Reverse the Epidemic of Arterial Disease

Weight-Loss Effects of Lactoferrin

European Anti-Aging Conference

Newly Discovered Benefits of Lipoic Acid

Gretchen DuBeau
Protecting Our Health Freedom
**BONE RESTORE**

*With Vitamin K2*

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 available with or without vitamin K2 (MK-7).

The retail price for 120 capsules of Bone Restore is $24. If a member buys four bottles, the price is reduced to $16.50 per bottle. (Item# 01727)

The same Bone Restore formula without vitamin K2 (MK-7) is available as well. The retail price for 120 capsules is $22. If a member buys four bottles, the price is reduced to $14.25 per bottle. (Item# 01726)

### Just four capsules of Bone Restore provide:

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highly Absorbable Calcium</td>
<td>700 mg</td>
</tr>
<tr>
<td>(as DimaCal® dicalcium malate, TRAACS® calcium bisglycinate chelate, calcium fructoborate)</td>
<td></td>
</tr>
<tr>
<td>Vitamin D3</td>
<td>1,000 IU</td>
</tr>
<tr>
<td>Vitamin K2 (as menaquinone-7)</td>
<td>200 mcg</td>
</tr>
<tr>
<td>Magnesium (as magnesium oxide)</td>
<td>300 mg</td>
</tr>
<tr>
<td>Boron (calcium fructoborate as patented FruiteX B® OsteoBoron®)</td>
<td>3 mg</td>
</tr>
<tr>
<td>Zinc (as zinc amino acid chelate)</td>
<td>2 mg</td>
</tr>
<tr>
<td>Manganese (as amino acid chelate)</td>
<td>1 mg</td>
</tr>
<tr>
<td>Silicon (from horsetail extract)</td>
<td>5 mg</td>
</tr>
</tbody>
</table>

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.

FruiteX B® and OsteoBoron® are registered trademarks of VDF FutureCeuticals, Inc. U.S. patent #5,962,049. DimaCal® and TRAACS® are registered trademarks of Albion Laboratories, Inc. Malate is covered by U.S. Patent 6,706,904 and patents pending.

Fruitex B® and OsteoBoron® are registered trademarks of VDF FutureCeuticals, Inc. U.S. patent #5,962,049. DimaCal® and TRAACS® are registered trademarks of Albion Laboratories, Inc. Malate is covered by U.S. Patent 6,706,904 and patents pending.

To order Bone Restore, call 1-800-544-4440 or visit www.LifeExtension.com
30 WEIGHT LOSS BENEFITS OF LACTOFERRIN  
Well known for its healthy immune benefits, lactoferrin has been found to help shed body fat by inhibiting fat synthesis and stimulating liberation of stored body fat (lipolysis).

38 BLOOD TEST THAT MAY SAVE YOUR LIFE  
Once considered only a marker for inflammation, C-reactive Protein (CRP) now turns out to be a cause of inflammation and associated diseases. A simple CRP blood test can help lower one’s risk of heart disease, cancer, and diabetes.

50 LIPOIC ACID PRESERVES MITOCHONDRIAL FUNCTION  
Pharmaceutical companies are spending huge resources to develop a patentable version of the natural compound lipoic acid. This nutrient protects vital cellular energy and shields against diabetes, obesity, cardiovascular disease, and neurodegeneration.

62 FIGHTING FOR YOUR HEALTH FREEDOM  
The Alliance for Natural Health USA aggressively lobbies Congress to protect your free access to natural health and guard against the influence of Big Pharma. With numerous legislative and legal victories, ANH-USA remains vigilant in protecting dietary supplements against government censure.

72 PROBIOTICS PROTECT AGAINST CHRONIC DISEASE  
Researchers have discovered that probiotics promote not only healthy digestion but also protect against autoimmune disorders, metabolic syndrome, immune senescence, chronic fatigue syndrome, and non-alcoholic fatty liver disease.

86 EXCLUSIVE CONFERENCE REPORT  
At the European Congress on Biogerontology, an international group of scientists presented cutting-edge research on aging, including findings on longevity epigenetics, rejuvenation of the immune system, the dangers of CMV infection, and calorie restriction.

200,000 AMERICANS DIE NEEDLESLY EACH YEAR  
In 2013, the Centers for Disease Control reported that nearly 200,000 avoidable deaths occur each year in the United States from vascular diseases. The CDC described simple changes that can slash risk factors before heart attack or stroke strikes. Life Extension® points out that even more lives could be spared with vigilant annual blood testing.

97 BOOK REVIEW  
In his new book, Vice-President Dick Cheney discusses how his smoking and horrific eating habits lead to chronic heart disease and his near-death. Written with Jonathan Reiner, MD, Heart: An American Medical Odyssey chronicles Cheney’s 40-year struggle with heart disease and the life-saving innovations of modern medicine.
**CYTOKINE Suppress™ with EGCG**

For Balanced Inflammation Control

Inflammation is a natural process that affects every cell and organ in the body. As we age, maintaining a balanced inflammatory response becomes increasingly critical to guarding our whole-body health.1-3

Fortunately, there's something we can do to support this process at a deep molecular level. **Cytokine Suppress™ with EGCG** provides two natural food ingredients—long used in traditional Asian cuisine and medicine—that have the ability to promote a healthy inflammatory immune response.4-6

Key constituents found in mung beans and green tea support the natural process of the immune system's inflammatory activity. This potent benefit is delivered by the novel flavonoids and other molecules found primarily in the seed coat of the mung bean,4,5 and the compound EGCG (epigallocatechin-3-gallate), the major beneficial component in green tea.5

Acting together, these mung bean and green tea compounds help regulate levels, among those within the normal range, of a protein molecule known as HMGB1.4-6 This molecule is responsible for controlling the signaling compounds known as cytokines that generate inflammation.8,9

The result of this beneficial modulatory support is a healthy and balanced inflammatory response—which is particularly important as we age. **Life Extension® Cytokine Suppress™ with EGCG** supports healthy inflammatory levels.4-6,8,9

The suggested daily dosage of one vegetarian capsule of **Life Extension® Cytokine Suppress™ with EGCG** provides:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cytokine Suppress™ mung bean extract (coat) (providing 24 mg vitexin, 24 mg isovitexin)</td>
<td>240 mg</td>
</tr>
<tr>
<td>Epigallocatechin gallate (EGCG) [from green tea extract (leaf)]</td>
<td>300 mg</td>
</tr>
</tbody>
</table>

A bottle of 30 vegetarian capsules of **Life Extension® Cytokine Suppress™ with EGCG** retails for $30. If a member buys four bottles, the price is reduced to $20.25 per bottle.

To order **Life Extension® Cytokine Suppress™ with EGCG**, 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
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Broad Spectrum Benefits of

APPLE POLYPHENOLS

The benefits of plant polyphenols are well known to health enthusiasts. These natural plant constituents block oxidative damage that leads to inflammation and accelerated biological aging of tissues.¹

Recent studies by three separate laboratories have concluded that polyphenols extracted from apples extend life span in laboratory models by up to 12%.²

Unique Polyphenols

Apples, and especially their skin, are rich in an array of polyphenols. One particular major bioactive polyphenol, phloridzin, found in the skin of the apple, has been shown to act as a powerful agent against glycation and other destructive processes in the body. Phloridzin also regulates cell to cell signaling³ and supports healthy glucose levels in those already within normal range by inhibiting the glucose-6-phosphatase enzyme.⁴,⁵

Broad Spectrum Benefits

Apple polyphenols can slow triglyceride absorption from the intestine by blocking pancreatic lipase, an enzyme specifically required to break down triglyceride fats.⁶,⁷ Additional research has shown that apple polyphenols can increase the protective antioxidant molecule paraoxonase by as much as 23%, thereby inhibiting lipid peroxidation and inflammatory factors.⁸

Along with phloridzin, apples contain chlorogenic acid. Chlorogenic acid supports healthy glucose levels in those already within normal range by inhibiting the glucose-6-phosphatase enzyme.⁴,⁵ and by increasing some cellular mechanisms that are stimulated by insulin in liver cells.⁹

The Ultimate Form of Apple Polyphenols

AppleWise Polyphenol Extract is extracted from the highest quality organically grown apples. Each 600 mg vegetable capsule contains 300 mg apple polyphenols.

A bottle containing 30 600 mg vegetarian capsules of AppleWise Polyphenol Extract retails for $21. If a member buys four bottles, the price is reduced to $14.25 per bottle. Item #01625.

Consumer note: Members taking supplements providing standardized pomegranate and coffee bean extracts, along with anti-glycating nutrients like carnosine, benfotiamine and pyridoxal-5-phosphate may be deriving similar benefits of apple polyphenols.

References

To order AppleWise Polyphenol Extract 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.
The **Centers for Disease Control and Prevention** (CDC) deserve a level of respect that does not exist with most bureaucracies.

When the first cases of AIDS were reported in the United States in 1981, the CDC knew this country faced a contagious disease crisis and took action.

Despite interference by other government agencies, the CDC persisted with meticulous research. Within **18 months** the CDC identified **all** the major risk factors for acquired immune deficiency syndrome (AIDS).¹

The **Food and Drug Administration** (FDA), on the other hand, responded by organizing **armed raids** against those who sought novel ways to prevent the immune deficits that were ravaging AIDS patients.² **Life Extension** was one victim of these police-state actions. We were fortunate that our early recommendations were vindicated before the FDA could incarcerate us.³ ⁴ ⁵

In **2013**, the CDC released a report estimating that nearly **200,000 avoidable deaths** occur **each** year in the United States from heart disease, stroke, and hypertensive disorders.⁶

According to the CDC, prevention of vascular disease can be as simple as following the “ABCS”, which stands for: **aspirin, blood pressure control, cholesterol management**, and **smoking cessation**.⁷ **Life Extension** does not question the accuracy of this CDC report. We in fact believe it to be **understated**. Our concern is that the CDC report contains **omissions** about **other** preventable causes of **vascular disease** overlooked by hurried physicians.

This article will show why the number of needless deaths is **higher** than the CDC estimates and how you can **avoid** being a victim. >
Atherosclerosis is the term used to describe damage and obstruction to the linings of our arteries. When arterial blood flow is impeded or blocked, the result can be death or disability from a stroke or heart attack.

A misconception about atherosclerosis is that it is a modern day scourge caused by unhealthy habits. I’ve heard so-called experts’ claim that people didn’t suffer coronary artery disease in the past because their diets were so natural.

These “experts” had no basis to claim that atherosclerosis is a modern day phenomenon. All they could cite was that few people developed heart disease in the past compared to today. The reason more people weren’t having heart attacks back then was that most died before age 50 from diseases that are now preventable/curable.

A study on this topic published in The Lancet last year attracted worldwide media attention. It documented that mummified human bodies dating back 4,000 years and spanning multiple geographic locations/cultures suffered from clogged arteries.

As Life Extension has long argued, atherosclerosis is a disease of aging that has always been prevalent. It took MRI imaging to document clear signs of heart disease in 34% of mummified humans whose estimated mean age at death was 43 years. Those who died at an estimated mean age of 32 years were less likely to show signs of atherosclerosis.

According to the lead investigator of The Lancet study:

“The fact that we found similar levels of atherosclerosis in all of the different cultures we studied, all of whom had very different lifestyles and diets, suggests that atherosclerosis may have been far more common in the ancient world than previously thought,”

—Randall Thompson, MD

These findings help confirm that atherosclerosis has always been widespread. The encouraging news is that methods to prevent and even reverse it have been validated in modern clinical studies.

What Caused Atherosclerosis In The Mummified Bodies?

In seeking to identify what caused atherosclerosis in the mummified bodies, The Lancet researchers speculated that it could have been the high levels of inflammation these primitive people were exposed to from constant infections and a non-hygienic environment.

People with severe inflammatory conditions (like rheumatoid arthritis and lupus) suffer accelerated atherosclerosis. Multiple studies on normal modern people link chronic inflammation as an independent risk factor for stroke and heart attack.

A study published in late 2013 corroborate this. The investigators reported on a large group of older individuals who were followed for 17 years. Those with the highest levels of inflammatory blood markers were over 3 times as likely to suffer sudden cardiac death as those with the lowest levels.
The recent CDC report did not factor in chronic inflammation as an “avoidable” cause of vascular-related death.\(^1\) That’s just one reason why the CDC’s number of avoidable deaths is an underestimate of how many lives could be spared.

It’s comforting to live in an era where chronic inflammation can be identified with blood tests and corrective actions taken to suppress elevated inflammatory markers.

**Why Is Atherosclerosis So Common?**

We know that excess dietary intake of the wrong kinds of fats and sugars damages our arterial lining, as does tobacco smoke.\(^{18-23}\) Overlooked is the continuous toxic exposure arteries bear to cellular waste products that are released into our bloodstream for filtration and excretion primarily through the kidneys.\(^{24}\)

Most of us are born with a flawlessly intact endothelium that lines our arteries and protects against formation of atherosclerosis. As we age, our arterial lining endures chronic insult from internal and external factors that results in loss of blood flow to the heart, kidneys, and brain. This is the leading reason why most aging people today become disabled and then prematurely die.

Those who understand the many causes of atherosclerosis should not be surprised it is so common. What’s appalling is the number of people who continue to succumb to atherosclerotic diseases because of widespread physician apathy and ignorance.

**Endothelial Dysfunction: The Villain Behind Atherosclerosis**

Multiple culprits initiate and promote atherosclerosis. They share in common an ability to damage the delicate endothelium that lines our vascular systems.\(^{25}\)

An early step in the initiation of atherosclerosis is often reduced nitric oxide bioavailability that initiates endothelial dysfunction.\(^{26}\) Aging results in further impairment in the ability to synthesize endothelial nitric oxide that markedly accelerates atherosclerosis.\(^{27,28}\)

We are grateful to the many scientists who have conducted research showing that consumption of plant polyphenol concentrates (such as those found in pomegranate,\(^{29-31}\) green tea,\(^{32-34}\) and red grapes)\(^{35-39}\) protect nitric oxide production, thus helping to restore youthful function and structure to our endothelial arterial linings.

It is somewhat contradictory, however, for one to gobble down capsule concentrates of pomegranate, green tea, berries, and grapes and then ignore other proven factors that silently destroy endothelial function.

Elevated glucose,\(^{40-42}\) insulin,\(^{43-45}\) triglycerides,\(^{46,47}\) LDL,\(^{48-50}\) homocysteine,\(^{51-53}\) C-reactive protein,\(^{54-56}\) oxidative stress,\(^{57-59}\) along with low HDL\(^{60-62}\) and low testosterone\(^{63,64}\) (in men) inflict their own unique forms of endothelial damage. It is thus critical to have one’s blood tested annually to ensure that none of these destroyers of endothelial integrity get out of safe ranges.
Elevated homocysteine has been linked to atherosclerosis via several toxic mechanisms.65-69 A few years ago, some studies questioned whether modestly-elevated homocysteine was really a health concern. Life Extension has published extensive information on the dangers of homocysteine as well as rebuttals to studies that the media portrayed in a highly misleading way.70-74

There is now a controversy in the mainstream as to what blood level of homocysteine really poses a vascular disease risk. Children who have a genetic defect that causes extremely high homocysteine levels show signs of impaired endothelial function as early as age 4.75

The question is what blood level of homocysteine should typical aging people strive for. The mainstream defines elevated homocysteine (called hyperhomocysteinemia) as greater than 15 micromoles per liter of blood.76 Other studies suggest that keeping homocysteine far below 15 is advisable.76

High homocysteine is associated with increasing age, consumption of animal protein, smoking, postmenopausal state, sedentary lifestyle, decreased kidney function, deficiencies of B-vitamins or with certain genetic abnormalities.77-83

Failure to test homocysteine blood levels can leave one vulnerable to silent vascular damage and increased dementia risks.76

When one understands the mechanisms by which homocysteine inflicts cellular damage, the importance of keeping it in lower ranges becomes abundantly clear.

How To Slow And Reverse Atherosclerosis

Scientists long ago documented the ability of HDL (high-density lipoprotein) to remove cholesterol affixed to arterial walls and transport it to the liver for safe disposal.

This is why it is so important to maintain HDL levels above 50 mg/dL of blood and follow steps Life Extension has outlined to ensure optimal reverse cholesterol transport of lipids away from the arterial wall.124

HDL does more than just cleanse arterial walls of plaque. It also protects LDL against oxidation, while inhibiting chronic inflammation, vascular adhesion molecules, and platelet activation—all factors that can lead to atherosclerosis.125-130

For HDL to perform its vital functions, an enzyme called paraoxonase-1 (PON-1) is attached to its surface.130,131 Aging and poor diet result in a marked decline in PON-1 levels, thereby reducing the ability of HDL to protect against heart attack and stroke.132,133 This phenomenon helps explain the onset of accelerated atherosclerosis; where within a period of only a few years, an aging person’s healthy arteries rapidly occlude with plaque.

The age-related reduction in PON-1 may also explain studies showing that statin drugs lose their benefit in certain aging populations, since the effects of statins are no longer sufficient to protect against the multiple factors involved in the development of atherosclerosis in the elderly.134,135

PON-1 is anchored to the surface of HDL and is emerging as a formidable defense against atherosclerosis.130,136,137 Pharmacological companies would pay a king’s ransom for a drug that elevates PON-1 levels in the body. Fortunately, scientists have discovered low-cost natural methods (such as pomegranate and resveratrol) to elevate PON-1 and unleash its full antioxidant and anti-inflammatory power.138-142

In studying the effects of pomegranate alone over a one-year period, studies using human serum revealed an 83% increase in PON-1 activity and a 90% decrease in oxidized LDL. These same patients showed reversal in clinical measurements of atherosclerosis such as carotid artery narrowing.143
Homocysteine Damages The Brain

Solid evidence connects the reduced cerebral blood flow with higher Alzheimer’s risk as well as its rapid progression.84-86

A study published in 2013 showed that people with homocysteine levels of 25.5 micromoles/L and higher were almost 4 times as likely to have severe shrinkage of the brain’s temporal lobe and had almost 5 times the risk for a severe brain white matter abnormality.87 This brain damage places people at increased risk of stroke, dementia, and death.88 This study is corroborated by previous studies showing brain benefits when B-vitamins are used to suppress homocysteine.89

The devastating impact that elevated homocysteine has on the brain alone should motivate maturing individuals to check their homocysteine blood level and take appropriate actions to suppress it if elevated.

Fortunately, most people can reduce elevated homocysteine levels by ensuring proper intake of folic acid, vitamin B12, and vitamin B6.90-92

A fatal assumption we have observed in people taking multivitamins is they assume their homocysteine levels are being adequately suppressed. Only a blood test can verify that homocysteine levels are in the safe ranges.

Low Testosterone Associated With Higher Vascular Risk

Testosterone levels are high in young men, but plummet during aging.

Low testosterone in men is associated with excess abdominal fat,93,94 loss of insulin sensitivity,95,96 atherosclerosis,97,98 and increased incidence of cardiovascular disease.99

A review of data gathered between 1970 and 2013 provided further evidence that low testosterone in men may be linked to a higher risk of developing or dying from cardiovascular disease.100

Another 2013 study confirmed the increase of metabolic syndrome in men that are testosterone deficient.101 Metabolic syndrome is a cluster of cardiovascular risk factors that include insulin resistance, hypertension, elevated triglycerides/LDL and low HDL.102

This stream of favorable data is causing testosterone prescriptions to surge. From 1994 to 2004, prescription sales of testosterone increased by 500%.103 We believe they have grown substantially more than that since then, especially when considering that sales of low-cost compounded testosterone creams are not easily counted in the official statistics.

It is regrettable that despite compelling findings of profound efficacy, some conventional doctors still question the value of testosterone replacement in maturing men. This oversight is causing too many needless heart attacks.

For nearly 20 years, Life Extension has urged its male members to restore testosterone levels to youthful ranges. We have written meticulous rebuttal to media attacks that question the value of properly-prescribed natural testosterone.
George W. Bush’s Blocked Coronary Artery

George W. Bush (the younger Bush) may have been the first President to describe his daily health routine that included regular exercise along with a multivitamin, low-dose aspirin, and possibly some fish oil. Former President Bush had annual physical exams by the government’s best doctors.

In August 2013, doctors discovered that a vital coronary artery in George W. Bush was 95% blocked. An emergency stent was inserted to restore blood flow through the occluded artery. According to medical sources, the location and severity of the coronary artery blockage usually causes sudden death and the former President was lucky his doctors caught it in time.105

We are seeking the medical records of President Bush through the Freedom of Information Act, but we are confident that his annual “Presidential” exams did not include the comprehensive blood testing that Life Extension members take each year. As we long ago documented, all it takes is for one independent vascular risk factor to be out of safe range for a heart attack, stroke or kidney failure to ensue.106-108

Vascular disease was the cause of death of former Presidents Franklin Roosevelt, Harry Truman, Dwight Eisenhower, Lyndon Johnson, Richard Nixon and Gerald Ford. Eisenhower suffered horrifically from heart disease for over a decade before dying from congestive heart failure.109,110

In 2004, Bill Clinton underwent open heart surgery to bypass multiple blocked arteries in his heart that would have likely killed him in a few months if not treated.111 He had to undergo follow-up surgery in 2005 to correct a complication caused by his first bypass surgery.112

In 2010, Clinton was rushed to the hospital complaining of chest pains and had two stents implanted to open two new occluded coronary arteries. Clinton regularly exercised, but did little else other than what his conventional doctors prescribed. Clinton’s program obviously failed to protect him from severe and recurring coronary atherosclerosis.113

Dick Cheney’s Multiple Heart Attacks

In this month’s issue, we feature a review of a book authored by former Vice President Dick Cheney.116 Perhaps no living political figure better exemplifies what happens to one’s arteries in response to poor lifestyle choices than Dick Cheney.

Cheney was known for eating outrageous quantities of artery-clogging foods and smoking heavily for 20 years.

Dick Cheney suffered his first heart attack in 1978, when he was only 37. He suffered his second in 1984 and a third in 1988 before undergoing a quadruple bypass surgery to unblock his clogged arteries. His fourth heart attack occurred in 2000. At that time, doctors inserted a stent to open a re-occluded coronary artery.

In 2001, doctors implanted a device to track and control Cheney’s heart rhythm. In 2008, he underwent a procedure to restore his heart to a normal rhythm after doctors found that he was experiencing a recurrence of atrial fibrillation. Despite all this, Cheney...
suffered his fifth heart attack in February 2010.

