

**SUPPRESS EXCESS FOOD CRAVINGS**

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# LifeExtension®

The ULTIMATE Source For New Health And Medical Findings From Around The World

February 2014

## **Win the Battle Against HIGH BLOOD SUGAR**

**Brain Tumor  
Treatment  
Breakthrough**

**High Glucose  
Accelerates Aging**

**Restore Youthful  
Cellular Energy**

**PLUS—**

**Failure To Recognize Leading Cause Of Death  
Curcumin Compound Blocks Inflammation  
Boost Stamina Without Caffeine Or Sugar**



# SUPER \$ SALE

The annual **SUPER SALE** enables members to obtain premium grade supplements at prices substantially **below** what commercial companies charge. When members buy products from the **Life Extension Foundation Buyers Club**, they know that the **quality** of the products is backed by the organization's commitment to achieving an indefinitely extended life span. What follows are a few examples of the **savings** members enjoy during the **SUPER SALE**.



	Retail	Member SUPER SALE Discount Price Per Bottle
<p><b>New! Advanced Bio-Curcumin® with Ginger and Tumerones</b>  <b>30 softgels, Item # 01808</b>                      Enhanced-absorbing BCM-95 curcumin with broad-spectrum inflammation-suppressing support.</p>	\$30	<b>\$18.23</b> <i>(four-bottle purchase)</i>
<p><b>New! MacuGuard™ Ocular Support • 60 softgels, Item # 01885</b>                      Provides zeaxanthin, meso-zeaxanthin, and lutein to help support healthy ocular circulation. Now with enhanced absorption with phospholipids.</p>	\$22	<b>\$13.37</b> <i>(four-bottle purchase)</i>
<p><b>New! Tri Sugar Shield™ • 60 vegetarian capsules, Item # 01803</b>                      Supports healthy blood sugar levels using three novel ingredients that function via multiple mechanisms.</p>	\$36	<b>\$21.60</b> <i>(four-bottle purchase)</i>
<p><b>New! Ultra Natural Prostate Formula • 60 softgels, Item # 01895</b>                      Comprehensive prostate protection utilizing nettle, pygeum, saw palmetto, boswellia, lycopene, and boron. Now contains thymoquinone.</p>	\$38	<b>\$21.60</b> <i>(twelve-bottle purchase)</i>
<p><b>New! Brain Shield™ • 300 mg, 60 vegetarian capsules, Item # 01802</b>                      Novel orchid extract providing unparalleled, multi-factorial support for cognitive and circulatory brain function.</p>	\$33	<b>\$20.25</b> <i>(four-bottle purchase)</i>
<p><b>New! European Milk Thistle • 60 softgels, Item # 01822</b>                      High-absorption phospholipid-enhanced formula delivers up to <u>ten</u> times more silybin to the liver to promote healthy liver function.</p>	\$28	<b>\$16.88</b> <i>(four-bottle purchase)</i>
<p><b>PQQ Caps with BioPQQ® • 30 capsules, Item # 01500</b>                      Promotes mitochondrial biogenesis (generation of new mitochondria) in aging cells.</p>	\$24	<b>\$14.85</b> <i>(four-bottle purchase)</i>
<p><b>Super Omega-3 EPA/DHA with Sesame Lignans/Olive Fruit Extract</b>  <b>120 softgels, Item # 01482</b>                      Super-refined EPA/DHA fish oil plus sesame lignans and olive fruit extract to provide critical omega-3 fatty acids and essential components of the Mediterranean diet.</p>	\$32	<b>\$16.81</b> <i>(ten-bottle purchase)</i>
<p><b>Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™</b>  <b>100 mg, 60 softgels, Item # 01426</b>                      Superior ubiquinol CoQ10 plus an organic compound shown to <u>double</u> mitochondrial CoQ10 levels.</p>	\$62	<b>\$35.10</b> <i>(ten-bottle purchase)</i>
<p><b>Neuro-Mag™ Magnesium L-Threonate</b>  <b>90 vegetarian capsules, Item #01603</b>                      Optimal form of magnesium to protect synaptic density of neurons.</p>	\$40	<b>\$24.30</b> <i>(four-bottle purchase)</i>

**The SUPER SALE extends to February 3, 2014.**

Members traditionally take advantage of the **SUPER SALE** to stock up on a year's supply of their favorite supplements. To place your order, call **1-800-544-4440** or visit **www.lef.org** (**SUPER SALE** pricing available only to members in the US, Canada, and England.)

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.

## REPORTS

### 40 MODULATING APPETITE HORMONES TO BLOCK FOOD CRAVINGS

Out of balance **appetite hormones** can lead to increased snacking and persistent weight gain. Groundbreaking human studies demonstrate that a proprietary extract of the **Italian Lamona** variety of **Borlotto bean** modulates appetite hormones, such as **ghrelin**, to reduce hunger signals and facilitate body fat loss.

### 50 HOW BLOOD SUGAR ACCELERATES AGING

The **CR Way** is a lifestyle that emphasizes delicious, low-calorie meals designed to help control glucose and insulin levels. Studies now indicate that the **CR Way** approach to calorie restriction activates genes that are *specifically* associated with longevity.

### 58 OVERCOME FATIGUE WITHOUT STIMULANTS

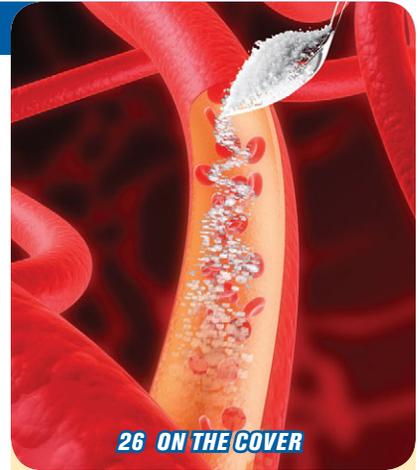
Fatigue is one of the most common complaints among aging humans. Rather than turn to stimulant drugs or excessive caffeine use, you can now safely boost cellular energy by increasing your ATP energy storehouse. A potent combination of **cordyceps** and **fermented ginseng** raises ATP to optimize energy production without jittery side effects.

