and disappeared in \textbf{9 to 12 days}.\textsuperscript{5} When the tumors were examined before they vanished, they were found to have a disordered, crumbly consistency, and no cancer cells remained alive within.\textsuperscript{5}
**Neuroprotection**

Olive extracts help protect the brain and central nervous system from the destruction brought on by strokes and age-related degenerative conditions such as Alzheimer’s and Parkinson’s diseases. They accomplish this by suppressing inflammation and reducing the damage done by oxidative stress.

In acute brain injuries such as those caused by a stroke or trauma, damaging processes such as oxidative stress occur within minutes of the original event—and, ironically, are worsened by the return of normal blood flow to the area.

Researchers found a number of positive effects in animals that were pre-treated with olive leaf extract and then induced with a stroke. Compared with untreated animals, the treated animals experienced a sharp reduction in markers of oxidation and an increase in normal cellular antioxidant systems. Microscopic examination of brain tissue revealed a similar decline in injury to brain cells and up to a 55% decrease in the volume of dying brain tissue. Similar results are shown in experimental spinal cord injury in animals pretreated with oleuropein.

**Arthritis**

Olive leaves and their extracts have long been used in the Mediterranean as folk remedies for arthritis. Now, scientific evidence has proven that olive leaf extracts can in fact interfere with the development of several different kinds of arthritis, including gout, rheumatoid arthritis, and osteoarthritis.

**Gout** is caused by the accumulation of uric acid crystals in joints, the byproducts of impaired recycling of DNA and RNA in cells. In a mechanism identical to that of allopurinol (the gold standard drug therapy for gout), oleuropein prevents the buildup of uric acid by inhibiting xanthine oxidase, the enzyme responsible for converting DNA and RNA into uric acid.

Oleuropein has also been found to help prevent and treat symptoms of **rheumatoid arthritis**. When administered at the earliest sign of arthritis in animal models, oleuropein prevented symptoms from developing and also produced marked improvement in the microscopic appearance of joint tissue from affected animals. When administered after arthritis was fully developed, there was significant improvement in inflammatory changes to joints, compared with untreated animals.

Oleuropein had similar benefits on **osteoarthritis**. In animal models of this degenerative joint disease, olive leaf extract improved joint swelling, improved the microscopic appearance of joint tissue, and prevented the production of inflammatory cytokines.
Convincing evidence now shows that oleuropein-rich olive leaf extracts help prevent many of the underlying factors leading to diabetes, cancer, neurodegenerative diseases, stroke, and arthritis.

Extra-virgin olive oil and olive leaf extract should be considered an important component of one’s health and longevity program.

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

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UNEXPECTED BENEFITS OF OLIVE LEAF EXTRACT


Maintaining eye support is essential for optimal eye health.

As we get older, our eyes become vulnerable to a variety of insults that can cause irritation and dry eye. With just a few drops of the proper eye lubricant, eye irritation stemming from dryness may be alleviated.

**Brite Eyes** provides a powerful dose of two well-established lubricants in every drop, soothing eye discomfort without irritation.

**Hydroxymethyl-cellulose** and **glycerin** are FDA-approved for ophthalmic use and are uniquely preserved with potent **antioxidants** and **antiglycating** 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, the price is reduced to **$24 per box**.
Many of the validated benefits of the Mediterranean diet derive from heart-healthy compounds contained in the olive fruit, including the polyphenols tyrosol and hydroxytyrosol.\(^1\)\(^4\)

When it comes to olive's power to support blood pressure already within a healthy range, research shows the bioactive compound oleuropein\(^5\)\(^-\)\(^8\) is primarily responsible.

The problem is that optimal amounts of oleuropein are not found in the fruit. The highest concentrations of oleuropein are contained in the olive leaf\(^9\)\(^-\)\(^13\)—a part of the plant that is neither readily available nor commonly consumed.

Oleuropein normally degrades during standard food processing. For this reason, Life Extension\(^\circledR\) provides Olive Leaf Vascular Support.

Olive Leaf Vascular Support consists of a patented, standardized oleuropein extract using a unique, gentle-processing technique.

Researchers using 1,000 mg per day of this formulation in a double-blind, controlled clinical trial documented an average 11.5-point (mmHg) decline in systolic readings and 4.8-point drop in diastolic readings in just eight weeks.\(^9\)\(^4\)

The suggested daily serving of two 500 mg vegetarian capsules of Olive Leaf Vascular Support supplies optimal concentrations of this proprietary, highly stable oleuropein, for maximum benefit.

CAUTION: Consult your healthcare provider before taking this product if you are being prescribed anti-hypertensive medication.
The Forgotten Longevity Benefits of Taurine

The Japanese have a life expectancy that is among the highest in the world. In fact, Okinawa, Japan’s famous “Island of Longevity,” likely has the world’s highest percentage of people over 100 years old.¹

Undoubtedly, there are many factors that play into the life spans of the longest-living populations, but evidence shows that they all have one thing in common: high dietary intake of an amino acid called taurine.²

The connection between taurine and a long life is so strong that researchers have dubbed taurine, “The nutritional factor for the longevity of the Japanese.”³

Taurine promotes cardiovascular health, insulin sensitivity, electrolyte balance, hearing function, and immune modulation. In animal research, taurine protected against heart failure, reducing mortality by nearly 80%.⁴

Its benefits are so broad and extensive that scientists have described taurine as “a wonder molecule.”⁵

Taurine is found abundantly in healthy bodies.⁶ However, certain diets, particularly vegetarian or vegan diets, lack adequate amounts of taurine.⁷ Disease states—including liver, kidney, or heart failure, diabetes, and cancer—can all cause a deficiency in taurine.⁹⁻¹¹ And aging bodies often cannot internally produce an optimal amount of taurine, making supplementation vital.¹²

That’s why those interested in longevity should consider this vital and super low-cost nutrient. In this article, you’ll learn how boosting taurine levels can contribute to better cardiovascular, metabolic, and neurologic health. >
Why We Need Supplemental Taurine

In the enthusiasm to investigate new longevity compounds, sometimes the importance of venerable ones that have been around for decades is forgotten. Such is the case of taurine. Foundation members used to get taurine as part of multi-nutrient formula, but this product is not as popular as it once was.

A study released in November 2012 made the bold statement that taurine is one of the most essential substances in the body. The authors wrote: “Considering its broad distribution, its many cytoprotective attributes, and its functional significance in cell development, nutrition, and survival, taurine is undoubtedly one of the most essential substances in the body.”

Although it’s possible for your body to produce taurine on its own, you still need to obtain taurine through diet and supplementation in order to achieve optimal amounts of this essential nutrient.8,11,13
Because of taurine’s essential role in the body, supplementing with taurine can provide numerous health benefits, including restoring insulin sensitivity, mitigating diabetic complications, reversing cardiovascular disease factors, preventing and treating fatty liver disease, alleviating seizures, reversing tinnitus, and more.

**Taurine Prevents Obesity**

One of the ways taurine can help improve overall health is by fighting obesity. Obesity impacts every area of the body, especially because of the inflammation-generating **abdominal fat stores**. Human studies show that **3 grams per day** of taurine for 7 weeks reduced body weight significantly in a group of overweight or obese (but not-yet-diabetic) adults.14 Subjects saw significant declines in their serum triglycerides and “atherogenic index,” a ratio of multiple cholesterol components that predicts atherosclerosis risk.

Various animal studies support the **anti-obesity** and **lipid-lowering** capabilities of taurine, both alone and combined with other natural products.15,16 These studies highlight taurine’s ability to improve glucose tolerance in obese animals, an important benefit given how many overweight people go on to develop diabetes.17,18

Perhaps most alarming, animal research reveals that obesity itself causes a **decline** in plasma taurine levels, which, in a vicious cycle, further promotes obesity.19 The observed decline in taurine levels was seen in mouse models of both genetic obesity and diet-induced obesity. Fortunately, in the same study, taurine supplementation interrupted the cycle, helping to prevent obesity and its consequences.19

**Taurine Promotes Glucose Control—and Treats Diabetes**

It is a known fact that taurine concentrations are lower among diabetics than they are in healthy individuals.20 Given the above information about low taurine levels promoting obesity, it is clear that the low levels of taurine only serve to promote the interdependence of diabetes and obesity.20 Fortunately, human studies have shown that supplementing with just **1.5 grams** of taurine a day can restore taurine levels to those in healthy control subjects, and additional animal research has shown that taurine supplementation can help prevent the onset **type II diabetes**.20,21

Normal taurine concentrations are essential in controlling diabetes and the impact of its consequences. Animal studies have found that having adequate taurine concentrations helps control diabetes by reducing blood glucose and restoring insulin sensitivity.22 But it doesn’t stop there. Taurine helps prevent—and even reverse—many of the consequences associated with the disease.

For example, in adult diabetics, supplementation with **1.5 grams** of taurine daily for just 14 days can **reverse** diabetes-induced abnormalities in arterial stiffness and in the ability of the vasculature to respond to changes in blood flow or pressure.23 This
can be critical to the longevity of diabetics, since these types of abnormalities are to blame for diabetics’ increased risk of dying from cardiovascular disease. In addition, studies in diabetic rats show that taurine helps protect heart function and helps prevent heart muscle damage, due in part to the ability of taurine to increase glucose transport from blood into energy-hungry heart muscle cells.24,25 In the process of increasing glucose transport into energy-producing cells, blood glucose levels are lowered.

Additional animal and cell culture studies have revealed that taurine supplementation is effective against diabetic complications as well. Taurine supports nerve fiber integrity, potentially slowing or reversing painful diabetic neuropathy.26-29 And in the retina, another target of destructive elevated blood glucose, taurine fights glucose-induced oxidant stress and preserves the health of light-sensing cells in diabetic retinopathy.30-32 Kidney damage, another consequence of diabetes, can be minimized with taurine supplementation in diabetic animals.33

Taurine Reverses Cardiovascular Disease Factors

Taurine has powerful effects on the heart and blood vessels. People with higher levels of taurine have significantly lower rates of dying from coronary heart disease.1,34 Additionally, they have lower body mass index, lower blood pressure, and lower levels of dangerous lipids. Many different mechanisms account for these powerful effects on the heart and blood vessels.

In animal models of hypertension, taurine supplementation lowers blood pressure by reducing the resistance to blood flow in the blood vessel walls and by minimizing nerve impulses in the brain that drive blood pressure up.35,36 Oral taurine supplementation has been found to reduce the arterial thickening and stiffness characteristic of atherosclerosis, to restore arteries’ responses to beneficial endothelial nitric oxide, and to reduce inflammation (a direct contributor to cardiovascular disease).34,35

A study of patients needing coronary bypass surgery showed that consuming a liquid drink containing 3 grams of taurine, combined with 3 grams carnitine, 150 mg CoQ10, and basic multivitamin nutrients, reduced left-sided ventricular volume during the heart’s resting phase (diastole).37 This is important since an increased left-ventricular diastolic volume is the single greatest predictor of death in patients requiring bypass or stent placements. This makes taurine a vital component of such patients’ diets.

What You Need to Know

**Taurine: Bountiful Benefits**

- Taurine is the most abundant amino acid you’ve never heard of; it is found throughout the body, but especially in tissues containing excitable cells, like nerves and heart muscle.
- Strong epidemiological evidence suggests that certain groups with the longest life spans consume higher amounts of taurine than those of us in the rest of the world.
- Taurine supplementation can prevent diabetes and obesity in animal models, and can mitigate the effects of both conditions in humans.
- Taurine supplementation strengthens heart muscle cells, extends their life spans, and protects them from damage, while reducing many of the factors that produce atherosclerosis and its deadly consequences.
- Taurine protects retinal and inner ear cells from damage, normalizing the flow of calcium ions they require for proper function.
- Evidence is growing for taurine’s role in preventing epileptic seizures and liver disease, two conditions that can be attributed to toxic effects on delicate tissue.
- If you are interested in a longer, healthier, and more active life, consider supplementing with taurine.
Enhance Your Exercise Performance

Want a better workout? Try taking taurine supplements! Trained athletes who supplement with taurine experience better exercise performance, and cyclists ride longer distances with less fatigue.\textsuperscript{38,39}

There's good reason for these positive effects: Taurine helps muscles work harder, longer, and safer.

- **Harder.** Taurine increases muscle contrac-tility (the force with which muscle cells pull together) in both skeletal and cardiac muscle.\textsuperscript{40,41} That means more powerful workouts as muscle works harder.

- **Longer.** Taurine helps exercising muscle rid itself of lactic acid.\textsuperscript{42,43} Lactic acid is what causes the feelings of pain and soreness and is what limits how much a muscle can continue to work. By cleaning up lactic acid, taurine helps muscles work longer.\textsuperscript{38,43}

- **Safer.** Working muscles generate oxidant stress and damage DNA, leading to the potential for muscle damage and poorer performance. Taurine protects muscles from such damage, so muscle works more safely.\textsuperscript{38,44}

**Taurine Provides Potent Retina Protection**

Taurine is especially vital when it comes to eye health. Adequate levels can help prevent age-related vision loss; conversely, a deficiency can lead to troubling vision problems. Age-related vision loss has many different causes, but near the top is the impact of oxidative stress on light-sensing cells in the retina. Such damage leads to age-related macular degeneration and other forms of retinal disease.\textsuperscript{45}

While taurine is found in very high concentrations in the retina, it declines significantly with age.\textsuperscript{46-48} Additionally, the taurine found in the retina fights oxidative stress, especially in diabetes, and helps restore deficient levels of nerve growth factor, required for maintaining retinal health.\textsuperscript{46,30,31}

When taurine levels are deficient, a variety of vision problems can occur including retinal ganglion cell degeneration,\textsuperscript{49} and in children, retinal dysfunction;\textsuperscript{7} taurine supplementation has been shown to ameliorate diabetic retinopathy.\textsuperscript{50} Evidence is strong that taurine is vital in maintaining optimal retinal function.\textsuperscript{50}

Certain drugs deplete the body of taurine, which can induce retinal damage.\textsuperscript{48,49,51} These include frequently used chemotherapy drugs such as cyclophosphamide (Cytoxan\textsuperscript{®}) and busulfan (Bulsufex\textsuperscript{®}) as well as the anti-epileptic drug vigabatrin (Sabril\textsuperscript{®}). Radiation therapy has also been shown to deplete the body of taurine.\textsuperscript{51} Fortunately, supplementation can restore taurine levels to normal and protect the retina in such cases.\textsuperscript{52,46,47,52}

**Taurine Helps Reverse Tinnitus**

Taurine plays a vital role in hearing. In fact, studies have found that in some cases, taurine can \textit{reverse} the biochemical processes behind hearing loss.\textsuperscript{53,54} Other studies have demonstrated that taurine can almost completely eliminate the ringing in the ears associated with tinnitus.\textsuperscript{55}

Much of the damage to hearing occurs not in the mechanical parts of the ear, but rather in the nerve cells that convert sound waves into the electrical energy that is perceived in our brains. Like other nerve cells, these so-called “hair cells” depend on the flow of calcium ions into and out of the cell. Taurine helps restore and control normal calcium ion flow in auditory cells.\textsuperscript{53,56}
Taurine improves the hearing ability in animals exposed to drugs like the antibiotic gentamicin, which is notoriously toxic to hearing. And in a boon for the 17% of us troubled by chronic tinnitus (ringing in the ears), taurine may be helpful in quieting the noise. Animal studies using human equivalent doses of 700 mg to 3.2 grams per day of taurine over the course of several weeks demonstrate near-complete resolution of tinnitus with taurine supplementation (the animals had been trained in tasks that are sensitive to distraction by tinnitus). And a human pilot study has shown encouraging results, with 12% of people responding to taurine supplementation.

**Solution for Seizures**

While there are many types and many causes of epilepsy (seizures), a disruption in the function of excitable brain tissue underlies all of them. One of taurine’s major roles in mammalian biology is the regulation of such excitable tissues, making taurine of natural interest to scientists and clinicians who study epilepsy.

Animal studies reveal that taurine depletion makes seizures more likely, while supplementation with taurine is capable of preventing seizures induced by a number of drugs and chemical toxins. Taurine appears to work by increasing the levels of glutamic acid decarboxylase (GAD), the enzyme responsible for the production of the neurotransmitter GABA, as well as by binding to so-called GABA receptors in brain cells, calming them and reducing their likelihood of participating in the random, uncoordinated electrical firing that produces an epileptic seizure.

**Taurine Prevents and Treats Liver Disease**

Increasing evidence suggests that taurine may help treat the most common cause of liver disease in the US, non-alcoholic fatty liver disease (or NAFLD). Non-alcoholic fatty liver disease occurs when too much fat accumulates in the liver, and it can be caused by insulin resistance and metabolic syndrome. Over time, the end result is the loss of liver function, leading to liver cirrhosis.

The human liver is our master detoxifying organ, screening our blood flow many times over each day for substances that can damage our bodies. Taurine is an integral part of the liver’s self-protective mechanisms. Studies show that taurine defends liver cells against free radicals and toxins, helping to reduce the severity of oxidative stress-induced liver injury. This is vitally important in alcoholic and non-alcoholic fatty liver diseases, both of which can progress to cirrhosis and liver failure.

**Taurine and Energy Drinks**

Energy drinks such as Red Bull, Monster, and others have been getting a lot of press recently, most of it unfavorable. There’s concern that the drink’s biggest consumers, adolescents and young adults, are at risk for sudden death and seizures following high consumption.

Because taurine is a major ingredient in these drinks, some readers may be concerned that taurine might be contributing to these ill effects.