Dick Cheney has reportedly taken statin drugs for nearly two decades. In June 2001, his LDL was an excellent 72 mg/dL, indicating he was taking a high-dose statin drug. This did not, however, prevent him from suffering another heart attack.

The former Vice President has had access to the best that conventional cardiology can offer, yet his chronic heart ailments did not abate until he received a heart transplant in 2012.

Don’t Be Victimized By Overwhelmed Doctors

We at Life Extension have new members send us their blood test results for our review. It never ceases to amaze us as to how many important blood tests such as C-reactive protein, hemoglobin A1c, homocysteine, and vital hormones are omitted.

Standard blood panels today look at lipids (cholesterol, LDL, HDL, triglycerides) and glucose. If levels of these vascular risk markers are within conventional “reference ranges,” then the patient is told they are fine.

One big mistake that people make is thinking that being in the “reference range” means they are safe. For instance, a doctor may look at your fasting glucose reading of 97 mg/dL and say you have no diabetic problems. If you happen to be over-secreting large amounts of insulin that keeps your glucose suppressed, then you are facing diabetic complications that can adversely impact every part of your body. A hemoglobin A1c test is a far more accurate measure of glucose control. Fasting glucose levels should be below 86 mg/dL and hemoglobin A1c below 5.6%.

With restrictions being placed on healthcare expenditures, aging Americans are being denied the opportunity to protect their circulatory system against atherosclerosis. Doctors facing a surge of newly insured patients under the Affordable Care Act are less able to spend the time to evaluate comprehensive blood test results. It is up to the individual to take charge of their health and longevity by having annual blood tests and following up on any reading that is out of optimal range.

Life Extension’s Common Sense Approach

A meticulous review of the scientific literature reveals a multitude of factors that cause humans to accumulate atherosclerotic plaque. Validated blood markers are available to identify specific vascular risks so that corrective actions can be taken before a heart attack or stroke strikes.

Yet this scientific approach to disease prevention is tragically overlooked by today’s hurried medical establishment.

Life Extension retails a comprehensive Male and Female Blood Test Panel for $400. This is a fraction of the price most commercial labs charge for all of these tests you can see outlined on the next page.

Once a year, we sharply discount the member price of the Male or Female Panels to $199. This enables Foundation members to gain control over their medical destiny and initiate meaningful changes before acute or chronic disease ensues.

With increasing insurance deductibles and co-pays, obtaining

“Despite progress against heart disease and stroke, hundreds of thousands of Americans die each year from these preventable causes of death. Many of the heart attacks and strokes that will kill people in the coming year could be prevented by reducing blood pressure and cholesterol and stopping smoking.”

Tom Frieden, MD, MPH
Director of the Centers for Disease Control and Prevention
I am often asked what are the most important nutrients, hormones or age-delaying drugs to take. My steadfast answer is that I have no idea what is most important for YOU until I see results from a comprehensive blood test panel.

It does little good to protect your body from say oxidized LDL if your homocysteine and C-reactive protein levels are elevated…or you’re unwittingly taking a drug that is slowly destroying your kidneys or liver.

The Male and Female Blood Test Panels provide a wide range of blood markers to reduce the risk that an insidious minor disorder will someday inflict permanent damage in you.

To order these comprehensive blood test panels at the year’s lowest prices, call 1-800-208-3444 today.

For longer life,

William Faloon

a comprehensive Male or Female Panel represents a huge economic value. Discovering correctable disease factors not only spares suffering and premature death, but could save tens of thousands of dollars in medical outlays that may not be covered by health insurance.

How Easy It Is To Get Tested...

You can order the Male Panel or Female Panel at these discounted prices by making one phone call to 1-800-208-3444 (24 hours).

Within a few days you’ll receive a listing of blood drawing stations in your neighborhood. Appointments are usually not necessary, meaning you can have your blood drawn at your convenience.

With today’s modern technology, your results come back fast. If you have any questions, you can phone or email our health advisors 7-days a week.

Elevated Glucose Kills After People Are Hospitalized

Higher hospital admission glucose levels have been shown in several studies to predict increased risk in heart attack patients. Data also suggest that elevated hemoglobin A1c is associated with an increased risk of cardiovascular disease, even in patients without diabetes.

For example, a study published in 2013 showed that combined admission glucose and hemoglobin A1c values were independently associated with adverse clinical outcomes in non-diabetic patients with acute coronary syndrome treated with coronary stents or other interventions.

The take-home message is that glucose need not reach diabetic levels (above 125 mg/dL) to inflict deadly consequences. Optimal fasting glucose levels are below 86 mg/dL.
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
- Estradiol (an estrogen)
- Free and Total Testosterone
- DHEA-S
- 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


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, PA)
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ARE YOU TAKING THE OPTIMAL FORMS OF VITAMIN E?

According to the Proceedings of the National Academy of Sciences, alpha tocopherol (vitamin E) displaces critically important gamma tocopherol in the cells.1 While alpha tocopherol inhibits free-radical production, gamma tocopherol is required to trap and neutralize existing free radicals.2

Prestigious scientific journals have highlighted gamma tocopherol as one of the most critically important forms of tocopherols, which includes d-alpha tocopherol (natural vitamin E) for those seeking optimal health benefits.

Most commercial vitamin E supplements contain little, if any, gamma tocopherol. They instead rely on alpha tocopherol as the primary ingredient. However, it is gamma tocopherol (not the alpha form) that quenches peroxynitrite, the free radical that plays a major role in the development of age-related decline.2,3

SESAME LIGNANS: THE NATURAL VITAMIN E BOOSTER

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

In a human study that combined gamma tocopherol with sesame lignans, gamma tocopherol/sesame was 25% more effective than gamma tocopherol/tocotrienols in suppressing tissue measurements for free-radical and inflammatory damage.4,5 Since tocotrienols are considered nature’s most potent antioxidants, the fact that low-cost gamma tocopherol with sesame is more effective is a remarkable finding.

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

WORLD’S MOST COMPREHENSIVE VITAMIN E FORMULA!

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

The retail price for 60 softgels of Gamma E Tocopherol with Sesame Lignans is $32. If a member buys four bottles, the price is reduced to only $21.75 per bottle.

Each softgel of Gamma E Tocopherol with Sesame Lignans provides:

- Gamma E mixed tocopherol 359 mg
- Gamma tocopherol 197.45-269.25 mg
- Delta tocopherol 71.8-107.7 mg
- Alpha tocopherol 30.52-43.08 mg
- Beta tocopherol <17.95 mg
- Sesame seed lignan extract 20 mg

Contains soybeans.

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

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

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

References

To order Gamma E Tocopherol with Sesame Lignans, call 1-800-544-4440 or visit www.LifeExtension.com

* These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
**Are You Getting Your OMEGA-7?**

PROVINAL® Purified Omega-7 from Highly Purified Fish Oil Supports Healthy Metabolic Factors

**Omega-3s** are already a part of Life Extension® members’ health routines and are recognized for their many benefits. But scientists are increasingly excited about the newly discovered effects of a little known family of “good fats”—omega-7 fatty acids.

Rather than replace omega-3s, the omega-7 fatty acid *palmitoleic acid* has been shown to powerfully complement omega-3s with its unique cellular-signaling properties that directly support healthy metabolic factors associated with:

- Superior *cardiovascular* health,
- Healthy *inflammatory* response,
- Optimum normal metabolism of *glucose* and *insulin*, and
- Beneficial modulation of *hunger* and *satiety*.

**Unique Cellular-Signaling Support**

*Palmitoleic acid* is a monounsaturated omega-7 that has been identified as a *lipokine*—meaning a lipid-controlling hormone—making it an incredibly unique fatty acid.

Scientific studies have shown that the cell-signaling and metabolic support provided by *palmitoleic acid* promotes healthy levels of *triglycerides*, *total cholesterol*, *LDL*, and *HDL* already within normal range—augmenting just one month of 210 milligrams of daily *palmitoleic acid* supplementation.

Studies also show that within normal ranges, palmitoleic acid helps balance *C-reactive protein* levels, a marker of whole-body inflammation; optimizes *insulin sensitivity*; and regulates levels of satiety-promoting and hunger-promoting gastric hormones.

**Advanced Purified Omega-7**

Conventional processing methods result in omega-7 products containing only about 25% of *palmitoleic acid*. But *Provinal® Purified Omega-7* is concentrated to 50% beneficial *palmitoleic acid*. This purifying technique also enables superior *palmitoleic acid* availability.

**Convenient One-Per-Day Dosing**

The suggested daily dosage of one softgel of Provinal® Purified Omega-7 softgel provides:

- **Palmitoleic Acid (Omega-7)** 210 mg
  - *from Provinal® highly refined anchovy and/or menhaden oil* (non-GMO)

A bottle of 30 softgels of Provinal® Purified Omega-7 retails for $27. If a member buys four bottles, the price is reduced to $18 per bottle.

Provinal® is a registered trademark of Tersus Pharmaceuticals, LLC.

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**To order Provinal® Purified Omega-7, 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.*
ULTIMATE PROSTATE PROTECTION

Now With Thymoquinone

At Life Extension®, we continually update our formulas to reflect the latest research findings.

Ultra Natural Prostate formula, now upgraded to include thymoquinone, provides the latest scientifically validated, standardized botanical extracts shown to promote healthy prostate function. No other prostate protection formula provides such a broad array of nutrients to support the multiple factors involved in supporting the aging prostate gland. Here are the ingredients in the new Ultra Natural Prostate formula:

- **Thymoquinone** targets prostate cells to promote healthy apoptosis (orderly removal of senescent cells). 1,9
- **Standardized lignans** convert to enterolactone in the intestine, which is then absorbed into the bloodstream to provide support for prostate cells against excess estrogen levels. 10-12
- **AprèsFlex™**, supports normal inhibition of 5-lipoxygenase or 5-LOX, an enzyme that is associated with undesirable cell division changes. 13,14
- **Stinging and Dwarf nettle root extracts** help support prostate cells against excess estrogen levels. 15,16
- **Saw Palmetto CO2 extract** helps inhibit dihydrotestosterone (DHT) activity in the prostate, helps support normal urinary flow, and helps regulate inflammatory reactions in the prostate. 17-20
- **Pygeum (Pygeum africanum)** extract helps suppress prosta-glandin production in the prostate and supports healthy urination patterns. 21,22
- **Pumpkin seed oil**, from select pumpkins, enhances the composition of free fatty acids and augments saw palmetto’s benefits. 23,25
- **Beta-sitosterol** enhances the protective effects of other botanical extracts and helps improve quality of life. 26-28
- **Graminex® Flower Pollen Extract™** provides such a broad array of nutrients to support the standardized botanical extracts shown to promote healthy prostate size and structure. 29-31
- **Proprietary EnteroLactone Precursors Blend** (HMRlignan™ Norway spruce (Picea abies) (knot wood) and Flax (seed) lignan extracts)
- **Lycopene** [from natural tomato extract (fruit)]
- **Boron** (as Albion® bororganic glycine) 3 mg

The suggested daily dose of two softgels of Ultra Natural Prostate provides:

- Saw Palmetto CO2 extract (fruit) [providing 272 mg total fatty acids] 320 mg
- Graminex® Flower Pollen Extract™ (from rye) 252 mg
- Stinging and Dwarf nettle extracts (root) 240 mg
- Beta-Sitosterol (from pine) 180 mg
- ThymoQ™ Phospholipid Complex [Phospholipids, thymoquinone (10 mg)] 170 mg
- Pygeum extract (bark) 100 mg
- Pumpkin seed oil [providing 170 mg total fatty acids] 200 mg
- AprèsFlex® Indian frankincense (Boswellia serrata) extract (gum resin) [providing 14 mg AKBA1] 70 mg
- Proprietary EnteroLactone Precursors Blend (HMRlignan™ Norway spruce (Picea abies) (knot wood) and Flax (seed) lignan extracts) 20 mg
- Lycopene [from natural tomato extract (fruit)] 10 mg
- Boron (as Albion® bororganic glycine) 3 mg

A bottle of 60 softgels of Ultra Natural Prostate retails for $38. If a member buys four bottles, the price is reduced to $26.25 per bottle. If a member buys 12 bottles, the price is $24.

Contains soybeans.

AprèsFlex® is a registered trademark of Lafe Nutraceuticals exclusively licensed to PL Thomas - Luke Nutra LLC, U.S. Patent No. 8,531,496 and other patents pending. HMRlignan™ is a trademark used under sublicense from Linnea S.A. US Patents 6,319,524 and 6,669,968. Albion® is a registered trademark of Albion Laboratories, Inc.

To order Ultra Natural Prostate, call 1-800-544-4400 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.
Low-Dose Aspirin Reduces Risk Of Dying Among Heart Failure Patients By 42%

In an article published recently in the journal *Circulation: Heart Failure*, researchers from Ireland report a survival benefit for low-dose aspirin among heart failure patients.*

The study evaluated 1,476 men and women enrolled in a heart failure disease management program. Aspirin was prescribed to 892 subjects, among whom 828 were recommended a low dose of 75 milligrams per day. Over a follow-up period of up to twelve years (median of 2.6 years), 464 deaths occurred.

Subjects who used low-dose aspirin had a 42% lower adjusted risk of dying over follow-up and 30% lower risk of being hospitalized for heart failure in comparison with non-aspirin users.

Those who used high-dose aspirin experienced a risk of dying similar to those who did not use the drug.

**Editor’s Note:** Authors Margaret Bermingham and her colleagues observe that in recent trials that identified a greater risk of cardiovascular and heart failure events in aspirin users in comparison with those who used the anticoagulant drug warfarin, the dose of aspirin ranged from 162 to 335 milligrams per day, which is much higher than the low dose commonly used in Europe. They remark that the current findings “challenge the belief that aspirin should be avoided in secondary prevention patients who go on to develop heart failure” and go on to suggest that patients on higher antiplatelet doses of aspirin may benefit from aspirin dose reduction.

—D. Dye

* *Circ Heart Fail.* 2014 Feb 3.

Dietary Supplements Part Of A Healthy Lifestyle

A review published in *Nutrition Journal* concludes that, rather than compensating for poor eating habits and a lack of exercise, the use of nutritional supplements is part of an overall healthy lifestyle among the majority of those who use them.*

“Compiling the available data on the health habits of dietary supplement users, we gained a sharper insight into the positive lifestyle choices of this large segment—one half to two-thirds—of the American population that takes supplements,” remarked coauthor Annette Dickinson, PhD. “Evidence from numerous surveys shows that dietary supplement users are more likely than non-users to adopt a number of positive health-related habits such as consuming healthier diets, exercising regularly, maintaining a healthy body weight, and avoiding tobacco products.”

“Dietary supplement users typically make healthful habits part of each day, and many stick with their supplement regimen for years,” added coauthor Douglas McKay, ND.

**Editor’s Note:** Drs. Dickinson and McKay found that reliance upon food alone to receive one’s nutrients resulted in intake levels below the Estimated Average Requirement for many nutrients. This status was improved by 50% by the consumption of enriched and fortified foods, and was further improved by supplementation.

—D. Dye

* *Nutr J.* 2014 Feb 6;13(1):14.
Meta-Analysis Affirms Association Between Omega-3 Fatty Acid Supplementation And Lower Markers Of Inflammation

The results of a meta-analysis published in *PLoS One* contribute further evidence of an anti-inflammatory benefit for supplementation with marine-derived omega-3 fatty acids EPA and DHA.* Researchers selected 68 randomized trials that examined the effects of omega-3 fatty acids in a total of 4,601 participants. The trials involved subjects with chronic autoimmune disease, chronic non-autoimmune disease, or healthy participants.

A pooled analysis of all subjects confirmed a significant association between omega-3 fatty acid supplementation and decreased blood levels of C-reactive protein (CRP) and interleukin-6 (IL-6), which are markers of inflammation. Among those with chronic non-autoimmune disease, a greater reduction in blood levels of IL-6 and tumor necrosis factor-alpha (another marker of inflammation) was observed in association with a longer duration of supplementation. A similar relationship was observed for IL-6 among healthy participants.

Editor’s Note: When studies that utilized fish as a source of omega-3 fatty acids were separately analyzed, an association was found for a decrease in interleukin-6 with increased intake, but unlike fish oil supplements, fish alone did not decrease CRP or tumor necrosis factor.

—D. Dye


Higher Vitamin C Levels Linked To Lower Risk Of Hemorrhagic Stroke

A presentation at the American Academy of Neurology’s 66th Annual Meeting revealed a protective effect for high plasma levels of vitamin C against the risk of hemorrhagic stroke.*

“Scurvy is caused by vitamin C deficiency, specifically a plasma vitamin C concentration of less than 11 micromoles per liter, and may have hemorrhagic manifestations,” write authors Stéphane Vannier, MD, and colleagues. “Vitamin C depletion (less than 38 micromoles per liter) is associated with cardiovascular diseases and could increase intracerebral hemorrhage risk.”

The researchers compared plasma ascorbate levels of 65 acute intracerebral hemorrhage patients with an equal number of control subjects. Subjects with stroke had depleted vitamin C levels averaging 35.3 micromoles per liter, in comparison with the control group, whose levels were normal at an average of 56.2 micromoles per liter. Depleted levels of vitamin C were also associated with longer hospitalization.

Editor’s Note: Hemorrhagic stroke is characterized by bleeding in the brain and, although less common than ischemic stroke, is associated with a greater risk of mortality.

—D. Dye


Creatine Shows Promise In Huntington Disease

A trial conducted at Massachusetts General Hospital has uncovered a benefit for creatine in delaying the symptoms of the inherited neurodegenerative disorder known as Huntington disease in asymptomatic adults.*

The trial included 109 men and women with a family history of Huntington disease, some of whom were aware of carrying a mutated form of the gene that causes the disease. For the double-blinded portion of the trial, half of the participants received a placebo and the remainder received 30 grams creatine per day for six months. This was followed by a 12 month open-label period in which some of the participants who received a placebo were switched to creatine.

At the end of the placebo-controlled phase of the trial, the rate of atrophy in the brain’s cortex and striatum among pre-manifest Huntington disease carriers was slower among those who received creatine than among the placebo group, who experienced progression.

Editor’s Note: This benefit was also observed among presymptomatic subjects who began creatine supplementation after the placebo-controlled phase.

—D. Dye

* *Neurology*. 2014 Feb 7.
Primate Brains Show Omega-3 Benefit

In the Journal of Neuroscience, Oregon Health and Science University researchers report a brain benefit for the omega-3 fatty acid docosahexaenoic acid (DHA) in rhesus macaques.* The study is the first to utilize functional brain magnetic resonance imaging (fMRI) to observe the interaction of multiple brain networks in live monkeys. The research involved rhesus macaques between the ages of 17 and 19 who had been given life-long diets that were low or high in DHA. Damien Fair, PA-C, PhD, and his colleagues found stronger connectivity of early visual pathways in the brains of monkeys given high-DHA diets as well as increased connections within brain networks similar to those found in humans, including those related to cognition and higher-level processing.

"The data shows the benefits in how the monkeys’ brains organize over their lifetime if in the setting of a diet high in omega-3 fatty acids," Dr. Fair concluded.

Editor's Note: Dr. Fair added that, “The data also shows in detail how similar the networks in a monkey brain are to networks in a human brain, but only in the context of a diet rich in omega-3-fatty acids.”

—D. Dye


Young US Workers Benefit From Mediterranean Diet

An article published in the journal PLoS One reveals a protective effect for a Mediterranean diet, characterized by an abundance of fruit, vegetables, whole grain, nuts, fish, and olive oil, against the risk of cardiovascular disease in Midwestern firefighters.* Lifestyle questionnaire responses of 780 male firefighters were scored on their adherence to a Mediterranean-style diet. Subjects whose adherence to the diet was greatest had a 35% lower risk of metabolic syndrome in comparison with men whose adherence was lowest. The group with the greatest adherence also had a 43% lower risk of weight gain over the previous five years, lower body fat percentage, greater high-density lipoprotein (HDL) cholesterol levels and lower low-density lipoprotein (LDL) cholesterol.

“Our study adds more evidence showing the health benefits of a Mediterranean diet, even after adjusting for exercise and body weight,” commented study coauthor Stefanos Kales.

Editor's Note: Metabolic syndrome is a disorder characterized by a cluster of risk factors, including abdominal obesity, disordered lipids, hypertension, and elevated blood glucose, which significantly increases the risk of developing diabetes or cardiovascular disease.

—D. Dye


Better Think Twice Before Adding That Spoonful Of Sugar

The conclusion of a study described recently in JAMA Internal Medicine suggests that adding sugar to the diet could significantly increase the risk of dying from cardiovascular disease, the leading cause of death in the developed world.*

Researchers at the CDC evaluated data from participants in the National Health and Nutrition Examination Surveys (NHANES) of the US population. While 71.4% of adults consumed at least 10% or more of their calories from added sugar during 2005-2010, sugar counted for at least 25% of the calories among 10% of the group. When the researchers examined the association between added sugar and the risk of cardiovascular death over a median 14.6 years of follow-up, subjects whose intake was among the top one-fifth of participants had an adjusted risk that was twice that of participants whose intake was among the lowest fifth.

Editor’s Note: An intake of sugar that accounted for 25% or more of one’s calories was associated with a 2.75 times greater risk of cardiovascular disease mortality in comparison with an intake of less than 10%.—D. Dye

Cinnamon Improves Liver Enzymes And Other Factors In Nonalcoholic Fatty Liver Disease

A recent issue of the journal *Nutrition Research* described the outcome of a trial conducted by Iranian researchers which revealed a benefit for cinnamon in men and women with nonalcoholic fatty liver disease (NAFLD).*

The trial included fifty men and women between the ages of 20 and 65 years with NAFLD. Participants were randomized to receive two 750 milligram capsules of cinnamon or a placebo daily for twelve weeks. Blood samples collected before and after the treatment period were analyzed for fasting blood glucose, lipids, liver enzymes, and C-reactive protein, a marker of inflammation.

Among those who received cinnamon, a significant reduction in glucose, total cholesterol, insulin resistance, triglycerides, C-reactive protein, and liver enzymes occurred, while remaining relatively unchanged among those who received a placebo.

*Editor's Note:* Nonalcoholic fatty liver disease includes steatosis, nonalcoholic steatohepatitis (NASH), fibrosis, cirrhosis, and hepatocellular carcinoma, and can result in death if left untreated.

—D. Dye

* *Nutr Res.* 2014 Feb;34(2):143-8.