### 68 BIO-ENHANCED COMPOUNDS BLOCK INFLAMMATORY PATHWAYS

Scientists have identified three compounds—**curcumin**, **ginger**, and **turmeric oil**—that powerfully inhibit the **multiple** underlying factors behind inflammation. A *bio-enhanced process* enables the delivery of almost seven times more of these extracts to your bloodstream.

### 82 BRAIN TUMOR TREATMENT BREAKTHROUGH

Perhaps the most frightening **malignancy** is a **brain cancer** called **glioblastoma multiforme**. A recent study published in the **New England Journal of Medicine** may represent the **most significant advance** yet discovered in **glioblastoma multiforme** treatment.



26 ON THE COVER

### WIN THE BATTLE AGAINST HIGH BLOOD SUGAR

Excess glucose increases risks of cancer, obesity, dementia, and vascular disease. New findings show high blood glucose accelerates aging by adversely impacting our longevity genes. Dietary restriction of carbohydrates is only a partial solution. That's because our maturing bodies produce too much glucose internally while glycemic regulatory functions are impaired. Fortunately, a low-cost approach has been developed to counteract the underlying factors behind today's epidemic of excess blood sugar.

## DEPARTMENTS

### 7 AS WE SEE IT: DOCTORS FAIL TO RECOGNIZE LEADING CAUSE OF DEATH

Excess glucose damages the delicate endothelium that lines our arteries, setting the stage for coronary and cerebral vascular disease. Reducing after-meal glucose levels has the potential to prevent far more death and disease than lowering cholesterol. A recent discovery can make a significant difference in after-meal glucose levels by *inhibiting* overproduction of glucose in the liver, *impeding* glucose absorption, and *improving* glucose clearance from the bloodstream.

### 19 IN THE NEWS

High magnesium reduces insulin resistance; beta-carotene, vitamin C, and magnesium improve protection against hearing loss; calcium with vitamin D protects against bone

density loss in men; wild blueberries may inhibit effects of metabolic syndrome; compounds in rosemary and spearmint may reduce cognitive decline; resveratrol improved factors associated with diabetes and cardiovascular disease; and more.

### 95 SUPER FOODS—SWEET AS SUGAR: HEALTH BENEFITS OF STEVIA AND XYLITOL

Two natural substances—**stevia** and **xylitol**—are known as safe sweeteners that provide alternatives to sugar. Studies show that both stevia and xylitol protect against typical after-meal glucose surges and reduce insulin needs. Stevia may also lower high blood pressure while xylitol helps prevent cavities and ear infections and may strengthen bones.





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Post your questions, add your comments, and access useful information on health, nutrition, prevention, anti-aging, and more.

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- The Most Complete Line of Life Extension Supplements
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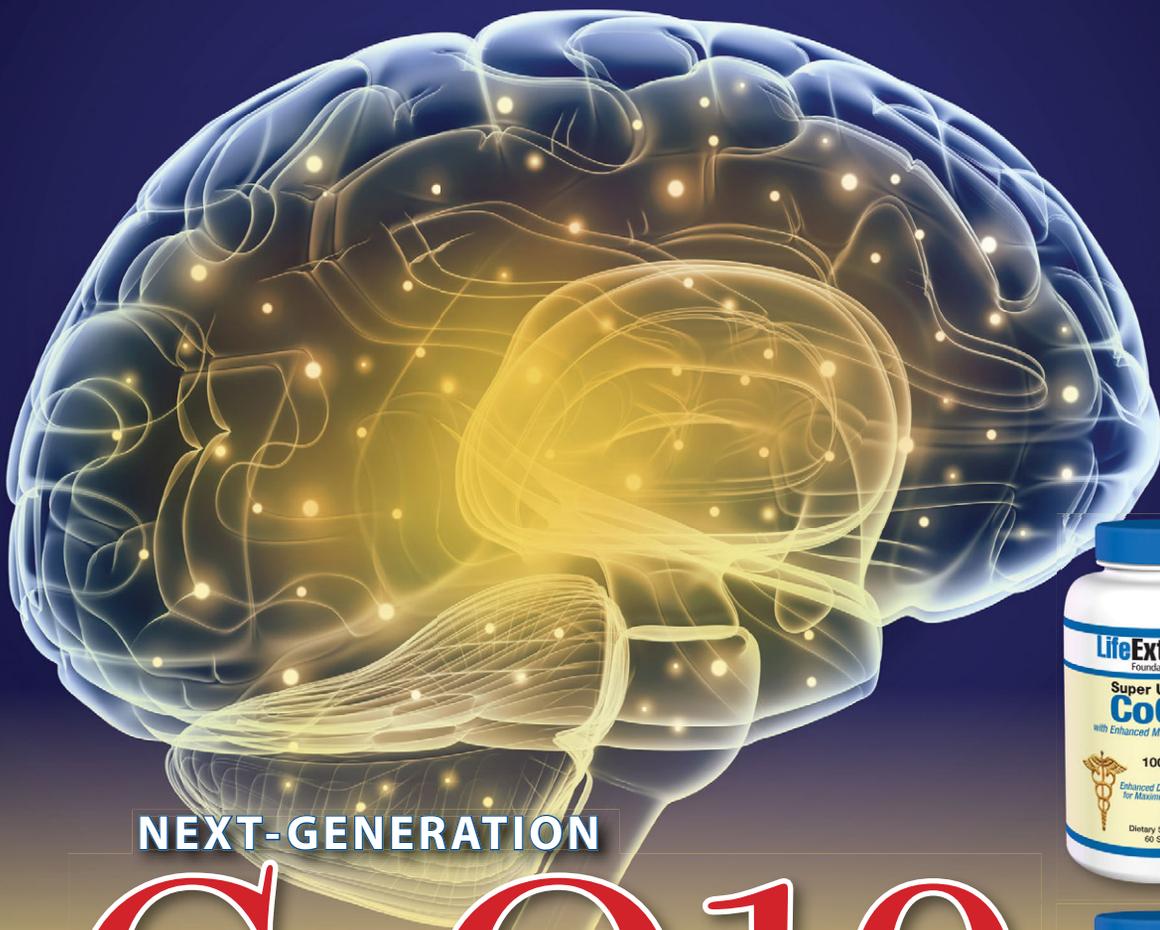
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NEXT-GENERATION