The good news (for taurine) is that there’s no evidence at all for taurine’s involvement in any adverse outcome of consuming energy drinks. It has been well-established that the high caffeine content in energy drinks (ranging from 80 milligrams, the amount in a strong cup of coffee, to 300 milligrams per serving) is to blame for the health problems associated with the drink. Side effects of energy drinks are the same as those of caffeine intoxication, and include nervousness, jitteriness, seizures, cardiac arrhythmias, and (rarely) death.

It’s probably best to avoid energy drinks entirely and instead focus on getting your energy from safe, natural sources. Taurine alone offers many of the advantages attributed to energy drinks, such as improved exercise performance.
Human studies reveal the impact of taurine on liver disease. When 24 patients with chronic hepatitis took 2 grams of taurine 3 times daily for 3 months, serum markers of liver damage, as well as markers of oxidative stress, decreased significantly, as did their elevated levels of cholesterol and triglycerides.65

**Summary**

Taurine is the most abundant amino acid you’ve never heard of. Strong evidence suggests that groups with the longest life spans consume higher amounts of taurine than those of us in the rest of the world. High intakes of taurine could be the underlying factor in the world’s longest-living populations—and for good reason.

Taurine supplementation can mitigate the damaging effects of fat, glucose, and excess insulin. Taurine strengthens and protects heart muscle cells and the system of blood vessels that supplies blood throughout the body, helping to protect against atherosclerosis, heart attacks, and strokes.

And taurine protects vision and hearing. It can prevent and alleviate seizures, and it has been shown to treat the most common cause of liver disease in the United States.

With epidemiological evidence that it contributes to the longevity of famously long-lived groups, taurine belongs on the short-list of supplements necessary for maintaining optimal health in the face of aging.

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

**Dietary Sources of Taurine**

Taurine occurs naturally in food, especially in seafood and meat.6 The amount consumed in most societies, however, is quite low. The mean daily intake from omnivore diets was determined to be around 58 mg (range of 9 to 372 mg).77 In another study, taurine intake was estimated to be generally less than 200 mg a day, even in individuals eating a high-meat diet.76 According to another study, taurine consumption was estimated to vary between 40 and 400 mg a day.77

Successful clinical studies with taurine have used daily doses of 1,500 to 3,000 mg.14,20,23,37,65 It is challenging to obtain this amount of taurine from traditional dietary sources.

Taurine is made by the body from the metabolism of the amino acid cysteine.9 Aging can reduce the amount of taurine made from cysteine, thus making taurine supplementation desirable in maturing individuals.12,51,79

Taurine is not abundant in most plant foods.7 On average, non-vegetarians typically eat around 43-76 mg of taurine per day.77 Vegans have been shown to have lower blood levels of taurine.80

**References**


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**Taurine: One of the Most Essential Substances in the Body!**

- It increases the action of insulin, improving glucose tolerance, and acting as an antioxidant.⁶⁷
- It is vital for the proper function of the minerals potassium, calcium, magnesium, and sodium.⁶⁸
- Taurine regulates heart rhythm, cardiac contraction, blood pressure, and platelet aggregation,⁶⁹,⁷⁰ and regulates the excitability of neurons.⁶⁹
- It detoxifies liver cells of various toxins.⁷¹-⁷⁴
- It helps form bile acids and maintains cell membrane stability.⁹
- It reduces the synthesis of lipids and cholesterol that are associated with atherosclerosis.⁷⁶


The suggested daily dose of 3 vegetarian capsules of Optimized Tryptophan Plus provides:

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A bottle of 90 vegetarian capsules of Optimized Tryptophan Plus retails for $32. If a member buys four bottles, the price is reduced to $21.75 per bottle.

Serotonin is a neurotransmitter made in the brain from tryptophan. Serotonin has been associated with positive moods and restful sleep.1-4

To produce and maintain optimum serotonin levels, your body requires tryptophan, an essential amino acid, which means that your body cannot produce it.1

In the body, tryptophan has been shown to:

- Improve sleep5,6
- Enhance mood7,8,9
- Modulate stress5,10

Life Extension® offers Optimized Tryptophan Plus to broadly and powerfully support tryptophan levels already within the normal range.

In addition to delivering an optimum intake of tryptophan itself—the Optimized Tryptophan Plus formula also provides a unique, balanced supply of other nutrients found to help maintain tryptophan activity in the body.6-8

Multi-Pathway Tryptophan Support

The Optimized Tryptophan Plus blends lysine, niacinamide, and extracts of hops and rosemary to provide nutritive support for the body’s production of serotonin.

Purity and Safety

Life Extension® Optimized Tryptophan Plus contains premium L-tryptophan which has undergone significantly more rigorous manufacturing processes than regular tryptophan material to assure the highest purity and safety.

For those who prefer capsules containing pure Tryptophan alone, Life Extension® also offers L-Tryptophan.

Each capsule provides 500 milligrams of L-Tryptophan.

A bottle of 90 vegetarian capsules of L-Tryptophan retails for $33. If a member buys four bottles, the price is reduced to $22.50 per bottle.

To order Optimized Tryptophan Plus and L-Tryptophan, 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.
DHEA is a critically important hormone, but its production declines sharply as we age. Scientists are discovering numerous health benefits when aging people restore their DHEA to youthful ranges. Life Extension offers a wide range of DHEA supplements to satisfy individual needs.

**DHEA 25 mg • 100 Capsules**
The minimum dose of DHEA for most healthy aging people is 25 mg a day, though optimal doses are often higher in men. These 25 mg capsules are a popular way to consume the precise amount of DHEA your body may need. A bottle containing 100 25 mg capsules of DHEA retails for $18; if a member orders four bottles, the price is reduced to $11.25 per bottle.

Contains rice.

**DHEA 15 mg • 100 Capsules**
While published studies show the greatest benefit occurs when 50-75 mg of DHEA is consumed each day, some women only need a low dose of DHEA. Just one of these 15 mg capsules a day is all some women need to bring DHEA levels back to youthful levels. A bottle containing 100 15 mg capsules of DHEA retails for $14; if a member orders four bottles, the price is reduced to $9 per bottle.

**DHEA 50 mg • 60 Capsules**
The optimal daily dose of DHEA for most people is 50 mg. These economical 50 mg capsules enable most people to conveniently consume the optimal dose of DHEA in just one capsule. A bottle containing 60 50 mg capsules of DHEA retails for $19; if a member orders four bottles, the price is reduced to $12.75 per bottle.

**DHEA 25 mg • 100 Dissolve-in-Mouth Tablets**
A bottle containing 100 25 mg dissolve-in-mouth tablets of DHEA retails for $14; if a member orders four bottles, the price is reduced to $8.81 per bottle.

Some people want to take DHEA in sublingual tablet form to avoid first pass through the liver, though published studies show that swallowing DHEA capsules consistently boost blood DHEA levels already within normal range.

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

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

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
Taurine is so vital that scientists have described it as “one of the most essential substances in the body.”1 Food sources provide relatively little taurine,2,3 and as we age, synthesis of taurine in our bodies (from cysteine) markedly declines.3-5

Fortunately, taurine is one of the lowest-cost nutrients, making it affordable to supplement with optimal doses.

SYSTEM-WIDE HEALTH BENEFITS
Taurine is one of the most abundant amino acids.6 Extensive studies have demonstrated the ability of taurine to support:

- Insulin sensitivity and glucose utilization,7,8
- Proper utilization of minerals such as calcium,9
- Eye health,1,9,10
- Regulation of the central nervous system,6
- Cell membrane stability6 and balanced water content (osmoregulation),11,12
- Immune system modulation,11,13
- Bile salt formation,11
- Neuron integrity6,11 and cognitive function,14
- Liver function,15 and
- Cardiovascular health.12,15,16

To promote system-wide health, the body requires adequate levels of this essential nutrient.11,18

ULTRA-LOW COST
A bottle of 50,000 mg capsules of Life Extension® Taurine retails for $8.95. If a member buys four bottles, the price is reduced to $6 per bottle.

One capsule taken one to three times daily on an empty stomach, or as recommended by a healthcare practitioner, supports optimal taurine levels. Taurine may represent one of the better values on the nutritional supplement marketplace today.

References:
Anti-Inflammatory Properties of Tart Cherry

On October 17, 2005, the FDA sent out warning letters to cherry growers insisting that they cease making substantiated health claims that specific chemicals found in cherries could reduce pain and inflammation.1,2

The FDA wanted cherry growers to stop citing published scientific studies showing that cherries are packed with unique anthocyanins and other compounds that naturally mediate the inflammatory process.3-6 These compounds deliver comparable anti-inflammatory activity to ibuprofen (Advil®) and naproxen (Aleve®)7—\textit{but without the significant side effects!}

Standard treatment for muscle pain and inflammation has been with nonsteroidal anti-inflammatory drugs. With over 111 million prescriptions and accounting for around 60\% of over-the-counter pain reliever sales in the USA alone, these are some of the most commonly used types of medications.8 But because they can have \textit{deadly} side effects, including gastric bleeding, heart attack, and kidney failure, the search for natural agents that could prove more beneficial and safer has gained increased attention.9,10

The compounds found in cherries modulate numerous pathways to protect against other conditions associated with \textit{inflammation}—including cancer, cardiovascular disease, metabolic syndrome, and Alzheimer’s disease.11-14 For example,
tart cherry constituents can switch critical genes off and on;\textsuperscript{15,16} modulate cell-signaling molecules like tumor necrosis factor;\textsuperscript{17} and target multiple cardiovascular factors—producing, in one study model, \textit{an astounding 65\% reduction in early mortality!}\textsuperscript{18}

In this article, you will learn of the multiple benefits found in cherries that the FDA did not want to be publicized. >
Muscle Protection

High-intensity or prolonged physical activity of any kind typically causes muscle damage, resulting in oxidative stress, inflammation, and pain.\(^{27-29}\)

As people age, muscle mass and strength tend to decrease, in a process called sarcopenia.\(^{30}\) Although exercise can help overcome this process, post-exercise pain and loss of strength tend to last much longer.

The observed anti-inflammatory benefits of tart cherries prompted researchers to investigate whether they could be used to protect muscles, lower pain, and accelerate muscle repair.

Research demonstrated that orally administered anthocyanins from tart cherries significantly lowered inflammation-induced pain in rats in a dose-dependent manner\(^3\) and that tart cherry juice blend lowered indicators of exercise-induced muscle damage in horses.\(^{31}\)

Then researchers turned to controlled human trials, first testing the impact of tart cherries on the degree of pain following intense exercise.

The effects of tart cherry juice consumption were tested in a double-blind, randomized trial of runners participating in a 24-hour relay race. Runners drank two 355 milliliter beverages containing either tart cherry juice or a placebo beverage daily for one week prior to the race and during the race. (Two 355 mL bottles of tart cherry juice daily provides at least 80 mg anthocyanins which is the equivalent of 90 to 100 cherries.)\(^{32}\)

Both groups reported pain after the race. But the runners who drank tart cherry juice experienced a substantially smaller pain increase after the race.\(^{32}\)

This natural protection against acute muscle soreness suggested that tart cherries must be providing some defense against muscle damage.

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Broad-Spectrum Tart Cherry Compounds

One of nature’s most potent classes of flavonoids is anthocyanins. These powerhouse nutrients are responsible for the deep colors in some berries, fruits, and vegetables. Naturally, like other anthocyanin-rich foods, tart cherries deliver substantial antioxidant and anti-inflammatory activity.\(^{3-6}\)

But tart cherries are superior because they provide high levels of some novel anthocyanins that are absent from a number of other anthocyanin-rich foods, such as blueberries or bilberries.\(^7\)

Also, the unique composition of tart cherries goes far beyond anthocyanins.

In fact, tart cherries were shown to contain much higher amounts of total phenolics than even their nutritious cousins, sweet cherries.\(^{19}\) Aside from a greater abundance of anthocyanins, tart cherries also deliver a cast of supporting compounds.

Tart cherries were ranked 14th among the top 50 foods for highest antioxidant content per serving—surpassing such well-known antioxidant sources as red wine and dark chocolate.\(^{20}\)

This complex profile prompted researchers to investigate what turned out to be numerous biochemical pathways modulated by tart cherry compounds.\(^{3-7,12,21-26}\)

The range of activity was breathtaking. Here’s a partial sampling: bioactive compounds found in tart cherries beneficially inhibit certain enzymes\(^5-7\) while boosting others,\(^{12,21,22}\) switch-on cancer defenses,\(^{23,24}\) down-regulate glucose,\(^25\) and enhance primary antioxidants.\(^{26}\) We’ll examine this multi-potent network of underlying mechanisms later.

But first, let’s learn about their resulting impact on degenerative conditions—starting with muscle inflammation.
To confirm this, scientists conducted a controlled trial on indices of muscle recovery. Participants were given either tart cherry juice or a control drink for five days before, on the day of, and for two days after a marathon race.

Runners in the tart cherry group had significantly lower inflammation biomarkers (Interleukin-6 and C-reactive protein) compared to the placebo group. The tart cherry group also recovered isometric strength faster than the control runners, demonstrating an accelerated recovery following strenuous exercise.33

To further assess the potential decrease in muscle injury and strength loss, another research team gave 14 male college students who never exercised 12 ounces of either a tart cherry juice blend or a placebo twice daily for eight consecutive days. Then participants performed a type of repeated arm exercise (elbow flexion eccentric exercise) that typically induces muscle damage. Isometric elbow flexion strength, pain, and muscle soreness were measured before, and for four days after, the protocol.

After 24 hours, the control group’s arm strength was decreased by 30%—while the tart cherry group’s arm strength was diminished by only 12%. After four days, the control group’s arm strength was still down by over 10% while, remarkably, the tart cherry group’s arm strength had increased by 6%!34

The research team concluded that tart cherry significantly reduced the typical pain and loss of strength induced by exercise—and produced marked preservation of muscle function.34

The most recent trial on muscle injury and recovery included ten males, half of whom drank one ounce of a tart cherry beverage twice daily for ten days, while the other half drank the same amount of a placebo beverage during this period. All subjects completed two sets of an intensive, unilateral leg exercise—first, one set with one leg before the ten-day beverage consumption period, and then another set with the other leg after the beverage period.

Faster recovery of the knee extension (maximum voluntary contraction force) was observed with the tart cherry juice protocol versus control. The researchers concluded that the improved muscle recovery time may have been due to attenuation of oxidative damage.35

The study author suggested that tart cherry components produce a significant myoprotective—or muscle-protecting—benefit.35

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**What You Need to Know**

Guard Against Degenerative Disease and Inflammation with Tart Cherries

- Physical exercise can induce muscle damage that generates inflammation and with it, burning, stiffness, and pain. The effect worsens with age.
- Standard treatment with nonsteroidal anti-inflammatory drugs such as ibuprofen (Advil™) involves potentially deadly adverse effects, such as stroke. Evidence shows that the weave of complex anthocyanins and phenols in tart cherries provides superior protection against muscle injury—by safely inhibiting the pain and inflammatory effects. The potent components in tart cherries have been demonstrated to deliver high-level protection against inflammatory and degenerative diseases, including cardiovascular disease, metabolic syndrome, and neurodegenerative diseases such as Alzheimer’s.
Experts estimate that one out of every two Americans will develop symptomatic osteoarthritis at some point in their lifetime. Osteoarthritis is a chronic condition characterized by a breakdown of joint cartilage that leads to pain and injury.

The Arthritis Foundation reports that the risk of developing osteoarthritis is greater among those of increased age, those who are athletic or regularly engage in repetitive-motion work, and those who are obese.

Osteoarthritis has a strong inflammatory component. Acetaminophen is the most commonly used osteoarthritis pain medication. However, this pain reliever does not help lower inflammation, and its side effects can include kidney or liver damage.

In a 2007 pilot study, researchers at Baylor Research Institute gave tart cherries in pill form to patients with osteoarthritis of the knee. They documented that, after 8 weeks, more than half the subjects experienced a significant improvement in pain and function.

Then, in 2012, a double-blind, randomized, placebo-controlled trial was presented at the annual meeting of the American College of Sports Medicine, ahead of publication. Scientists measured the impacts of tart cherry on serum inflammatory biomarkers among inflammatory osteoarthritis patients. (Patients with inflammatory or erosive osteoarthritis are those who suffer from sudden signs of inflammation, such as redness, pain, and swelling.)

The trial included 20 female participants between 40 and 70 years old who experienced at least moderate pain from osteoarthritis. The participants consumed two 10.5-ounce bottles of either tart cherry juice or a control beverage for 3 weeks.

Among those patients consuming the tart cherry juice, there was a statistically significant decrease in inflammation, indicated by reduced levels of C-reactive protein (CRP). The impact was greatest for those women who had shown the highest inflammation levels at the start of the investigation.

This research demonstrates that tart cherry juice provides osteoarthritis patients with anti-inflammatory activity without the adverse effects and risks of traditional arthritis medications.

Gout is another type of inflammatory arthritis, and it is associated with higher risks of cardiovascular disease and mortality. High blood concentration of uric acid is considered its main pathway.

Typically, drugs such as allopurinol and probenecid are used to help lower uric acid levels. But the side effects of these drugs can include difficulty breathing, unusual bleeding, vomiting, nausea, or severe skin rash. They may even interfere with other medications.

Fortunately, research has spotlighted a safe alternative. For decades, gout sufferers have consumed tart cherry juice for symptomatic relief, on the basis of anecdotal evidence. Now, rigid science has begun to support this tradition.

A study conducted by scientists at Boston University found that intake of cherry extract reduced the risk of gout attacks in those who suffered recurrent gout attacks by 45%. Additionally, the researchers discovered that when cherry intake was combined with allopurinol use, the risk for gout attacks was reduced by 75% versus no intervention. What’s more, these results persisted even across subgroups stratified for sex, obesity status, purine intake, and alcohol use.