Too Much Sitting Linked To Major Disability For Those Over Age 60

A team of researchers from Northwestern University's Center for Healthcare Studies became the first group to identify sedentary behavior as an independent risk factor for disability in performing activities of daily life (ADL) such as eating, getting in and out of bed, and bathing.* “This is the first time we’ve shown sedentary behavior was related to increased disability regardless of the amount of moderate exercise,” said Dorothy Dunlop, lead author of the study.

Study participants included 2,286 adults aged 60 and older from the National Health and Nutrition Examination Survey. Participants wore an accelerometer (a device that measures physical activity) for at least four days and underwent a physical exam.

Participants spent almost 9 hours a day being sedentary during waking hours and 3.6% reported ADL disability. The odds of ADL disability were 46% greater for each daily hour spent in sedentary behavior even after being adjusted for moderate-vigorous activity, socioeconomic status, and other health factors. This study revealed a strong relationship between increased sedentary behavior and the presence of ADL disability, independent of moderate or vigorous activity.

*Editor's Note:* To cut down on sitting time, the study authors suggest standing up when you talk on the phone and standing up during meetings. They also suggest parking in a space far away from the grocery store or mall, and when you get up to have a glass of water; they say you should take a walk around the house or office. Also, they suggest people take the stairs instead of an elevator whenever possible.

—A. Pryce

* *J Phys Act Health.* 2014 Feb 5.
Critical Importance of Mitochondria

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.1,4

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.3 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.

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

- **Antioxidant power.**
- **Favorably modulates gene expression.**
- **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 CoQ10.15,16 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.9

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.16

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. (Item #01647)

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 #01506)

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

References


To order PQQ Caps with BioPQQ® standalone or any other PQQ-containing formula call 1-800-544-4440 or visit www.LifeExtension.com
The consequences of sleep deprivation go far beyond fatigue and diminished performance. Sleep deprivation can impact the immune system, the nervous system, memory and cognitive impairment, mood, and more.1

Ultimately, lack of sleep leads to an overall poor quality of life.

If you’re one of the more than 20 million Americans who suffer from occasional sleep problems,6 you don’t have to settle for frustrating nights of tossing and turning.

A new, fast-acting LIQUID melatonin may enable you to…

TAKE BACK CONTROL OF YOUR SLEEP!

Melatonin is well known for its ability to regulate your body’s internal clock. However, as you grow older, the secretion of melatonin declines significantly as the pineal gland becomes calcified.3,4

Fortunately, melatonin has been studied and shown to be effective for managing disturbances in circadian rhythms.5,6

A meta-analysis of 17 studies concluded that melatonin supplementation decreases the time it takes to fall asleep while increasing sleep efficiency and total sleep duration.7

In fact, melatonin has been shown to increase the speed of falling asleep—and the quality of sleep—in about 60% of people who use it.8,9

MELATONIN LIQUID DROPS!

Not all people benefit from melatonin when it’s in the form of a capsule or tablet. However, some report that by applying melatonin liquid drops under their tongue at bedtime for immediate absorption, they are able to sleep better. While any kind of liquid melatonin has been reported to work, Life Extension has developed melatonin liquid drops that are completely free of sugars.

This soothing Fast-Acting Liquid Melatonin has a great tasting natural citrus vanilla flavor and is quickly absorbed for a restful night’s sleep.

An increase in age doesn’t have to mean an increase in sleep problems. Consider making Liquid Melatonin a part of your healthy sleep program.

The retail price for 1 bottle of Fast Acting Liquid Melatonin is $12. If a member buys 4 bottles, the price is reduced to $8.25 a bottle. Seven drops provide about 1 mg of melatonin and there are approximately 1,180 drops in each bottle. Most people place one to two full eyedroppers under their tongues at night which provides 3 to 6 mg of melatonin.

WHY WE NEED SLEEP

Decades of clinical research document that a good night’s rest supports nearly all systems of the body, including:

- Skin health and youthful appearance10,11
- Healthy collagen formation12
- Insulin levels already within normal range13,14
- Healthy body weight15,16
- Glucose levels already within normal range17,18
- Blood pressure already within normal range19,20
- Healthy cell division20
- Cardiovascular health20,21
- A good mood22

References

1. Available at: http://www.webmd.com/sleep-disorders/features/importantsleep-habits
A high percentage of men will endure some form of prostate-induced discomfort over the course of their lifetimes.¹

A placebo-controlled, double-blind trial presented September 2013 reported that a specific blend of pomegranate, green tea, turmeric, and broccoli—formulated together in a capsule called Pomi-T—powerfully maintained healthy levels of prostate specific antigen (PSA).²

Life Extension® offers this same capsule for men who are serious about supporting and protecting their prostate as they age—by targeting PSA. The four foods in Pomi-T have healthful benefits for your entire body. But their constituent molecules, naturally present in food, have now been shown to concentrate within prostate tissue and provide a rich array of complementary, prostate-supporting, PSA-modulating mechanisms.³-¹⁹

POMEGRANATE
- Specifically concentrates in prostate tissue³
- Supports healthy apoptosis, your body’s system of removing senescent cells when needed⁴-⁶
- Promotes healthy levels of inflammatory response, inhibits androgen receptor expression, and inhibits abnormal cell migration.⁸⁻¹⁵

GREEN TEA
- EGCG, a green tea catechin, specifically concentrates in prostate tissue where it regulates PSA (prostate specific antigen) production to maintain healthy PSA levels⁵,¹⁰
- Helps modulate genetic expression and activity of androgen receptors¹¹
- Supports body’s natural defenses against oxidation.¹²

TURMERIC
- Promotes a healthy level of inflammatory response, chiefly due to its main component, curcumin¹³
- Helps modulate cell signaling mechanisms, inhibiting abnormal cell adhesion and migration.¹⁴
- Promotes healthy cell proliferation and apoptosis.¹⁵

BROCCOLI
- Helps regulate enzymes (phase II detoxifying enzymes) in gut and liver tissue that helps render harmful dietary molecules harmless¹⁶
- Helps promote healthy PSA levels¹⁷
- Supports regulation of cell growth and transcription factors and normal production of apoptosis-inducing proteins¹⁸,¹⁹

The novel and scientifically validated blend of food in Pomi-T represents the next generation of targeted support for the aging prostate!

The suggested daily dosage of two vegetarian capsules of Pomi-T provides:

Pomi-T® Super Foods Proprietary Blend 960 mg
Broccoli (florets and stalks) powder, Turmeric (root) powder, Pomegranate (whole fruit) powder, and Green Tea (leaf) extract 5:1

A bottle of 60 vegetarian capsules of Pomi-T retails for $33.33. Members of the Life Extension Foundation pay only $25 per bottle.

To order Pomi-T®, 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.
Lactoferrin is well known for its immune-supportive properties. Surprising new research is uncovering an unexpected benefit—that lactoferrin might help humans *shed body fat* as well.

Lactoferrin’s ability to reduce body fat was first discovered at the cellular level. In these studies, researchers found that lactoferrin can help fight against obesity by inhibiting the accumulation of fat in fat cells and by inhibiting the formation of new fat cells (a process called *adipogenesis*).
A follow-up study investigating the molecular mechanism behind these results showed that lactoferrin works by inhibiting fat synthesis and stimulating liberation of stored body fat (a process called lipolysis). These are important findings with direct relevance for the well-documented expanding waist lines in Americans of all ages, and its ensuing detrimental health consequences.
**Lactoferrin For Fat Loss**

The potential anti-obesity effect of lactoferrin was confirmed in obese mice, when researchers found that a lactoferrin-rich diet resulted in increased fat loss.\(^{14}\) Another study in mice found that a lactoferrin-rich whey protein isolate prevents obesity by inhibiting weight gain, and fights obesity by enhancing fat loss.\(^{15}\)

During spontaneous feeding (when mice were not calorie restricted), the lactoferrin-rich whey protein isolate prevented weight gain and fatty liver formation. During a calorie-restricted diet, the lactoferrin-rich whey protein isolate enhanced fat loss.\(^{15}\)

New research is showing that lactoferrin might help humans shed body fat as well. One indicator is that higher blood levels of lactoferrin are associated with lower BMI (body mass index, an indicator of obesity), lower waist-to-hip ratio, and lower fasting triglyceride (blood fat) and glucose concentrations.\(^{16,17}\)

A number of studies confirm this finding as well. In one notable study, healthy men and women between 22 and 60 years old supplemented with 300 mg of lactoferrin tablets a day for 8 weeks.\(^{18}\) Subjects were told to maintain their regular food habits. Compared to the placebo group, the group taking the lactoferrin supplement experienced a significant 12.3% reduction in intra-abdominal (visceral) fat.\(^{18}\) The lactoferrin group also showed significant decreases in body weight (-3.3 lb), BMI (-0.6), hip circumference (-1 inch), and waist circumference (-1.7 inches). The placebo group, on the other hand, gained 2.2 pounds.

The researchers concluded that lactoferrin appears to be a promising supplement for counteracting the accumulation of belly fat.

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**Another Fat Fighting Target Of Lactoferrin**

Another way lactoferrin can help in the fight against obesity and its associated metabolic and cardiovascular complications is by decreasing the risk of a condition called **metabolic endotoxemia**.

Metabolic endotoxemia is a condition characterized by two- to three-fold increases in blood lipopolysaccharide (LPS) levels.\(^{19,20}\) Lipopolysaccharide is an endotoxin, a toxin produced by certain bacteria.\(^{19}\)

Unhealthy food habits (like the typical Western diet high in fat and processed foods, and low in fiber) increase the production, absorption, and blood levels of lipopolysaccharide (LPS), which in turn increase the risk of metabolic endotoxemia.\(^{19,21}\)

This is important because elevated blood levels of lipopolysaccharide and metabolic endotoxemia can result in **insulin resistance** and obesity.\(^{19,22}\) In addition, metabolic endotoxemia produces low-grade inflammation that can damage many organs in the body.\(^{22-25}\)

By binding to and sequestering lipopolysaccharide,\(^{26,27}\) lactoferrin and its metabolites help prevent the development of metabolic endotoxemia and can help relieve an already established metabolic endotoxemia condition.

Metabolic endotoxemia represents a molecular link between obesity and the diseases related to it.

Further evidence for the involvement of metabolic endotoxemia in the development of obesity is the finding that it directly stimulates the formation of new fat cells.\(^{28}\) Thus, lactoferrin might inhibit new fat cell formation via several different mechanisms.\(^{3,4}\)
Lactoferrin’s Role As A Prebiotic

In addition to fighting obesity and protecting against metabolic endotoxemia, lactoferrin also has a number of actions that contribute to a healthy gut.

First, it inhibits the growth of bacteria that produce bacterial toxins, such as *Listeria*, *Staphylococcus*, *Salmonella*, *Clostridium*, and *Escherichia coli*.\(^{29-33}\) Research has shown that lactoferrin supplementation reduces both intestinal levels of toxins (such as lipopolysaccharide) produced by bacteria, protects against lipopolysaccharide-induced immune cell stress, and down-regulates production of harmful reactive nitrogen species.\(^{34,35}\)

Lactoferrin stimulates the growth of several strains of good bacteria in the gut, such as various species of *Bifidobacteria*.\(^{36-38}\) A recent study found that digestion of lactoferrin in the stomach releases a peptide that has an even stronger bifidogenic (bifidobacteria growth promoting) effect than intact lactoferrin.\(^{39}\) Lactoferrin also stimulates the growth of *Lactobacillus acidophilus*.\(^{37}\) Since Lactobacilli and Bifidobacteria both promote a healthy gut flora, this might provide an even greater health benefit.\(^{40,41}\)

Lactoferrin Helps Prevent Osteoporosis

There is a growing interest in the scientific community regarding the potential therapeutic use of lactoferrin in osteoporosis. In fact, a number of recent studies have found that lactoferrin supplementation improved bone mineral density and bone strength.\(^{42}\)

Since osteoporosis primarily affects postmenopausal women, researchers investigated the effect of lactoferrin supplementation on bone parameters using rodents with surgically removed ovaries as a model for postmenopausal bone loss. The studies revealed that dietary lactoferrin promoted an increase in biomarkers of bone formation, decrease in biomarkers of bone resorption, and improvements in bone microarchitecture.\(^{43-45}\)

Similar benefits have been found in humans as well. In a clinical study, 38 healthy postmenopausal women between 45 and 60 years old received a lactoferrin dietary supplement or placebo.\(^{46}\) The researchers monitored bone health status by assessing blood markers of bone breakdown (resorption) and of bone formation. They discovered that lactoferrin supplementation significantly reduced bone breakdown and increased bone formation, moving toward restoring the balance of bone turnover in just six months.\(^{46}\)

This is the first demonstration in a clinical study that lactoferrin has a favorable effect on biomarkers of bone turnover in postmenopausal women, and confirms the findings previously seen in cell culture and rodent studies.

What You Need To Know

**Lactoferrin:**
Beyond Immune Health

- Lactoferrin has well-documented anti-infective, immune strengthening, antioxidant, anti-inflammatory, and anti-cancer effects.
- New research is showing that lactoferrin might be an effective weight-loss agent that also can help maintain a healthy gut flora.
- Lactoferrin is a potent anabolic agent that stimulates bone growth and bone repair, and may help in preventing osteoporosis.
- Multiple studies have indicated that lactoferrin could play a role in the regulation of glucose control.
- Lactoferrin stimulates the growth of several strains of good bacteria in the gut.
Recent evidence has shown that lactoferrin helps prevent osteoporosis by acting as an anabolic and anti-catabolic agent in bone tissue, and by stimulating bone growth and healing. Studies have shown that lactoferrin potently induces the growth of bone forming cells called osteoblasts, while inhibiting the growth and activity of osteoclasts, another type of bone cell that breaks down bone tissue.

**Summary**

Lactoferrin continues to demonstrate a wide range of potential benefits to humans. It has well-documented anti-infective, immune strengthening, anti-inflammatory, and anti-cancer effects.

New research is showing that lactoferrin might be an effective weight-loss agent that also can help maintain a healthy gut flora. Lactoferrin is also a potent anabolic agent that stimulates bone growth and bone repair, and helps in prevention of osteoporosis.

Lactoferrin is a natural component of both human breast milk and cow’s milk, which are ingested by infants. It is considered to be very safe and bovine lactoferrin has been granted GRAS (generally recognized as safe) status in the US.

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

**References**


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 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.
As researchers continue to investigate the various immune benefits of lactoferrin, they are also discovering this protein’s other important wellness factors.\(^1\)-\(^9\) Lactoferrin delivers a remarkably diverse range of health benefits. It has been shown to:

- Modulate immune function and support natural protection for healthy cells.\(^1\),\(^4\)
- Support lipolysis, the body’s natural fat-balancing process.\(^2\)
- Help maintain balanced bone formation and turnover.\(^3\)
- Help promote beneficial bacterial flora growth in the intestines.\(^5\),\(^6\)
- Scavenge excess iron to block free radical damage.\(^7\),\(^8\)

Studies show that the iron-depleted form of lactoferrin—called apolactoferrin—has unique benefits and may be the superior choice for supplementation.\(^9\)-\(^12\) Life Extension® Lactoferrin Caps extracted from whey protein contain only the premium apolactoferrin form of lactoferrin.

The suggested daily dosage of one 300-milligram capsule of Lactoferrin Caps provides:

| Bioferrin® (from bovine whey)* | 300 mg  
|-------------------------------|--------
| [providing 95% of Apolactoferrin (285 mg)] |

A bottle of 60 capsules of Lactoferrin Caps, a full two-month supply, retails for $33. If a member buys four bottles, the price is reduced to $33 per bottle. Contains milk.

* Bioferrin® is a registered trademark of Glanbia.

References

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
Testing For C-reactive Protein May Save Your Life

Have you had your CRP levels tested? You should—because this simple blood test might just save your life.

C-reactive protein, or CRP, has long been used as a marker of inflammation in the body. High CRP levels are found in practically every known inflammatory state. Even if you have no symptoms of disease, elevated CRP levels may signal an increased risk for practically all degenerative disorders, including cardiovascular disease, cancer, diabetes, and more.

Now, it turns out that CRP is more than just a marker of inflammation—it is also a cause of inflammation.

Knowing your CRP status puts you in an enviable position. If it is elevated, you can take proactive steps to lower it, thereby slashing your risk of a long list of disorders related to chronic inflammation.
What Is CRP?

C-reactive protein (CRP) is manufactured throughout the body, especially by immune cells, the liver, and by adipocytes (fat cells). During the early phase of an inflammatory stimulus (such as infection or tissue injury) CRP levels rise dramatically.

CRP is an incredibly sensitive and robust “marker” of general inflammation. It’s used to track the progress of chronic inflammatory conditions such as rheumatoid arthritis, vasculitis, or inflammatory bowel diseases like Crohn’s disease. In those cases, increased symptoms accompanied by a rise in CRP signals a “flare” of the disease, and indicates the need to provide anti-inflammatory therapy.
More recently, however, CRP has been recognized as an active cause of inflammation in addition to simply being a marker of inflammation.\(^7\) This important discovery opened the door for additional ways to fight chronic inflammation.

When CRP binds to specific molecules in the body, it participates in rapidly raising the production of inflammatory signaling molecules called cytokines and other inflammatory mediators.\(^{14}\) This is a healthy function of acute inflammation because it helps speed up the race to the scene of any damage, and quickly destroys invading organisms.\(^{15}\)

However, when CRP rises unchecked, it can contribute to destructive chronic inflammation.

It is easy to see why Big Pharma is now hotly pursuing CRP-inhibiting drugs.\(^6\) Fortunately, there are a number of methods that lower CRP by changing the underlying conditions that cause it to rise.

**What CRP Can Reveal About Your Health**

The use of CRP has been a standard diagnostic practice for many years in determining the status of known inflammatory disorders,\(^{17}\) such as rheumatoid arthritis and Crohn’s disease, and in discriminating between inflammatory and functional bowel disorders.\(^{12,13,18}\)

But as we keep learning more about diseases that have been linked with inflammation, CRP is turning out to be a useful research tool for both diagnosis and risk assessment. This is especially the case with two major killers of Americans: cardiovascular disease and cancer.

**Cardiovascular Disease**

CRP levels are closely correlated with the risk of cardiovascular disease; the higher the CRP, the greater the risk.\(^{19,20}\) Even otherwise healthy people with modestly raised CRP levels have a significantly higher risk of future cardiovascular events.\(^20\)

In one important study, patients with the highest CRP levels were at a 45% increased risk for coronary heart disease compared with those having the lowest levels.\(^{21}\) Another study found that people with elevated CRP levels were 60% more likely to develop ischemic heart disease and 30% more likely to have a cerebrovascular event, compared to those with normal levels.\(^{22}\) In addition, CRP levels have now been shown to be capable of predicting serious complications in hospitalized patients with coronary artery disease.\(^{23}\)

Preliminary evidence suggests that CRP levels may even help distinguish between your risk for a fatal vs. a non-fatal heart attack, but that is far from established.\(^{24}\)

Such risk increases seem to hold true for other conditions, such as diabetes, that also contribute to cardiovascular disease.\(^{25,26}\) Indeed, in one study, women with the highest CRP levels had a 16-fold risk for developing diabetes compared with those at the lowest levels.\(^{25}\) In another study, the risk was about 2.8-fold for both sexes.\(^{25,26}\)

CRP is also associated with other cardiovascular-related conditions such as high blood pressure.

In people with high blood pressure, CRP levels are correlated with stiffness of arteries and atherosclerosis, as well as damage to organs such as the heart and kidney.\(^{27}\)
In people with normal baseline blood pressure, CRP levels have repeatedly been shown to predict the later development of hypertension.27

And people with heart rhythm disturbances, such as atrial fibrillation, have significantly higher CRP levels than do normal controls.28

CRP levels are such strong indicators of cardiovascular risk that circulating levels of CRP are now being used to predict the likelihood of cardiovascular events and to assist in choosing therapy.27

In addition to being a marker of risk, there is growing evidence that CRP contributes directly to cardiovascular and diabetes risk.26,27 Studies have shown the presence of CRP directly inside of most arterial plaques—and all heart lesions—after a heart attack.20 Indeed, in a damaged brain or heart after a stroke or heart attack, there is a correlation between CRP and the size of the affected area; this is strong support for a contributing role of CRP in these diseases.16

Cancer

With the discovery that cancer is strongly related to overall inflammation status, there’s been growing interest in CRP as a predictor of prognosis in a variety of cancer types.29,30 And, with strong evidence that CRP is an active (and destructive) participant in promoting inflammation, there’s equally strong interest in discovering ways to actively lower a person’s CRP levels to reduce their cancer risk—or to promote their recovery if they already have cancer.

Optimal CRP levels for everyone to strive for are under 0.55 mg/L in men and under 1.0 mg/L in women.

Interestingly, CRP is now associated with a number of cancers as a powerful tool for determining prognosis and survival.29-36 When CRP is measured at the time of diagnosis, high levels consistently predict poor survival, whereas normal (especially the lower-end of normal) levels predict good outcomes.30-36

For example:

In men with penile cancer, a CRP level greater than 20 mg/L at diagnosis is significantly associated with the probability of developing lymph node metastases, a sign of poor outcome.31

In patients with advanced stomach cancer, those with a CRP level greater than 17 mg/L had an 11% greater chance of dying within 3 months after diagnosis, compared to those with lower levels.32 A later study found that CRP greater than 10 mg/L was associated with a 77% increase in poor overall survival, with a 196% greater chance of having a higher disease stage, and an 81% increase in the likelihood of tumor recurrence.33

CRP Predicts Heart Disease And Cancer Risk

• C-reactive protein, or CRP, is a sensitive marker of inflammation. It rises quickly after an inflammatory attack, but should return to normal levels. When CRP remains high, it is an indication of chronic inflammation.

• Elevated CRP signals increased risk for many chronic inflammation-related disorders, including cardiovascular disease, cancer, diabetes, obesity, and more.

• But CRP is much more than simply a marker of inflammation; it actively participates in the inflammatory process.

• Lowering CRP levels, then, is a vital part of a healthy lifestyle and a host of safe, affordable nutritional supplements may offer immediate help.