# CoQ10

## Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™

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

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

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

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

**Shilajit** boosts CoQ10's beneficial effects by stabilizing CoQ10 in the superior **ubiquinol** form, which *prolongs* its action at the cellular level.<sup>3,4</sup> Additionally, **shilajit** facilitates the more efficient *delivery* of CoQ10 into the mitochondria, which results in enhanced cellular energy.<sup>5-9</sup>

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

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

To order Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™ call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

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## Restore Cellular Energy with...



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



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



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



Ratings based on results of the 2013 ConsumerLab.com Survey of Supplement Users. More information at [www.consumerlab.com](http://www.consumerlab.com).

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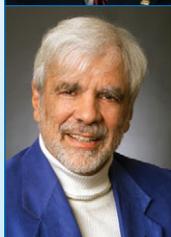
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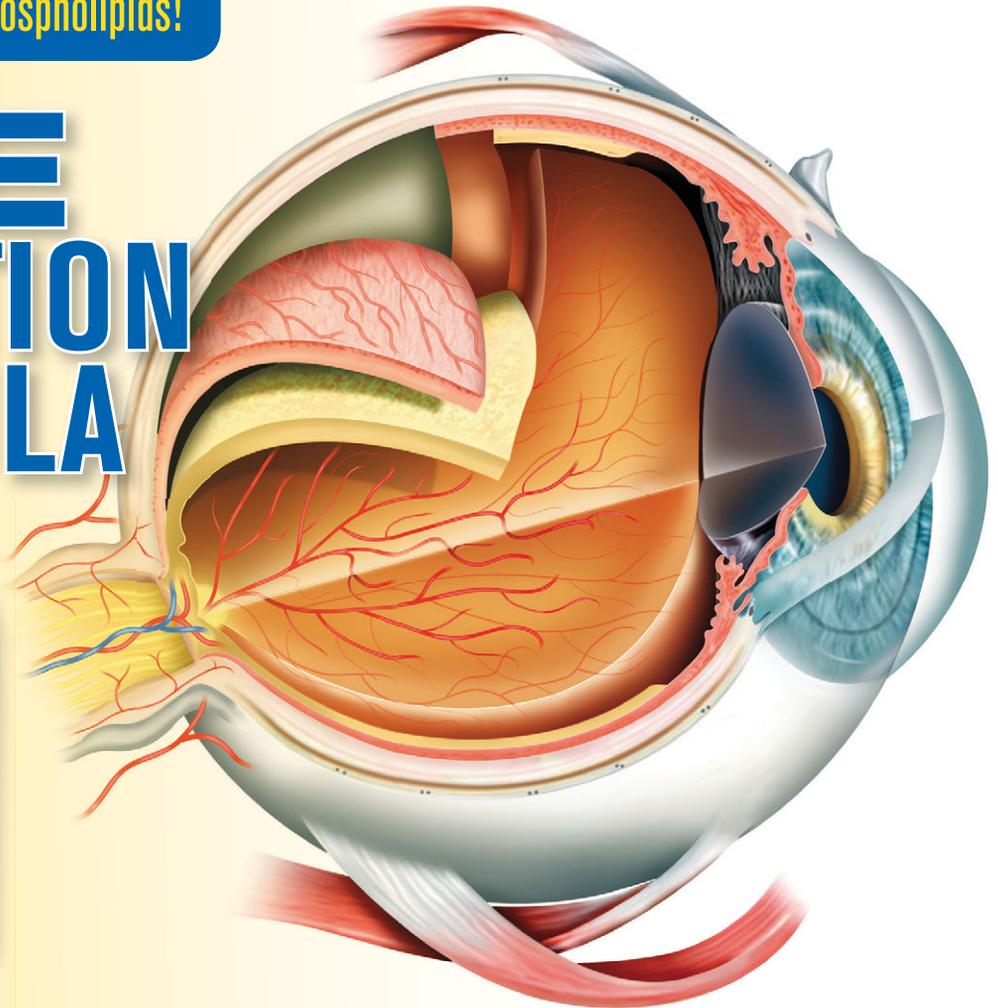
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Enhanced Absorption With Phospholipids!

# EYE PROTECTION FORMULA



## Ocular Circulation Support

**Lutein** is one of the major components of **macular pigment** and it is essential to proper vision.<sup>1</sup> Eating large quantities of **lutein**- and **zeaxanthin**-containing vegetables can help provide the nutritional building blocks necessary to maintain the structural integrity of the macula. It's difficult, however, to increase systemic circulation of these important nutrients through food alone.<sup>2</sup> Now there is an easier way to bolster your eye integrity.

**MacuGuard™ Ocular Support** contains **phospholipids**, which are an integral part of the cell membrane. In addition to mixing well with other important fat-soluble components of the eye such as **lutein**, **phospholipids** have been shown to help support efficient **absorption** of dietary lutein in the blood stream as well.<sup>2-7</sup>

**Phospholipids** have been shown in scientific research to improve systemic circulation and accumulations of lutein in the retina of the eyes, making them a potent all-around weapon in your arsenal for eye health.<sup>6,7</sup>

## MacuGuard™ Ocular Support offers TRIPLE EYE PROTECTION:

- Supports concentration of **lutein** in the eye.
- Supports efficient **absorption** of lutein in the blood stream.
- Phospholipids enhance lutein in the cell membrane.
- Supports **zeaxanthin** concentrations in eye.
- Provides **meso-zeaxanthin** which is difficult to obtain from dietary sources.