Tart cherries appear to be a natural—and safe—way to inhibit the key gout pathway.

Quelling the Chronic Inflammation of Obesity

Chronic inflammation significantly boosts the risk of a number of conditions, including cancer and heart disease. But few people realize that obesity can be both a cause—and a consequence—of chronic low-level inflammation.
Adipose cells are not simply fat stores—they are chemically active cells. In obese individuals, belly fat deposits generate a torrent of pro-inflammatory cell-signaling molecules known as cytokines. Left unchecked, these cytokines trigger a cascade of destruction that can lead to a number of degenerative diseases.

Researchers demonstrated that obese or overweight human adults who consumed 8 ounces daily of tart cherry juice for 4 weeks exhibited significantly lowered inflammation. This was evidenced by marked decreases in erythrocyte sedimentation rate, tumor necrosis factor levels, and monocyte chemotactic protein—all key indicators of inflammation.

Tart cherries are clearly a potent tool for inhibiting the chronic, often obesity-related, low-level inflammation that can lead to many disorders—and they could even inhibit obesity itself!

Cardiovascular Disease Prevention

Elevated readings of low-density lipoprotein (LDL) cholesterol are a factor in the onset of atherosclerosis and other cardiovascular diseases. To help decrease low-density lipoprotein to a safer range, the standard medical approach is to prescribe statins or fibrates to decrease blood lipid levels. However, some patients encounter side effects with these drugs that range from muscle pain (myalgia) to very serious complications such as liver dysfunction and rhabdomyolysis, a condition in which damaged skeletal muscle is broken down, sometimes resulting in kidney failure.

A series of studies on rats concluded that diets enriched with tart cherries improved multiple cardiovascular risk factors. These included a reduction in cholesterol, body fat, weight, and abdominal fat. Tart cherries also calmed inflammation at sites—such as the belly and heart—specifically linked to heart disease risk.

Then, in 2011, scientists reported a 26% decrease in cholesterol in mice given tart cherry powder, as well as a 65% reduction in early death. This lower mortality was believed to be due to improved cardiovascular health.

Turning their attention to humans, researchers investigated the impact of tart cherry juice on serum triglycerides. They reported in 2011 that consuming 8-ounce-daily of tart cherry juice lowered triglycerides levels by over 17% on average.

Together, these studies suggest that tart cherries promote cardiovascular health by safely lowering levels of cholesterol and triglycerides, as well as other risk factors.

Anti-Cancer Mechanisms

Studies have shown that berry anthocyanins—found in tart cherries—can switch off genes involved in the multiple pathways of cancer. These include genes for cell proliferation and inflammation, and for angiogenesis (the growth of new blood vessels that feed a tumor).

Anthocyanins can also trigger apoptosis, the programmed cell death that causes pre-cancerous cells to self-destruct.

These studies establish that anthocyanins work through a network of mechanisms to promote a broad spectrum of natural anticancer protection. And because there is a unique synergy among the anthocyanins and phenolic acids in tart cherries, scientists have been investigating them for their anticancer benefits.

In mice, a diet of tart cherries inhibited both the incidence and size of adenomas (benign tumors) of the cecum, an area at the beginning of the large intestine that is a common site for colon cancer. In the same study, the growth of human colon cancer cell lines was shown to be reduced by tart cherry anthocyanins.

Finally, in 2011, a review of past studies concluded that cherries exert a variety of anti-carcinogenic effects.
Sweet or Tart: Which Type of Cherry Packs the Most Powerful Phenol Punch?

Not all cherries contain the same type—let alone the same amounts—of potent compounds.

The two cultivated varieties of cherry are the sweet cherry (Prunus avium L.), sometimes known as the wild cherry, and the tart cherry (Prunus cerasus L.), sometimes known as sour cherry or pie cherry.

All cherries provide substantial quantities of antioxidants and other nutrients. But tart cherries deliver a much greater content of various anthocyanins than sweet cherries, as well as higher amounts of other phenolic compounds and other nutrients.19

But keep in mind that tart cherries are not the cherries you are likely to see at the grocery store, which will almost certainly be sweet cherries. The potent but less common tart cherries are chiefly used for baking and so usually come frozen, canned, dried, or juiced. Tart cherries may occasionally be located at a farmer’s market. Fortunately, standardized extracts of tart cherries are available.

Superior Results

An impressive study released in 2013 reported that after 28 days of consumption, sweet cherries were found to selectively and significantly reduce a number of biomarkers associated with inflammatory diseases. Among other decreased inflammation indicators, blood levels of C-reactive protein were reduced by over 20% and blood levels of plasminogen activator inhibitor-1 were reduced by 19.9%. And newly identified ligand for advanced glycation end products was slashed by a full 29%!175

The take-away message? If sweet cherries provide this degree of anti-inflammatory impact, try to imagine the powerful wallop you get from tart cherries—which pack twice the phenol content!19

And tart cherries don’t contain the sugar and calories found in sweet cherries.

What Cherry Suppliers Can’t Tell You

A series of studies reporting on the compelling anti-inflammatory activity of sweet cherries—and especially tart cherries—has many scientists excited.

But not the Food and Drug Administration. The agency has taken draconian steps to suppress this information. It may seem difficult to believe, but on October 17, 2005, the Food and Drug Administration issued an edict that precludes cherry companies from posting scientific data about cherries on their websites.1,2 Letters from the agency went out to 29 companies warning them that if they continue to inform consumers about these scientific studies, criminal prosecutions will ensue.1,2

What can’t cherry suppliers tell you? Simply this: tart cherries may well be the ultimate super food. Due to their superior phenolic matrix, tart cherry compounds help reduce the risk of osteoarthritis, gout, obesity, cardiovascular disease, metabolic syndrome, diabetes, and neurodegenerative diseases such as Parkinson’s and Alzheimer’s.

And Life Extension® will continue to report the latest scientific findings about tart cherries and their potent health benefits!
ANTII-NFLAMMATORY PROPERTIES OF TART CHERRY

As the population ages, there is growing interest in the neuroprotective benefits of antioxidants, and one scientific report concluded that rich sources of polyphenolic compounds, such as tart cherries, can play a role.

Both sweet and tart cherries are known to contain a matrix of bioactive constituents that are characterized as beneficial against multiple degenerative diseases.

Underlying Mechanisms of Action

To understand how tart cherries can target so many disease origins, it’s important to appreciate their many underlying biochemical pathways. Extensive evidence demonstrates that these versatile components naturally:

- Inhibit cyclooxygenase-1 and cyclooxygenase-2 (COX-1 and COX-2) enzymes that help make inflammatory prostaglandins.
- Suppress nuclear factor-kappaB activation (linked to autoimmune reactions) in monocytes (a type of white blood cell) and calm inflammatory factors in the body.
- Switch off pivotal genes involved in cancer and inflammation and switch on apoptosis, the programmed death of potentially pre-cancerous cells.
- Prevent lipoprotein peroxidation that leads to endothelial damage that causes white blood cells to cling to blood vessel walls.
- Target cholesterol and triglycerides and improve some high-risk metabolic phenotypes.
- Aid in controlling blood glucose levels and interfere with glucose synthesis and release.
- Boost detoxifying enzymes and the natural body antioxidants and superoxide dismutase.
- Lower blood levels of uric acid.
- Exert an analgesic activity, inhibit oxidative stress, neurodegeneration, and tumorigenesis.
Summary

Prolonged physical exertion, especially with advancing age, causes the inflammation, pain, redness, and swelling that indicate muscle damage.

Emerging data demonstrate that the anthocyanins, phenols, flavanols, and other constituents in tart cherries provide protection against muscle injury, inhibiting inflammation.

In fact, while nonsteroidal anti-inflammatory drugs such as ibuprofen (Advil®) and naproxen (Aleve®) involve potentially deadly side effects such as kidney failure, the molecules in tart cherries deliver anti-inflammatory impact safely.

The same potent effects that tart cherry compounds deliver to muscles similarly protect the entire body against an array of inflammation-associated pathologies. Unique compounds in tart cherries have been shown to substantially decrease the risk of osteoarthritis, cardiovascular disease, cancer, metabolic syndrome, and neurodegenerative diseases.

Tart cherry standardized anthocyanin extract has now been added to some multi-nutrient formulas and is also available as a standalone dietary supplement.

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

For Balanced Immune Support and Inflammation Control

Introducing Black Cumin Seed Oil

As we age, a balanced immune and inflammatory response becomes critical to guarding our health.¹⁻⁵

Research has shown Black Cumin Seed Oil to be particularly effective.⁶⁻⁷

UNIQUE MOLECULAR COMPLEX

Scientists have determined that black cumin seeds contain a broad spectrum of active compounds.⁵ Combined, these compounds provide powerful and wide-ranging immune support and promote healthy inflammatory response.⁶⁻⁷

DUAL IMMUNE SUPPORT

A number of biological factors contribute to the body’s normal inflammatory activity, including cell-signaling chemicals and hormone-like messengers.⁸ In a series of scientific studies, Black Cumin Seed Oil has been shown to support the normal effectiveness of these inflammatory factors.⁶⁻⁷

Also, an aging, healthy immune system needs to orchestrate the activity of macrophages and helper T-cells that work together to identify and destroy dangerous microbes and abnormal cells. Black Cumin Seed Oil was also shown to support the optimal function of these vitally important defensive activities.⁹⁻¹¹

A BALANCED INFLAMMATION RESPONSE

By acting on both immune factors and inflammatory factors, Black Cumin Seed Oil supports a healthy immune system—which is increasingly important as we age—and facilitates a healthy inflammatory response!

The suggested daily dosage of two softgels of Black Cumin Seed Oil provides:

Thymocid™ organic Black Cumin seed oil (Nigella sativa) 1,000 mg

A bottle containing 60 softgels of Black Cumin Seed Oil retails for $16. If a member buys four bottles, the price is reduced to $10.50 per bottle. (Item# 01709)

Since curcumin possesses some of the properties of black cumin seed oil, some people might want to take both nutrients in the same capsule.

The suggested daily dose of two softgels of Black Cumin Seed Oil with Bio-Curcumin® provides:

BCM-95® Bio-Curcumin® (Curcuma longa) extract 400 mg

Thymocid™ organic Black Cumin Seed Oil (Nigella sativa) 1,000 mg

A bottle containing 60 softgels of Black Cumin Seed Oil with Bio-Curcumin® retails for $32. If a member buys four bottles, the price is reduced to $22.50 per bottle. (Item# 01710)

To order Black Cumin Seed Oil or Black Cumin Seed Oil with Bio-Curcumin®, call 1-800-544-4440 or visit www.LifeExtension.com.

References

Thymocid™ is a trademark of Verdure Sciences, Inc.
Bio-Curcumin® and BCM-95® are registered trademarks of Dolcas-Biotech, LLC. U.S. Patents Nos. 7,883,728, 7,736,679 and 7,879,373.

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 serving size of one vegetarian capsule of Tart Cherry Extract with Standardized CherryPURE® contains:

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<tr>
<td>Tart cherry (Prunus cerasus) extract (skin)</td>
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<tr>
<td>[std to 6.5% anthocyanins (40 milligrams)]</td>
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A bottle of 60 vegetarian capsules of Tart Cherry Extract with Standardized CherryPURE® retails for $22. If a member buys four bottles, the price is reduced to $15 per bottle.

References

With nearly 40 scientific studies published on the wide-ranging benefits of tart cherries, scientists are now discovering important new health applications for this American fruit.

Tart cherries are packed with unique beneficial compounds that have been shown to block COX-1 and COX-2 enzymes, as well as maintain muscle function and promote rapid muscle recovery after exercise, bringing faster relief from the minor aches, discomfort, and stiffness that can follow everyday muscle exertion.

Clinically Proven

In human studies, researchers have scientifically confirmed the muscle-supporting benefits of tart cherries. For example, a randomized controlled trial found that consuming tart cherry juice twice daily produced a substantial decrease in muscle symptoms related to exercise. In the same study, the exercise-induced loss of strength over the four days following a workout was reduced from 22% to only 4%.

In another randomized controlled trial, marathon runners given tart cherry juice for 5 days before a race, on race day, and for 2 days after a race experienced significantly faster recovery of isometric strength and muscle function.

And in yet another controlled trial, tart cherry juice taken twice daily for 7 days prior to a race produced a significantly smaller increase in post-race pain, according to a standard pain assessment scale, compared to the placebo group.

Anthocyanins

Anthocyanins are powerful flavonoids that provide the dark pigmentation to blueberries, raspberries, and bilberries. In addition to being potent antioxidants, anthocyanins have been extensively studied for their numerous health benefits that include heart, cellular, and cognitive health.

What has drawn the attention of scientists is the fact that tart cherries contain a higher content of anthocyanins than other fruits.

To allow members to take full advantage of these discoveries, Life Extension now offers 100% natural Tart Cherry Extract, a supplement that opens the door to the remarkable benefits of continued physical activity—at any age!

This formulation provides all the muscle-supporting benefits of tart cherries and mimics the anthocyanin dose used in successful clinical trials by providing a standardized 40 mg anthocyanins per capsule.
Reishi mushroom has been traditionally used to boost immune system vitality. Its broad-spectrum benefits have been demonstrated in thousands of studies.¹

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.²⁻⁹

Reishi’s immune-supporting compounds include an array of unique polysaccharides, triterpenes, and other constituents,¹⁰⁻¹¹ many of which assist activation of the cell surface receptors that modulate normal immunity.¹²

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.¹³⁻¹⁴

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.¹⁵

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

- Reishi mushroom (Ganoderma lucidium) extract (Fruit body) 980 mg (standardized to 13.5% polysaccharides (132.3mg) and 6% triterpenes (58.8mg))
- Shell-broken Reishi mushroom (Ganoderma lucidium) spore 150 mg

A bottle containing 60 vegetarian capsules of Reishi Extract Mushroom Complex retails for $30. If a member buys four bottles, the price reduced to $20.25.

References
15. FASEB. 2012;26:373.2.
**Astaxanthin** is a fat-soluble carotenoid compound. The challenge to deriving maximum benefits is its normally limited absorption—as low as about 50%. Assimilation of astaxanthin is impeded by limited uptake and intestinal degradation.

A new **Astaxanthin 4 mg with Phospholipids** combines 4 milligrams of natural astaxanthin with a proprietary blend of phospholipids.

By incorporating phospholipids, scientific study shows that carotenoid absorption may be enhanced *several-fold*.

The new **Astaxanthin 4 mg with Phospholipids** uses four different phospholipids to facilitate maximum absorption of astaxanthin into the bloodstream, where it is transported to cells throughout the body.

**ASTAXANTHIN**

Each softgel of the new Astaxanthin with Phospholipids provides 4 mg of natural astaxanthin along with 80 mg of proprietary phospholipid blend. Just one softgel a day provides tremendous systemic cellular support!

A bottle of 30 softgels of **Astaxanthin 4 mg with Phospholipids** retails for $16. If a member buys four bottles, the price is reduced to $10.50 per bottle. Contains soybeans.

**References**


**To order Astaxanthin 4 mg with Phospholipids, 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.
Stem cell therapy has the potential to transform medicine from mostly just treating symptoms to restoration of healthy, youthful tissue following every injury, disease, and age-associated degeneration. Unfortunately, along with such great hope has come scientific fraud, ethical questions, and a host of other controversies. The federal ban placed on stem cell research in 2001 has markedly delayed the introduction of this breakthrough therapy into clinical practice application.

Stem cells vary in their potency to become different tissue types. Adult stem cells and cord blood stem cells have less capacity to become different tissues than pluripotent or embryonic stem cells. Embryonic stem cells can potentially generate any tissue in the body and carry a reduced risk for being rejected by the immune system. Although embryonic stem cells are derived from an embryo consisting of less than a couple hundred cells, there has been much ethical and religious controversy over whether such an embryo should be considered human.
In August 2001, President George W. Bush attempted to compromise by limiting federal research funding to a few dozen embryonic cell lines. In March 2009, President Barack Obama removed some of the restrictions. Nonetheless, a study published in 2011 indicated that nearly half of stem cell scientists surveyed reported that the political uncertainty had substantially affected their research or desire to continue working in the field.6

Science does not work like a light switch. Once research is mostly “turned off” (as occurred in 2001), it isn’t instantly “turned on” in response to changed government policy.
World Stem Cell Summit

The World Stem Cell Summit 2012, held December 3-5, 2012, in West Palm Beach, Florida, was organized to not simply be a scientific conference, but to be a conference on all issues related to stem cells. Many of those in attendance were patients in wheelchairs who were eager for research and available therapies. When there were parallel sessions (as there often are), I opted to attend the scientific sessions rather than the ones dealing with law, ethics, industry, or patient advocacy. With so much hype about the potentials of stem cell therapy, my prime interest at the World Stem Cell Summit was to learn what medicine has actually accomplished with stem cells. Nonetheless, there were plenary (general) sessions on all topics which I attended along with most of the others attending the conference.

Decades of Stem Cell Therapy

Stem cells have been used in medicine for decades, primarily for the treatment of certain cancers and blood disorders, but those have been adult stem cells rather than the embryonic stem cells that have caused so much controversy. More recently, umbilical cord blood stem cells have been used because the immature immune system in cord blood results in fewer immune incompatibilities, and because stem cells from cord blood have greater potency than adult stem cells. As noted above, ethical, political, and legal controversies have greatly reduced the development and application of embryonic stem cell therapies. Shinya Yamanaka won a 2012 Nobel Prize for his 2006 discovery that four proteins could stimulate four genes to convert connective tissue cells into pluripotent stem cells. Whether these induced pluripotent stem cells are equivalent in potency and safety to embryonic stem cells is an unresolved scientific question.