• Get your CRP tested, and get started today on supplements that can work for you.
CRP is strongly associated with survival in patients with colon and/or rectum cancers. Those with elevated levels of CRP were more likely to have lymph node (local) and distant metastases, invasion of blood vessels and nerves, and a higher stage diagnosis."34 For patients with CRP greater than 5 mg/L, only 13.3% survived after 5 years, while 57% of patients with lower CRP were still alive 5 years later.34 Indeed, one study indicated that CRP was the only marker that was an independent predictor of disease-free survival.30 CRP concentrations were higher in a group of colorectal cancer patients, at 2.4 mg/L, compared with 1.9 mg/L in healthy controls, and those with the highest CRP were 2.6 times as likely as those with the lowest levels to develop such cancers.35

In pancreatic cancer, high plasma CRP levels at diagnosis indicated a 121% increased risk of dying from the disease.29

In breast cancer, a CRP level of greater than 10 mg/L, compared with a level of less than 1 mg/L, predicted:36:

- A 96% greater risk of dying from any cause,
- A 91% greater risk of dying from breast cancer specifically, and
- A 69% greater risk of having additional breast cancer-related events.

**How To Lower Your CRP**

With high levels of CRP being so closely tied to cardiovascular disease and cancer, the question you’re probably wondering right now is, “How do I lower my CRP levels?”

For starters, your lifestyle has a direct impact on CRP levels. Certain dietary habits, such as a high intake of trans-fatty acids, can increase CRP levels, leading to a reason why *trans fats* increase cardiovascular risk to a greater degree than one would expect based on its adverse effects on blood fat levels.37

A 2013 study found that ideal health behaviors (such as diet, exercise, etc.) could lower CRP.38 In that study, people having four to six “ideal behaviors” had up to a 32% reduction in their CRP levels. Exercise alone has been shown to be a means of lowering high CRP. In fact, the higher the baseline CRP, the greater the impact of a reasonable exercise regimen on CRP.39

Eating foods cooked at high temperature can increase inflammation.40-42 Avoiding high temperature-cooked food can reduce production of pro-inflammatory cytokines and CRP, thus helping to extinguish the inflammatory fire raging in the bodies of most aging people today.40-43

Wouldn’t it be incredible if Americans could throw away side effect-laden pain killing drugs just by changing the way their food is prepared?

Some drugs, such as statins, have been shown to lower CRP levels in patients with elevated blood lipids.19,44 In fact, one study using *rosuvastatin* (Crestor®) showed that healthy people without raised blood cholesterol but with CRP levels greater than 2.0 mg/L reduced hs-CRP levels by 37% and reduced the frequency of major cardiovascular events (though the study didn’t address the long-term consequences of statin therapy).45 There are, however, other ways to lower CRP without a prescription.

Over a dozen dietary supplements have been shown to bring down CRP levels in laboratory or human models. Red yeast rice, for example, lowered CRP by nearly 24% in people with moderately high cholesterol;46 ginger reduced CRP in diabetic adults;47 and vitamin C reduced plasma CRP 24% in smokers.48

The table on the next page describes 17 nutrients that have been shown to favorably influence CRP levels.

In order to determine your CRP level, all it requires is a low-cost blood test.

By lowering your CRP, you’ll be protecting yourself against chronic inflammation before it progresses to a life-threatening disease.
TABLE: Selected Nutrients Known To Lower CRP

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Key Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creatine</td>
<td>Prevented exercise-induced rises in CRP in athletes&lt;sup&gt;49&lt;/sup&gt;</td>
</tr>
<tr>
<td>Curcumin</td>
<td>Lowered CRP more than control in patients with toxin-induced skin irritation&lt;sup&gt;50&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Lowered CRP by a huge <strong>6.4 mg/L</strong> in a meta-analysis of 6 studies of patients with elevated CRP&lt;sup&gt;51&lt;/sup&gt;</td>
</tr>
<tr>
<td>Fenugreek</td>
<td>Reversed elevated CRP levels in rats with experimental arthritis&lt;sup&gt;52&lt;/sup&gt;</td>
</tr>
<tr>
<td>Ginger</td>
<td>Reduced hs-CRP in diabetic adults&lt;sup&gt;47&lt;/sup&gt;</td>
</tr>
<tr>
<td>Green Tea Polyphenols</td>
<td>Lowered CRP in a rat model of systemic inflammation&lt;sup&gt;53&lt;/sup&gt;</td>
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<tr>
<td>Isoflavones</td>
<td>Reduced CRP by <strong>1.1 mg/L</strong> in postmenopausal women when combined with exercise&lt;sup&gt;54&lt;/sup&gt;</td>
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<tr>
<td>L-carnitine</td>
<td>Lowered CRP in end-stage renal disease patients on dialysis&lt;sup&gt;55&lt;/sup&gt;</td>
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<tr>
<td>Magnesium</td>
<td>Higher serum magnesium correlated with lower CRP in overweight middle-aged women&lt;sup&gt;56&lt;/sup&gt;</td>
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<tr>
<td>Probiotics</td>
<td>Lowered hs-CRP in diabetes patients&lt;sup&gt;57&lt;/sup&gt;</td>
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<tr>
<td>Omega-3 fatty acids</td>
<td>Low omega-3 in blood correlated with higher CRP in patients with peripheral artery disease&lt;sup&gt;58&lt;/sup&gt;</td>
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<tr>
<td></td>
<td>Lowered hs-CRP and depression scores in depressed shift workers&lt;sup&gt;59&lt;/sup&gt;</td>
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<tr>
<td></td>
<td>Lowered CRP and CRP/albumin ratio (beneficial) in colorectal cancer patients&lt;sup&gt;60&lt;/sup&gt;</td>
</tr>
<tr>
<td>Quercetin</td>
<td>Lowered CRP when given with vitamin C&lt;sup&gt;61&lt;/sup&gt;</td>
</tr>
<tr>
<td>Red yeast rice</td>
<td>Lowered hs-CRP by nearly <strong>24%</strong> in people with moderately high cholesterol&lt;sup&gt;66&lt;/sup&gt;</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>Reduced plasma CRP <strong>24%</strong> in active or passive smokers&lt;sup&gt;48&lt;/sup&gt;</td>
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<tr>
<td></td>
<td>Lowered hs-CRP in hemodialysis patients&lt;sup&gt;62&lt;/sup&gt;</td>
</tr>
<tr>
<td>Vitamin D</td>
<td>Higher vitamin D levels correlated with lower CRP in humans with rheumatoid arthritis, an inflammatory condition&lt;sup&gt;63&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Reduced serum CRP in pregnant women by <strong>1.4 mg/L</strong> while controls rose by <strong>1.5 mg/L (400 IU daily dose)</strong>&lt;sup&gt;64&lt;/sup&gt;</td>
</tr>
<tr>
<td>Vitamin E (alpha-tocopherol)</td>
<td>Lowered CRP in humans and animals&lt;sup&gt;65&lt;/sup&gt;</td>
</tr>
<tr>
<td>Zinc</td>
<td>Lowered hs-CRP from more than <strong>10</strong> to <strong>7.7 mg/L</strong> in diabetics with kidney disease&lt;sup&gt;66&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Lowered hs-CRP in young obese women&lt;sup&gt;67&lt;/sup&gt;</td>
</tr>
<tr>
<td>Combinations</td>
<td>Mixture of resveratrol, pterostilbene, quercetin, delta-tocotrienol, and nicotinic acid reduced CRP <strong>29%</strong> in healthy seniors&lt;sup&gt;58&lt;/sup&gt;</td>
</tr>
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*All differences statistically significant*
Summary

We’ve known for years that C-reactive protein (CRP) is an important marker of dangerous inflammation in the body, but we’ve recently discovered that it also actively participates in the inflammatory process.\(^1,7\)

High CRP levels are found in practically every known inflammatory state. Even if you have no symptoms of disease, elevated CRP signals increased risk for cardiovascular disease, cancer, diabetes, obesity, and more.\(^2\)

Additionally, there’s strong evidence that people with lower CRP levels have fewer inflammation-related diseases.\(^21,22,30,34,63\)

This knowledge has opened the door to a new way of treating chronic inflammation: by lowering your CRP level back to a safe, normal range. There are drugs such as statins that lower CRP levels, but high-dose statin drugs have proven side effects.\(^45\) Fortunately, over a dozen nutrients have been found to have a safe, immediate impact on this dangerous cause of chronic inflammation.

Don’t delay—get your CRP checked, and get started on a lifestyle, supplement, hormone or drug regimen that works for you.

Measuring CRP In The Laboratory

A laboratory test measurement called “high sensitivity CRP (or “hs-CRP”) is now often used to measure inflammation, especially in cardiovascular disease. This newer test uses the same scale as previous standard CRP measurements, but because of its higher sensitivity, it is better at discriminating even very small increases in CRP measurements at the lowest levels. While Life Extension currently recommends an optimal hs-CRP of less than 1.0 mg/L for women and less than 0.55 mg/L for men, standard laboratory testing uses the following risk stratification for hs-CRP:

- The “lowest risk” range is less than 1.0 mg/L.
- “Average risk” is 1.0 to 3.0 mg/L.
- The “highest risk” category is greater than 3.0 mg/L.\(^59\)

The CRP (high-sensitivity) test is included in the Male and Female Blood Test Panels described on page 15 of this issue. To order these comprehensive panels at the discounted price of $199, just call 1-800-208-3444.

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

Clinical Uses Of CRP In Diagnosis

C-reactive protein has been in use as a screening measure for inflammation almost since its original discovery.\(^7^0\)

Levels of CRP begin to rise in the body usually 6 to 12 hours after an inflammatory stimulus and peak around 48 to 96 hours after the event.\(^7^1,7^2\)

Changes in repeated measurements of CRP are often used as a way to track a patient’s inflammatory course, helping to identify improvement (falling CRP) or relapse (rising CRP).\(^7^3\)

While CRP is never diagnostic of a specific condition, if interpreted in terms of clinical context, it does help to determine if inflammation is the source of worrisome signs and symptoms, and whether symptoms are being caused by infections or by other causes.\(^7^0,7^4\)

In infants and toddlers with high fevers, for example, a CRP below 5 mg/dL was shown to rule out a serious bacterial infection.\(^7^5\)

In a similar fashion, CRP is frequently used diagnostically to rule out a potentially dangerous diagnosis in adults. For example, adult patients with chest pain were found to be safe to go home from the hospital if they had CRP levels within the normal range.\(^7^6\)

Elevated CRP levels are also useful as early markers of the seriousness of inflammation in a very wide range of disorders, from urinary tract infections and appendicitis to heart attacks.\(^1^5,7^0,7^6\)

And CRP has been shown to help in discriminating Crohn’s disease from non-inflammatory bowel disorders, including intestinal lymphoma.\(^7^7\)

Another widespread use of CRP is as a means of following a patient’s progress after a major diagnosis has already been made. In such patients, the CRP level correlates with the severity of the ongoing disease, and therefore rising levels can be used as an early warning that the disease is rapidly worsening, and that aggressive treatment is necessary.\(^7^8\)
Obesity And CRP

Two conditions that contribute to a rise in CRP levels are obesity and diabetes—an effect that may be the reason behind the rise in inflammation seen in those conditions.78,80

Obese individuals experience a double threat from CRP. First, while much of the circulating CRP is made in the liver, human fat tissue also produces substantial amounts of CRP.87,89 Second, obese individuals experience a rapid rise in cytokines, particularly the one known as interleukin-6 (IL-6),81 which may induce CRP production in the liver—potentially causing CRP levels to climb even higher and promoting additional inflammation.82

In this way, CRP may be at least part of the missing link between obesity, diabetes, and cardiovascular disease, in which inflammation plays such a major part.78,80,82
Next Generation Curcumin

Curcumin is an active compound derived from the Indian spice turmeric. It has been widely acclaimed for its diverse health-promoting effects on nearly every organ system in the body, including its support for the body’s natural inflammatory response system. But most curcumin is neither absorbed well nor retained well in the blood—posing a challenge to those who wish to maximize its benefits.

Life Extension® took the lead in resolving this issue several years ago by introducing Super Bio-Curcumin® containing BCM-95®, a patented, bioenhanced preparation of curcumin that has been shown to reach up to 7 times higher concentration in the blood than standard curcumin.

Now, an exciting next generation curcumin formula has become available! The new Advanced Bio-Curcumin® with Ginger & Turmerones provides additional compounds that further boost absorption of curcumin’s highly beneficial phytonutrients.

UNRIVALED POTENCY AND ABSORBABILITY

In addition to BCM-95®, this new curcumin formula contains:

1. Turmerones: After curcumin is extracted from turmeric, what remains is turmeric oil rich in compounds called turmerones. Combining BCM-95® with a high content of turmerones provides health consumers with more beneficial turmeric compounds that further multiply absorption.

Scientists have shown that these potent turmerones not only support curcumin absorption, but significantly increase the amount of curcumin inside the cell as well.

2. Ginger: Curcumin and ginger are close botanical relatives. Research demonstrates that they have overlapping and complementary health benefits, and scientists are focusing on the therapeutic effects of combining these two plants.

Advanced Bio-Curcumin® with Ginger & Turmerones provides a supercritical extract of ginger standardized to the greatest concentration of ginger compounds—including beneficial gingerols and shogaols.

3. Phospholipids: This new curcumin formula also contains phospholipids, a type of emulsifying molecule known to greatly enhance absorption of poorly soluble active compounds.

The powerfully enhanced bioavailability and potency of Advanced Bio-Curcumin® with Ginger & Turmerones is superior to conventional curcumin supplements. This product represents the most powerful and cost-effective way to supplement with—and receive the full benefits of—this very critical nutrient.

The suggested daily dosage of one softgel of Advanced Bio-Curcumin® with Ginger & Turmerones provides:

Turmeric Phospholipid Blend 630 mg

BCM-95® Bio-Curcumin Turmeric 25:1 extract (rhizome) [total curcuminoids complex with essential oils (380 mg), Turmeric oil (rhizome) [providing 60 mg total turmerones], Phospholipids

Ginger CO₂ extract (root) 200 mg [providing 60 mg gingerols]

Each softgel of Advanced Bio-Curcumin® with Ginger & Turmerones provides 400 mg of BCM-95® Super Bio-Curcumin plus an array of turmerones and phospholipids.

A bottle of 30 softgels of Advanced Bio-Curcumin® with Ginger & Turmerones retails for $30. If a member buys four bottles, the price is reduced to $20.25 per bottle.

Contains soybeans.

Bio-Curcumin® and BCM-95® are registered trademarks of Dolcas-Biotech, LLC.

To order Life Extension® Advanced Bio-Curcumin® with Ginger & Turmerones, call 1-800-544-4440 or visit www.LifeExtension.com

References


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

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.
Super Ubiquinol CoQ10 With BioPQQ® contains shilajit to increase coenzyme Q10 in mitochondria plus PQQ to support the generation of new mitochondria in aging cells. This three-way mitochondrial support strategy offers the following benefits:

1. **SUPER UBIQUINOL CoQ10**
   - CoQ10 is required to convert the fats-sugars you eat into cellular energy. The body’s production of CoQ10 markedly declines with advancing age.
   - Scientific studies show that absorption of the ubiquinol form of CoQ10 is far greater than the ubiquinone form.¹

2. **ENHANCED SUPPORT WITH SHILAJIT**
   - PrimaVie® shilajit has been shown to double levels of CoQ10 in mitochondrial¹¹! Combining CoQ10 and shilajit produced a 56% increase in energy production in the brain—40% better than CoQ10 alone. And in muscle, there was a 144% increase in energy production—27% better than CoQ10 alone.²

3. **PQQ PROMOTES YOUTHFUL CELLULAR FUNCTION**
   - PQQ activates genes that promote the formation of fresh mitochondria.³
   - Mitochondrial DNA is situated at the source of free radical production, but has relatively little protection from their damaging effects.³ PQQ’s powerfully boost mitochondrial antioxidant defenses while promoting the generation of new mitochondria.³,⁵

The optimal dose of PQQ is 20 mg each day. Members taking Mitochondrial Energy Optimizer, Mitochondrial Basics, or PQQ 10 mg caps obtain this optimal PQQ dose when taking the new Super Ubiquinol CoQ10 with PQQ.

PQQ is an essential nutrient, meaning that your body cannot make it on its own. A wealth of research demonstrates that—alone and especially in combination with CoQ10—its unique nutritional profile supports heart health and brain function.⁶-⁸

The suggested dosage of one (1) softgel daily of Super Ubiquinol CoQ10 With BioPQQ® provides:

<table>
<thead>
<tr>
<th>Component</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Ubiquinol (as Kaneka QH® Ubiquinol)</td>
<td>100 mg</td>
</tr>
<tr>
<td>PrimaVie® Shilajit fulvic acid complex</td>
<td>100 mg</td>
</tr>
<tr>
<td>BioPQQ® Pyrroloquinoline quinone disodium salt</td>
<td>10 mg</td>
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</table>

A bottle of 30 softgels of Super Ubiquinol CoQ10 With BioPQQ® retails for $54. If a member buys four bottles, the price is reduced to $37.50 per bottle.

Kaneka QH Ubiquinol® is a registered trademark of Kaneka Corporation. PrimaVie® is a registered trademark of Natreon, Inc. BioPQQ® is a registered trademark of MGC (Japan).

References

To order Super Ubiquinol CoQ10 With BioPQQ®, 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.
Pharmaceutical companies are focusing massive resources to develop a drug that targets *mitochondrial dysfunction*,¹ one of the major causes of the chronic diseases of aging.² Much of their efforts are aimed at developing a patentable version of a natural compound called *lipoic acid*.³,⁴

For almost two decades, scientists have known that *lipoic acid* offers an effective solution to mitochondrial dysfunction.⁵ Ongoing clinical trials across the globe show the promise of lipoic acid’s benefits on a wide range of diseases—from diabetes to cardiovascular disease to Alzheimer’s and countless more.⁶

Fortunately, you don’t need to wait for Big Pharma to develop a synthetic, costly version of lipoic acid in order to combat *mitochondrial dysfunction*.

In this report, you will discover how supplemental *lipoic acid* protects vital cellular energy while shielding against and possibly reversing the damaging effects of disorders that include diabetes, obesity, cardiovascular disease, neurodegeneration, and cancer.
Dramatic Impact On Diabetes-Related Disorders

For many years, scientists have researched how lipoic acid affects insulin sensitivity and the severity of diabetes-related disorders, including heart disease, stroke, glaucoma, neuropathic pain, and kidney disease.7

Significant research into lipoic acid has centered on its benefits in diabetic neuropathy. Affecting up to around two out of every three people with diabetes, neuropathy is nervous system damage that can produce unbearable pain in the legs and feet. It eventually contributes to the damage of surrounding blood vessels in the lower limbs that results in circulatory impairment.8,9 Amputation is sometimes the only way to end the rampant infections and ulcers that accompany reduced blood flow to the lower limbs caused by neuropathy.10

Despite years of research, a cure for diabetic neuropathy remains elusive.11 However, doctors in Germany have used lipoic acid for more than a decade to reduce pain and inflammation in those suffering from diabetic peripheral neuropathy.12,13
Over 15 randomized clinical studies have shown that intravenous administration of **300-600 mg** of lipoic acid a day greatly improves nerve function and relieves pain symptoms in diabetic neuropathy patients.\(^4\) Lipoic acid is well tolerated and effective for prolonged use at **600 mg** per day (equivalent to **300 mg** of R-lipoic acid)—a level that noticeably improves muscle function and stops further impairment in movement.\(^15\)

Lipoic acid’s benefits in diabetic neuropathy—and in diabetes as a whole—arise from its striking ability to dramatically improve glucose control and restore insulin sensitivity.\(^16-20\) In a recent placebo-controlled clinical trial, researchers found that after only 6 months of lipoic acid supplementation, patients with type II diabetes had reduced fasting blood glucose and lowered levels of oxidized lipids.\(^21\)

Lipoic acid increases the abundance of other protective antioxidants while improving mitochondrial function and preventing glycation-induced damage in the kidney and blood vessels of those with diabetes—thus defending against diabetic kidney disease, vision loss, and vascular dysfunction.\(^7,22-29\)

**Take Control Of Obesity**

In addition to its anti-diabetic effects, lipoic acid has a known ability to help combat obesity. Even without a change in diet or exercise, large doses of lipoic acid (**800-1,800 mg/day**) have produced moderate weight loss in obese patients.\(^30,31\) Lipoic acid has been particularly effective in reducing body weight and BMI in patients taking antipsychotics, which are known for causing weight gain and other metabolic disturbances.\(^32\)

Lipoic acid displays striking benefits in components of metabolic syndrome, including inducing weight loss, improving insulin resistance, and lowering blood pressure. Metabolic syndrome raises the risk of diabetes and heart disease.\(^33,34\)

Several other promising scientific studies now show that lipoic acid has a beneficial effect on a number of the factors involved in metabolic syndrome: it reduces triglyceride levels, lowers cholesterol, improves fasting plasma glucose, and causes weight loss in rodent models of obesity.\(^22,35-40\) Lipoic acid curbs food intake and stimulates production of the insulin-sensitizing, anti-inflammatory hormone, *adiponectin*.\(^39,41\)

Likewise, lipoic acid supplements have been shown to reduce circulating oxidative stress markers and elevate levels of “good” cholesterol in men with metabolic syndrome who already take glucose control medications.\(^42\)

Owing to its insulin-sensitizing, lipid-lowering, and appetite-suppressing effects, lipoic acid is almost certainly an indispensable addition to conventional treatments for obesity and metabolic syndrome.
Protect Against The Leading Cause Of Death

Protecting your heart and blood vessels may be the most important thing you can do to save your life.

The leading cause of death in the United States, heart disease, is actually a collection of problems often arising from atherosclerosis, the process in which plaque accumulates in arteries and attaches to the vessel walls. Over time this process restricts arterial blood flow and, if the arteries become completely blocked, leads to a heart attack or stroke.

Because of the vast numbers of people affected by this disease, pharmaceutical companies spend considerable time and resources devoted to developing blockbuster drugs that attack key problems in heart disease, such as high blood pressure, high cholesterol, high triglycerides, and blood clots. However, these drugs are not primarily focused on two key causes of heart disease—namely oxidative stress and inflammation.43,44

Fortunately, lipoic acid wields powerful antioxidant and anti-inflammatory effects that directly attack these causes.