## Comprehensive Ocular Protection in One Daily Softgel

This formula provides ingredients that have been shown to promote healthy eyesight. Just one softgel of **MacuGuard™ Ocular Support** provides:

<b>MacuGuard™ Carotenoid Phospholipid Blend</b>	<b>145 mg</b>
Phospholipids, marigold extract (flower)	
[providing 10 mg free lutein, 4 mg <i>meso</i> -zeaxanthin & <i>trans</i> -zeaxanthin]	
<b>C3G (Cyanidin-3-glucoside)</b>	<b>2.2 mg</b>
[from European black currant extract (fruit)]	

The retail price for a bottle containing 60 softgels of **MacuGuard™ Ocular Support** is \$22. If a member buys four bottles during **Super Sale**, the price is reduced to **\$13.37** per bottle.

Contains soybeans.

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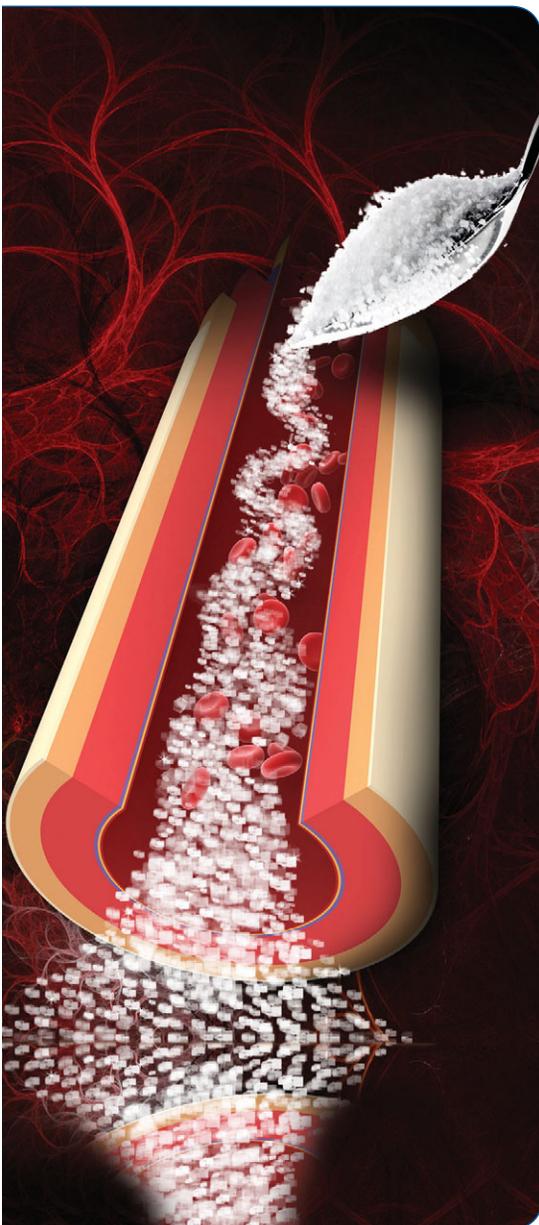
**To order MacuGuard™ Ocular Support call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)**

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# When Will Doctors Recognize This Leading Cause of Death?



BY WILLIAM FALOON



Today's cardiologists understand that **oxidized cholesterol** plays a role in the development of **atherosclerosis**.<sup>1</sup>

What may surprise you was the **debate** that raged last century as to whether one's blood **lipid** levels had any relationship to **heart attack** risk.

In **1951**, the first book that connected **LDL cholesterol** to **heart disease** was published by a group that included one of our early members, **John Gofman, MD, PhD**.<sup>2</sup> The medical establishment at the time rebelled against this concept and issued an armada of withering criticisms against Dr. Gofman.<sup>3</sup>

In **1959** and **1965**, the **FDA** proclaimed it **illegal** to promote foods low in saturated fat and cholesterol as being potentially protective against artery disease.<sup>4</sup>

Medical schools back then taught doctors that **atherosclerosis** was an **inevitable** accompaniment of **aging** about which nothing could be done. Despite epidemic numbers of middle-aged men succumbing to sudden death heart attack, very little was being done. Vocal opposition to the **cholesterol theory** of vascular disease continued into the **1980s**.<sup>3</sup>

The purpose of this article is to remind Life Extension® members of a **correctable** risk factor that significantly increases risk of **vascular** and other diseases, but is not being taken seriously by mainstream physicians. >

Excess **glucose** damages the delicate **endothelium** that lines our arteries, setting the stage for coronary and cerebral vascular disease.<sup>5</sup> Previous articles published in *Life Extension* magazine have shown the deadly impact in response to high **after-meal** glucose levels.<sup>6-14</sup>

**Acarbose** is a prescription drug that inhibits the **alpha-glucosidase** enzyme in the intestines.<sup>15</sup> People taking acarbose with meals **reduce** the amount of ingested **carbohydrates** that **absorb** into their bloodstream. Acarbose blunts deadly **after-meal** glucose surges that occur in response to eating **sugars** and **starches**.<sup>15-17</sup>

Results from **seven** long-term studies suggest **acarbose** may **reduce heart attack** risk by up to **64%**.<sup>18</sup> The initial data is so impressive that a study of 7,500 cardiac patients titled the **Acarbose Cardiovascular Evaluation Trial** has been initiated to see if **acarbose** can prevent **heart attacks** in people with impaired glucose tolerance and type II diabetes.<sup>19</sup> Results from this study are expected to be released by **2016**.