Stem Cell Clinical Trials

Chris Mason, PhD, (Professor of Regenerative Medicine Bioprocessing, University College London, London, England) moderated a panel at which he discussed current clinical trials of stem cell treatments. Thousands of clinical trials are currently in progress for stem cell therapies, but at least half of them are only in Phase I.

Artificial Organs from Stem Cells

Paolo Macchiarini, MD, PhD, (Professor of Regenerative Medicine, Karolinska Institute, Stockholm, Sweden) was a keynote speaker who reported on his breakthroughs in transplantation using stem cells. In 2008, he achieved the world’s first successful tissue-engineered bronchial transplant. He started with the trachea of a donor which would serve as a biological scaffold for the stem cells, he colonized the trachea...
with epithelial and stem cell-derived chondrocytes (cells found in cartilage) cultured from cells taken from the recipient (a 30-year-old woman), and successfully transplanted the bronchus into the recipient. He performed a similar tracheal transplant into a 36-year-old cancer victim in 2011. Dr. Macchiarini spoke of the difficulties of getting the stem cells to integrate into the biological scaffold, not just colonize on the surface of the scaffold.

Joshua Hunsberger, PhD, (Research Fellow, NIH Center for Regenerative Medicine, Bethesda, Maryland) was also a keynote speaker. He talked about what the National Institutes of Health (NIH) has done to advance the field of regenerative medicine. Similar to the work Dr. Macchiarini reported with tracheas, Dr. Hunsberger spoke about clinical trials of bladder replacement using artificial bladder scaffolds seeded with stem cells from patients. He described the use of gene therapy on induced pluripotent stem cells from a patient suffering a rare genetic immune cell disease. Inherited defective genes were modified in the pluripotent stem cells from the patient, and after the corrective modification were reintroduced into the patient. (A similar combination of gene therapy and stem cell therapy may have cured an individual of HIV infection.) The NIH is also attempting to confer stemness to immune system cells to make those cells more effective at combating cancer.

**Stem Cells for Heart Disease**

Carl Pepine, MD, (Professor, Division of Cardiovascular Medicine, University of Florida, Gainesville, Florida) noted that for years, heart attack victims have been receiving into their hearts infusions of adult stem cells taken from their bone marrow. Those patients have shown improved heart function, reduced incidence of death, and reduced incidence of subsequent heart attack. Dr. Pepine has been developing a hydrogel for improved delivery of stem cells to heart tissue.

Leslie Miller, MD, (Director, Heart Institute, University of South Florida, Tampa, Florida) questioned the use of bone marrow stem cells for heart treatment, especially for patients over age 60. Stem cells from fat tissue are at least a hundred times more plentiful than stem cells from bone marrow and are easily extracted by liposuction. Preclinical trials in Denmark indicate that fat-derived stem cells can promote new blood vessels and differentiate into cardiomyocytes to replace injured heart muscle. Dr. Miller said that stem cells from fat tissue would soon be available in Europe, but not in the USA because of the FDA.

**What You Need to Know**

- **Breakthrough Clinical Potential of Stem Cell Therapy**
  - The federal ban placed on stem cell research in 2001 has markedly delayed the introduction of this breakthrough therapy into clinical practice application.
  - Stem cells have been used to successfully bioengineer organs for transplant.
  - Heart attack victims, receiving infusions of adult stem cells directly into their heart, have shown improved heart function, reduced incidence of death, and reduced incidence of subsequent heart attack.
  - Preclinical trials have used stem cells to treat spinal cord injuries and brain cancer.
  - Using a mouse model, scientists have discovered that ovarian stem cells can generate new oocytes (eggs) and that regenerating these cells prevented menopause leading to a significant reduction in age-related health problems, but no increase in cancer.
Ovarian Stem Cells

Jonathan Tilly, PhD, (Director, Vincent Center for Reproductive Biology, Harvard Stem Cell Institute, Boston, Massachusetts) has been studying mouse ovaries for nearly a decade. It was long believed that female mammals are born with a fixed number of oocytes (egg cells) in their ovaries, but in 2004 Tilly demonstrated that mice have ovarian stem cells that can generate new oocytes.34 He later showed that sustaining ovarian function into advanced age prevented mouse menopause leading to a significant reduction in age-related health problems, but no increase in cancer.35

Most recently Tilly has found strong evidence for oocyte stem cells in women, but legal, ethical, and technical limitations prevented the same comprehensive validation as was done for mice.36 Tilly wants to convince doubters by attempting to fertilize the oocytes in the UK, which he is not permitted to do in the US with federal funding. 37 Tilly is hopeful that delayed menopause by oocyte stem cell preservation can produce similar benefits for women as he achieved with mice.

Stem Cells for Nervous Tissue

Wado Akamatsu, MD, PhD, (Assistant Professor, School of Medicine, Keio University, Tokyo, Japan) reported on the use of iPSCs from humans that were used to treat spinal cord injury in mice.30 Dr. Akamatsu was also able to directly induce the formation of neural stem cells from mouse connective tissue cells without an intermediate step of iPSCs.31

Karen Abooty, MD, (Associate Professor of Neurosciences, City of Hope, Duarte, California) is an activist in the effort to accelerate the process of translating research results into clinical therapies ("from bench to bedside").32 In her presentation she spoke of her efforts to use neural stem cells to treat brain cancer in rodents.33 Neural stem cells can cross the blood-brain barrier, migrate toward tumors in the brain, and are a non-toxic alternative to chemotherapy and radiation therapy.

Medical Tourism for Stem Cell Therapy

James Guest, MD, PhD, (Associate Professor of Neurological Surgery, University of Miami, Miami, Florida) did not speak of his research, but instead warned against the dangers of stem cell medical
If the stem cell advocacy groups are to be effective, in hastening application of new therapies they should be calling for the repeal of the 1962 Kefauver-Harris Amendment that added a proof-of-efficacy requirement to the proof-of-safety requirements for FDA drug approval. Requiring efficacy in addition to safety in the wake of the 1962 thalidomide scare was pure politics; thalidomide was entirely a safety issue.

The effect of the Kefauver-Harris Amendment was to reduce the availability of new drugs to the public. The average number of new drugs introduced dropped from 40 per year before 1962 to 16 per year soon after 1962. Average time from filing to approval for new drugs rose from 7 months before 1962 to 7.8 years by 1998. A 2006 study estimated the cost to bring a new drug to market at between $500 million to $2 billion. After FDA approval, safety rather than efficacy is mainly what matters because physicians are free to prescribe the drug “off label” for any indication they please. And FDA-approved drugs are not very safe, anyway. The American Medical Association has reported that adverse reactions to FDA-approved drugs in American hospitals is a leading cause of death.

For those who want to see greatly accelerated availability of safe stem cell therapies, the Kefauver-Harris Amendment should be repealed.

**Summary**

Stem cell therapy has the potential to transform medicine from mostly just treating symptoms to restoration of healthy, youthful tissue following every injury, disease, and age-associated degeneration. Unfortunately, the federal ban placed on stem cell research in 2001 has markedly delayed the introduction of this breakthrough therapy into clinical practice. Stem cells vary in their potency to become different tissue types. **Adult stem cells** and **cord blood stem cells** have less capacity to become different tissues than pluripotent or embryonic stem cells. **Embryonic stem cells** can potentially generate any tissue in the body and carry a reduced risk for being rejected by the immune system. Stem cells have been used in medicine for decades, primarily for the treatment of certain cancers and blood disorders. Currently, thousands of clinical trials are underway to evaluate the use of stem cell therapies for a variety of anti-aging and clinical applications.


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 cardiovascular3-5 and bone health,6 researchers are now focusing intensely on magnesium’s benefits for cognitive function.6

It is very hard for your body to maintain optimal levels of magnesium in the brain.7 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 with Calcium and Vitamin D3 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 with Calcium and Vitamin D3 Powder retails for $40. If a member buys four units, the price is reduced to $27 per unit.

References

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In 1983, Life Extension® was the first to introduce CoQ10 as a proven method to enhance mitochondrial energy production. CoQ10 has since gained universal recognition for its role in supporting cellular performance throughout the body.¹ ⁶

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

Mitochondria are cellular energy generators that supply virtually all the power your body requires for a healthy 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.
The Ultimate Cell Rejuvenator

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

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

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

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

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

Vital Protection for the Aging Heart and Brain

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

Research shows that PQQ supports heart cell function in the presence of free radicals and promotes blood flow in heart muscle.19 When taken in combination with CoQ10, just 20 mg per day of PQQ has been shown to promote memory, attention, and cognition in maturing individuals.20

A Breakthrough Weapon in the Battle Against Aging

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

A bottle containing 30 20 mg vegetarian capsules of PQQ Caps with BioPQQ® retails for $40. If a member buys four bottles, the price is reduced to $27 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 10 mg PQQ caps is $24. If a member buys four bottles, the price is reduced to only $16.50 per bottle. (Item #01500)

BioPQQ® is a registered trademark of MGC (Japan).

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

References


These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
For those seeking a new weapon in the fight against aging skin, a peptide has recently been developed that promises to breathe new life into aged and damaged skin. Peptides are one of the most popular active ingredients for repairing damaged and aging skin today.

Peptides trigger increased collagen production, enhance antioxidant defense, and improve cellular repair—all of which result in skin that is softer, smoother, and more radiant-looking.

A new peptide has been developed that mimics the action of the body's own natural youth hormone, thymopoietin. By mimicking thymopoietin, this anti-aging peptide known as Acetyl Tetrapeptide-2 helps rejuvenate facial skin by improving skin tone and texture.

And best of all, results have been seen in as little as 5 days!

Unique PEPTIDE Repairs Aging Skin


**Understanding the Youth Hormone**

*Thymopoietin* is a polypeptide hormone secreted by the thymus that affects the rate at which your skin ages. Normal aging causes significant atrophy of the thymus gland, resulting in diminished production of thymopoietin.

Lack of this hormone jeopardizes immune function and negatively affects the body's ability to produce DNA and undergo normal cell division. Simply put, thymopoietin affects the body's capacity to maintain youthful function in everything from skin cells to brain cells. The loss of thymopoietin is considered by many immunologists to be a major bio-marker of aging.

**Reinforce Your Skin's Immune Defenses**

Studies have shown that T-cells (a type of immune cell that matures in the thymus gland) promote cellular restoration by secreting growth hormone and growth hormone releasing factor. Growth hormone stimulates the growth, reproduction, and regeneration of cells. And growth hormone releasing factor triggers the production of growth hormone.

All of these biological processes that are vital for the health and longevity of your skin are largely controlled by thymopoietin and the thymus.

Unfortunately, around the age of puberty, the thymus begins to shrink. This results in a lack of thymopoietin in the bloodstream, which in turn compromises the skin's immune system and its ability to reproduce and replace old cells. That's why maintaining adequate levels of this important hormone is critical for maintaining youthful skin.

**Stimulate the Growth of New Skin Cells**

Thymopoietin stimulates the growth and differentiation of keratinocytes. Keratinocytes are specialized skin cells in the epidermis that control the ongoing process of cell turnover and renewal. This is a key component in anti-aging because the skin's ability to renew itself and the rate at which it does so is absolutely essential to keeping the skin looking young.

Keratinocytes make up 95% of all the cells in the epidermis, the outer layer of the skin. The keratinocytes that are located in the basal (bottom) layer of the skin are often referred to as basal cells.

Keratinocytes perform a number of functions that are vital to the health and beauty of the skin. The keratinocytes in the top layer of skin form a protective barrier against harmful environmental influences (such as bacteria and UV damage). They also lock in water, which keeps the skin soft and moist.

However, it's the keratinocytes located on the bottom layer of the epidermis that produce new replacement cells and start them on their journey to the surface of the skin.

Since thymopoietin stimulates the growth of keratinocytes, adequate thymopoietin levels are necessary for the growth of new skin cells to occur at a healthy rate.

Unfortunately, the older we get, the longer it takes basal keratinocytes to regenerate due to the declining levels of thymopoietin. This negatively impacts the rate at which skin cells renew themselves. As a result, your skin gradually becomes thinner and more susceptible to injury and attack. Additionally, since new cells take longer to reach the surface, the dull, devitalized skin cells on the surface eventually dominate—creating the rough, uneven texture so characteristic of aging.
5 Days to Younger-Looking Skin

A restorative polypeptide has been developed that helps stimulate the reproductive function of basal cells to combat the signs of aging. It's called Acetyl Tetrapeptide-2.

This peptide compensates for the natural loss of thymopoietin by boosting the skin's immune defenses and stimulating the growth and differentiation of keratinocytes. This innovative ingredient helps trigger cellular reactions and reparative processes that are usually only seen in much younger skin.

Early Experimental Studies Have Been Remarkable!

In-vitro tests show that Acetyl Tetrapeptide-2 increased cellular growth (as measured in keratinocyte density) by 51% in just 5 days! In addition, it enhanced the metabolic activity of keratinocytes, increasing the production of keratin by 75% and of keratohyalin by 28%. Observations of skin biopsies from participants in the study showed a visibly improved skin profile and increased skin regeneration.

But that’s not all. This ingredient stimulated keratinocytes to produce something called granulocyte macrophage colony stimulating factor (GM-CSF). Granulocyte macrophage colony stimulating factor activates the production of cells that are vital to the skin's immune response (including white blood cells, macrophages, and Langerhans cells). The study revealed that the granulocyte macrophage colony stimulating factor production was boosted by 450% in just 5 days! By reinforcing immune defenses and enhancing epidermis regeneration, this discovery can help restore aging, mature skin.

Seaweed and Your Skin

Another natural compound found to stimulate the activity of keratinocytes (that improve cell growth) and to counteract the destructive forces of oxidation is Chondrus crispus, a seaweed that grows in the Atlantic Ocean. This Irish moss, as it's called, has a number of beneficial effects on the health and vitality of the skin.

Chondrus crispus provides a protective, water-binding barrier that promotes the regeneration of damaged skin and is an excellent source of skin-supporting vitamins, minerals, and phytonutrients. It improves skin softness and silkiness by trapping and holding moisture, which instantly cools and hydrates the skin. And its high sulfur content is incredibly nourishing to the skin.

What You Need to Know

Revive Functionally Compromised Skin Cells

- Your body’s youth hormone, thymopoietin, is vital for the health and longevity of your skin.
- Thymopoietin reinforces your skin’s immune defenses and stimulates the growth of new skin cells.
- Thymopoietin levels decline with age, and many immunologists consider this to be a major bio-marker of aging.
- Acetyl Tetrapeptide-2 is a unique polypeptide that mimics the powerful action of thymopoietin.
- Acetyl Tetrapeptide-2 actively energizes mature skin, resulting in visibly younger skin.
- In addition, the Irish moss Chondrus crispus promotes the regeneration of damaged skin, improves cell growth, counteracts the destructive forces of oxidation, and is an excellent source of skin-supporting vitamins, minerals, and phytonutrients.
In addition, the botanical seaweed *Chondrus crispus* is known to promote repair of damaged skin cells, improve skin texture, and reduce oxidative damage to the skin.

Together, these two skin rejuvenators improve skin by exfoliating, nourishing, moisturizing, protecting, detoxifying, and regenerating it. The unique combination of nourishing botanical extracts and potent anti-aging polypeptides can breathe new life into aging and damaged skin.

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**References**


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**Summary**

Your body’s youth hormone, thymopoietin, is vital for the health and longevity of your skin. Thymopoietin reinforces your skin’s immune defenses and stimulates the growth of new skin cells. As we age, our thymus gland atrophies, resulting in the loss of thymopoietin.

An innovative peptide called Acetyl Tetrapeptide-2 has recently been developed that mimics the action of thymopoietin. Acetyl Tetrapeptide-2 has been scientifically shown to help revive old and functionally compromised skin cells, causing them to operate in a more youthful fashion.
Restore Cellular Energy with...

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Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™

Since Life Extension® introduced CoQ10 in 1983, our scientists have continued to develop increased potency and absorbability.

Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™ contains PrimaVie® shilajit that doubles levels of CoQ10 in the mitochondria.1

Combining CoQ10 and shilajit produced a 56% increase in energy production in the brain, and in muscle there was a 144% increase in energy production.2

The primary reason people take CoQ10 supplements is to help restore youthful energy levels.

Shilajit boosts CoQ10’s beneficial effects by stabilizing CoQ10 in the superior ubiquinol form, which prolongs its action at the cellular level.3,4 Additionally, shilajit facilitates the more efficient delivery of CoQ10 into the mitochondria, which results in enhanced cellular energy.5,6

Shilajit helps the mitochondria convert fats and sugars into the body’s main source of energy, ATP (adenosine triphosphate).5-9

Combining ubiquinol CoQ10 with shilajit generates a powerful synergy that supports more youthful cellular energy production than CoQ10 alone.2,4,5

The retail price for 60 100 mg softgels of Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™ is $62. If a member buys four bottles, the price is reduced to $42 per bottle.

Item # 01426

The retail price for 100 50 mg softgels of Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™ is $58. If a member buys four bottles, the price is reduced to $39.75 per bottle.

Item # 01425

The retail price for 30 200 mg softgels of Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™ is $62. If a member buys four bottles, the price is reduced to $42 per bottle.

Item # 01431

References

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


To order Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™ call 1-800-544-4440 or visit www.LifeExtension.com
Successful aging is often dependent on a dynamic immune system. But just having a “strong” immune system isn’t enough. A healthy and youthful body requires balanced immune-cell signaling to maintain effective and responsive immunity. That’s why Life Extension® now offers Immune Modulator with Tinofend®, a botanical extract that has been shown to support a normal, modulated immune response.