In experimental models of atherosclerosis, lipoic acid—through reductions in blood cholesterol, inflammatory markers, oxidative stress, and immune activation—shrank atherosclerotic plaques and improved the blood-flowing capacity of the aorta—the body's chief artery.45-48 In a remarkable study, researchers discovered that, within only 12 weeks, lipoic acid reduced plaque size in the aorta by about 70%.46 Another group of researchers found that lipoic acid decreased the total number of atherosclerotic plaques developing in animals fed a high cholesterol diet.47

During a stroke, lipoic acid not only reduces brain cell death but, to the surprise of scientists, also restores blood flow to damaged brain regions by creating new blood vessels necessary for repair of brain function and the formation of new brain cells.50,55

Prevent Age-Related Neurodegeneration

Although the exact mechanism behind neurodegenerative brain disorders still remains elusive, more and more researchers consider mitochondrial dysfunction and oxidative stress to play a pivotal role in diseases such as Alzheimer's and Parkinson's.56 Alzheimer's disease alone is estimated to affect over 5 million Americans.57

A recent clinical trial indicated that lipoic acid may delay the progression of Alzheimer's. Over a 12-month period, a combination of omega-3 fatty acids and lipoic acid significantly improved memory, cognitive function, and activities of daily living.58

What You Need To Know

Lipoic Acid Fights Mitochondrial Dysfunction

- Research has exposed mitochondrial dysfunction and oxidative stress as two of the primary culprits of age-related disease.
- Lipoic acid counteracts aging by improving mitochondrial function and decreasing oxidative stress.
- Lipoic acid may reverse and protect against the destructive consequences of diabetes, obesity, heart disease, neurodegeneration, and cancer.
- It has even been found to reduce signs of aging.
- Pharmaceutical companies are attempting to modify lipoic acid to render it patentable.
- Fortunately, the natural form of lipoic acid is available without a prescription and for a reasonable cost.
Lipoic acid has beneficial effects against many types of cancer, including those of the colon, lung, breast, brain, and even leukemia—and for good reason. Lipoic acid has been shown to inhibit tumor growth, induce tumor cell apoptosis, and impede metastasis.

Over the past few years, many researchers examining the role of lipoic acid in experimental cancer models have called for clinical trials to investigate the effectiveness of lipoic acid to treat cancer in humans. This call was answered by a pharmaceutical company that created a patentable, modified version of lipoic acid that has been used in clinical trials involving different cancer types.

In addition to its cancer-fighting properties, lipoic acid displays promise in stopping the negative side effects of radiation and chemotherapy. More specifically, lipoic acid may protect healthy tissues against damage and cell death during cancer-targeted radiation treatment. It has the potential to prevent the development of chemotherapy-induced peripheral neuropathy.

The remarkable neuroprotective effects of lipoic acid extend also to Parkinson’s disease in which it defends movement-controlling brain cells against neurotoxins and oxidative damage.
Summary

Scientific research has exposed mitochondrial dysfunction and oxidative stress as two of the primary culprits of age-related disease. Recent data highlight the role of lipoic acid to counteract aging by improving mitochondrial function and decreasing oxidative stress. Owing to these properties, lipoic acid can protect against the destructive consequences of diabetes, obesity, heart disease, neurodegeneration, and cancer.

Lipoic acid is so universally effective that pharmaceutical companies have modified lipoic acid to render it patentable and profitable. Fortunately, the natural form of lipoic acid is available without a prescription and for reasonable expense. Given its extensive health benefits, lipoic acid is an indispensable asset in one’s arsenal to combat 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.

References


Use The “Right” Form Of Lipoic Acid

Lipoic acid comes in two “mirror image” forms labeled “R” and “S.” The R form is the main form that is produced and used by life processes. Inexpensive chemical manufacturing produces equal quantities of R and S lipoic acid, often labeled “R/S Lipoic Acid” or simply “alpha lipoic acid” (ALA).

Newer precision techniques allow production of a pure R-lipoic acid, which provides a much more concentrated potency. A dose of pure R-lipoic acid provides twice the active ingredient as a typical R/S-alpha lipoic acid supplement, simply because the whole dose consists of the active “R” molecule. Look for the “R” label to assure you are getting the most potent form of this valuable nutrient.
HOW LIPOIC ACID PRESERVES CRITICAL MITOCHONDRIAL FUNCTION

Reduce The Signs Of Aging

Interesting research studies show that lipoic acid may reduce visible signs of aging. In a recent report, volunteers using a facial application of a gel containing lipoic acid reduced fine lines, particularly around the eyes and upper lip, while enhancing skin texture and color.107

Lipoic acid works to reduce signs of skin aging by increasing production of collagen.108 Age- and sun-related reductions in skin collagen, one of the molecules responsible for skin’s elasticity, are thought to be a key part of fine line and wrinkle formation.109

Lipoic acid in combination with other antioxidants has been shown to improve skin hydration and protect against UV-induced skin cell damage.110

By reversing age- and sun-related skin changes, lipoic acid regenerates skin’s youthfulness and suppleness.


HOW LIPOIC ACID PRESERVES CRITICAL MITOCHONDRIAL FUNCTION


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 registered trademark of LAVIPHARM Group of Companies.

References
Maintaining healthy, flexible joints is essential to quality of life. Joint stiffness and discomfort can stand in the way of performing even simple everyday tasks.

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

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

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

**THREE SYNERGISTIC COMPOUNDS FOR SUPERIOR BENEFIT**

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

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

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

Krill oil is a natural source of the antioxidant carotenoid **astaxanthin**. Astaxanthin works in multiple ways, including suppression of free radical activity and enhanced mitochondrial function.9 It also maintains krill oil’s molecular stability. Most commercially available krill oils do not contain significant amounts of astaxanthin because it is nearly eliminated during processing. **Krill Healthy Joint Formula** is fortified with astaxanthin, for maximum stability and superior benefit.

**JUST ONE SOFTGEL DAILY**

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

A bottle containing **30** softgels of **Krill Healthy Joint Formula** retails for $32. If a member buys four bottles, the price is reduced to **$21.75** per bottle. Just one softgel a day of **Krill Healthy Joint Formula** duplicates a successful human clinical trial.

**References**


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

Contains crustacean shellfish (krill).

Licensed from Valensa International.

Zanthin® is a registered trademark of Valensa International, Inc.

To order **Krill Healthy Joint Formula**
call **1-800-544-4440** or visit [www.LifeExtension.com](http://www.LifeExtension.com)
Published studies have shown the critical importance of lipoic acid in supporting healthy mitochondrial function.

Unlike other forms of lipoic acid, Super R-Lipoic Acid is more bioavailable, stable, and potent, achieving 10-30 times higher peak blood levels than pure R-lipoic acid. This unique sodium-R-lipoate can help you reach peak plasma concentrations within just 10-20 minutes of supplementation.

Super R-Lipoic Acid provides more of the active “R” form of lipoic acid than any other supplement.

A bottle of Super R-Lipoic Acid containing 60 vegetarian capsules retails for $49. If a member buys four bottles, the cost is only $33.75 per bottle. Each capsule contains 300 mg of stabilized, Bio-Enhanced® Super R-lipoic acid supplying 240 mg of R-lipoic acid. Suggested dose is one capsule daily.

References

CAUTION: If you are taking glucose lowering medication, consult your healthcare provider before taking this product. Bio-Enhanced® is a registered trademark of Geronova Research, Inc.
Alliance For Natural Health

Protecting Your Supplements
Against Government Censure

If he had his way, one senator would remove most of your nutritional supplements from the market. But Life Extension® and the Alliance for Natural Health USA (ANH-USA) are working hard to stop him.

ANH-USA is part of an international organization dedicated to promoting sustainable freedom of choice in healthcare through good science and good law. Since 1992, they have worked to shift the medical paradigm from an exclusive focus on surgery, drugs, and other conventional techniques to an integrative approach incorporating functional foods, a healthy diet, dietary supplements, and lifestyle changes. To ensure consumers’ rights, ANH-USA lobbies Congress and state legislatures, acts as a government watchdog, files comments on proposed rulemakings, and educates the public, the press, and other decision-makers.
Richard "Dick" Durbin, the senior US senator from Illinois and the Senate Majority Whip since 2007, recently said on National Public Radio\(^1\) that all he wants is for supplements to be safe and effective. No one would disagree with that. But behind the soothing and frankly deceptive words, he actually wants to treat supplements like drugs.

Drug companies may spend up to an average $5.8 billion per drug to win FDA approval.\(^2\) Drug companies can pay these enormous sums because their products are synthetic and therefore patentable. Once patented and approved, a drug becomes a monopoly and can be sold at any price, even for hundreds of thousands of dollars per patient.
A Deceptive Bill

In 2011, the senator introduced a bill he called the Dietary Supplement Labeling Act. He said his bill was designed to stop “mislabeling products and making health claims that have no scientific basis” and “marketing supplements with impure or incorrectly identified ingredients.” He knows—or should know—that all those things are already against the law!

Since the purpose of this bill was clearly not the one stated, what was its purpose? It seems that this was an attempt to move us one step closer to a full FDA approval system for supplements. That, of course, would make supplements insanely expensive, like drugs, if you could get them at all. If supplements are not yanked from the market—as they could be if the FDA doesn’t “approve” them—or turned into drugs, the high prices would kill demand and drive supplement companies out of business. The drug industry would be waiting, ready to pick up the pieces and make their current monopoly position even tighter.

Durbin’s bill required that the FDA, together with the government’s Institute of Medicine (IOM), compile a list of dietary ingredients (read: supplements) that could possibly lead to adverse events or are otherwise deemed risky in some way. Dietary supplement manufacturers would have to put mandatory warnings on labels for any ingredient on this list.

What the FDA and the IOM have in common is that both agencies know very little about supplements but are nevertheless deeply biased against them.

As for the Institute of Medicine (IOM), look at their recent report on vitamin D. They threw out most of the scientific research. The IOM is hardly the authority to determine which supplement is safe and which isn’t!

Creating lists of “bad” ingredients or “bad” doses based on completely arbitrary or non-existent standards is a slippery slope. It could be used as a hammer by the FDA to go after supplement companies. It could easily lead to European-style standards being applied here in the US. In Europe, if a beta carotene capsule contains more beta carotene than is in around one-third of a large carrot, it is banned.

Current law already requires that all dietary supplement products show ingredient lists. Health claims already have to be pre-approved by the FDA according to the Nutrition Labeling and Education Act. Supplements must be manufactured under
Current Good Manufacturing Practices to ensure that the ingredients are safe and at the levels they claim them to be. Accurate disclosure of the contents in the dietary supplement package is required under the Fair Packaging and Labeling Act. And almost all supplement manufacturers have a list of all their products and ingredients available to the public on their websites. In other words, *everything the bill mandates is already being accomplished under laws now on the books!*

**Durbin Meets His Match**

That’s where Alliance for Natural Health (ANH-USA) enters the picture. The moment the Durbin bill was introduced, ANH-USA sent Action Alerts to its members and to the hundreds of thousands of readers of the *Pulse of Natural Health*, its weekly newsletter. It also contacted important allies such as Life Extension® to be sure that an even larger number of messages were sent.

While consumers contacted their senators calling for the defeat of this bill, ANH-USA kept up the pressure through lobbying on Capitol Hill. In the end, the pressure was so great that the bill became a hot potato, and no one would touch it. The bill died in committee.

That same year, Durbin decided to try a different approach to get the same results. He proposed an amendment to an appropriations (budget) bill, which is a sneaky way of getting controversial laws passed without too much attention. The amendment wanted the FDA to follow the recommendations of a report containing some of the same provisions that were in Durbin’s anti-supplement bill! Happily, because of the pressure ANH-USA and its allies were able to bring to bear, Durbin’s sneaky amendment didn’t make it into the appropriations bill.

One month later, however, Sen. Durbin and his frequent collaborator in the House, Rep. Henry Waxman (D-CA) were back at it. They asked the Government Accountability Office (GAO) to review adverse event report data—but only for supplements. If consumer safety was really Sen. Durbin’s motivation, why didn’t he and Rep. Waxman also ask the GAO to review adverse event reporting data for vaccines and drugs, which have far more reported adverse events?

Fast forward to May of 2012. The *FDA Safety and Innovation Act* was considered “must-pass” legislation, and without notice, Senators Durbin and Blumenthal offered a new anti-supplement amendment to the bill. Once again, ANH-USA issued an emergency Action Alert, and readers sprang into action, sending more than 100,000 messages in less than twenty-four hours. Congress listened, and Sen. Durbin’s anti-supplement amendment was soundly defeated by a vote of 77 to 20.

In March of 2013, the GAO report on adverse event reports requested by Sen. Durbin and Rep. Waxman was finally issued. It left both legislators with egg on their face. The report they hoped would say supplements are dangerous only proved how incredibly safe supplements are—and says, “…the greatest challenge for identifying potential safety concerns from AERs [adverse event reports] is the small number of AERs [adverse event reports] that FDA receives related to dietary supplements.”

You’d think that would be the end of it, but you’d be wrong. Shockingly, in August of 2013, Sen. Durbin reintroduced his misleading anti-supplement bill—the one he couldn’t garner enough support for in 2011. Its language is identical to that of his previous bill, and would deal the same deadly blow to nutritional supplements. ANH-USA and its allies are battling on Capitol Hill once again.
Two Powerhouses, Working Together

ANH-USA celebrated its twentieth anniversary last year. It has over 250,000 members nationwide—and it is only because of them that the organization is able to be so successful.

Thanks to its members and allies like Life Extension, ANH-USA is changing the politics of medicine. Most critically, ANH-USA has played an important role in passing significant legislation that directly benefits the natural health approach while blocking legislation that threatens it.

ANH has also filed lawsuits to accomplish the same aims. To date, they have filed nine precedent-setting lawsuits against the FDA, which have established qualified health claims for saw palmetto, omega-3 fatty acids, fiber, vitamin E, vitamin B, and selenium. One of their early suits was the landmark case of Pearson v. Shalala—and because they won, there is now widespread public knowledge about the importance of consuming enough folate (a B vitamin) during pregnancy to prevent neural tube defects. Prior to this legal victory, supplement manufacturers were not permitted to let consumers know about this important nutrient relationship, and many consumers were in the dark.

ANH-USA Victories

Life Extension is one of ANH-USA’s most important allies. With the support of grassroots activists and organizations like Life Extension, ANH-USA has had a number of major victories for consumers.

They:
- Incorporated an explicit statement into HIPAA that the practice of alternative medicine is not fraud—a critical protection for alternative healthcare practitioners.
- Led the effort to establish the National Center for Complementary and Alternative Medicine in 1998. It’s part of NIH, undertakes research, does training, and disseminates data to the public and professionals.
- Worked with Reps. Chaffetz and Polis to introduce the Free Speech about Science Act, which will permit food and supplement companies to cite peer-reviewed scientific research in support of a product’s health benefits. It is hard to believe, but all too true, that free speech protections do not extend to food or supplement companies to make truthful statements about scientific research.
- Organized an emergency response to a major threat to dietary supplements in Congress: Sen. McCain’s Dietary Supplement Safety Act. ANH-USA members sent more than 200,000 messages to Congress opposing the bill, and the organization took out a full-page ad in Roll Call, the Capitol Hill newspaper, which highlighted misleading remarks from Sen. McCain on the Senate floor. In just three weeks, Sen. McCain took the almost unheard-of step of withdrawing support for his own bill, which subsequently died without a vote.
- Defeated a sneak amendment to the Wall Street Finance Reform bill from Rep. Waxman that would have greatly expanded the Federal Trade Commission's power to restrict supplements.

- Sent messages to Congress opposing Sen. Leahy's Food Safety Accountability Act, which would have established ten-year prison terms for violating FDA regulations. This resulted in Leahy's office reaching out to ANH-USA to develop compromised language requiring proof of actual harm for prosecution.

- Filed petitions to ban the use of the toxic chemical BPA in cash register receipts and children's dental devices.

- Petitioned the USDA and FDA to study GMOs, and supported state bills to demand GMO labeling. These petitions are a necessary prelude to lawsuits.

- Organized a coalition of dietitians and nutritionists to oppose the American Dietetic Association's ties to junk food companies and anti-competitive legislation, and launched ReallyEatRight.org to bring to light the ADA's attempts to establish a monopoly on nutritional advice through state and national legislation.

- Openly opposed draft guidance on New Dietary Ingredients (NDI) that threatened to remove 29,000 dietary supplements from the market—and became the only consumer organization invited to the FDA's bargaining table.

- Helped amend the Drug Quality and Security Act of 2013 which would have given the FDA power to regulate large compounding facilities. ANH-USA worked with Congress—across party lines—to protect important ingredients such as compounded bioidentical estriol and time-released medications, and make sure non-standardized dosages remain available to be tailored to the individual.

ANH-USA monitors legislation and regulatory activity on the state, federal, and international levels daily. This is in addition to court action, since the court system has a critical role in protecting integrative medicine and a consumer's right to choose.

The organization's executive and legal director is Gretchen DuBeau. A lifelong environmentalist and devotee to closely related natural health and healing, Gretchen is an attorney who practiced environmental law and policy for five years before joining ANH to work on natural and sustainable health issues. She is joined by Liz Ardagna, membership director; Nandini Gopinadh, legislative and policy analyst; and Beth McCabe, director of public affairs. ANH's International and European office is led by Dr. Robert Verkerk, a widely acclaimed expert in agricultural, environmental, and health sustainability.

**Summary**

In the year ahead, ANH-USA will continue to fight for consumers' rights to free access to healthy food and nutritional supplements—as well as the right to information about them. ANH-USA currently keeps close tabs on Sen. Durbin's Dietary Supplement Labeling Act of 2013, the zombie bill that refuses to stay dead. If this bill passes, supplements would either be pulled from the market, or would see their prices rise so high that no one could afford them. Countless supplement companies would be driven out of business.

This need not happen. ANH-USA is asking *Life Extension* magazine readers to take action on it! By going to ANH-USA.org/LEF, you’ll be taken to a page with more information and a form that will let you effortlessly send a message to your senators, asking them to oppose Sen. Durbin's bill.

And while you’re at it, you can also subscribe to ANH-USA’s weekly e-newsletter, *The Pulse of Natural*
Health, on the front page of the organization’s website at ANH-USA.org. There you can keep abreast of the latest politics affecting your ability to make health choices.

One last thing: an incredibly generous donor has offered to match all donations to ANH-USA from Life Extension readers—up to $100,000. What that means is that if Life Extension readers collectively donate $50,000 to ANH-USA, this donor will contribute another $50,000—up to $100,000.

Just go to ANH-USA.org/LEF and you’ll be able to support ANH-USA’s important work in protecting your supplements painlessly—and powerfully. Donations of any amount are greatly appreciated, no matter how small.

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

ANH-USA Receives $125,000 Donation

In response to the relentless attacks against dietary supplements being waged by certain members of Congress, a health conscious citizen donated $125,000 to ANH-USA. This is the largest single donation ANH-USA has ever received.

This same concerned citizen has pledged a matching grant of one dollar for each dollar contributed to ANH-USA by Life Extension supporters, up to $100,000.

While these donations pale compared to the hundreds of millions of dollars mainstream medical interests lavish on Congress and the FDA, the success ANH-USA has had in combatting pharmaceutical industry-backed attempts to take away your supplements shows that certain powers are still retained by the people.

In this case, the majority of aging Americans are using dietary supplements and their voices are being heard in Congress, through the legislative efforts of Life Extension Buyers Club and ANH-USA.

If you donate, let’s say, $35 to ANH-USA.org/LEF; another $35 will be contributed (matched) by this generous citizen concerned about the eroding freedoms citizens have in deciding what goes into their own bodies.

To make a tax deductible donation to ANH-LEF, please visit ANH-USA.org/LEF today.
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 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.
A Delicious Asian-Style Soup Rich in Vital Plant Nutrients

Mung Bean Soup with Turmeric

Rich Rewards™
If you're looking for a different food to try, you'll be delighted with our **Mung Bean Soup with Turmeric**. The mung beans have a chewy texture and unique taste that will make you feel you're eating something new for the first time.

The mung bean, a legume used since ancient times, is considered in Traditional Chinese Medicine to be a “cooling food” and is a favorite among many Asian cultures.∗

This new healthy food choice soup contains green mung beans, turmeric, ginger, coriander, olive oil, and lemon juice. It's a refreshing, non-tomato based soup suitable for vegans.

**No High-Glycemic Carbs**

Processed food companies sell vegetable soups so cheaply because they load them with high-glycemic carbohydrates (rice, potatoes, pasta) that cost virtually nothing. They then add inexpensive ingredients such as corn, sugar, and sometimes omega-6 fats (such as cottonseed oil). So for less than $2, you get a relatively high-carb-calorie soup that provides virtually no health benefits.

**Rich Rewards™** soups contain only healthy ingredients without the cheap starches.

**Rich Taste—Low Calories**

Each serving of **Rich Rewards™ Mung Bean Soup with Turmeric** contains only **130 calories**. It is an excellent source of fiber and provides 6 grams of protein. You can consume the entire contents or use a smaller portion of the soup as part of a meal for you (or several people).

The entire container provides about **3.5 servings** of mung beans, turmeric, and other ingredients—with none of the glucose-spiking fillers found in commercial soups.

**Rich Rewards™ Mung Bean Soup with Turmeric** is packaged in a re-closable bottle free of BPA. While the FDA says the BPA lining in most cans is safe, we at Life Extension have always used BPA-free containers for our soups.

The retail price for a **3.5 serving bottle** of **Rich Rewards™ Mung Bean Soup with Turmeric** is $13. The member price is **$9.75**.