What has us excited about this research is that **reducing** after-meal **glucose** levels has the potential to prevent far **more** death and disease than lowering **LDL-cholesterol**. One reason is that elevated **glucose** not only promotes **vascular disease**, but is also associated with an increased risk of **dementia**, an increased risk of developing **cancer**, and worse outcomes in patients with **cancer**.<sup>18,20-29</sup>

### Doctors Are Failing To Warn Their Patients

Aging people today are being told by their physicians that their glucose is “**normal**” when it’s usually at dangerously high levels. It is analogous to the **1960s-1970s** when doctors viewed **cholesterol** levels of **300 mg/dL** as normal.

Doctors in the **1960s-1970s** were correct that diets rich in animal fat made high blood **cholesterol** quite **normal**, but at a cost of **heart attack** rates in middle-aged men much greater than today!<sup>30,31</sup>

It took many decades before mainstream medicine reduced the

reference range of **cholesterol** considered safe to **under 200 mg/dL**.<sup>32</sup>

Today we have the same problem with **glucose**, where doctors tolerate fasting levels **up to 110 mg/dL** as “normal” in their aging patients.<sup>33</sup> To optimally protect against degenerative disease, **fasting glucose** should be **under 86 mg/dL**.<sup>34</sup>

Even more insidious is data showing that blood sugar “**spikes**” that occur **after** meals dramatically **increase** the risk of cardiovascular disease,<sup>17,35,36</sup> retinal damage,<sup>37</sup> and cancer.<sup>38</sup>

Unless steps are taken to suppress after-meal **sugar surges**, the elevated glucose levels triggered by most large meals will incite a dangerous metabolic cascade that results in cell damage and accelerated aging.<sup>39</sup>

I am grateful to report that improved **natural** methods have been discovered to suppress deadly **after-meal** glucose surges.

### Epidemic Of High Blood Sugar

Most adults suffer from **elevated** blood sugar levels.<sup>40</sup>

One report evaluated 46,000 middle-age individuals and found more than **80%** had fasting blood sugar of **85 mg/dL** or greater.<sup>40</sup> Another study involving over 11,000 middle-age and older individuals showed nearly **85%** had fasting blood sugar of **85 mg/dL** or greater.<sup>41</sup>

Since incidence of disease starts to increase when fasting blood sugar rises **above 85 mg/dL**, this means the majority of aging humans today endure chronic cellular damage associated with elevated blood sugar, along with the accumulation of **surplus fat pounds**.<sup>34</sup>



## Glucose Fuels Breast Cancer Risk

Life Extension's analysis of the published scientific literature has identified strong data suggesting *increased breast cancer risk* amongst women with so-called "normal" blood glucose levels. For example, premenopausal women with a blood sugar above 84 mg/dL had more than **two-times** the risk of developing breast cancer compared to those with a blood sugar below 84 mg/dL.<sup>44</sup>

Another study compared women with a **fasting glucose** under **100 mg/dL** with those whose blood glucose was between **100-125 mg/dL**. Women with the higher glucose readings had a **32% increased** risk of **breast cancer** after multivariate analysis.<sup>61</sup>

A study of 10,633 women from Italy found significant relationships between blood sugar levels and breast cancer risk.<sup>45</sup> In this study, women in the highest glucose quartile (median **96 mg/dL**) had a **63% increased** risk for **breast cancer** compared to those in the lowest quartile (median **73 mg/dL**) after being "fully adjusted" for multiple variables. The authors stated in the discussion:

***"...we found that elevated fasting glucose levels were significantly associated with subsequent occurrence of breast cancer. The association was significant both in pre- and post-menopausal women."***

This epidemic of elevated blood sugar will continue to cause age-related disease until the medical profession realizes that their test values for defining "normal" blood sugar are antiquated.

### The Glucose-Cancer Connection

In the United States, over **200,000** women are diagnosed with some form of **breast cancer** each year. Around **41,000** die from it.<sup>42</sup> Most breast cancer victims' lives are spared, but at the cost of surgical mutilation, radiation injury, systemic chemotherapy damage, and acute menopause caused by estrogen-blocking drugs.

With **12%** of all American women destined to develop breast cancer,<sup>43</sup> taking preventive steps make sense, especially if the same approach also slashes risk of **dementia** and **heart attack**...and helps **shed fat pounds**.

An abundance of published research links high-normal **blood glucose** levels to increased breast cancer risk.<sup>44-46</sup> This fact alone emphasizes the importance of maintaining **glucose** at safe **low-normal** ranges.

In response to reports showing that **type II diabetics** suffer greater incidence and mortality from **breast cancer**,<sup>47-51</sup> Life Extension conducted an analysis of the scientific literature to ascertain if there was a connection between higher "normal" blood glucose and breast cancer risk.

We identified twelve separate studies that examined blood glucose levels in relationship to incidence of breast cancer.<sup>47-58</sup> Out of these **twelve** studies, **nine** showed an association of higher **fasting glucose** or other indicators of poor glycemic control with **increased** cancer risks.<sup>47-52,54,56,57</sup>

The take-home message in examining this data is to initiate steps to lower **glucose** (which also

reduces insulin) in order to help prevent the most prevalent malignancy striking women today.

While **glucose** provides fuel for rapidly dividing cancer cells, **insulin** is a hormonal stimulator for cell growth and differentiation.<sup>44,48</sup> The role of elevated **glucose** and **insulin** on cancer incidence and progression is being increasingly recognized and was the subject of a report on the CBS news magazine show **60 Minutes**.<sup>59</sup>

A recent study looked at the risk of overall cancer death in relation to blood glucose levels. Those with **fasting glucose** averaging around **100 mg/dL** had **49% increased** cancer death risk. Those with after-meal glucose above **199 mg/dL** had **52% increased** cancer death risk. This 19-year study of 2,438 people shows that elevated **glucose** levels markedly increase one's risk of dying from cancer.<sup>60</sup>

### High "Normal" Sugar Levels Shrink Brain Volume

In September 2012, Australian researchers published findings showing blood **glucose** at the **high end of normal** resulted in significant **brain shrinkage**.<sup>62,63</sup>