TARGETED IMMUNE SUPPORT

The plant known as Tinospora cordifolia has a long tradition of use in Ayurvedic medicine. Tinofend® is a standardized extract of active compounds that work synergistically to provide immune-modulatory support. A double-blind, placebo-controlled clinical trial on humans found that Tinofend® produced significant changes in several immune parameters that are known to help support healthy, immune system modulation.

MULTIPLE MECHANISMS

Tinofend® promotes optimal immune health in three ways:

- Helps support the activity that regulates immune response and enhances the function of protective cells called macrophages.

- Helps limit the number of eosinophils (type of white blood cell) already within normal range.

- Provides polysaccharides to help optimize the immune system’s normal defenses, including neutrophil (type of white blood cell) function.

IMMUNE MODULATION

Immune Modulator with Tinofend® provides the versatile Tinospora compounds shown to help maintain the balanced cellular responsiveness, sensitivity and strength of an optimized and properly-modulated immune response.

The suggested daily dose of 2 capsules of Immune Modulator with Tinofend® provides:

<table>
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<th>Tinofend® (Tinospora cordifolia) extract (stem)</th>
<th>900 mg</th>
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<td>[std. to 20% polysaccharides (180 mg)]</td>
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A bottle of 60 vegetarian capsules of Immune Modulator with Tinofend® retails for $17. If a member buys four bottles, the price is reduced to $11.25 per bottle.

Tinofend® is a registered trademark of Verdure Sciences, Inc.
A new weapon has been developed in the fight against aging skin. It’s a powerful peptide that breathes new life into aging and damaged skin.

By mimicking the action of the body’s own natural thymic youth hormone, this innovative peptide works at the cellular level to reinforce your skin’s immune defenses and to stimulate the growth of new skin cells.

The result? Improved tone and texture—in as little as 5 days!

This anti-aging peptide is called Acetyl Tetrapeptide-2 (AT-2), and it’s one of the top ingredients in Cosmesis Youth Serum.

**5 DAYS TO YOUNGER-LOOKING SKIN**

Acetyl Tetrapeptide-2 has been shown to rejuvenate facial skin, improve skin tone and texture—and help defend against the visible signs of premature aging. Experimental studies have shown:

- Increased cellular growth by 51%—in just 5 days!
- Increased keratin production by 75%!
- Increased keratohyalin production by 28%!
- Increased production of granulocyte-macrophage colony-stimulating factor (GM-CSF), the substance that activates your skin’s immune cells, by 450%—in just 5 days!

By reinforcing immune defenses and enhancing skin regeneration, this discovery can help restore aging, mature skin to a more youthful appearance.

**THE SERUM’S SECRET WEAPON…**

Cosmesis Youth Serum contains a seaweed called Chondrus crispus that repairs damaged skin cells, improves skin cell growth, and reduces oxidative damage to the skin. This nutrient-packed botanical…

...Provides skin-supporting vitamins, minerals, and phytonutrients that help rejuvenate and restore aging skin,

...Improves skin softness and silkiness by trapping and holding moisture, cooling, and hydrating the skin,

...Provides a protective, water-binding barrier that promotes the regeneration of damaged skin.

But that’s not all...

The Chondrus crispus in Youth Serum contains a performance-boosting ingredient called carrageenan that delivers active ingredients deep into your skin, leaving skin looking younger, healthier, and more refreshed.

Together, the two skin rejuvenators in Cosmesis Youth Serum help revive aging skin by exfoliating, nourishing, moisturizing, protecting, detoxifying, and regenerating it. The unique combination of nourishing botanical extracts and potent anti-aging polypeptides can breathe new life into aging and damaged skin.

**PEPTIDES AND SKIN CARE**

Peptides are the natural choice for repairing damaged and aging skin. These anti-aging, non-toxic substances…

- Trigger increased collagen production.
- Enhance antioxidant defense.
- Improve cellular repair.

The result? Softer, smoother, more radiant-looking skin.

A 1-oz bottle of Cosmesis Youth Serum retails for $65. If a member buys 2 bottles, the price is reduced to $42.75 per bottle.

**References**


To order Cosmesis Youth Serum, call 1-800-544-4440 or visit www.LifeExtension.com
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

Each bottle of Super K lasts 90 days, so members pay as little as $6.75 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, the price is reduced to $20.25 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.)

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

References
4. 2 Kardiol. 2001;90 Suppl 3:S7-63.
ORANGES

A Squeeze of Nutritional Power

Oranges possess over 60 different flavonoids, making them a nutritious fruit to eat on a daily basis. Immensely rich in hesperidin and naringin, oranges are emerging as a weapon for boosting eye health, fighting heart disease, preventing kidney stones, and enhancing immunity.

Orange’s History

While oranges are widely available and fairly inexpensive today, they were once considered a prized luxury before the 20th century. The orange (Citrus sinensis) originated in Asia thousands of years ago, with the most common types being bitter and sweet. The latter became
that vitamin C in oranges might be largely responsible for this powerful protective effect. Retinal nerve cells contain GABA receptors, which help modulate their transmission of electrical signals to the brain. Without sufficient amounts of the vitamin, GABA receptors malfunction, causing retinal nerve cells to fire signals at an excessive rate. This constant workload causes nerve cells to "burn out" and induces cell death. Vitamin C rich oranges allow GABA receptors to function properly, thereby protecting against the loss of retinal nerve cells and preserving vision.

Along with glaucoma, a greater intake of oranges shows promise in defending against age-related macular degeneration, the most common cause of vision loss in individuals over the age of 50. Researchers analyzed data from more than 118,400 adults between the ages of 30 to 55 regarding fruit and vegetable intake over an 18-year period. They found that those who ate three or more servings of oranges per week had a 39% lower risk of age-related macular degeneration than those who consumed less than two servings per month.

Boosting Eye Health

Glaucoma is a long-term visual neuropathy defined by structural abnormalities in the nerve fibers of eye structures as well as the optic nerve itself. It can result in permanent vision loss if left untreated. A wealth of carotenoids, including lutein and beta-cryptoxanthin, along with vitamin C, make oranges well-equipped to protect against this often symptomless disease. In one study, researchers at the University of California revealed that those consuming more than two servings of fresh oranges per week produced an 82% reduction in glaucoma risk compared to those who ingested less than one serving per week.

A recent study published in the Journal of Neuroscience suggests popular across Europe in the 15th century before Spanish explorers brought it to Florida and California, currently two of the largest US producers of the citrus fruit. Other major world producers include Brazil, Mexico, and Israel.

**Orange Nutritional Facts, 1 Large**

<table>
<thead>
<tr>
<th>Nutrients</th>
<th>Amount</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Vitamin C</td>
<td>97.9 mg</td>
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</tr>
<tr>
<td>Dietary Fiber</td>
<td>4.4 g</td>
<td>18%</td>
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<tr>
<td>Folate</td>
<td>55.2 mcg</td>
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<tr>
<td>Thiamine</td>
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<tr>
<td>Potassium</td>
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<tr>
<td>Calcium</td>
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</tr>
<tr>
<td>Vitamin B6</td>
<td>0.1 mg</td>
<td>6%</td>
</tr>
</tbody>
</table>
SUPER FOODS

SUPER FOODS were attributed to a 27% increase in the transfer of free cholesterol to HDL where it’s transported back to the liver for excretion. No lipid changes were reported for the normal cholesterol group.10

Kidney Stone Prevention

Kidney stones are an increasingly common condition affecting approximately 1 in 11 individuals in the US.11 Kidney stones were once thought to be a painful disorder that rarely impaired long-term kidney function, but recent research suggests otherwise, with stone formers up to 67% more likely to develop chronic kidney disease than non-stone formers.12 Potassium citrate supplements have drawn considerable attention for their ability to inhibit the formation of calcium-oxalate, the most common type of kidney stones. However, its association with gastrointestinal side effects has led researchers to explore other effective alternatives.13 Since citrus fruits are naturally rich in potassium citrate, researchers investigated the potential of citrus fruits, particularly orange juice and lemonade, in preventing the occurrence of kidney stones. Scientists reported in the Clinical Journal of the American Society of Nephrology that human volunteers with and without a history of kidney stones adhering to a stone prevention diet supplemented with 13.5 ounces of orange juice three times daily with meals for one week increased their citrate levels and urinary pH value, which decreased the risk of calcium oxalate stones, whereas those supplemented with lemonade experienced no such changes.13

Selecting and Storing Oranges1

1. The freshest oranges are available winter through summer.
2. Choose fully ripened oranges that are firm and have a smooth texture.
3. Avoid oranges that are soft and changing in color.
4. Oranges can be stored in the refrigerator or at room temperature for approximately two weeks.

Cardiovascular Support

Since endothelial dysfunction is perhaps the main underlying cause of heart disease, scientists are continually pursuing new dietary avenues to protect and improve its function. With their antioxidant and anti-inflammatory properties, oranges are beginning to emerge as the ideal candidate for this role. A study published in the American Journal of Clinical Nutrition found that participants with increased risk for cardiovascular disease ingesting about 2 cups of red orange juice daily for one week experienced significant decreases in inflammatory markers that accompanied a 38.5% improvement in endothelial function.7

In a separate study, French researchers observed comparable results between orange juice and hesperidin beverage supplementation on endothelial function and diastolic blood pressure after four weeks in healthy volunteers, suggesting the high concentration of hesperidin in orange juice contributes to its positive effect on blood vessels.8 High levels of homocysteine have been shown to induce endothelial dysfunction and increase the risk for vascular disease.9 Oranges contain a plethora of folate, which enhances homocysteine metabolism. Folate is required for methionine synthase to convert dangerous homocysteine into the amino acid methionine, thus preventing the buildup of homocysteine.9

Oranges also appear to favorably alter lipid metabolism, especially in those with high cholesterol. Brazilian researchers assigned patients with normal and high cholesterol 3 cups of orange juice or a control for 60 days. At the end of the study, LDL cholesterol fell significantly in the high cholesterol group by 19 mg/dL, without affecting HDL cholesterol and triglycerides. The results were attributed to a 27% increase in the transfer of free cholesterol to HDL where it’s transported back to the liver for excretion. No lipid changes were reported for the normal cholesterol group.10

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Enhancing Immunity

Although oranges are often touted as immune boosters because of their vitamin C content, recent findings indicate that pectin fiber might be their true standout for improving immunity. Scientists at the University of Illinois gave mice a low-fat diet rich in soluble fiber pectin or insoluble fiber for six weeks before injecting them with an endotoxin to imitate a bacterial infection. The results showed that the pectin group became less sick and recovered 50% faster than mice in the insoluble group. Pectin fiber was shown to enhance immune function by stimulating the production of the anti-inflammatory molecule interleukin-4.14

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

Summary

Oranges contain a wealth of nutrients, from flavonoids to vitamin C, to pectin fiber. Research has shown that this popular fruit protects against the development of glaucoma and age-related macular degeneration, two of the leading causes of blindness. In addition, oranges improve heart health, block the formation of common calcium-oxalate kidney stones, and enhance immunity, all of which make them one of the healthiest fruits to eat on a regular basis.

While orange fruit contains healthy ingredients, avoid regular consumption of orange juice, even though studies reported in this article report short-term favorable effects on vascular risk markers. The reason is that orange juice concentrates contain fructose that causes sharp after-meal glucose spikes that in the long term can increase the risk of a host of diseases. Feel free to enjoy oranges, but not the concentrated juice.

References

**Super Bio-Curcumin** turmeric extracts comparable to effects of standard curcumin against complete nutritional profile.

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

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

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

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

Life Extension’s Super Bio-Curcumin® derives from turmeric that is 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:1,2

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

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

Unrivaled Potency and Absoriability 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 mg of commercial curcumin supplements.

A bottle containing 60 vegetarian capsules of Super Bio-Curcumin® retails for $38. If a member buys four bottles, the price is reduced to only $26.25 per bottle.

**References**

5. Bioavailability study of BCM-95® in rats.

**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.*
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.

Vitamin C efficacy can be limited because it is quickly utilized and excreted by the body.\(^1\)

A novel formula sets a new standard for rapid absorption, enhancing the time that vitamin C is delivered to the cells for protection.

In two human trials at a distinguished research center, FAST-C® was compared head-to-head with a leading premium brand of “enhanced absorption” vitamin C.\(^2,3\)

Their findings validate that FAST-C® has faster absorption—and without greater excretion!

The Need for Rapid Vitamin C Delivery

Vitamin C neutralizes free radicals,\(^4,7\) supports biosynthesis of certain neurotransmitters,\(^8,9\) and promotes production of vital tissue (collagen) that supports arterial walls, skin, and bones.\(^7,9\) Vitamin C promotes immunity,\(^7,10\) boosts lymphocyte glutathione levels,\(^11\) and helps regenerate other antioxidants, including vitamin E.\(^12\)

But because it leaves the body quickly,\(^1\) capturing vitamin C’s optimal benefits has required taking supplements several times daily, hoping they’ll be effective without posing a risk for acid-sensitive stomachs.

The scientific community has long sought faster-absorbing vitamin C formulas.
The Search for Enhanced Absorption

A leading brand of “enhanced” vitamin C has been promoted claiming to increase vitamin C bioavailability. A published study in a top nutritional sciences journal found no difference in absorption speed, blood vitamin C increase, or urinary excretion between that product and ascorbic acid (vitamin C).1

The good news? A next-generation FAST-C® supplement has been proven in double-blind, human trials to have faster absorption—combined with equal or greater body retention!

This breakthrough—FAST-C®—is available exclusively to Life Extension® members. It also contains dihydroquercetin to enhance vitamin C’s “recycling” power.

Next-Generation Breakthrough!

FAST-C® with Dihydroquercetin is the only vitamin C product to incorporate:

- Alkalizing minerals that yield an almost completely acid-neutralized—which is better than “buffered”—vitamin C for sensitive stomachs.

- Piperine (Bioperine®), a multi-patented, black pepper alkaloid that significantly accelerates vitamin C absorption, shortening the time to peak plasma concentration.

- Dihydroquercetin, a grape leaf derived flavonoid that donates electrons back to vitamin C molecules that have spent their electrons neutralizing free radicals—regenerating vitamin C to work again.

In recognition of this breakthrough, FAST-C® received the prestigious Scientific Achievement Award from Nutrition Business Journal.

Validated Faster in Human Studies

In a soon-to-be journal-published article, scientists evaluated the FAST-C® formulation in humans. They found that in just 60 minutes the FAST-C® composition generated a “significantly higher” vitamin C blood increase than the leading, enhanced-absorption vitamin C product.

To further validate these findings, a second clinical trial was conducted to compare two different variations of the formula in FAST-C® with the leading “enhanced” brand.

One of the FAST-C® formulations produced higher blood concentrations of vitamin C after 30, 60, and even 90 minutes!

Despite faster and greater rises in blood vitamin C with FAST-C® the amounts of vitamin C excreted in the urine were no greater than the amount excreted in the urine with the leading “enhanced” brand—which suggests similar or better vitamin C retention by the body.

**FAST-C® with Dihydroquercetin—faster-absorbed, self-regenerating, harder-working.**

Take one (1) tablet once or twice daily. Do not take more than 15 mg per day of Bioperine®.

A bottle of 120 vegetarian tablets of FAST-C® with Dihydroquercetin retails for $26. If a member buys four bottles, the price is reduced to just $18 per bottle.

FAST-C® is a registered trademark of Scientific Food Solutions, LLC.

Bioperine® is a registered trademark of Sabinsa Corporation.

References

To order FAST-C® with Dihydroquercetin, 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.
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, the price is reduced to $31 per bottle. The suggested dose of one capsule a day provides:

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<tbody>
<tr>
<td>Trans-Resveratrol</td>
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</tr>
<tr>
<td>Grape-Berry Actives</td>
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<tr>
<td>Quercetin</td>
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<tr>
<td>Trans-Pterostilbene</td>
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<tr>
<td>Fisetin</td>
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To order Optimized Resveratrol with Synergistic Grape-Berry Actives, call 1-800-544-4440 or visit www.LifeExtension.com

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Young for Life

One hundred and seventy million Americans are obese and in danger of premature aging. Thirty million are “skinny fat,” not outwardly big but inwardly nutrition deficient and also aging prematurely. The authors of this book, both staunch vegans for decades, were among the prematurely aged “skinny fat” population. After witnessing some of the most challenging symptoms of this accelerated decline, Marilyn Diamond, author of the New York Times bestseller Fit for Life, and Dr. Donald Schnell transformed their health through a radical lifestyle change to reverse aging that most people over 40 will find easy and intuitive.

Young for Life begins with the premise that as a day-to-day choice, you’re either building yourself up or tearing yourself down. In science, building up is known as anabolism, and tearing down is known as catabolism. The knowledge of how to support anabolism, while avoiding excessive catabolism is the secret to life-long vitality, sexuality, and youthfulness through the use of three key life-changing practices:

- A focus on an abundance of the right molecules of nutrition for anabolism to combat genetic aging.
- Convenience exercise—6-second techniques of muscle contraction that are the foundation of shaping sexy muscle anytime, anywhere.
- Disease-prevention—fighting nutrient deficiency with micronutrient supplements.
The following is an exclusive Life Extension® interview with Young for Life authors Marilyn Diamond and Dr. Donald “Rock” Schnell.

LE: You have an entire chapter titled: Solar Eclipse – Our Vitamin D Deficiency. Life Extension has long touted the benefits of this vitamin and you make the case that the mass deficiencies seen in Americans are due to an egregious campaign by Big Pharma and Big Government to silence its benefits.