Probiotics, the beneficial bacteria commonly found in yogurt cultures, are popularly thought of as an aid to good digestion. But scientists are discovering that probiotics and the resulting healthy balance of gut bacteria confer a broad spectrum of previously unrecognized health benefits.¹

As we age, take antibiotics, or eat an unhealthy diet, the delicate balance between beneficial and bad gut bacteria becomes disrupted.²⁻⁴ Not having the proper balance of good-to-bad bacteria can wreak havoc throughout the body as well.⁵⁻⁹

For instance, scientists have discovered that an imbalance of healthy gut bacteria plays an important role in the development of chronic conditions such as autoimmune disorders, metabolic syndrome, diabetes, obesity, chronic fatigue syndrome, and non-alcoholic fatty liver disease (NAFLD).⁵⁻¹¹

So while supplementing with good bacteria has been seen as providing defense primarily against intestinal conditions—such as inflammatory bowel disease (IBD), irritable bowel syndrome (IBS), and colon cancer—scientists now believe that they help prevent many of the diseases of aging as well.⁶,⁷,⁹,¹¹⁻¹³
Fortunately, evidence demonstrates that supplementing with the right mix of probiotic bacteria such as *Lactobacillus* and *Bifidobacterium* species can powerfully ward off many of the factors leading to chronic disease.\textsuperscript{12} Probiotics can restore your body’s natural, *intestine-based* protection against a host of *non-intestinal* diseases and shield you from the diseases of aging.\textsuperscript{5-11}
Similarly, associations have been found between different Bifidobacterium species (Bifidobacterium lactis, Bifidobacterium bifidum, and Bifidobacterium longum) and improved blood sugar control, decreased liver inflammation, and reduced DNA damage that could trigger malignant cell development, respectively.16-18

How Intestinal Imbalance Affects The Entire Body

So why is it that an imbalance in gut bacteria affects areas of the body outside of the intestines? The answer lies in the fact that the intestinal tract contains one of the highest concentrations of chemical detection and signaling molecules—molecules that affect cells throughout your entire body.15

Your intestinal bacteria produce proteins that have a powerful influence on these chemical detectors—and as with any influence, this one can be positive or negative.19 Over time, an imbalance in the ratio of good-to-bad bacteria activates many of these detectors in negative ways that can trigger the development of a host of diseases in many body areas—not just those associated with the gut.5-11

Fortunately, using probiotic supplements to restore a healthy balance to your gut bacteria can reverse these disruptions to intestine-based signaling mechanisms. This, in turn, reverses the negative influence that triggers the development of chronic disease.20

Total Body Benefits Of Balanced Gut Bacteria

It has long been known that certain types of beneficial gut bacteria:

- Help break down dietary residues (such as indigestible fibers) and synthesize vitamins;
- Limit pathogenic colonization within the gut, protecting our bodies from infections; and
- Play a crucial role in the immune system, an estimated 70-80% of which is located in and around the gut.14,15

But compelling new evidence indicates that good bacteria also play a beneficial role outside the digestive tract, delivering broad-spectrum protection throughout the body.5-11

For example, two of the most studied and proven groups of bacteria—Lactobacillus and Bifidobacterium—have been found to protect against diseases not normally associated with intestinal origins.16-18

Scientific studies have found associations between different species of Lactobacillus (Lactobacillus acidophilus, Lactobacillus paracasei, and Lactobacillus rhamnosus) and increased HDL cholesterol, balanced immune response, and reduced markers of inflammation, respectively.16

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The Powerful Role Of Probiotics In Cancer

As an example, take just one deadly disease: cancer. Scientists have demonstrated that probiotic organisms switch on protective signaling mechanisms that:

- **Suppress** bacteria that convert pro-carcinogen molecules into carcinogens.\(^{21,22}\)
- **Bind** to potential carcinogens, promoting their excretion.\(^{21}\)
- **Decrease** enzymes implicated in the development of carcinogens.\(^{21}\)
- **Boost** populations of immune cells that play a role in tumor inhibition.\(^{22,23}\)
- **Up-regulate** immune cytokines to battle the early stage of cancer or other threats.\(^{22}\)
- **Suppress** the inflammatory response as the cancer or infection threat fades.\(^{22,24}\)

Probiotics Protect Against Numerous Diseases

Experimental models and randomized, controlled human intervention studies have confirmed that taking a probiotic supplement to restore the balance of gut bacteria also restores natural protection against multiple diseases.\(^{25}\) Take a look:

**Intestinal health.** A popular use of probiotics is to improve intestinal health by increasing levels of beneficial bacteria.\(^{26,27}\) *Lactobacillus* and *Bifidobacteria*, two of the most studied types of beneficial bacteria, have been shown to support intestinal function and improve both diarrhea and constipation.\(^{28-30}\) Probiotic supplements have helped improve both the quality of life and symptoms of patients with functional bowel disorders such as irritable bowel syndrome (IBS) and ulcerative colitis, as well as those of generally healthy people.\(^{29,31-33}\)

**Diabetes and the metabolic syndrome.** *Lactobacillus* and *Bifidobacteria* probiotics demonstrated improvement in insulin resistance and significant reductions in blood sugar concentrations in animal studies and human diabetes clinical trials.\(^{17,34-36}\) In a 6-week study of patients with type II diabetes, fasting glucose and hemoglobin A1c (a measure of long-term blood sugar control) were significantly improved through consumption of a probiotic yogurt containing *Lactobacillus acidophilus* and *Bifidobacterium lactis*; total antioxidant status also increased.\(^{17}\)

What You Need To Know

**Probiotics And Chronic Disease**

- Evidence shows that prolonged imbalance in intestinal bacteria can do more than induce intestinal diseases—it can trigger lethal diseases throughout the body!
- Properly balanced gut bacteria produce biologically active proteins that cross into the blood. In this way, “good bacteria” inhibit pathways of numerous chronic diseases—including obesity, diabetes, the metabolic syndrome, cardiovascular disease, cancer, and respiratory infections.
- Today’s diet, lifestyle, medical practices, and other factors tend to disrupt gut bacterial balance.
- Evidence shows that supplementing with key species restores the proper balance of beneficial bacteria—in turn restoring your body’s natural, intestine-based protection against a host of non-intestinal diseases!
**Obesity.** An association between antibiotic overuse and obesity has been demonstrated. Studies of probiotic supplementation in animal models and humans showed a reduction in body weight and fat accumulation. Studies show that probiotic supplements given to mothers prenatally (meaning from at least one month before birth and continuing up to 6 months after birth), subsequently reduced excessive weight gain in the mothers—and their children.

**Cardiovascular disease.** In studies conducted on both animals and humans, the use of probiotics decreased total and LDL cholesterol, and increased HDL cholesterol. In addition, recent studies suggest that supplements of beneficial bacteria can reduce cholesterol absorption and the inflammation of fat stores. These changes contribute to a significant decrease in the formation of inflammatory, cholesterol-laden plaques observed in early atherosclerosis.

**Cancer.** The risk of cancer, particularly of the colon, can be reduced through the use of probiotics. Scientists have shown that supplementation with *Lactobacillus acidophilus* and *Bifidobacterium longum* significantly decreases the DNA damage that can trigger malignant cell development—confirmed by a reduction in DNA strand-breaking compounds in human feces. Replenishing beneficial bacteria with supplements has been found to boost natural antioxidant and detoxification enzymes that prevent the activation of potential dietary carcinogens.

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**Six Factors Behind Gut Imbalance**

The lethal implications for the link between gut imbalance and increased disease risks are clear. But what factors are behind this dangerous imbalance? The answer is that accompanying the rise in a number of diseases in Western societies is the increased influence of a host of factors that continually disrupt our natural gut bacteria balance.

1. **Antibiotics.** One cause of an imbalance between good-to-bad bacteria is the unnecessary use of antibiotics. Antibiotic use, even at low subtherapeutic doses, can disrupt the number and relative proportions of gut bacteria.

2. **Infant formula.** Common use of infant formula instead of breast milk has interfered with mankind’s long history of transferring bacterial diversity from mother to baby. Similarly, *Caesarian delivery* prevents babies from inheriting diverse bacteria from their mothers.

3. **Excessive hygiene.** An exploding obsession with hygiene has drastically reduced our ability to naturally acquire certain key bacteria from our environment.

4. **Western Diet.** The Western diet—high in animal proteins and fats, sugars, and refined carbohydrates—causes a rise in undesirable bacteria, not counterbalanced by those that hold them at ideal levels. An example would be a rise in *Firmicutes* bacteria associated with obesity. In animals whose digestive tracts were colonized with human bacterial lines, switching from a low-fat, plant polysaccharide-rich diet to a high-fat/high-sugar Western diet adversely shifted the balance of the gut bacteria within a single day. Additionally, this dietary shift resulted in changes to metabolic pathways within the gut bacterial ecosystem and altered bacterial gene expression. Much of the food in the Western diet is made up of refined carbohydrates, which are absorbed in the upper part of the gastrointestinal tract. What eventually reaches the large intestine is of limited value to microbiota in this area because it contains only small amounts of the minerals, vitamins, and other nutrients necessary to maintain them. As a result, the numbers and diversity of beneficial intestinal bacteria of modern humans is greatly reduced, compared to the diets of Paleolithic man.

5. **Modern Medical Treatments.** A number of modern medical treatments are known to severely impair the proper balance of gut bacteria. These include artificial ventilation, hygienic measures, use of skin-penetrating devices, tubes and catheters, frequent pharmaceutical use, and more.

6. **Age.** Recent findings suggest that aging disrupts the bacterial makeup of the gut. This imbalance may contribute to the age-related increase in inflammation known as “inflammaging.”
Also, patients with colon cancer and those with pre-cancerous polyps had sharply reduced proliferation of abnormal colon cells and a significant decline in harmful *Clostridium* bacteria when supplemented with *synbiotics* (probiotic bacteria combined with *prebiotics*, which are substances that feed or promote the accompanying bacteria).  

**Respiratory infections.** Probiotics can significantly suppress respiratory infections such as the common cold and the flu—especially if you begin supplementing prior to cold and flu season. Studies show that people who supplemented for 3-6 months with different strains of *Bifidobacteria* and *Lactobacillus* reduced the duration of symptoms by an average of one to two or even more days, with a similarly impressive reduction in symptom severity. Two studies in children who were given both *Lactobacillus* and *Bifidobacterium* twice daily for 3 to 6 months found a significant decrease in school absenteeism and in the use of antibiotics, as well as reduced symptoms and duration.  

Colonization of the nose by potentially pathogenic bacteria, a common complication of colds, was shown to be reduced by 19% with regular probiotic use while the control group showed no change. This effect could save the lives of those who are older, or who have a compromised immune system due to chronic disease such as diabetes, or who have recently undergone a major operation—all of whom have a higher risk of being overwhelmed by bacterial infection, particularly those infections affecting the lungs.

**The Importance Of Multiple Species**

Although good bacteria can be found in small amounts in food, changing the entire ratio of gut bacteria requires substantial and consistent dosing with supplements providing potent levels of beneficial bacteria to enable their survival. Two types of probiotic bacteria commonly used include *Lactobacillus* and *Bifidobacterium*. There are many specific types of bacteria within each of these two broad groups, and health benefits associated with one type may be unique to that specific species and not hold true for others. This means that using multiple different species delivers better odds of reversing the negative effects of *dysbacteriosis*, a condition where there is an imbalance between good and bad bacteria.
Six Popular Probiotics And Their Specific Disease Benefits

**Lactobacillus acidophilus**
- Reduced diarrhea and improved bowel function in cases of radiation-induced enteritis.
- Increased HDL (good) cholesterol.
- Improved markers for metabolic syndrome, inflammation, and heart disease.
- Improved allergy-driven immune response.
- Improved markers for ulcerative colitis and irritable bowel disease.
- Increased control of blood sugar.\(^{17,34}\)
- Decreased the DNA damage that can trigger malignant cell development.\(^{18}\)

**Lactobacillus rhamnosus**
- Reduced diarrhea and improved bowel comfort in cases of radiation-induced enteritis.
- Improved markers for metabolic syndrome, inflammation, and heart disease.
- Reduced allergic response to milk in milk-sensitive patients.
- Improved markers for ulcerative colitis, and irritable bowel disease, including Crohn’s disease.

**Bifidobacterium lactis**
- Improved immune function in healthy, elderly individuals.
- Greater weight gain and less gut inflammation in preterm infants.
- Improved immune response and respiratory symptoms from birch pollen allergies in children.
- Increased control of blood sugar.\(^{17,34}\)

**Bifidobacterium bifidum**
- Improved markers for liver inflammation and damage in alcohol-related liver disease.
- Improved inflammation profiles in ulcerative colitis and irritable bowel disease.

**Bifidobacterium longum**
- Reduced diarrhea and improved bowel function in cases of radiation-induced enteritis.
- Increased HDL (good) cholesterol.
- Improved markers for ulcerative colitis and irritable bowel disease, including Crohn’s disease.
- Decreased the DNA damage that can trigger malignant cell development.\(^{18}\)

Summary

Scientists have shown that prolonged imbalance in intestinal bacteria can do more than induce intestinal or digestive problems—it can trigger numerous chronic diseases outside the intestine\(^{15-11}\). The link between unbalanced intestinal bacteria and several of today’s most prevalent diseases is clear. However, today’s diet, lifestyle, medical practices, and other factors tend to disrupt gut bacterial balance.\(^{2-4}\)

Fortunately, supplementing with key bacterial strains and species counters these destructive influences—restoring your body’s natural, intestine-based protection against a host of non-intestinal diseases.\(^{25}\)
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

PROBIOTICS PROVIDE VITAL PROTECTION AGAINST CHRONIC DISEASE


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. 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 SOFTGELS FOR SUPERIOR ABSORPTION**

VITAMIN D3 1,000 IU
250 softgels
Retail: $12.50
Four-bottle Member Price: $8.44 ea.

VITAMIN D3 5,000 IU
60 softgels
Retail: $11
Four-bottle Member Price: $7.43 ea.

VITAMIN D3 7,000 IU
60 softgels
Retail: $14
Four-bottle Member Price: $9.45 ea.

VITAMIN D3 5,000 IU WITH SEA-IODINE™
60 capsules (non-softgel)
Retail: $14
Four-bottle Member Price: $9.38 ea.

VITAMIN D3 LIQUID
2,000 IU (Natural mint flavor)
1 ounce
Retail: $28
Four-bottle Member Price: $18.75 ea.

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.
Excess calorie consumption has become epidemic in the United States. The invariable result is more overweight Americans and a litany of associated health problems.

A crucial component of a longevity or weight loss program is reducing portion size and the quantity of ingested calories.

A natural supplement has been developed to help tame hunger and promote satiety so more people can adhere to lower-calorie diets.

The Body’s Appetite Hormones

Hunger and satiety are controlled by hormones. Advanced Natural Appetite Suppress contains a Italian Borlotto variety bean extract that helps support normal levels of the gut hormones that control appetite and satiety. The result is reduced desire for food and less food intake.

The stomach hormone ghrelin produces feelings of hunger, while the hormones cholecystokinin (CCK), glucagon-like peptide-1 (GLP1), and peptide YY (PYY) produce feelings of food satisfaction and fullness. Advanced Natural Appetite Suppress provides a potent dose of a novel Italian Borlotto variety bean extract. Studies show this proprietary extract helps the body modulate levels of ghrelin and the satiety hormones CCK, GLP1, and PYY. This helps reduce food intake and supports normal, healthy levels of hunger and fullness.

This extract also modulates alpha-amylase, the enzyme that converts dietary starch into simple sugars. This can affect the rate at which free sugars are absorbed from the digestive tract into the blood stream.

Remarkable Clinical Research

In a recent human trial in which all overweight participants avoided making intentional dietary or exercise changes, those taking this Italian Borlotto variety bean extract lost 9 pounds on average in 12 weeks—versus only one-third of a pound in those taking placebo! The supplemented subjects also lost 2.5 inches in waist size—a 4.2 times greater reduction than the placebo subjects.

The supplemented participants had reduced appetite levels and increased satiety, and no significant side effects were reported. Advanced Natural Appetite Suppress contains the identical Italian Borlotto variety bean extract used in this study.

The suggested twice daily dosage of one (1) vegetarian capsule of Advanced Natural Appetite Suppress provides:

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<tr>
<th>Ingredient</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>European (Italian Borlotto variety) white kidney bean extract</td>
<td>200 mg</td>
</tr>
</tbody>
</table>

A bottle of 60 vegetarian capsules of the new Advanced Natural Appetite Suppress retails for $38. If a member buys four bottles, the price is reduced to $25.50 per bottle.

Beanblock® is a registered trademark of Indena S.p.A

References

To order Advanced Natural Appetite Suppress, call 1-800-544-4440 or visit www.LifeExtension.com

Item #01807

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.
Choosing the Right Probiotic for You

While many supplements provide just one type of bacteria, taking a probiotic with multiple varieties of good bacteria can help better fight off bad bacteria.¹²

**FlorAssist™ Probiotic Liquid Vegetarian Capsules** provide a proprietary blend of six bacterial strains! Each FlorAssist™ dual capsule contains 15 Billion CFU (Colony Forming Units)† consisting of:

- *Lactobacillus acidophilus* LA-14
- *Bifidobacterium lactis* BL-04
- *Lactobacillus paracasei* LPC-37
- *Lactobacillus rhamnosus* LR-32
- *Bifidobacterium bifidum/lactis* BB-02
- *Bifidobacterium longum* BL-05

These potent strains of probiotic bacteria adhere to the soft lining of the intestinal tract, help maintain a healthy surface, and support the digestive system.

The retail price for a bottle containing 30 capsules of **FlorAssist™ Probiotic Liquid Vegetarian Capsules** is $33. If a member buys four bottles, the price is reduced to just $22.50 per bottle.

†Colony Forming Units.

To order FlorAssist™ Probiotic Liquid Vegetarian Capsules, 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.
Profound loss of connections between nerve cells in the brain is one of the major hallmarks associated with neurodegeneration and memory impairment. Previous research has shown that magnesium is a critical factor in controlling synaptic density.¹

To combat this, an innovative form of magnesium called Neuro-Mag™ has been developed. The magnesium-L-threonate contained in Neuro-Mag™ has been shown to specifically target multiple areas of the aging brain. In fact, pre-clinical models show that the magnesium-L-threonate contained in Neuro-Mag™ boosted levels of magnesium in spinal fluid by 15% versus no increase from conventional magnesium.²

New Cognitive Benefits Revealed!

Although research into the role of magnesium in the brain dates back 70 years, scientists continue to uncover its comprehensive benefits for cognitive function.¹,² Studies using magnesium-L-threonate show this unique form of magnesium maintains the quantity of synaptic connections between brain cells and inhibits the dysregulation of signaling pathways.¹

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 supplying a modest 144 mg of elemental magnesium, its superior absorption into the bloodstream and nervous system make it a preferred choice for maturing individuals to supplement with.

This same brain-health supporting magnesium is also available in a natural lemon flavor called Neuro-Mag™ Magnesium-L-Threonate with Calcium and Vitamin D3 Powder. In addition to its fresh lemon flavor, the one-scoop per day serving supplies the same amount of magnesium as the capsules plus 500 mg of highly soluble calcium and 1,000 IU of vitamin D3.

A bottle containing 90 vegetarian capsules of Neuro-Mag™ Magnesium-L-Threonate or a jar containing 30 scoops of Neuro-Mag™ Magnesium-L-Threonate with Calcium and Vitamin D3 Powder retails for $40. If a member buys 4 units, the price is reduced to $27 per unit.

References
The Supplement Pyramid

This is the Step-By-Step Guidebook You’ve Been Waiting For.

You’ll find no other book on the market quite like it. In *The Supplement Pyramid*, Dr. Michael A. Smith, Senior Health Scientist for Life Extension®, provides you with an easy-to-understand, illustrated approach to tailoring a personalized nutritional regimen that’s just right for your needs.

Dr. Mike explains why even the healthiest diets fall short in terms of supplying the optimal amount of nutrients we need not just to survive, but also to thrive. And with such a staggering amount of nutritional supplement choices available, it’s hard to know where to start. *The Supplement Pyramid* provides you with the road map … so you can achieve the best possible results.

Learn How to Build Your Own Personalized Nutritional Regimen.

The key to the “Pyramid” is its three-tiered plan. The base features the essential nutrients everyone needs to support basic life processes at the cellular level. The next tier offers a series of detailed medical quizzes designed to help you identify your individual needs with a focus on disease prevention. And the top of the Pyramid is all about those nutritional supplements that can help you extend your life and make your later years healthier.

Written in easy-to-understand language, *The Supplement Pyramid* is an informative and enjoyable “how-to” book that answers all your questions about building a personalized nutritional regimen. Order it for your library today.

Order Today at lef.org/supplement-pyramid

Call toll free 1-855-867-9358

Mention Code: SPB425A

For more information, visit www.mysupplementpyramid.com
As you may know, I was hired by the Life Extension Foundation® to attend worldwide scientific conferences and report findings from these events to you in this magazine. I typically attend about two conferences a month. An advantage of attending these conferences is that new information is often presented long before it gets published in a journal.

Some conferences I attend yield little in the way of apparent advances in our understandings of aging. This year’s European Congress on Biogerontology held in Israel, was exceptional in the volume of meaningful research findings that were disseminated. What follows is my succinct report. >
Why Naked Mole Rats Don’t Get Cancer

Vera Gorbunova, PhD (Professor, University of Rochester, Rochester, New York) reported on the investigations she and her husband (Andrei Seluanov, PhD) have made into why naked mole rats live so long and don’t get cancer. Her husband has the second largest naked mole rat colony in the world. Naked mole rats are about the same size as mice, but live about ten times longer.

Cancer is the cause of death in nearly all laboratory mice that die naturally, but cancer has never been observed in a naked mole rat. Normal cells are limited in the number of times they can divide, but cancer cells often have the enzyme telomerase, which allows them to divide an unlimited number of times. The abundance of telomerase in mouse cells is believed to be one of the reasons mice so often die of cancer. But Dr. Seluanov and Dr. Gorbunova have found that naked mole rats have about as much telomerase as mice.1 So the naked mole rats must be preventing cancer by some other means.

The two scientists found that naked mole rat cells stop growing when the cells start to crowd each other.2 Cancer is the uncontrolled growth of cells, which can quickly lead to a crowding of cells - something that the biology of naked mole rats prevents. Dr. Gorbunova reported that she and her husband later discovered that naked mole rats secrete a form of hyaluronic acid that is five times larger than what human or mouse cells secrete. When the hyaluronic acid was removed from the naked mole rat cells, they became as vulnerable to cancer as mouse cells.3 That discovery was reported in the July 18, 2013 issue of the journal Nature as a cover story.

Calorie Restriction In Monkeys

George Roth, PhD (CEO, GeroScience, Inc, Pylesville, Maryland) discussed the seemingly conflicting results of calorie restriction studies on rhesus monkeys being conducted at the National Institute on Aging (NIA) and the University of Wisconsin (UW).

Dr. Roth was affiliated with the NIA study. Life span studies on rodents and more short-lived species have shown that calorie restriction with adequate nutrition extends both average and maximum life span.6 The relevance of these studies to humans is disputed on the grounds that such a mechanism would only be needed by short-lived species for survival.7

Unlike rodents, which do not generally develop diabetes or cardiovascular disease with age, humans and rhesus monkeys have a similar pattern of aging-associated diseases. Life span studies on humans are not typically feasible because of the long time involved, but rhesus monkeys also live quite long: an average of 27 years and maximum of 40 years when in captivity. The NIA and UW monkey studies began over 30 years ago, but those life span studies will not be concluded until all the monkeys have died, which will take at least another 10 years. Nonetheless, both institutions have released preliminary results.