The shrinkage occurred in regions of the brain (hippocampus and amygdala) involved in memory and other critical functions. Atrophy (shrinkage) in these brain areas worsens memory.<sup>62,63</sup>

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

Comparing the before and after images, the researchers found



significant **brain shrinkage** among those whose blood sugar levels were high but still below the World Health Organization's threshold for **pre-diabetes** (fasting glucose under **110 mg/dL**). The researchers report that these high normal levels may account for a **6% to 10% decrease** in the volume of the hippocampus and amygdala.<sup>62,63</sup>

The lead researcher stated, "**It is this chronic exposure to high glucose levels that is more likely to lead to poorer brain health.**" He cautioned that these findings should **not** be taken "lightly," as the association between **high normal blood sugar** and **brain shrinkage** was "robust."<sup>63</sup>

### One Way To Protect Arteries Against After-Meal Glucose

Your risk of suffering a cardiovascular death is the greatest in the **two-hour** period **after** you eat a meal.<sup>64</sup> That's partly because during that time, you can experience dangerous **blood sugar spikes** that **acutely** impair blood flow

through vital arteries, which can ultimately lead to a **heart attack** or **stroke**.<sup>65</sup>

Fortunately, you're about to learn about **new** natural methods that significantly **reduce** the surge of **glucose** into your aging arteries. And while you may not entirely eliminate **after-meal** sugar surges, **Life Extension** members should feel assured that steps they long ago initiated confer protection against some of the damage **glucose** inflicts to their cardiovascular systems.

For example, a landmark study showed that **gamma tocopherol** **limits** the artery damaging impact of an **after-meal** glucose burst. This human study, published in **January 2013**, showed an expected **30-44% decrease** in **endothelial function** in men after consuming 75 grams of pure glucose. Men who took **gamma tocopherol** five days in a row **before** the glucose challenge showed **no** significant loss of **endothelial function**.<sup>66</sup>

This well-designed study revealed how **gamma tocopherol** protected the arterial **endothelium** against glucose damage. Foundation members have supple-

mented with **gamma tocopherol** since as early as **1996**. It's still critical, however, to take steps **before** carbohydrate-containing meals to **reduce** the amount of **glucose** that enters your bloodstream.

### Novel Approaches To Glucose Management

As mentioned in the beginning of this article, the drug **acarbose** functions by inhibiting the **alpha-glucosidase** enzyme.<sup>15</sup> This limits the amount of **glucose** available for rapid **absorption** from dietary **starch** and **sugar**.

Initial studies indicate that **acarbose** may dramatically reduce cardiovascular risk.<sup>16</sup> We'll know definitively how well acarbose works when the results of a large human trial are released around **2016**. You don't have to wait until year **2016** to benefit.

Instead of taking the drug **acarbose** (which **Life Extension** has advocated for the past 7 years), consumers now have access to **low-cost nutrients** that have demonstrated **alpha-glucosidase** **inhibiting** properties.<sup>67-74</sup>

Scientists have identified **three** natural agents that when combined not only **inhibit alpha-glucosidase**, but function by **additional** mechanisms to impede glucose absorption, reduce glucose over-production in the liver, and enhance clearance of excess glucose from the bloodstream.<sup>72,74-77</sup>

A discovery that has us very excited is a nutrient that in laboratory studies increases glucose **uptake** from the bloodstream into energy producing cells by up to **54%**.<sup>78</sup> It does this by stimulating an energy transporter called **GLUT4** in cells, which is a mechanism by which the drug **metformin** beneficially lowers glucose.<sup>79</sup>

Another of these novel nutrient extracts inhibits a **transport system** in the small intestines that enables glucose to enter the bloodstream.<sup>75</sup> The name of this glucose transport protein is **sodium-dependent glucose transporter-1** or **SGLT1** for short.<sup>80</sup> A nutritional **SGLT1 inhibitor** impedes the ability of glucose to enter the bloodstream, thus providing another shield to guard your body against deadly after-meal sugar spikes.<sup>75,80</sup>

Few people realize that most of the **glucose** in our bloodstream after **fasting** comes from its production in the **liver**. This process is called **gluconeogenesis** and is an underlying culprit behind the difficulty in controlling many cases of type II diabetes.<sup>81</sup> One of these novel nutrients has been shown to interfere with excess **gluconeogenesis**, which is a property by which the drug **metformin** beneficially helps lower **insulin** and **glucose** levels.<sup>77,82</sup>

Another of these nutrients has demonstrated effects that naturally increase the expression of beneficial **PPAR-gamma** in cells, which enables blood sugar levels to drop without stimulating excess **insulin** release.<sup>83</sup>

These nutrients, which function by four different mechanisms, have been combined into one **low-cost** formula to be taken before meals that contain glucose-spiking **starches** (bread, pasta, potatoes, and rice) or **sugars**.

Overwhelming evidence shows **excess glucose** to be a leading killer of Americans. Doctors are failing to recognize that even high normal blood sugar predisposes us to virtually all killer diseases.<sup>35,36,38</sup> It is thus critical that consumers take steps to protect their aging bodies against the deadly impact of **glucose overload**.

### Don't Wait For A Diabetes Diagnosis

It might not surprise you to learn that some people are diagnosed with **type II diabetes** in a hospital emergency room. This can occur in response to a **heart attack** when a hospital blood lab reveals an ER patient's **glucose** levels are very high.

What people fail to understand is that glucose-induced arterial damage starts long before

sugar levels rise to where **diabetes** or **pre-diabetes** is clinically diagnosed.

A study released in **2013** showed that individuals with **impaired fasting glucose levels** (around **110 mg/dL**) have similar cardiovascular risk factors as **diabetic** patients (fasting glucose over **126 mg/dL**). This study showed that **36%** of patients with impaired fasting glucose had **coronary artery disease** compared to **42%** of those with frank diabetes.<sup>86</sup>

### It's Not Your Fault...

Your body has evolved potent **enzymes** to rapidly break down ingested foods for immediate absorption into your body. If it were not for these enzymes, your ancestry lineage would have perished eons ago from **famine**.