DS: For nearly 30 years, a collective group of individuals from the dermatology associations, governmental regulatory agencies, and the media have been on a campaign to prevent healthy and safe sun exposure. What they want you to ignore is a historical fact. We’ve had a positive relationship with the sun for as long as humanity has been on the planet. What you’re not told is that scores of respectable researchers, epidemiologists, and dermatologists have published studies that show that sunlight is good for your health.

LE: All of these warnings have lead to a worldwide epidemic of vitamin D deficiency and to a real-world body count of victims, correct?

DS: Let’s put this into perspective. A study published in June 2008 in the Archives of Internal Medicine showed that men with low vitamin D levels suffer over twice as many heart attacks (2.22 times more).1 Now let’s look at what this means in actual body counts.

Each year, about 133,958 Americans die from coronary artery disease–related heart attacks. And each year, tens of millions of dollars are being spent to advertise that cholesterol-lowering drugs reduce heart attacks by 39 to 60%. How many more lives could be saved by vitamin D, and without wasting all those advertising dollars?

Combined, all forms of heart disease kill over 724,600 Americans each year. These lethal forms of heart disease include cardiomyopathy, valvular insufficiency, congestive heart failure, arrhythmia, coronary thrombosis (blood clot in coronary artery), and coronary atherosclerosis (narrowing or blockage of coronary arteries). According to that Archives of Internal Medicine study, there is significant reason to believe that vitamin D could help protect against most of these forms of cardiac-induced death, with the fortuitous side benefit of an increase in libido.1

LE: You list vitamin E as a lifesaver as well.

DS: Richard A. Passwater, PhD, has been one of America’s leading nutrition-focused biochemists since 1959. He is credited with legitimizing megavitamin therapy through 46 books on nutrition, including the bestseller Super-Nutrition: Megavitamin Revolution. Dr. Passwater’s research on cardiovascular health and vitamin E was published in 1971, when he was the first to inform the public of research on antioxidants and free radicals. In 1976, Passwater published more of his research, this time showing that long-term users of vitamin E had less than half the heart disease risk of typical Americans of the same sex and age who did not use the vitamin.

Unfortunately, government and medical experts failed to give a fair hearing to these studies. Instead, the public remained uninformed or unwilling to abandon the anti-saturated-fat and anti-cholesterol chorus in favor of vitamin E supplementation.

LE: You open the first chapter of your book with this question: How can malnutrition run rampant in the richest nation on earth? Another way of putting this could be: How are so many obese people, clearly with enough calories available, still deficient in key nutrients?

DS: In this country, food is plentiful, but most of it is processed, artificial, laden with cellular and neurotoxic chemicals, dyes, preservatives, and additives; it is irradiated, fractionated, microwaved, sprayed with pesticides, fungicides, and herbicides; it is stored for long periods or shipped in hot weather; it is contaminated and genetically modified.

Technically, Americans are not starving to death. In fact, we are eating more than enough calories, but we are getting far too few real nutrients. Like a bird attempting to fly with one wing—we’re limping along with symptoms of nutrient deficiencies that we’ve been conditioned to expect and accept.
If you want more energy, but it seems to be slipping away, you’re likely deficient in nutrients. The “headache” or “sense of malaise” that keeps you from performing at your peak can be traced directly to your diet.

LE: When did this problem with our food supply start?

DS: Over hundreds of millennia, humans existed on natural foods. These can be defined as foods that are growing and alive, or were recently alive, in nature, in the rain and under the sun—all plant foods, meat, eggs, and fish. We ate our food within minutes or hours of gathering it, because there was little opportunity for storage. Even when we no longer hunted and gathered, we still planted our foods in nature’s laboratory of the earth, or found them in the rivers, pastures, and meadows where we lived. We could see food’s authenticity. This “stuff of life” was what we recognized as food through the generations, until less than a century ago.

Until that time, there was little possibility of the mass manufacturing, packaging, labeling, warehousing, shipping, and advertising that completely drive what we eat today. In 1940, a very small percentage of our purchased food was processed. Today, that figure is over 90%! Processed foods—even when labeled as health foods—are not foods; they are modern artifacts, a glut of fake foods masquerading as whole, natural foods, consumed in a society that has been conditioned to accept that industry is the modern mom in the kitchen.

LE: The ingestion of nutrient-sparse, pseudo-foods causes what you call Nutrient Deficiency Disorder, which you say is clearly one side of the coin responsible for the decline in the health of Americans. The other is what you call Sedentary Death Syndrome. Can you explain this condition?

DS: Sedentary Death Syndrome, or SeDS, is the term developed by more than 200 leading physiologists to bring attention to the growing epidemic of physical inactivity and poor nutrition, and their relationship to chronic, preventable diseases. It is estimated that 60% of all Americans are currently at risk for premature disability or death due to poor nutrition and a sedentary lifestyle. What’s most alarming is that some of them are children.

Approximately 2.5 million Americans will die prematurely in the next ten years due to Sedentary Death Syndrome; that’s greater than the number of deaths related to alcohol, guns, motor vehicles, illicit drug use, and sexual behavior combined. These researchers call Sedentary Death Syndrome the second-largest threat to public health and expect it to add as much as $3 trillion to health care costs over the next ten years, far more than the tax cuts being proposed today.

LE: In your book, you point to some pretty compelling studies that relate exercise to longer life span.

DS: In 2008, British researchers conducted tests on 2,400 sets of twins to measure the length of the telomeres in their DNA, a good indicator of the age-potential of DNA. With each cell replication, scientists can see that under normal conditions, telomeres tend to shorten, and as they shorten, the ability of the cell to replicate declines until cell replication is no
longer possible. This is one of the major breakthroughs in science today. If we can see that telomeres shorten under certain conditions, we can also determine what we need to do to lengthen them. Never before in the history of humanity have we had this kind of understanding about how to control our longevity.

**LE:** On this note, you refer to sarcopenia as the epidemic behind the epidemic. Can you explain that?

**DS:** Sarcopenia is a condition of accelerated muscle wasting that leads to the diseases of premature aging. Identified by the Centers for Disease Control in 1999, this condition was first considered to be a geriatric disease that became severe in one’s seventies. However, today muscle wasting can begin even in your twenties or even earlier. As you age, your body naturally loses muscle mass to the tune of about 1 percent a year after age 30; but when you are sedentary and ignore the need for regular muscle contraction to stimulate muscle growth, muscle wasting accelerates, and it can start much earlier in life.

Your very life depends on a healthy ratio of more toned muscle to less fat on your body. Once this healthy ratio is inverted, when you have much more fat than muscle, you expose yourself to the entire chain of the modern killer diseases, including obesity, diabetes, heart attack, stroke, and cancer.

**LE:** What are the two deadly side effects of muscle wasting?

**DS:** Muscle wasting has two deadly side effects. First, with less muscle, your metabolism slows down. As your metabolism slows, you burn fewer calories and have less energy. Trapped in the inactivity that leads to *Sedentary Death Syndrome*, you gain fat weight, which is inactive flabby tissue. The remedy is a lifestyle that easily and quickly builds active, toned muscle tissue, which burns calories even as you rest. Second, the less muscle you have, the less sugar is burned from your blood. Thus, muscle wasting not only prevents fat burning, but also leads to a higher risk of diabetes and heart and kidney disease.

**LE:** So many lethal problems stem from high blood sugar, but you talk specifically about how increased blood sugar poses problems for our nerves and neurons. How so?

**DS:** You’ve heard of diabetic neuropathy—the nerve damage from high blood sugar that can ultimately lead to amputation and death. Did you know that the nerves in your brain and spinal cord are also under siege when your blood sugar is too high? When they are destroyed, and where they are destroyed, the muscles are lost. An early example of this common symptom of nerve damage is the loss of eyesight and hearing. But the greater point we’re making is that a lifestyle that causes excess sugar in the blood affects your nerves and ages you prematurely.

**LE:** Readers will be interested to know that in addition to wreaking havoc on the body through stress, cortisol also affects sarcopenia, right?

**DS:** Cortisol plays a major role in sarcopenia. It’s the primary catabolic hormone that signals the destruction of your youthful lean muscle tissue, while telling your body to store fat. To fight cortisol, you need to perform anabolic exercises like those in our dynamic Isotonics Routine and eat nutrient-rich anabolic foods before and immediately after exercising.

Often when you’re irritable, grouchy, overstressed, or aggressive, cortisol is in control of you. If you wake up in a bad mood, your body could be flooded with cortisol. You don’t even know it, but an anabolic food such as plain, unsweetened yogurt will quickly reduce cortisol production. Sugar will also do this, temporarily, for 20 to 30 minutes, but at a serious cost. Sugar suppresses glucagon, your valuable fat-burning hormone.
LE: You mention the importance of many micronutrients, and specifically five other key nutrients to maintain one’s youth. Your thoughts on vitamin C are particularly compelling.

DS: Every time you consume vitamin C, somewhere in your body you stop aging. Somewhere you stimulate repair. Somewhere you bring about detoxification. Somewhere you eradicate infection and prevent free radical damage. Somewhere your skin will clear up. You may see fewer wrinkles on your face. According to an article in the August 2002 issue of Biological Psychiatry, you’ll have more sex and less depression, and you’ll ward off serious disease. And all this is just scratching the surface, because vitamin C is a miraculous healing nutrient.

What is vitamin C? In our opinion, it should not be classified as a vitamin at all. It stands alone in your body as a unique micronutrient, and it acts like an enzyme in its ability to stimulate a multitude of beneficial biological processes, when it contains the appropriate mineral cofactors. Vitamin C can save your life.

LE: How are collagen and vitamin C linked?

DS: Because a vitamin C deficiency results in poor-quality collagen, suboptimal or minimal amounts of vitamin C over prolonged periods during childhood and early adulthood may be a factor that influences the high incidence of later-life problems such as arthritis and joint diseases, broken hips, heart and vascular diseases that cause sudden death, and the strokes that bring on senility.

Collagen is intimately connected with the entire aging process. Studies show that as you age, you need larger amounts of vitamin C to maintain and repair collagen damage from stressors in the environment such as pollution, ultraviolet light, CAT scans and other radiation, oxidative stress from free radical formation, and the harmful effects of the protein- and fat-deficient high-carbohydrate and high-sugar diet.

LE: Thank you for all of this information, even though it is literally the tip of the iceberg of what’s available in the book.

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


Marilyn Diamond gained her claim to fame as the author of Fit for Life, one of the best-selling books of all time. In 1986, Fit for Life made the Top 25 Best-selling Books in History list. Marilyn’s other books include Fit for Life II, Recipes for Life, Fitonics, A New Way of Eating, and The American Vegetarian Cookbook. Marilyn is a Founder’s Day Graduate of New York University and a member of the French National Honor Society.

Dr. Donald Schnell holds a Bachelor of Education from Arizona State University, a Masters in Computer Science from Nova University, and a doctorate in Clinical Hypnotherapy (D.CH) with certification in Medical Hypnotherapy in the State of California. Dr. Schnell is the Founder of Prema Yoga—the Yoga of the Power of Love. He is a certified Reality Therapist, Fire-walking Instructor, and Nimmo therapist.
**Dual-Action Support for Aging Joints!**

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

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

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

**Better Absorption for Optimum Benefit**

AprèsFlex® represents a quantum leap forward in the delivery to aging joints of boswellia, long prized for its ability to help with inflammatory issues. It is a superior inhibitor of the enzyme 5-LOX or 5-lipoxygenase. Excess activity of 5-LOX results in the accumulation of leukotriene B4, a pro-inflammatory compound that affects aging joints. Boswellia has been shown to bind directly to the 5-LOX enzyme in our bodies, blocking it from facilitating production of pro-inflammatory leukotrienes.1,2

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

---

**ArthroMax™ Advanced with UC-II® and AprèsFlex®**

In addition to AprèsFlex®, ArthroMax™ contains a novel form of undenatured chicken cartilage: UC-II®. Data show it helps with immune issues that can impact joint discomfort and ease of motion in aging individuals.

Two capsules of **ArthroMax™ Advanced with UC-II® and AprèsFlex®** provide the following nutrients in one convenient, joint-protecting formula:

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<td>UC-II® standardized chicken cartilage</td>
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The retail price of a bottle of 60 capsules of **ArthroMax™ Advanced with UC-II® and AprèsFlex®** is $36. If a member buys four bottles, the price is reduced to $24 per bottle.

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**To order ArthroMax™ Advanced with UC-II® and AprèsFlex®, call 1-800-544-4440 or visit www.LifeExtension.com**

*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
Nutritional Dangers of Acid Reflux Medications

Q: I have suffered with acid reflux for many years. My doctor has prescribed Prilosec® indefinitely, which is beyond the maximum recommended window of 8 to 12 weeks. Are there any long-term health complications to this approach and can you suggest any steps I can take to avoid these side effects?

A: Heartburn medications are among the most frequently prescribed medicines in the US with sales exceeding $13.5 billion annually.¹ Prilosec®, Nexium®, Protonix®, and Aciphex® are known as proton pump inhibitors (PPIs).² They are the most powerful acid secretion inhibitors available today. Unfortunately, long-term use has been linked to nutritional deficiencies, bone fractures, an increased risk of bacterial infection, and even withdrawal symptoms.³⁻⁸
Role of Stomach Acid in Nutrient Absorption

Stomach acid plays an important role in the digestion of your food and nutrients. When the sphincter valve at the end of your esophagus fails to close properly, stomach contents including stomach acid leaks back up into the esophagus, damaging the delicate esophageal lining, causing heartburn. Drugs like Prilosec® inhibit the release of stomach acid and provide some relief. However, the continual reduction of stomach acid through medicines like proton pump inhibitors hinders digestion and absorption of key nutrients.9,10 This ultimately leads to deficiencies in key nutrients, such as vitamin B12, iron, calcium, magnesium, folic acid, and zinc.11 Due to the alteration in pH balance in your gut, the absorption of other nutrients is possibly at risk as well.11

- Proton pump inhibitors not only block the release of stomach acid but also something else called "intrinsic factor," making it impossible to absorb vitamin B12.11-13
- The inhibition of dietary iron can contribute to anemia over a long period of time.14
- It’s well known that calcium is best absorbed in the presence of acid.15
- Proton pump inhibitors are thought to inhibit active transport of magnesium in the intestine, leading to deficiencies and potentially serious health outcomes.16
- Your absorption of folic acid is inhibited, disrupting the production of new cells, which helps your body grow and repair itself.17,18
- The absorption of zinc is impaired, which is needed for many enzyme reactions in the body.19

It is evident that the lack of stomach acid has far-reaching effects that extend well beyond the digestive system.

You can offset these damaging effects by supplementing to provide some protection against these deficiencies. Consider talking to your doctor and at the very least take a blood test (Complete Blood Count, Comprehensive Metabolic Panel) to check for nutrient deficiencies.

Increased Risk of Fractures

A 2011 meta-analysis study in The Annals of Family Medicine reported that high doses or long-term usage of proton pump inhibitors (PPIs) have been linked to an increased risk of osteoporosis-related fractures of any type, including wrist, spine, and hip.20 This elevated risk of osteoporosis is connected to the drastic drop in calcium absorption while on these medications.21,22 If you are taking a proton pump inhibitor, make sure you avoid a calcium deficiency by supplementing with a high-quality, bio-available calcium to offset the depletion of this mineral. Scientific evidence shows that calcium can be an effective bone builder, especially when combined with vitamin D3 and vitamin K.23

Increased Risk of Infections

When you decrease acid secretion in the stomach, you also boost the risk of infection.4,5,24,25 Without adequate stomach acid present, large amounts of undigested food pass into the intestines, contributing to the growth of opportunistic organisms, an increase in toxins, and an imbalance in intestinal flora.26 Studies published in the Journal of the American Medical Association revealed that when taking a proton pump inhibitor drug, the risk of developing pneumonia increases up to 89%, and the risk of developing a potentially
deadly chronic infection from the intestinal bacterium *Clostridium difficile* increases as well.27-29

A randomized, double-blind, controlled trial published in *Gastroenterology* shows that withdrawal from acid blockers can lead to *rebound acid hypersecretion*, which then forces the patient to immediately go back to the acid blocker drug.30 This becomes a vicious cycle of trying to stop the drug, but the body has become conditioned to be dependent on the drug for acid regulation.

### Practical Recommendations

If you suffer from acid reflux, there are a number of preventative measures you can take to limit reflux symptoms without having to rely on proton pump inhibitors:31,32

- Eat slow. Eat smaller, frequent meals
- Avoid fried junk food
- Limit alcohol
- Replace sodas with water and other healthy beverages
- Reduce drug intake (caffeine, prescription, and over-the-counter medications)
- Choose foods with care
- Quit smoking
- Don’t eat within two to three hours before bedtime
- Maintain a healthy weight
- Wear loose-fitting clothes
- Manage stress

When evaluating your symptoms, your doctor should assess whether they are due to the illness, side effects of the drugs, or if they are caused by a drug-induced nutrient depletion. Taking a high-quality multivitamin and mineral supplement with a focus on the nutrients being depleted from the acid blockers will generally offset an imbalance.

In addition, a number of natural remedies have been found to soothe the gut:

- Supplement with a good digestive enzyme formula to promote healthy digestion. Look for a formula that includes only proteases (which break down proteins) and lipases (which break down fats). Be aware that many formulas also include carbohydrases (which break down carbohydrates) that increase absorption of sugar and can cause unwanted spikes in post-meal blood sugar levels.
- Take 1-2 teaspoons of apple cider vinegar mixed with water and raw honey to reduce symptoms of acid reflux and poor digestion.
- Deglycyrrhizinated licorice (DGL) has been shown to provide soothing relief of the stomach lining and intestinal tract.33 Although licorice is best known as a flavor for candy, it contains a compound called glycyrrhizin, which is known to pose certain health problems in high doses. However, many of today’s digestive formulas utilize DGL which does not contain the glycyrrhizinated compound. Look for a label that specifically states “DGL” or “deglycyrrhizinated licorice.”
- D-limonene, a supplement extracted from the peels of citrus fruit, helps to neutralize gastric acid and supports normal peristalsis for relief of heartburn and gastroesophageal reflux (GERD).34

- Supplement with betaine hydrochloride after meals to help with digestion.
- Re-inoculate the gut with healthy bacteria by using probiotics.