UW results released in 2009 indicated that only 13% of the calorie-restricted monkeys had died of age-related causes compared with 37% of the controls (who were not calorie-restricted).8 The calorie-restricted monkeys had half the incidence of cancer and cardiovascular disease and no cases of diabetes. Nearly an eighth of the control monkeys had developed diabetes. This UW study showed robust survival improvements in calorie-restricted monkeys along with huge reductions in incidences of the diseases that most commonly strike aging humans.
Preliminary results released from the NIA study in 2012 reported that 20% of the calorie-restricted monkeys had died of age-related causes, compared with 24% of the controls which is not a statistically significant difference. One explanation for the conflicting results may be that the UW control monkeys could eat whenever they wanted (which represents the typical human diet), whereas the NIA control monkeys received a standard allotment of food, which mildly restricted their calories. On average, there was a greater difference in body weight between the calorie-restricted and the control monkeys at UW than at the NIA. In rats, very low levels of dietary restriction have a significant effect on survival, so the NIA controls may be showing those benefits, which diminished the longevity difference between the two groups of monkeys (calorie restricted versus controls).

Although both the NIA and the UW monkeys received nearly 60% carbohydrates, the UW diet was 28.5% sucrose, whereas the NIA diet was only 3.9% sucrose. The UW protein source was lactalbumin, whereas the NIA diet included fish meal, which is rich in omega-3 fatty acids. Omega-3 fats are known to reduce cardiovascular disease. Differences in diet composition could explain the differing results between these two studies.

The media used the NIA study to question the value of humans reducing their calorie intake, which is regrettable as the UW study demonstrated remarkable survival improvements. The beneficial changes that occur in calorie-restricted humans (such as reduced blood levels of glucose, insulin, lipids and inflammatory markers, and lower body weight) clearly show this is what humans should be doing, yet misleading media headlines made it appear that it is alright for people to calorically overindulge.

Dr. Roth acknowledged that he does not have the self-discipline or inclination to practice calorie-restriction. For this reason he has long been looking for supplements that produce the benefits of calorie restriction. He noted that the Wikipedia entry on “caloric restriction mimetic” lists resveratrol, metformin, and other compounds that are claimed to produce the benefits of calorie-restriction.

**Longevity Genes And Longevity Epigenetics**

Nir Barzilai, MD (Director, Institute for Aging Research, Albert Einstein College of Medicine, Bronx, New York) is interested in genetic and lifestyle causes of longevity. He has determined that although a healthy lifestyle may promote longevity in the general population, protective genes are more important than lifestyle for achieving extreme longevity. Studying Ashkenazi Jews aged 95 or older, he has found some highly protective genes. One such gene encodes a plasma protein that transfers cholesterol and triglycerides between the various forms of cholesterol carriers (HDL, LDL, and VLDL). Another longevity gene, which encodes a cholesterol carrier, harbors a modification that occurs in about 10% of individuals aged 60, but in about 25% of centenarians (people over 100 years of age).

Gil Atzmon, PhD (Associate Professor, Albert Einstein College of Medicine, Bronx, New York), who is a collaborator of Dr. Barzilai, is interested in the epigenetics of longevity. Epigenetics is the heritable modification of gene expression that is not controlled by DNA sequence. Comparing the children of centenarians with their spouses, Dr. Atzmon determined that the children had half the incidence of diabetes, a 60% lower incidence of heart attacks, and higher levels of protective cholesterol (HDL cholesterol). Dr. Atzmon has also determined that centenarians have had fewer children, and reproduced later in life than the general population. Although identical twins have the same genome (DNA sequences), their epigenetic differences increase with age, particularly when their lifestyles differ and they have not spent much time together. A greater randomness of epigenetic changes, such as methylation patterns, are associated with the “biological aging rate.” Dr. Atzmon has identified specific epigenetic changes associated with longevity.
Muscle Stem Cells And Aging

Zipora Yablonka-Reuveni, PhD (Professor, University of Washington, Seattle, Washington) has been studying muscle stem cells. Injury, exercise, and even routine daily activity results in muscle damage that is repaired by muscle stem cells. Age-related muscle deterioration is associated with a substantial decline in skeletal muscle mass, strength, and quality, which contributes to frailty in the elderly. Dr. Yablonka-Reuveni has established that the quantity of muscle stem cells declines with age, but the regenerative potential of those stem cells does not decline. Using running rats she demonstrated that exercise results in an increase in subsequent spontaneous activity in the old rats.

Imune System Stem Cells In Aging And Diabetes

Paolo Madeddu, MD (Professor, University of Bristol, Bristol, England) is concerned with the effects of aging and diabetes on the immune system. Influenza vaccine is less effective in the elderly. A decline in stem cell function in the immune system is believed to be partially responsible for this effect. Stem cells of the immune system are created in the bone marrow. Dr. Madeddu’s team has established that immune system stem cells of diabetic patients are damaged as a result of blood vessel malfunction in the bone marrow. His team has shown that insulin replacement significantly protects bone marrow blood vessels.

Eliminating Senescent Cells

Adi Sagiv, PhD student (Weizmann Institute of Science, Rehovot, Israel) has been studying fibrosis in the liver, which is caused by senescent cells (aged cells). Fibrosis is limited when immune system cells known as natural killer cells (NK cells) kill the senescent cells. Dr. Sagiv has been investigating means by which NK cells can be activated to enhance the elimination of senescent cells, and thereby reduce fibrosis.

Stem Cells From Fat For Heart Attack

Jonathan Leor, MD (Professor of Cardiology, Tel-Aviv University, Tel Aviv, Israel) is interested in the use of mesenchymal stem cells to treat heart disease. Mesenchymal stem cells are a specialized form of stem cells that have traditionally been isolated from bone marrow, but increasingly are being isolated from fat, which is more convenient and less invasive. Macrophages are immune system cells that can be either pro-inflammatory and destructive, or anti-inflammator
inflammatory and reparative. Mesenchymal stem cells can determine which type of macrophage manifests.38 Using human stem cell cultures, Dr. Leor showed that mesenchymal stem cells from fat could promote anti-inflammatory macrophage development.39 Using mesenchymal stem cells from the bone marrow of mice he demonstrated the ability of those cells to induce repair of experimentally-produced heart damage in mice.40 Later, using cells isolated from human patients, he was able to show that mesenchymal stem cells isolated from fat near the heart were more likely to induce pro-inflammatory macrophages, whereas mesenchymal stem cells from subcutaneous fat (fat under the skin) induced anti-inflammatory properties.41 So it appears that mesenchymal stem cells from subcutaneous fat have potential for treatment of heart attack victims.

Rejuvenation Of Immune System B-Cells
Doron Melamed, PhD (Professor, Technion Israel Institute of Technology, Haifa, Israel) is concerned with why the adaptive immune system declines in function with age, rendering vaccination of the elderly less effective than vaccination of the young. Many tissues of the body are continuously replenished by stem cells. Over a period of about two months, skin cells in the epidermis are shed and replenished by stem cells. Red blood cells last about four months before they are replenished by stem cells. The white blood cells (leukocytes) of the adaptive immune system are not continuously replenished, however, because they must maintain immunity over the life span of the organism.42 Vaccination is thus less effective in the elderly.43 Dr. Melamed has attempted to understand the mechanism by which the adaptive immune system ages.44 The adaptive immune system consists primarily of T-cells (which mature in the thymus gland) and B-cells (which mature in bone). B-cells produce antibodies that are used by T-cells to identify and destroy virus-infected cells and cancer cells. Part of the reason that T-cells age is that the thymus gland begins shrinking at puberty. Dr. Melamed has focused his attention on why B-cells age. He has shown that he could rejuvenate B-cells in mice simply by removing the existing B-cells.42,45,46 The stem cells that create new B-cells retain their capacity to do so even in old age. The same technique could not be used to rejuvenate T-cells, however, because of the degeneration of the thymus gland after puberty.

Cytomegalovirus Is Not Harmless
Graham Pawelec, PhD (Professor, University of Tubingen, Tubingen, Germany) specializes in aging of the immune system due to cytomegalovirus (CMV). CMV can be a life-threatening virus even for those with a healthy immune system.47 Like herpes simplex virus, CMV is usually inactive in infected persons, but is never eliminated by the immune system. Unlike herpes simplex, however, a substantial portion of the immune system is involved in controlling CMV, which drains the resources of the immune system.48,49 Dr. Pawelec noted that death rates in people as a result of cancer and cardiovascular disease cease accelerating by age 75-80, but death rates from infectious diseases continue to accelerate with age indefinitely.50 Persons with the highest levels of CMV antibodies have a much higher risk of death from all causes than persons with few or no antibodies.51,52 CMV is pro-inflammatory, which helps to explain its contribution to immunosenescence and potential relationship with other pathologies.53,54 CMV prevalence increases with age, leveling off at about 85-90% of the population being infected by age 75-80.55 Dr. Pawelec’s team has found that a lower responsiveness to vaccination is associated with CMV infection.56 His team has also found that families having longevity genes have lower levels of CMV-associated alterations in immune function.57 Efforts to develop a vaccine
against CMV have not yet been successful.\textsuperscript{58,59} CMV is transmitted through body fluids such as blood, urine, saliva, vaginal secretions, and semen. Infants are often newly infected, and therefore infectious. Infant caregivers should wash themselves thoroughly with soap and water after changing diapers, feeding, or handling toys. The drug\textsuperscript{60} valganciclovir can eradicate active CMV infection.

**Life Extension Contributions To Modern Medicine**

Ilia Stambler, PhD (Researcher, Bar-Ilan University, Tel Aviv, Israel) is a historian of life-extension science.\textsuperscript{61} The theme of his presentation was that many modern medical therapies had their origin in the efforts of early scientists to find methods of rejuvenation or life extension. Modern hormone replacement therapy originated from 19th century efforts to rejuvenate men using testicular extracts from animals. Similarly, some of the first transplantation operations were attempts at rejuvenation by transplantation of sex glands. Nobel Prize winning researcher Alexis Carrel fostered the idea that cells are immortal and that rejuvenation is possible. Dr. Carrel contributed to the first academic institution devoted to blood transfusion being founded in 1925 by a Russian physician who was seeking rejuvenation.

Dr. Stambler credits Alexander Bogomolets, a Soviet-era President of the Academy of Sciences of Ukraine, with the use of adjuvants (added components) to potentiate the immune response of the body. Dr. Bogomolets was an ardent life extension proponent. In 1938 Bogomolets organized the first publicized gerontological conference, and he also published his book*The Prolongation of Life.*

**Conference Coverage In The Israeli Media**

Dr. Stambler is himself an enthusiastic life extensionist. He was on the organizing committee of this conference. His promotion of the conference in Israeli television and newspapers emphasized the possibilities of life extension. He estimates that these media exposures reached nearly a fifth of the population of Israel.

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

**References**

The upgraded LIFE EXTENSION MIX™ provides more green tea extract than found in commercial formulations.

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

**Olive polyphenols** help protect against LDL oxidation, quench free radicals, and stabilize cell membranes. LIFE EXTENSION MIX™ contains an olive extract standardized to provide the best-documented polyphenol called hydroxytyrosol.

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

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

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

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

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

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

**Pterostilbene** is a compound naturally found in blueberries and grapes that has been shown to have beneficial, anti-aging effects.

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

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

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

Scientists have identified multiple mechanisms by which **green tea** extract helps to remove DNA toxins and DNA. **Wild blueberry extract** is found in up to 2.6 ounces of pomegranate juice.

**Vegetable-Fruit Complex**

<table>
<thead>
<tr>
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<th>Quantity</th>
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<tr>
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<td>Broccoli sprout concentrate extracts and calcium D-Gluconate</td>
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<td>(providing sulforaphane, glucosinolates, D-3T, and PEITC)</td>
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<td>Olive juice extract (providing polyphenols, hydroxytyrosol, tyrosol, oleuropein)</td>
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<tr>
<td>Grape seed proanthocyanidin extract (Leucoselect®)</td>
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<td>Grape (proanthocyanidin) extract (BioVin®)</td>
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<td>Luteolin (from orange extract)</td>
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<td>Lycopene (natural tomato extract) (Tomat-O-Red®)</td>
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<td>Lutein (marigold extract)</td>
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<td>Maqui Berry (Aristotelia chilensis) anthocyanin extract</td>
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<td>Bilberry extract (MirtoSelect®)</td>
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<td>Pomegranate extract (30% punicalagins) (POMELLA®)</td>
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<td>Fruit/Berry Complex blend</td>
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<td>(proprietary blend of concentrated blackberry, blueberry, cherry, cranberry, elderberry, persimmon, prune powders)</td>
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<tr>
<td>Wild Blueberry anthocyanin extract (fruit)</td>
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<td>trans-Pterostilbene (from pTeroPure™)</td>
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<td>CherryPure® Tart Cherry (Prunus cerasus) proanthocyanidin extract</td>
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<td>(from Delphinol® Maqui berry (Aristotelia chilensis) extract)</td>
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**Water-Soluble Vitamins and Enzymatic Activators**

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</tr>
<tr>
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<tr>
<td>Biotin</td>
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<tr>
<td>Trimethylglycine (TMG)</td>
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<tr>
<td>Vitamin B1 (thiamine HCI)</td>
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<tr>
<td>Vitamin B2 (riboflavin)</td>
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<tr>
<td>Supplying: Riboflavin 5'-phosphate</td>
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<tr>
<td>Vitamin B3 (niacinamide and niacinamide ascorbate)</td>
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<td>Vitamin B3 (niacin)</td>
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<tr>
<td>Vitamin B5 (l-calcium pantotenate)</td>
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</tr>
<tr>
<td>Pantethine</td>
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</tr>
<tr>
<td>Vitamin B6 (pyridoxine HCI)</td>
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<tr>
<td>Pyridoxal 5'-phosphate (vitamin B6)</td>
<td>100 mg</td>
</tr>
<tr>
<td>Vitamin B12 (methylcobalamin)</td>
<td>600 mcg</td>
</tr>
</tbody>
</table>

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
THE MOST COMPLETE MULTIVITAMIN AVAILABLE TODAY

Published scientific studies document that people who eat the most fruits and vegetables have much lower incidences of health problems. Few people, however, consistently eat enough plant foods to protect against common age-related decline, and commercial multivitamins do not provide all of the vital plant components needed to maintain good health. Life Extension Mix™ provides a broad array of vegetable/fruit extracts.

Life Extension Mix™ now contains an upgraded vitamin B12 that offers superior absorption compared to other forms of B12.

Fat-Soluble Vitamins

Vitamin A (as Betatene® natural beta-carotene from dunaliella and acetate) 5,000 IU
Vitamin D3 (cholecalciferol) 2,000 IU
Vitamin E (as calcium ascorbate, ascorbic acid, ascorbyl palmitate, magnesium ascorbate, niacinamide ascorbate, acerola extract) 100 IU
Natural mixed tocopherols (prodiving gamma, delta, alpha, and beta tocopherols) 60 mg

Amino Acid Complex

N-acetyl-L-cysteine 600 mg
Taurine 200 mg

Mineral Complex

Selenium (from S-methyl L-selenocysteine) 100 mcg
Selenium (from L-selenomethionine—SelenoPure™) 50 mcg
Selenium (from sodium selenite) 50 mcg
Zinc (as zinc citrate) 20 mg
Zinc (monomethionine) (OptiZinc®) 15 mg
Boron (Albion® bororganic glycine) 3 mg
Calcium 218 mg
Copper (as copper bisglycinate chelate TRACCS®) 1 mg
Chromium (as Crominex® 3+ chromium stabilized with Capros® and PrimaVie® Shilajit) 500 mcg
Potassium chloride (37.4 mg elemental) 71.3 mg
Molybdenum (sodium molybdate) 125 mcg
Manganese (gluconate) 1 mg
Iodine (potassium iodide) 150 mcg
Magnesium oxide (335.96 mg elemental) 560 mg
Magnesium citrate (35.28 mg elemental) 261.3 mg
Magnesium glycinate (11.74 mg elemental) 100 mg
Magnesium taurinate (7.83 mg elemental) 100 mg
Magnesium arginate (5.87 mg elemental) 100 mg
Magnesium ascorbate (3.40 mg elemental) 58.1 mg

Cholinergic Complex

Choline (from bitartrate) 120 mg
Phosphatidylcholine (from soy) 150 mg
Inositol 250 mg

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

The Life Extension Mix™ utilizes natural mixed tocophers that provide natural vitamin E from alpha tocopherol and a small amount of gamma tocopherol (40 mg). Compared to synthetic vitamin E, the natural form is far more bioavailable to the body.

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

Life Extension Mix™ contains the sodium selenite, selenomethionine, and Se-methyl L-selenocysteine forms of selenium. Some scientific evidence suggests that consumption of selenium may reduce the risk of certain forms of cancer; however, the FDA has determined that this evidence is limited and not conclusive.

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

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

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

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

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

Contains soybeans. Contains fish (Tilapia).

1. Betatene® is a registered trademark of BASF SE. 2. Delphinidin® is a registered trademark of MNL protected by U.S. patent application US 13/075,117 and WPO PCT/IB2010/002698. 3. OptiZinc® is a registered trademark of InterHealth Nutraceuticals, Inc. 4. SelenoPure™ is a trademark of Nutrition, Inc. 6. Leucovorin® is a registered trademark of Indena S.p.A.

CAUTION: Some people choose a high-niacin version of Life Extension Mix that provides 862 mg in the daily dose, of which 345 mg is the form of niacin that can cause temporary flushing, itching or gastric disturbances. Liver function testing is recommended when niacin is taken in excess of 500 mg daily. Those with gout or liver diseases should avoid taking high doses of niacin. Consult with your doctor before using this product if you are taking anticoagulant medications. Individuals consuming more than 2,000 IU/day of vitamin D (from diet and supplements) should periodically obtain a serum 25-hydroxyvitamin D measurement. Vitamin D supplementation is not recommended for individuals with high blood calcium levels.

References


To order call toll-free 1-800-544-4440 or visit www.LifeExtension.com

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
FIGHT BACK AGAINST AGING!

Aging is Characterized by Inflammation, Glycation, and Mitochondrial Decay

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

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

- **CARNOSINE**: As humans age, proteins in their bodies become irreversibly damaged by glycation reactions. Glycation is the cross-linking of proteins and sugar to form non-functioning structures called advanced glycation end products in the body, which can lead to alterations of normal cell function. Carnosine is not only a powerful anti-glycating agent, but it also protects neurons against reactive and cytotoxic protein carbonyl species associated with normal aging.1-10

- **PQQ**: This breakthrough micronutrient has been shown to trigger mitochondrial biogenesis—the growth of new mitochondria in aging cells! PQQ also activates genes involved in protecting the delicate structures within the mitochondria.7,10

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

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

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

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

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

Taking all of the individual ingredients in the Mitochondrial Energy Optimizer with BioPQQ® separately would be prohibitively expensive, but Life Extension members obtain this comprehensive formula at substantial savings. A bottle of Mitochondrial Energy Optimizer with BioPQQ® containing 120 capsules retails for $94. If a member buys four bottles, the price is reduced to $63 per bottle.

Just four capsules of Mitochondrial Energy Optimizer with BioPQQ® provide:

- Carnosine 1000 mg
- ArginoCarn® Acetyl-L-carnitine argininate DIHCl 675 mg
- R-Lipoic acid (as microencapsulated Bio-Enhanced®) 150 mg
- Benfotiamine 150 mg
- Pyridoxal S’-Phosphate 100 mg
- BioPQQ® 10 mg
- Luteolin 8 mg
- Calcium 230 mg

**References**


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

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For those aware of how painfully behind the curve the federal government is when it comes to our nation's health, it will come as no shock to learn that the White House, in fairly recent history, used to give out free packs of cigarettes emblazoned with the presidential seal. Furthermore, it should come as no surprise that even after the US surgeon general issued his first report on the dangers of smoking, the general public, along with our government officials, ignored the warning and continued to smoke at will.

Vice President Dick Cheney, who spent most of his political career working in or near the White House, is a poster child for how smoking and horrific eating habits can lead to chronic heart disease and, if not for the miracle of modern medicine, death.
In the new book, *Heart: An American Medical Odyssey – The story of a patient, a doctor, and 35 years of medical innovation*, Cheney chronicles his 40-year battle with heart disease, along with his doctor, Jonathan Reiner, MD. It all began with a near-suicidal diet and smoking problem that took off in the late 1960s. Here is how Cheney describes his lethal lifestyle in his own words:

“My habit really picked up once I got into Washington and was working for Don Rumsfeld, who was a counselor to President Nixon. In those days, just about everyone smoked in meetings, at meals, at home. It was pervasive... Tobacco companies kept the White House stocked with presidential cigarettes that came in gold-trimmed white boxes stamped with the presidential seal. You could also get matches from Air Force One, Marine One and even Camp David... Despite the growing evidence that smoking was bad for your health, we all did it. Even in a meeting in the Oval Office, it wasn’t unusual for most participants to be smoking... By the time I was in my early thirties, I’d developed a heavy smoking habit, my diet was terrible, and I didn’t get nearly enough sleep or exercise. I basically ate whatever anyone put in front of me. Many nights, dinner consisted of high-calorie, high-fat hors d’oeuvres at Washington receptions. Other nights, I’d arrive home late and whip up some eggs and bacon for dinner. Sunday morning meant a trip to the local Krispy Kreme for a dozen doughnuts... I rarely got exercise.”

—Dick Cheney

The book begins with Cheney as a 34-year-old White House chief of staff, who begins and ends each day with the most powerful man in the world, Gerald Ford, the President of the United States. Like most men in their thirties, Cheney didn't give much thought to mortality and lived his day-to-day life as if it would never end. The fact that he smoked almost non-stop throughout the day and ate sugar-laden, fatty, nutrition-less foods on a regular basis didn't concern him. Nor did he concern himself with regular doctor visits or blood tests.

Following President Ford’s loss to Jimmy Carter in the 1976 elections, Cheney took some time off and finally had time to go to a doctor for a physical. Following his visit, his doctor told him that given his smoking, cholesterol levels, bad diet, and family history on his mother's side, he was a prime candidate for a heart attack. He wasn't even 40 years old.

Cheney didn't believe him. Instead, he proceeded with his dangerous lifestyle and embarked on a run for Congress. While on a campaign stop in Cheyenne, Cheney woke up at 2 a.m. with a tingling sensation in the two small fingers of his left hand. He woke up his wife and they went to the hospital, where Cheney walked in on his own—then promptly passed out. When he came to, his room was buzzing with a frenzy of people; he was 37 years old and having a heart attack.