Not only do you readily break down the foods you eat, but surplus calories are **stored** as body **fat**. Almost **70%** of Americans suffer from excess fat storage and experts believe this will become the leading cause of preventable disability and death.<sup>84</sup>

Glucose-spiking starches and sugars dominate modern dietary patterns.<sup>85</sup> A life saving countermeasure is to inhibit specific **enzymes** that enable starches-sugars to readily convert to glucose that is excessively **absorbed** into the bloodstream. Fortunately, these carbohydrate **enzyme inhibitors** are available in a low-cost dietary supplement form.



The study also showed that those with impaired glucose tolerance or diabetes had nearly double the rate of **hypertension** and **high cholesterol** when compared to people with normal glucose. The authors of this study stated:

*“...it is recommended to identify and treat impaired fasting glucose early since impaired fasting glucose patients’ distribution in coronary artery disease is comparable to diabetes mellitus.”<sup>86</sup>*

Another **2013** study showed that people drinking just one 12-ounce sugar-sweetened soda a day increased their risk of developing **type II diabetes** by **18%**. This study indicates that only a small amount of excess sugar ingestion each day creates havoc in one’s body over the long term.<sup>87</sup>

Some of you might smugly think that you haven’t touched a sugary soda in years, but the reality is that it’s hard to avoid consuming glucose-spiking foods and drinks. Even whole grains convert to glucose, and healthy fruit juices can saturate your bloodstream with more glucose than a 12-ounce soda.

Unless you zealously follow a diet devoid of **starches** and **sugars**, you likely will derive enormous benefit by taking nutrients before meals that impede glucose absorption, reduce liver over-production of glucose (gluconeogenesis), and facilitate efficient removal of glucose from the blood.

We discuss a novel **glucose-regulating** nutrient blend in the first article of this month’s issue. Price-conscious consumers will be impressed about the broad-spectrum protection against glucose overload they can obtain at a very modest cost.

## Most Advanced Formulas At Year’s Lowest Prices

Every time you purchase a **Life Extension** product, you contribute to **biomedical research** aimed at extending your healthy life span.

**Life Extension** funds pioneering scientists seeking to reverse degenerative disease. We do this while simultaneously battling mindless bureaucrats who want to suffocate medical innovation.

During our 25<sup>th</sup> annual winter **Super Sale**, all Life Extension formulas are **discounted** so that members can obtain the newest ingredients and most up-to-date versions at the **lowest** prices of the year.

Members traditionally take advantage of **Super Sale** discounts to stock up on cutting-edge formulas designed to circumvent the underlying causes of aging, such as the spiraling increase in **glucose** that most physicians today accept as normal.

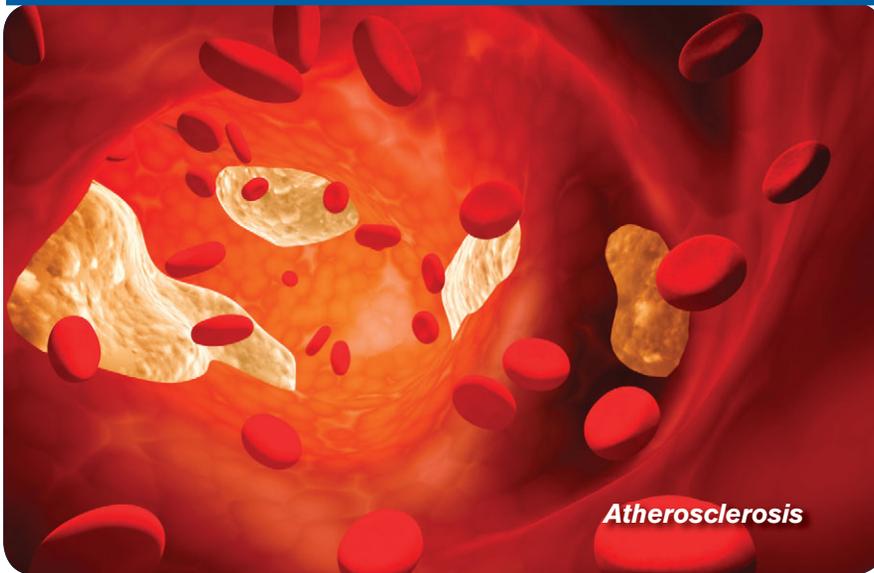
For longer life,



William Faloon

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# Magnesium and Brain Health

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**.<sup>1</sup>

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.<sup>2</sup>

## 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.<sup>1,3</sup> 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.<sup>1</sup>

## 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 during **Super Sale**, the price is reduced to **\$24.30** per unit.

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To order **Neuro-Mag™ Magnesium L-Threonate Capsules** or Powder call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

Magtein™ is a registered trademark of Magceutics, Inc. distributed exclusively by AIDP, Inc. Magtein™ is covered by registered and pending US patents. Neuro-Mag™ Magnesium-L-Threonate- Item #01603 Neuro-Mag™ Magnesium-L-Threonate with Calcium and Vitamin D3 Powder Item #01602



Item # 01602



Item # 01603





# PQQ



# PROMOTES

## Mitochondrial Biogenesis

### 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.<sup>1-6</sup>

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.<sup>7</sup> **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.<sup>8-14</sup> Energy-intensive organs like the heart and brain are *dense* with mitochondria.

Until recently, the **only** natural ways for aging individuals to increase the number of mitochondria in their bodies were long-term calorie restriction or exhaustive physical activity.

**PQQ** offers a viable alternative.

### The Ultimate Cell Rejuvenator

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

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

- **Antioxidant power.**
- **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**.<sup>15,16</sup> 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.<sup>17</sup>

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.<sup>18</sup>

### 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 during **Super Sale**, the price is reduced to **\$24.30** per bottle.