### Summary

Despite the well-known safety profile of proton pump inhibitors, the risks associated with long-term use can play an integral part in developing serious health complications later on. More importantly, working toward eliminating the cause of your gastric distress can decrease or even eliminate your need for this medication. (Note: Altering your dose or discontinuing any of your prescription medications should always be done under the care and supervision of your physician.)

Kimmi Le is a member of the American Pharmacists Association Foundation, American Academy of Anti-Aging Medicine, and a clinical pharmacy educator for The Life Extension Foundation®.

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


A myriad of laws censor our ability to mention in advertisements all of the topical hormone creams we make available at rock bottom prices.

You are still allowed, however, to phone or fax the Life Extension Pharmacy® with the prescription drugs you are currently prescribed and receive a free price quote.

You may be pleasantly surprised to find savings of 50% or greater on out-of-pocket expenses. In some cases, we save our clients thousands of dollars a year on their prescription drug costs.

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As you may know, the Life Extension Foundation®, our partner in preserving your health, is a pioneer in the use of natural bioidentical hormones. The Foundation’s track record documents it was almost a decade ahead of the mainstream in identifying the toxic effects of FDA-approved synthetic hormones. To find out how much you can save, contact the Life Extension Pharmacy® today by phone or fax.
ANNUAL
Blood Test
April 1-June 3, 2013
SUPER SALE

LIFE EXTENSION’S SUGGESTIONS FOR ANNUAL SCREENING (Member Prices*)

### MEN’S ANNUAL BLOOD TESTING

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<th>Test Description</th>
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### SUGGESTED ADDITIONS TO ANNUAL BLOOD TESTING

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<td>Vitamin B12/Folate</td>
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For the past 30 years, the Life Extension Foundation® has stated that the most important step one can take to prevent disease cannot be found in a bottle of pills. The true cornerstone of any preventive health care program is annual blood screening. Proactive blood screening can help you greatly reduce your risk of disorders such as heart and kidney disease, stroke, liver conditions, anemia, and diabetes. Plus it’s particularly valuable in helping you prevent and treat symptoms associated with hormone imbalance, such as fatigue, memory impairment, bone loss, weight gain, and depression. Blood testing remains one of the most important things you can do for yourself and your loved ones. More than any other measure, annual blood testing holds tremendous potential to protect both yourself and your loved ones.

**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.)
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 mailed, emailed, or faxed directly to you by Life Extension.
5. Take the opportunity to discuss the results with one of our knowledgeable health advisors by calling 1-800-226-2370, or review the results with your personal physician.

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

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

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**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

Life Extension Foundation Members only

MEMBER NO.

- Male
- Female

Name

Date of Birth (required) / / 

Address

City

State Zip

Phone

Credit Card No.

Expiration Date / 

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Life Extension

3600 West Commercial Boulevard

Fort Lauderdale, FL 33309

Phone your order to: 1-800-208-3444

Fax your order to: 1-866-728-1050

*Certain tests need to be shipped to the lab on dry ice for customers using a blood draw kit, and incur an additional $35 charge. If you are going to LabCorp, this charge does not apply.*

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

This is NOT a complete listing of LE blood test services. Call 1-800-208-3444 for additional information.
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Arginine/L-Ornithine Capsules
L-Carnitine Capsules
L-Carnitine Powder Natural Lemon Flavor
L-Glutathione, L-Cysteine & C
L-Glutamine Capsules
L-Glutamine Powder
L-Lysine Capsules
L-Tyrosine Tablets
Mega L-Glutathione Capsules
N-Acetyl-L-Cysteine Capsules
Optimized Carnitine with GlycoCarn®
PharmaGABA
Super Carnosine Capsules
Taurine Capsules

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ArthroMax™ Advanced with UC-II® and AprèsFlex®
Bone-Up™
Bone Restore
Bone Restore w/Vitamin K2
Bone Strength Formula w/KoAct™
Fast Acting Joint Formula
Glucosamine Chondroitin Capsules

BRAIN HEALTH
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Acetyl-L-Carnitine-Argrade
CDP Choline Capsules
Cognitex® with NeuroProtection Complex
Cognitex® with Pregnenolone & NeuroProtection Complex
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DMAE Bitartrate
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Vinpocetine

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Natural EsoPhaGuard
Pancreatin
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Probiotic Anti-Aging
Regimint
Theracurmin
Theracurmin

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Full-Spectrum Pomegranate™
Grapeseed Extract with Resveratrol & Pterostilbene
Huperzine A
Kakuyic® Garlic Formula 102 + 105
Kakuyic® Reserve
Mega Green Tea Extract
Mega Green Tea Extract (Decaffeinated)
Mega Green Tea Extract (Decaffeinated) (also w/CoffeeGenic® Green Coffee Extract)
Mega Lyopene Extract
Optimized Ashwagandha Extract
Optimized Garlic
Pomegranate Extract
Pomegranate Juice Concentrate
Pycnogenol
Optimized Quercetin
Resveratrol with Synergistic Grape-Berry Actives
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D-Ribose Powder
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Fibrinogen Resist
Forskolin
Homocysteine Resist
Krill Healthy Joint Formula
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Olive Leaf Vascular Support
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Policosanol
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Super Ubiquinol CoQ10 with Enhanced Mitochondrial™ Support
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DHEA
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GH Pituitary Support Night Formula
Melatonin
Melatonin Timed Release
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Super Mirafort with Standardized Lignans

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Black Cumin Seed Oil w/Bio-Curcumin®
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Echinacea Extract
26 Hyperimmune E participants
Immune Modulator w/Tinofend®
Immune Protect with PARACTIN®
Lactoferrin
Norwegian Shark Liver Oil
Optimized Fucoidan w/Maritech® 926
ProBoost™ Thymic Protein A
Reishi Extract Mushroom Complex
Vitamin C with Dihydroquercetin
Zinc Lozenges with Vitamin C

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Boswellia
Bromelain (Specially-coated)
DHA (Vegetarian Sourced)
Fast Acting Joint Formula
Ginger Force
Krill Oil
5-LOX Inhibitor w/AprèsFlex®
Mega EPA/DHA
Mega GLA with Sesame Lignans
MSM
Natural Relief 1222™ Cream
Omega-3 Whirl
Serraflazine
SODzyme™ with GlisODin® and Wolfberry
Super Omega-3 EPA/DHA with Sesame Lignans & Olive Fruit Extract
Tart Cherry
Tart Cherry w/Standardized CherryPURE®
Zythamend® Complete

LIVER HEALTH
Branch Chain Amino Acids
N-Acetyl Cysteine
Liver Efficiency Formula
Certified European Milk Thistle
Hepatoprotector
SAMe
Silmyarin

MINERALS
Biosil
Bone Restore
Bone Strength Formula w/KoAct™
Bone-Up™
Boron Capsules
Calcium Citrate with D3
Chromium Ultra
Copper
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<td>ADRENAL ENERGY FORMULA - 60 veg. caps</td>
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<td>APPLEWISE POLYPHENOL EXTRACT - 600 mg, 30 veg. caps</td>
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<td>ARGinine/ORNithine - 500/250, 100 caps</td>
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<td>ARGinine/ORNithine POWder - 150 grams</td>
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<td>(L)-ARGININE CAPs - 700 mg, 200 veg. caps</td>
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<td>ARTHROMAX® Advanced w/UC-II® &amp; APRESFLEX® - 60 caps</td>
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<td>ASTAXANTHIN WITH PHOSPHEROLIPIDS - 4 mg, 30 softgels</td>
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**SUB-TOTAL OF COLUMN 1**

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<td>BENFOTIAMINE (MEGA) - 250 mg, 120 veg. caps</td>
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<td>BONE RESTORE w/VITAMIN K2 - 150 caps</td>
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<td>BONE-UP® - 240 caps</td>
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<td>BOOSTER - 60 softgels</td>
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<td>BOOSTER w/ADVANCED K2 COMPLEX (SUPER) - 60 softgels</td>
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<td>BORON - 3 mg, 100 veg. caps</td>
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<td>00202</td>
<td>BOSWELLIA - 100 caps</td>
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**SUB-TOTAL OF COLUMN 2**
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<td>BRITE EYES III - 2 vials, 5 ml each</td>
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<td>BUTTERBUR EXTRACT w/STANDARDIZED ROSMARINIC ACID - 60 softgels</td>
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<td>CALCIUM CITRATE w/VITAMIN D - 300 caps</td>
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<td>CALCIUM D-GLUCARATE - 200 mg, 60 veg. caps</td>
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<td>01693</td>
<td>CALORIE CONTROL WEIGHT MANAGEMENT FORMULA w/COFFEEGENIC® GREEN COFFEE EXTRACT BLUEBERRY FLAVOR - 414 grams powder</td>
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<td>CARDIO PEAK® w/STANDARDIZED HAWTHORN &amp; ARJUNA - 120 veg. caps</td>
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<td>L-CARNITINE w/GLYCOCARIN® (OPTIMIZED) - 60 veg. caps</td>
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<td>CARNISOSOOTHE w/PIROPHICTIONTM - 60 veg. caps</td>
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<td>CARNOSINE (SUPER) - 500 mg, 90 veg. caps</td>
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<td>CDP CHOLINE CAPS - 250 mg, 60 veg. caps</td>
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<td>CHILDREN’S FORMULA LIFE EXTENSION MIX® – 100 chewable tablets</td>
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<td>CHOLERELLA - 500 mg, 200 tablets</td>
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<td>01477</td>
<td>CHROMIUM ULTRA - 100 veg. caps</td>
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<td>01504</td>
<td>CHROMIUM w/CROMINEX® 3+ (OPTIMIZED) - 500 mcg, 60 veg. caps</td>
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**SUB-TOTAL OF COLUMN 3**

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<td>COGNITEX® w/NEUROPROTECTION COMPLEX - 90 softgels</td>
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<td>01696</td>
<td>COGNITEX® w/PREGNENOLONE &amp; NEUROPROTECTION COMPLEX - 90 softgels</td>
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<td>01421</td>
<td>COQ10® w/ENH MITOCHONDRIAL SUPPORT™ (SUPER UBIQUINOL) - 600 mg, 150 veg. caps</td>
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<td>00949</td>
<td>COQ10® w/-LIMONENE (SUPER ABSORBABLE) - 50 mg, 60 softgels</td>
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<td>COQ10® w/-LIMONENE (SUPER ABSORBABLE) - 100 mg, 100 softgels</td>
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<td>COQ10 w/THI MITOCHONDRIAL SUPPORT® (SUPER UBIQUINOL) - 50 mg, 30 softgels</td>
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<td>COROLUS SUPER STRENGTH - 600 mg, 150 veg. caps</td>
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LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS  
JUNE 2013
Buyers Club Order Form  

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

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<td>COBESSIS ADVANCED UNDER EYE SERUM w/STEM CELLS - 33 oz</td>
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<td>80118</td>
<td>COBESSIS ANTI-AGING MASK - 2 oz</td>
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<td>COBESSIS ANTI-GLYCATION SERUM - 1 oz w/BLUEBERRY &amp; POMEGRANATE EXTRACTS</td>
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<td>COBESSIS ANTI-OXIDANT REJUVENATING FOOT CREAM - 2 oz</td>
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<td>COBESSIS ANTI-OXIDANT REJUVENATING FOOT SCRUB - 2 oz</td>
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<td>COBESSIS ANTI-OXIDANT REJUVENATING HAND CREAM - 2 oz</td>
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<td>COBESSIS ANTI-REDNESS &amp; ADULT BLEMISH LOTION - 1 oz</td>
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<td>COBESSIS BIOFLAVONOIDE CREAM - 1 oz jar</td>
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<td>COBESSIS BROCCOLI SPIRUTOD CREAM - 1 oz</td>
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<td>COBESSIS CORRECTIVE CLEARING MASK - 2 oz</td>
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<td>COBESSIS DNA REPAIR CREAM - 1 oz jar</td>
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<td>COBESSIS ESSENTIAL PLANT LIPIDS REPARATIVE SERUM - 1 oz</td>
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<td>COBESSIS FACE REJUVENATING ANTI-OXIDANT CREAM - 2 oz</td>
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<td>COBESSIS FINE LINE-LESS - 1 oz</td>
<td>74.50</td>
<td>55.88</td>
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<tr>
<td>80131</td>
<td>COBESSIS HAIR SUPPRESS FORMULA - 4 oz</td>
<td>59.00</td>
<td>44.25</td>
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<tr>
<td>80137</td>
<td>COBESSIS HEALING FORMULA ALL-IN-ONE CREAM - 1 oz</td>
<td>53.00</td>
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<tr>
<td>80115</td>
<td>COBESSIS HEALING MASK - 2 oz</td>
<td>64.50</td>
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<td>COBESSIS HEALING VITAMIN K CREAM - 1 oz</td>
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<tr>
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<td>COBESSIS HYALURONIC FACIAL MOISTURIZER - 1 oz</td>
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<td>COBESSIS HYALURONIC OIL-FREE FACIAL MOISTURIZER - 1 oz</td>
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<td>COBESSIS HYDRATING ANTI-OXIDANT FACE MIST - 4 oz</td>
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<tr>
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<td>COBESSIS LIFTING &amp; TIGHTENING COMPLEX - 1 oz</td>
<td>74.50</td>
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**SUB-TOTAL OF COLUMN 5**

<table>
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<th>Qty</th>
<th>Total</th>
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<td>COBESSIS LYCOPENE CREAM - 1 oz jar</td>
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<td>COBESSIS MELATONIN CREAM - 1 oz</td>
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<tr>
<td>80114</td>
<td>COBESSIS MILD FACIAL CLEANSER - 8 oz</td>
<td>59.00</td>
<td>44.25</td>
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<tr>
<td>80122</td>
<td>COBESSIS NECK REJUVENATING ANTI-OXIDANT CREAM - 2 oz</td>
<td>64.00</td>
<td>48.00</td>
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<tr>
<td>80111</td>
<td>COBESSIS PIGMENT CORRECTING CREAM - 1/2 oz</td>
<td>74.00</td>
<td>55.50</td>
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<tr>
<td>80106</td>
<td>COBESSIS REJUVENATING SERUM - 1 oz</td>
<td>74.50</td>
<td>55.88</td>
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<tr>
<td>80142</td>
<td>COBESSIS REJUVENATRIL ANTI-OXIDANT SERUM - 1 oz</td>
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<tr>
<td>80112</td>
<td>COBESSIS SKIN LIGHTENING SERUM - 1 oz</td>
<td>85.00</td>
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<td>80130</td>
<td>COBESSIS SKIN STEM CELL SERUM - 1 oz</td>
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<tr>
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<td>COBESSIS STEM CELL CREAM W/ALPINE ROSE - 1 oz jar</td>
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<td>COBESSIS TIGHTENING &amp; FIRMING NECK CREAM - 2 oz jar</td>
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<td>80116</td>
<td>COBESSIS ULTRA LIP PLUMPER - 1/3 oz</td>
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<td>80101</td>
<td>COBESSIS ULTRA WRINKLE RELAXER - 1 oz</td>
<td>89.95</td>
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<td>80113</td>
<td>COBESSIS UNDER EYE REFINING SERUM - 1/2 oz</td>
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<tr>
<td>80104</td>
<td>COBESSIS UNDER EYE RESCUE CREAM - 1/2 oz</td>
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<tr>
<td>80129</td>
<td>COBESSIS VITAMIN C SERUM - 1 oz</td>
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<tr>
<td>80136</td>
<td>COBESSIS VITAMIN D LOTION - 4 oz</td>
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<td>COBESSIS VITAMIN E-ESSENTIAL CREAM - 1 oz</td>
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<td>COBESSIS YOUTH SERUM - 1 oz</td>
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<tr>
<td>00862</td>
<td>CRN-MAX - 500 mg, 60 veg. caps</td>
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<tr>
<td>01424</td>
<td>CRN-MAX with UTI/ROSE™ (OPTIMIZED) - 60 veg. caps</td>
<td>18.00</td>
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<tr>
<td>01529</td>
<td>CREATINE CAPSULES - 120 veg. caps</td>
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<td>01746</td>
<td>CREATINE WHEY GLUTAMINE POWDER - 454 grams (vanilla)</td>
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<tr>
<td>01429</td>
<td>CR MIMETIC LONGEVITY FORMULA - 60 veg. caps</td>
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<td>033840</td>
<td>CRWAY GREAT GLUCOSE CONTROL CD</td>
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<td><strong>CRWAY</strong></td>
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<td>COBESSIS REJUVENATING SERUM - 1 oz</td>
<td>74.50</td>
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**SUB-TOTAL OF COLUMN 6**
<table>
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<th>No.</th>
<th>Description</th>
<th>Retail Each</th>
<th>Member Each</th>
<th>Qty</th>
<th>Total</th>
</tr>
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<tbody>
<tr>
<td>00658</td>
<td>7-KETO® DHEA METABOLITE - 25 mg, 100 caps</td>
<td>$28.00</td>
<td>$21.00</td>
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</tr>
<tr>
<td></td>
<td>Buy 4 bottles, price each</td>
<td>24.00</td>
<td>18.00</td>
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<tr>
<td>01479</td>
<td>7-KETO® DHEA METABOLITE - 100 mg, 60 veg. caps</td>
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</tr>
<tr>
<td></td>
<td>Buy 4 bottles, price each</td>
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<td>27.00</td>
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<tr>
<td>01640</td>
<td>DNA (VEGETARIAN SOURCED) - 200 mg, 30 veg. softgels</td>
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<td>Buy 4 bottles, price each</td>
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<td>13.50</td>
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<td>00607</td>
<td>DHEA - 25 mg, 100 tablets (dissolve in mouth)</td>
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<td>DHEA COMPLETE - 60 veg. caps</td>
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<td>00882</td>
<td>DHEA - 50 mg, 60 caps</td>
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<tr>
<td>01689</td>
<td>DHEA - 100 mg, 60 veg. caps</td>
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<td>DIGEST RC - 30 tablets</td>
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<td>DIGESTIVE ENZYMES (ENHANCED SUPER) - 100 veg. caps</td>
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<td>D,L-PHENYLALANINE CAPSULES - 500 mg, 100 veg. caps</td>
<td>$18.75</td>
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<td>Buy 4 bottles, price each</td>
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<td>12.00</td>
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<td>DMAE BITARTRATE - 150 mg, 200 veg. caps</td>
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<td>00059</td>
<td>DMG - 125 mg, 80 tablets</td>
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<td>DNA PROTECTION FORMULA - 60 veg. caps</td>
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<td>DOG MIX - 100 grams powder</td>
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<tr>
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<td>Buy 4 bottles, price each</td>
<td>32.00</td>
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<td>DR. PROCTOR’S HAIR FORMULA SHAMPOO - 8 oz</td>
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<td>DUAL-ACTION MICRODERMABRASION ADV. EXFOLIATE - 2-4 oz</td>
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<td>Buy 4 jars, price each</td>
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<td>DUAL-C® - 90 veg. caps</td>
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<td>ECHINACEA EXTRACT - 250 mg, 60 veg. caps</td>
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<td>ENDOTHELIAL DEFENSE® w/FULL-SPECTRUM POMEGRANATE™ - 60 softgels</td>
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<td>ENDOTHELIAL DEFENSE® w/GLIODIN® - 60 veg. caps</td>
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<td>Buy 4 bottles, price each</td>
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<td>EPIDNA (Mega) - 120 softgels</td>
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<td>Buy 4 bottles, price each</td>
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**SUB-TOTAL OF COLUMN 7**