The book goes back and forth between Cheney's own battle with heart disease and the history of humanity's struggle with the condition, as told by his doctor, Jonathan Reiner, MD. For instance, Reiner talks about how during World War II, the US Army solicited the assistance of a physiologist, Ancel Keys, to help design a mobile diet for paratroopers. Following the war, Keys, from the University of Minnesota, spent his time trying to figure out why Americans were experiencing such a sharp rise in deaths from cardiac disease. In 1961, in a profile story on him for *Time* magazine, he recommended the following diet:
Eat less fat meat, fewer eggs, and dairy products. Spend more time on fish, chicken, liver, Canadian bacon, Italian food, Chinese food, supplemented by fresh fruits, vegetables, and casseroles.

While he had a few things right, he had almost everything else wrong—and this was considered a cutting-edge recommendation for his time!

In 1984, Cheney had his second heart attack while working on Capitol Hill. Even though his first heart attack prompted him to quit smoking, he considered the second one a “true wake up call,” as his lifestyle in terms of his hours worked, the stress he endured, and his new hobbies of playing tennis, hiking, and skiing pushed his heart to the limit. Unfortunately for his health, as his heart conditioned worsened, his responsibilities in Washington continued to increase. At this time, Cheney began to develop a relationship with his physician, who would monitor his activities and allow him to fully participate in his life and job.

Of course, the best-laid plans often fall apart, and the bill of Cheney's early abuse to his body, along with his genes, came due for a third time in 1988, when he awoke once again with chest pain and was brought to George Washington University Hospital.

When he arrived in the emergency room his blood pressure was 115/70, and his pulse was 64, which were both considered normal. However, his EKG showed signs of a new MI and after a series of tests a new clot was discovered blocking the right coronary artery, confirming a third heart attack in ten years.

Further tests showed that Cheney's coronary artery disease was progressing, prompting his doctor to advise bypass surgery. Cheney says that at this time, his quality of life was greatly affected and he was having difficulty carrying his luggage through airports due to such decreased stamina.

“Having open heart surgery wasn’t something I looked forward to, but if I wanted to continue my career in Congress and continue my skiing and pack trips in Wyoming and all of the other activities I loved, it was necessary,” he says, reflecting on his thoughts.

The surgery was successful and four months later he was back to skiing at Vail and Beaver Creek.

Vice President Cheney’s fourth heart attack occurred in 2000 and ultimately became famous for the physician’s description of how insignificant the cardiac event was in his press conference:

“We have biochemical markers that enable us to determine whether or not there has been any damage at all to the heart muscle. And over the last several years…we've had some new tools, much more sensitive markers which weren't available several years ago which enable us to detect extremely small levels of heart muscle damage… Two or three years ago we would simply—based on the biochemical data available then—we would simply have classified the event as just angina.

Nevertheless, it was Cheney’s fourth heart attack in less than two decades, and it signaled an increasingly serious escalation of his heart problems. As the book is about medical innovation and the evolution of cardiac care, the following chapters are filled with information about the history of several heart devices, as well as the men who invented them. With each device, for instance, a stent, we learn how it was used in the care of Vice President Cheney, all the way up to when an ICD (implantable cardioverter defibrillator) saved his life in 2009 by rapidly pacing his heart during a V Fib event.

This reprieve, however, was only temporary, as Cheney would remarkably suffer a fifth heart attack in 2010. The story behind each of these events is relatable on a medical level but also holds special interest in terms of how it is handled when the man suffering the event is the Vice President.

Following his fifth minor heart attack, Cheney continued to try and keep a normal schedule, but he was experiencing labored breathing and exhaustion on a regular basis, and by June of 2010 he was approaching end-stage heart failure. He could no longer walk down the driveway to get his newspaper or climb the stairs to get to the second floor of his house. He describes waking up in the morning with barely enough
energy to make it to a large chair, just to fall asleep again. After dozens of heart procedures and nearly countless episodes, the Vice President began to feel like his time was almost up, as they had used nearly every bit of technology and all the medical procedures available for dealing with his disease. At this point, there were only two options left. The first was a heart transplant, which, with an average waiting period of 12 months, wasn’t a possibility due to his worsening condition. The second was an LVAD, or left ventricular assist device, which is ultimately what Cheney opted for.

Cheney’s five-week hospital stay for the LVAD surgery was the “toughest” procedure he’d undergone, and the details should be required reading for those who feel they don’t need to take care of their heart. Essentially, with the exception of breathing, following the LVAD procedure, there was no bodily function he could perform without assistance.

His recovery from the procedure was painstaking and it was especially so when you consider that the purpose of the device was to allow him to live long enough for an even more serious procedure: a heart transplant.

Altogether Cheney would spend 20 months on the LVAD pump. Then, on March 23, 2012, Cheney got the call that the transplant team had a new heart for him. Later the next day, Cheney’s badly diseased heart was removed and he was given a new one, almost 30 years after his original heart began deteriorating.

Following the procedure, Cheney was on a respirator for a few hours and says he only experienced minor discomfort. Three days after surgery, he was out of bed and walking around the hospital; nine days later he was discharged. Other than taking antirejection medications to suppress his immune system so that it doesn’t reject his new heart, his recovery has been trouble free.
GUTSY PRODUCTS
FOR THAT QUEASY, UNEASY FEELING.

GUTSY CHEWY
chewable tablet

Gutsy Products promote oral and digestive health with a proprietary blend of nature’s remedies. So the next time you have that queasy, uneasy feeling, Gutsy products can help you.

Invented by a Gastroenterologist & Dentist

Dr. Doug Haghighi is a Cleveland Clinic trained gastroenterologist and Harvard trained dentist with expertise in diagnosing and treating oral and digestive diseases.

All-Natural Ingredients

Gutsy Chewy contains our proprietary blend of nature’s remedies (GIGS™): papaya, licorice root and apple cider vinegar. It also has xylitol to optimize oral health, plus calcium and magnesium for digestive health. Together, they enhance the body’s natural defense mechanisms that maintain a normal digestive system.

Effective and Safe

GIGS™ with calcium was tested in a randomized, double-blind, placebo-controlled human clinical study.1 GIGS™ has been assessed by leading U.S. toxicologists and found to be safe at the levels recommended.

A tube of all-natural Gutsy Chewy containing 8 gluten-free, lactose-free, vegan-friendly tablets retails for $11.50. Members of the Life Extension Foundation pay only $8.63 per tube.

To order Gutsy Chewy, 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.
For the past 34 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.)
   Online orders can also be placed at www.lef.org/blood
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.

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

### MEN’S ANNUAL BLOOD TESTING

- **MALE LIFE EXTENSION PANEL (LC322582)**
  - CBC/Chemistry Profile (description on next page)
  - DHEA-S
  - PSA (prostate-specific antigen)
  - Homocysteine
  - C- Reactive Protein (high-sensitivity)
  - Free Testosterone
  - Total Testosterone
  - Estradiol
  - TSH for thyroid function
  - Vitamin D (25-hydroxyvitamin D)
  - Hemoglobin A1c
  - **Retail Price:** $400
  - **Member Super Sale Price:** $199

- **MALE HORMONE ADD-ON PANEL** (LCADD3M)
  - Pregnenolone and Dihydrotestosterone (DHT)
  - **Retail Price:** $206.75
  - **Member Super Sale Price:** $116.25

- **THYROID ADD-ON PANEL (LCTHYROID)**
  - Free T3 & Free T4.
  - **Retail Price:** $73.33
  - **Member Super Sale Price:** $36

- **OMEGA SCORE™** (LCOMEGA)
  - Provides valuable information on your risk of developing heart disease, sudden heart attack, and cardiac death. The Omega Score™ also includes your AA:EPA ratio, allowing you to determine and track a major factor in total body inflammation.
  - **Retail Price:** $175
  - **Member Super Sale Price:** $99

- **INSULIN (LC004332)**
  - Helpful to assess insulin resistance.
  - **Retail Price:** $33.33
  - **Member Super Sale Price:** $22.25

- **VAP™ TEST** (LC084500)
  - The VAP™ cholesterol test provides a more comprehensive coronary heart disease (CHD) risk assessment than the conventional lipid profile. This test includes measurements of LDL particle size and lipoprotein subclasses.
  - **Retail Price:** $120
  - **Member Super Sale Price:** $67.50

- **FOOD SAFE ALLERGY TEST** (LC736301)
  - This test measures delayed (IgG) food allergies for 95 common foods.
  - **Retail Price:** $264
  - **Member Super Sale Price:** $148.50

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**SUGGESTED ADDITIONS TO ANNUAL BLOOD TESTING**

- **CORTISOL** (LC004051)
  - This test is used to help assess adrenal function.
  - **Retail Price:** $52
  - **Member Super Sale Price:** $29.25

- **LP-PLA2 (PLA2® TEST)** (LC122340)
  - This test is used to aid in predicting risk for coronary heart disease and ischemic stroke associated with atheroecrosis. LP-PLA2 is a cardiovascular risk factor that provides unique information about the stability of the plaque inside your arteries.
  - **Retail Price:** $175
  - **Member Super Sale Price:** $83.75

- **HEAVY METALS PANEL (BLOOD)** (LC100003)
  - This panel contains mercury, arsenic, and aluminum.
  - **Retail Price:** $265.33
  - **Member Super Sale Price:** $149.25

- **FERRITIN** (LC084598)
  - Used to evaluate iron stores in the body and to determine iron deficiency anemia.
  - **Retail Price:** $37
  - **Member Super Sale Price:** $21

- **HEARING** (LC000810)
  - This test measures the amount of vitamin B12 and folate in the blood.
  - **Retail Price:** $44
  - **Member Super Sale Price:** $24.75

* For non-member pricing call 1-800-208-3444.
** This test is packaged as a kit, requiring a finger stick performed at home.
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This blood test service is for informational purposes only and no specific medical advice will be provided. National Diagnostics, Inc., and the Life Extension Foundation contract with a physician who will order your test(s), but will not diagnose or treat you. Both the physician and the testing laboratory are independent contractors and neither National Diagnostics, Inc., nor the Life Extension Foundation will be liable for their acts or omissions. Always seek the advice of a trained health professional for medical advice, diagnosis, or treatment. When you purchase a blood test from Life Extension/National Diagnostics, Inc., you are doing so with the understanding that you are privately paying for these tests. There will be absolutely no billing to Medicare, Medicaid, or private insurance. I have read the above Terms and Conditions and understand and agree to them.

Signature of Life Extension Member

X

Life Extension Foundation Members only

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Male Female

Name

Date of Birth (required) / /

Address

City

State Zip

Phone

Credit Card No.

Expiration Date /

Mail your order form to:

Life Extension
National Diagnostics, Inc.
3600 West Commercial Boulevard
Fort Lauderdale, FL 33309

Phone your order to: 1-800-208-3444
Fax your order to: 1-866-728-1050

 order lifesaving blood tests from virtually anywhere in the US!
| Category                     | Products                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
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### SUB-TOTAL OF COLUMN 1

### SUB-TOTAL OF COLUMN 2

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To order call: 1.954.766.8433 or 1.800.544.4440
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**SUB-TOTAL OF COLUMN 4**

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

MAY 2014

To order online visit: www.LifeExtension.com
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**SUB-TOTAL OF COLUMN 5**

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**SUB-TOTAL OF COLUMN 6**

LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS
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**SUB-TOTAL OF COLUMN 7**

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**SUB-TOTAL OF COLUMN 8**
To order call: 1.954.766.8433 or 1.800.544.4440

**Buyers Club Order Form**

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<th>No.</th>
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**J, K**

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**SUB-TOTAL OF COLUMN 9**

**SUB-TOTAL OF COLUMN 10**

MAY 2014

LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS
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**BUYERS CLUB ORDER FORM**

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**SUB-TOTAL OF COLUMN 11**

**SUB-TOTAL OF COLUMN 12**

For more information, visit www.LifeExtension.com
Buyers Club Order Form

To order call: 1.954.766.8433 or 1.800.544.4440

<table>
<thead>
<tr>
<th>No.</th>
<th>Product Description</th>
<th>Retail Each</th>
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**SUB-TOTAL OF COLUMN 13**

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<td>Resveratrol w/Synergic Grape-Berry Actives (Optimized) - 250 mg, 60 veg. caps</td>
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**SUB-TOTAL OF COLUMN 14**

Life Extension Members receive 25% off the retail price of all products.
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<td>RICH REWARDS® CRUCIFEROUS VEGETABLE SOUP - 32 oz. bottle</td>
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<td>RICH REWARDS® MUNG BEAN SOUP W/TURMERIC - 32 oz. bottle</td>
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<td>RNA CAPSULES - 500 mg, 100 caps</td>
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<td>SEA-ODINE™ - 1,000 mcg, 60 veg. caps</td>
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<td>SELENIUM - 2 oz dropper bottle</td>
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<td>SERRAFLAVME - 100 tablets</td>
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<td>SODIUM® w/GLISODON® AND WOLFBEERRY - 90 veg. caps</td>
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<td>ST. JOHN’S WORT EXTRACT - 300 mg, 60 veg. caps</td>
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<td>(L) THEANINE - 100 mg, 60 veg. caps</td>
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<td>TMS - 1,000 mg, 60 veg. liquid caps</td>
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<td>TOOTHPASTE - 4 oz (Mint)</td>
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<td>01803</td>
<td>TNI SUGAR SHIELD™ - 60 veg. caps</td>
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<td>TRUFIBER® - 180 grams</td>
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<td>TRUFLORA PROBIOTICS - 32 veg. caps</td>
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<td>L-TRYPTOPHAN - 500 mg, 90 veg. caps</td>
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<td>TRYPTOPHAN PLUS (OPTIMIZED) - 90 veg. caps</td>
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**SUB-TOTAL OF COLUMN 15**

**SUB-TOTAL OF COLUMN 16**

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

MAY 2014
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| V       |             |             |     |       |
| 00213   | $15.00      | $11.25      |     |       |
| 00408   | $18.95      | $14.21      |     |       |
| 01327   | $18.00      | $13.50      |     |       |
| 01526   | $12.75      | $9.56       |     |       |
| 00372   | $7.65       | $5.74       |     |       |

| 00098   | $10.50      | $7.88       |     |       |
| 01535   | $12.50      | $9.38       |     |       |
| 00361   | $8.75       | $6.56       |     |       |
| 01634   | $10.00      | $7.50       |     |       |
| 00927   | $25.50      | $19.13      |     |       |
| 00084   | $23.95      | $17.96      |     |       |
| 01736   | $20.00      | $15.00      |     |       |
| 01732   | $28.00      | $21.00      |     |       |
| 01758   | $14.00      | $10.50      |     |       |

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

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To order a Life Extension Gift Card for someone special, call 1-800-544-4440.
<table>
<thead>
<tr>
<th>Order Number</th>
<th>Retail Member</th>
<th>Quantity</th>
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</tbody>
</table>

Buyers Club Order

Super Sale Savings on all products.

To order call: 1.954.766.8433 or 1.800.544.4440

**ORDER SUBTOTALS**

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<th>Sub-Total Column 18</th>
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**ORDER TOTALS**

Sub-Total A (Sub-total of Columns 1 through 18) $5.50

Postage And Handling (Any size order, continental U.S.) $5.50

C.O.D.s (Add $7 for C.O.D. orders)

Shipping: UPS OVERNIGHT add $16, UPS 2nd DAY AIR add $7. For Puerto Rico, US Virgin Islands, Alaska & Hawaii, add $7. CANADA UPS EXPRESS Flat rate $17.50, UK Flat rate $25.00. ALL OTHER INTERNATIONAL AIR WILL BE ADDED.

GRAND TOTAL (Must be in U.S. dollars)

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CHECK HERE FOR C.O.D. ORDERS

CHECK HERE FOR UPS BLUE LABEL (2ND DAY)

CHECK HERE FOR UPS RED LABEL (OVERNIGHT)

**BILL TO ADDRESS**

NAME ____________________________ E-MAIL ____________________________

ADDRESS ____________________________

CITY/STATE/ZIP-POSTAL CODE __________ COUNTRY ____________________________

PHONE ____________________________ FAX ____________________________

VISA/MASTERCARD/AMEX/DISCOVER #

EXP. DATE ____________________________

SIGNATURE ____________________________

**SHIP TO ADDRESS**

NAME ____________________________ E-MAIL ____________________________

ADDRESS ____________________________

CITY/STATE/ZIP-POSTAL CODE __________ COUNTRY ____________________________

PHONE ____________________________ FAX ____________________________

SIGNATURE ____________________________

PRICES SUBJECT TO CHANGE WITHOUT NOTICE. PLEASE NOTIFY THE LIFE EXTENSION FOUNDATION® OF ANY ADDRESS CHANGE.
FREE Gift to New Members

This 2014 edition of Disease Prevention and Treatment provides 1,400 pages of information about therapies that are documented in the scientific literature, but are not routinely used in clinical medical practice. Gaining access to this knowledge enables one with a medical disorder to take advantage of these advanced modalities immediately, rather than waiting years for conventional medicine to catch on.

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3. Fax back to 1-866-728-1050
4. Mail to: Life Extension Foundation® • PO Box 407198 Ft. Lauderdale, FL 33340-7198

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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)

Item code: MEMB1. Call for multiple year membership rates.

Name ____________________________________________
Address ____________________________________________
City ___________________________ ST ___________ ZIP ____________
Email ____________________________________________
Phone ____________________________________________
☐ Check enclosed (payable to Life Extension Foundation®)
☐ Charge my cc: ____________________________ Exp. ____________

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MAY 2014
Teralac® and TruFlora® pack powerful help for digestive health.

Powerful Pair.

**Teralac®**
- 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 Teralac® 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 seven U.S. Patents that ensure delivery through harsh stomach acid and active prebiotic stimulation of the probiotics with LacoStim®, found only in Master Supplements products.

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ENTEROGUARD® CAPSULES

PROTECT VALUABLE CARGO

Jarrow Formulas® new Jarro-Dophilus EPS® 25 Billion contains clinically documented strains. Each capsule is packaged in blister packaging for enhanced room temperature stability and protected with the EnteroGuard® coating, meaning that probiotic organisms arrive at the intestines unharmed by stomach acid. Each blister pack is made in a humidity-controlled environment, preventing moisture from decreasing potency.

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Jarro-Dophilus EPS® 25 Billion Per Capsule, 30 caps. Item # 01759.
Retail Price - $39.95
Member Price - $29.96

www.Jarrow.com
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Whole-Body Health as Nature Intended

Discover Zyflamend, the premier herbal supplement for helping to balance and support the body’s natural, healthy inflammation process.*

What is the Inflammation Response?
Our body’s inflammation response is a natural process and part of the body doing its job. We often think of the inflammation response as something we can feel—such as 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. Whether we’re aware of it or not, this inflammation response can affect the whole body.

Zyflamend® from New Chapter® is an intelligent blend of full-spectrum herbal extracts containing a multitude of naturally occurring compounds. These whole, active phytoneutrients work together to support a healthy inflammation response.* Perhaps as important as a daily multivitamin, Zyflamend is the patented herbal protocol to help your whole body’s natural inflammation process stay balanced. In addition, whole-food antioxidants, including Ginger, Turmeric, Green Tea, and Rosemary, help quench free radicals and support healthy aging.*

Zyflamend’s Patented Formula
Many of the herbs in Zyflamend have been used traditionally to support human health and longevity in cultures around the world. Chinese Skullcap, Chinese Goldthread, and Barberry are time-honored tonic herbs in the Chinese herbal tradition. Rosemary and Oregano are native to the Mediterranean region. Zyflamend’s Hu Zhang is a natural source of resveratrol, a heart-supportive compound in red wine.* Turmeric, Ginger, and Holy Basil are common elements in Asian and Indian wellness regimes. Green Tea is known across this region for its many remarkable properties.

Visit newchapter.com to learn more!

Available at Life Extension
To order, call 1-800-544-4440 or visit www.LifeExtension.com

Zyflamend Whole Body
120 Softgels (Item #01051) Retail $64.95 Member Price $48.71

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*According to 2013 SPINS® Market Research

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**High Potency FAT-SOLUBLE NUTRIENTS in ONE Softgel**

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

Just one **SUPER BOOSTER** provides:

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

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

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

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

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

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

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

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Quantity</th>
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<tr>
<td>Vitamin K2 (as menaquinone-7)</td>
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</tr>
<tr>
<td>Vitamin K2 (as menaquinone-4)</td>
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<tr>
<td>Vitamin K1 (as phytonadione)</td>
<td>1000 mcg</td>
</tr>
<tr>
<td>Ginkgo extract</td>
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<tr>
<td>Sesame lignans</td>
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<tr>
<td>Chlorophyllin</td>
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<tr>
<td>Gamma Tocopherol</td>
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<tr>
<td>Lycopene</td>
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<td>Lutein</td>
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<tr>
<td>Vitamin B12</td>
<td>300 mcg</td>
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<tr>
<td>Vitamin C</td>
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A bottle of 60 Super Booster softgels retails for $42. If a member buys four bottles, the price is reduced to $28.50 per bottle. The Super Booster saves consumers huge dollars by combining a wide variety of costly nutrients into one daily softgel. If you add up the price of the individual ingredients contained in the Super Booster, you would spend two to three times more for this potency if taken separately.

To order Super Booster, call **1-800-544-4440** or visit [www.LifeExtension.com](http://www.LifeExtension.com)

Contains soybeans.

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

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

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7 200,000 AMERICANS DIE NEEDLESSLY EACH YEAR
The Centers for Disease Control report that nearly 200,000 needless deaths occur each year from vascular diseases. Life Extension points out that even more lives could be spared with vigilant annual blood testing.

30 WEIGHT LOSS BENEFITS OF LACTOFERRIN
Lactoferrin, with its immune boosting benefits, has been found to help shed body fat by inhibiting fat synthesis and stimulating liberation of stored body fat (lipolysis).

38 BLOOD TEST THAT MAY SAVE YOUR LIFE
Elevated CRP (C-reactive Protein) increases risk of heart attack, cancer, and diabetes. A low-cost blood test identifies those who should initiate steps to lower their CRP level.

62 FIGHTING FOR YOUR HEALTH FREEDOM
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72 PROBIOTICS PROTECT AGAINST CHRONIC DISEASE
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86 EXCLUSIVE CONFERENCE REPORT
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