**SUB-TOTAL OF COLUMN 8**
Buyers Club Order Form

<table>
<thead>
<tr>
<th>No.</th>
<th>G (CONTINUED)</th>
<th>Retail Each</th>
<th>Member Each</th>
<th>Qty</th>
<th>Total</th>
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<tbody>
<tr>
<td>00522</td>
<td>GLUCOSAMINE/CHONDROITIN CAPSULES - 100 caps</td>
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<td>$28.50</td>
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<tr>
<td>01541</td>
<td>GLUTATHIONE, CYSTEINE &amp; C - 100 veg. caps</td>
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<td>15.00</td>
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<tr>
<td>00314</td>
<td>L-GLUTATHIONE (Mega) - 250 mg, 60 caps</td>
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<tr>
<td>01669</td>
<td>GLYCINE - 1,000 mg, 100 veg. caps</td>
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<tr>
<td>01091</td>
<td>GRAPE EXTRACT w/RESVERATROL (Whole) - 60 veg. caps</td>
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<td>27.00</td>
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<tr>
<td>01411</td>
<td>GRAPE SEED EXTRACT w/RESVERATROL &amp; PTEROSTILBENE - 100 mg, 60 veg. caps</td>
<td>36.00</td>
<td>27.00</td>
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<tr>
<td>01604</td>
<td>GREEN COFFEE EXTRACT COFFEEGENIC® - 200 mg, 90 veg. caps</td>
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<tr>
<td>01620</td>
<td>GREEN COFFEE EXTRACT COFFEEGENIC® - 400 mg, 90 veg. caps</td>
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<td>28.50</td>
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<tr>
<td>00953</td>
<td>GREEN TEA EXTRACT (Mega) - lightly caffeinated - 100 veg. caps</td>
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<tr>
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<td>GREEN TEA EXTRACT (Mega) - decaffeinated - 100 veg. caps</td>
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<td>HCA - 90 veg. caps</td>
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<td>HEPATOPRO - 900 mg, 60 softgels</td>
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<td>01435</td>
<td>HOMOCYSTEINE RESIST - 100 caps</td>
<td>24.00</td>
<td>18.00</td>
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<tr>
<td>01527</td>
<td>HUPERZINE A - 200 mg, 60 veg caps</td>
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<tr>
<td>00661</td>
<td>HYDRODERM® - 1 oz</td>
<td>79.95</td>
<td>59.96</td>
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<tr>
<td>*01060</td>
<td>I2E® HYPERIMMUNE EGG - 140 grams powder</td>
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<td>56.00</td>
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To order call: 1.954.766.8433 or 1.800.544.4440

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SUB-TOTAL OF COLUMN 9

SUB-TOTAL OF COLUMN 10

JUNE 2013

LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS
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**SUB-TOTAL OF COLUMN 11**

**SUB-TOTAL OF COLUMN 12**

LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS  
JUNE 2013
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<td>OMEGA 3 EPA/DHA W/SESAME LIGNANS &amp; OLIVE FRUIT EXTRACT (SUPER) - SMALL SOFTGEL</td>
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<td>28.00</td>
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<td>72.00</td>
<td>54.00</td>
<td>96.00</td>
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<tr>
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<td>84.00</td>
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<td>90.00</td>
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<td>02186</td>
<td>OMEGA 3 EPA/DHA W/SESAME LIGNANS &amp; OLIVE FRUIT EXTRACT (SUPER) - SMALL SOFTGEL</td>
<td>Buy 4 bottles, price each</td>
<td>96.00</td>
<td>72.00</td>
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<td>02186</td>
<td>OMEGA 3 EPA/DHA W/SESAME LIGNANS &amp; OLIVE FRUIT EXTRACT (SUPER) - SMALL SOFTGEL</td>
<td>Buy 10 bottles, price each</td>
<td>120.00</td>
<td>90.00</td>
<td>180.00</td>
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<td>01473</td>
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<td>01609</td>
<td>RICH REWARDS® BREAKFAST GROUND COFFEE - 12 oz. bag</td>
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<td>01610</td>
<td>RICH REWARDS® DECAFFEINATED ROAST GROUND COFFEE - 12 oz. bag</td>
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<td>01712</td>
<td>RICH REWARDS® BLACK BEAN VEGETABLE SOUP - 32 oz. bottle</td>
<td>13.00</td>
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<tr>
<td>01530</td>
<td>RICH REWARDS® CRUCIFEROUS VEGETABLE SOUP - 32 oz. bottle</td>
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<td>RICH REWARDS® (SPC) CRUCIFEROUS VEGETABLE SOUP - 32 oz. bottle</td>
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<td>RICH REWARDS® LENTIL VEGETABLE SOUP - 32 oz. bottle</td>
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<td>R-LIPICID ACID (SUPER) - 300 mg, 60 veg. caps</td>
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<td>RNA CAPSULES - 500 mg, 100 caps</td>
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<td>01432</td>
<td>SAFFRON w/SATIERAL (OPTIMIZED) - 60 veg. caps</td>
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<td>Selenium - 2 oz dropper bottle</td>
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<td>SILYMARIN - 100 mg, 50 veg. caps</td>
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<td>SKIN RESTORING PHYTOCEMIDES w/LIPOWHEAT® - 30 veg. liquid caps</td>
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<td>00961</td>
<td>SODZYMEX™ w/GLISSON® AND WOLFBERRY - 90 veg. caps</td>
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<td>00657</td>
<td>SOLARSHIELD SUNGLASSES - 1 pair smoke color</td>
<td>12.99</td>
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**SUB-TOTAL OF COLUMN 15**

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<td>SUNGLASSES (OVERCAST POLARIZED) - gray color, large</td>
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<td>SUPER SELENIUM COMPLEX - 200 mcg, 100 veg. caps</td>
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<td>00199</td>
<td>TAURINE - 1000 mg, 50 caps</td>
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<td>TAURINE POWDER - 300 grams</td>
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<td>THEAFLAVIN STANDARDIZED EXTRACT - 30 veg. caps</td>
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<td>(L) THEANINE - 100 mg, 60 veg. caps</td>
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<td>00781</td>
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<td>TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT - 60 veg. caps</td>
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<td>01386</td>
<td>TRUFIBER® - 180 grams</td>
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<td>TRUFLORA PROBIOTICS &amp; ENZYMES - 32 veg. caps</td>
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<td>01722</td>
<td>L-TRYPTOPHAN</td>
<td>33.00</td>
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</table>

**SUB-TOTAL OF COLUMN 16**

LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS JUNE 2013
### Buyers Club Order Form

**JUNE EXTNSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS**

To order call: 1.954.766.8433 or 1.800.544.4440

<table>
<thead>
<tr>
<th>No.</th>
<th>Item Description</th>
<th>Retail Each</th>
<th>Member Each</th>
<th>Qty</th>
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<td>TRYPTOPHAN PLUS (OPTIMIZED) - 90 veg. caps</td>
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<td>VENOTONE - 60 caps</td>
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<td>VITAMIN B5 - 500 mg, 100 caps</td>
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<td>Buy 10 bottles, price each</td>
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<td>ZINC LOZENGES - 75 lozenges</td>
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I want to contribute to your research efforts to extend the healthy human life span. Enclosed is my first year’s membership donation of $75 to join the most elite group of longevity enthusiasts in the world. (Canadians add $7, all others outside the U.S. add $35)

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Theralac® and TruFlora® pack powerful help for digestive health.

**Powerful Pair.**

**Theralac®**
- Bio-Replenishing® Action
- Colonizes the intestinal lining in the large and small intestines
- Five clinically proven probiotic strains
- High Bifido bacteria count to help with colon health

**TruFlora®**
- Bio-Cleansing Action
- Colonizes the contents of the G.I. Tract
- Three probiotic strains and two enzymes
- Contains enzymes that help digest problematic yeast cell walls

Both Theralac® and TruFlora® offer powerful probiotic action for total digestive balance. Because they differ, they can be used alternatively for maximum digestive biodiversity. Both are covered by four U.S. Patents that ensure delivery through the harsh stomach acid and active prebiotic stimulation of the probiotics with Lacostim®, found only in Master Supplements products.

Call your Life Extension® advisor to learn more.

Call Life Extension to place your order today. 1-800-544-4440

Master Supplements

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A Partnership in Heart Health

New Chapter Zyflamend & Life Extension Super Omega-3

A Holistic Approach to Cardiovascular Health
Maintaining heart health and a strong cardiovascular system are vital to a healthy body. Diet and exercise are the most important factors. Scientists and doctors both agree that a program of preventive health today is preferable to a treatment program tomorrow. But unfortunately, most Americans don’t eat enough heart-healthy foods or get enough exercise. We now know that there are several additional factors that can support cardiovascular health, including:
- Supporting the body’s healthy inflammation response
- Consuming “good fats” such as Omega-3 fatty acids

What is the Inflammation Response?
Our body’s inflammation response is a natural healing process. We often think of the inflammation response as something we can feel—such as in our joints and muscles where there are large numbers of sensitive nerve endings. But we can also have a response we can’t feel, where sensitive nerves aren’t concentrated—including in the heart and blood vessels. Whether we’re aware of it or not, this inflammation response can affect every organ and cell.

Extensively Researched Herbal Blend
New Chapter’s Zyflamend represents a scientific breakthrough in supporting a healthy inflammation response.* Zyflamend is formulated based on a large body of scientific research showing its ten herbs and spices contain hundreds of plant compounds that support a healthy inflammation response.* Just as important as a daily multivitamin, Zyflamend is the patented herbal protocol to help your whole body’s natural inflammation process stay balanced and healthy every day.* Zyflamend has been studied at leading research institutions and shown to benefit multiple areas of health, including heart health.*

Omega-3 Is Important for Cardiovascular Health
Life Extension’s Super Omega-3 is a premium, scientifically validated fish oil concentrate. Super Omega-3 EPA/DHA with Sesame Lignans and Olive Fruit Extract promotes a healthy heart.* 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.† To further emulate the benefits of a Mediterranean diet, Super Omega-3 delivers standardized, high-potency olive fruit extract. Research shows that when combined with olive oil, fish oil supplements help with inflammation better than fish oil alone.‡

To order Zyflamend or Super Omega-3, call 1-800-544-4440 or visit www.LifeExtension.com

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Better Bones by Design

2%-4% of your skeleton is “rebuilt” every year as calcium and minerals leave the bone and must be replaced.

Jarrow Formulas® Presents . . .
A Complete Multi-Nutrient Bone Health System!

Bone-Up® provides your body with much needed calcium as well as essential nutrients for building strong bones.* It utilizes the finest source of calcium available: Australian/New Zealand bovine bone hydroxyapatite from chemical-free, range grazed calves less than two years old.

Bone-Up® is a clinically-validated formula and an effective addition to any bone health regimen.* It features added vitamins and minerals that synergistically support healthy bone density and overall bone health*:

- **Ossein Microcrystalline Hydroxyapatite (MCHA):** Promotes calcium balance.*
- **Vitamin D₃:** Converts to calcitriol to enhance calcium absorption.
- **MK-7:** The more bioavailable form of Vitamin K₂, which is needed for building bone matrix and proper calcium distribution.*
- **Boron:** A trace mineral important in calcium retention.*
- **Manganese, Copper and Zinc:** Essential trace minerals involved in the formation of bone.*

Jarrow Formulas® Bone-Up®, 240 capsules Item # 00313: $28.95
If a member buys four bottles, the price will be reduced to $20.41 per bottle.
To order, call (800)544-4440 or visit www.LifeExtension.com

www.Jarrow.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.
Comprehensive Brain Support!

**COGNITEX®**

Brain decline affects all aging humans. Scientific studies demonstrate more youthful cognition and memory in response to the proper nutrients. Cognitex® provides the following brain boosting ingredients in one advanced formula:

- **Alpha-glyceryl phosphoryl choline** boosts levels of acetylcholine, a neurotransmitter that enables brain cells to communicate and is intimately involved in memory and learning. Acetylcholine levels markedly decline as humans age past 30.

- **Vinpocetine** enhances circulation, oxygenation, and electrical conductivity of brain cells.

- **Uridine-5‘-monophosphate** is a compound naturally found in the milk of nursing mothers and is essential to humans when brains are the youngest. UMP also supports superior cognitive function in aging adults.

- **Wild blueberry extract** has been shown to inhibit oxidative and inflammatory changes in brain cells believed to be involved in memory decline.

- **Hops and rosemary** have all been shown to help suppress inflammatory cytokines.

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

- **DHA** combines with phosphatidylserine to form cell membrane structure. The ability of phosphatidylserine to improve cognitive skills has been extensively studied. Sharp PS® Gold is a patented compound of phosphatidylserine and DHA to support normal neuronal cell membrane function and structure.

- **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.

Just three softgels of Cognitex® provide the following nutrients:

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<tr>
<td>Phosphatidylserine-DHA (PS-DHA)</td>
<td>100 mg</td>
</tr>
<tr>
<td>[Sharp-PS® GOLD Conjugated Phosphatidylserine-DHA]</td>
<td></td>
</tr>
<tr>
<td>Pregnenolone</td>
<td>50 mg</td>
</tr>
<tr>
<td>Vinpocetine</td>
<td>20 mg</td>
</tr>
<tr>
<td>Phospholipid-Grape Seed Extract</td>
<td>150 mg</td>
</tr>
<tr>
<td>Wild Blueberry Extract (Vaccinium angustifolium)</td>
<td>150 mg</td>
</tr>
<tr>
<td>Sensoril® Ashwagandha Extract (Withania somnifera)</td>
<td>125 mg</td>
</tr>
<tr>
<td>Uridine-5‘-Monophosphate (disodium)</td>
<td>50 mg</td>
</tr>
<tr>
<td>Proprietary NeuroProtection Complex Blend</td>
<td>125 mg</td>
</tr>
</tbody>
</table>

To order Cognitex® with NeuroProtection Complex, 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.*

**References for most can be found at:**

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WHAT’S INSIDE

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7 LETHAL MISCONCEPTIONS
Many lives could be saved if physicians and patients realized that women require proper blood tests to identify key reversible risk factors before heart attack, stroke, or malignancy strikes.

38 FORGOTTEN BENEFITS OF TAURINE
The amino acid taurine plays an important role in fostering longevity, restoring insulin sensitivity, preventing obesity, and inhibiting arterial thickening.

64 CONFERENCE REPORT: WORLD STEM CELL SUMMIT
At the World Stem Cell Summit scientists report on innovations that include bioengineering of artificial organs and novel stem-cell treatments for heart, spinal cord, and ovarian tissue.

28 CARDIO-PROTECTIVE EFFECTS OF OLIVES
A polyphenol found in olives helps lower blood pressure, prevents formation of arterial plaques, and combats endothelial dysfunction.

50 IMPROVE MUSCLE RECOVERY AFTER EXERCISE
Compounds found in tart cherries help muscles recover after exercise and deliver anti-inflammatory activity comparable to ibuprofen (Advil®) and naproxen (Aleve®).

74 UNIQUE PEPTIDE REJUVENATES SKIN
Studies have shown that the peptide acetyl tetrapeptide-2 increased cellular growth and increased keratin production, resulting in noticeable skin regeneration.