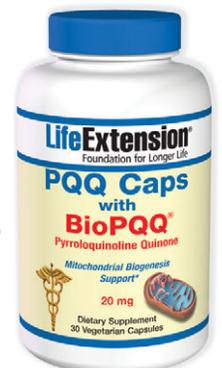
The recommended daily dose for **PQQ** is **20 mg**. Those taking **Mitochondrial Energy Optimizer** or **Mitochondria Basics** only require an additional **10 mg** of **PQQ** since these formulas already provide **10 mg** of **PQQ**. The retail price for **30 10 mg PQQ caps** is \$24. If a member buys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

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

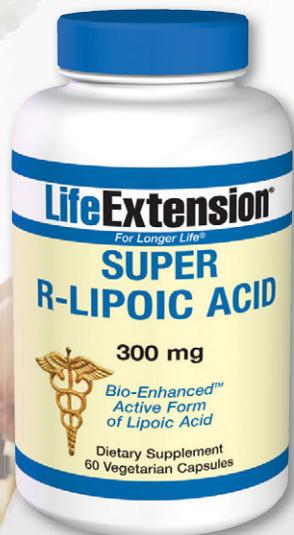
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To order **PQQ Caps with BioPQQ**® standalone or any other **PQQ-containing formula** call **1-800-544-4440** or visit **www.LifeExtension.com**



Item #01647



Item # 01208

Preserve Youthful  
**CELLULAR  
ENERGY**  
with Next-Generation  
**LIPOIC ACID**

Published studies have shown the critical importance of **lipoic acid** in supporting healthy mitochondrial function.

Unlike other forms of lipoic acid, **Super R-Lipoic Acid** is more bioavailable, stable, and potent, achieving 10-30 times higher peak blood levels than pure R-lipoic acid.<sup>1</sup> This unique **sodium-R-lipoate** can help you reach peak plasma concentrations within just 10-20 minutes<sup>2</sup> of supplementation.

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

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

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

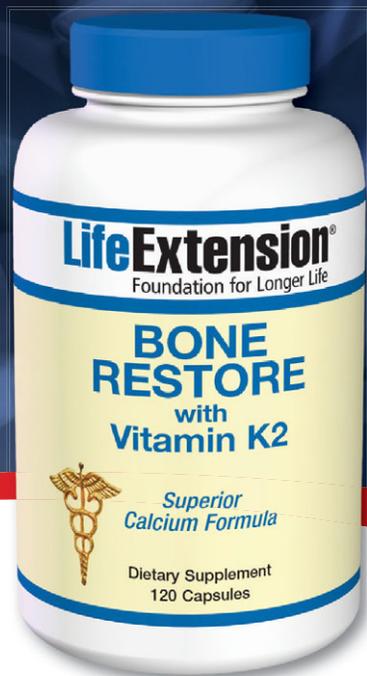
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**CAUTION:** Because this product may lower blood glucose, consult your healthcare provider before taking this product if you are taking glucose lowering medication. Bio-Enhanced® is a registered trademark of Geronova Research, Inc.

# BONE RESTORE

WITH VITAMIN K2



Item #01727

**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).

**Bone Restore** now contains **300 mg** of **magnesium**.

The retail price for 120 capsules of **Bone Restore** is \$24. If a member buys four bottles during **Super Sale**, the price is reduced to **\$14.85** 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 during **Super Sale**, the price is reduced to **\$12.83** per bottle. (Item# 01726)

**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**<sup>®</sup> (warfarin) should use **BONE RESTORE** without vitamin K2.

#### Just four capsules of Bone Restore provide:

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

FruiteX B<sup>®</sup> and OsteoBoron<sup>®</sup> are registered trademarks of VDF Futureceuticals, Inc. U.S. patent #5,962,049.  
DimaCal<sup>®</sup> and TRAACS<sup>®</sup> 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](http://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.



## IN THE NEWS

### Increased Magnesium Intake Associated With Reduced Insulin Resistance In Men And Women With Metabolic Syndrome

The journal *Nutrients* published the finding of an association between greater magnesium intake and improved insulin resistance in adults with metabolic syndrome.\*



The study included 234 nondiabetic trial participants who exhibited three or more metabolic syndrome components. Dietary assessments conducted at the beginning of the study and at six and twelve months provided data concerning the intake of magnesium. Blood samples collected

at these time points were analyzed for plasma insulin and glucose in order to evaluate insulin resistance.

Among subjects whose magnesium intake over the course of the study was among the top **25%** of participants, the adjusted odds of having insulin resistance was **71%** lower than those whose intake was among the lowest **25%**. For those whose intake of magnesium over time met the US RDA, the risk of insulin resistance was **63%** lower than the risk experienced by those whose intake was inadequate.

**Editor's Note:** Metabolic syndrome is characterized by the presence of several cardiovascular disease and diabetes risk factors that include increased waist circumference, high blood pressure, elevated blood glucose, and disordered lipids. Previous research findings suggest that supplementation with magnesium could improve insulin sensitivity or insulin resistance in diabetics; however, there are few longitudinal studies that have investigated the protective effects of magnesium in nondiabetics with metabolic syndrome.

—D. Dye

\* *Nutrients*. 2013 Sep 27;5(10):3910-9.

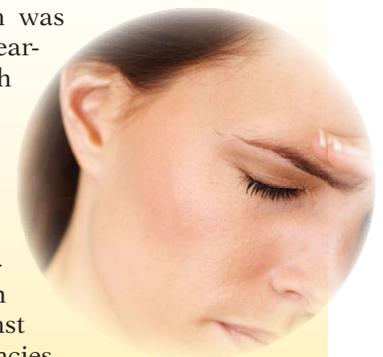
### Greater Intake Of Beta-Carotene, Vitamin C, And Magnesium Associated With Lower Risk Of Hearing Loss

An article in the *American Journal of Clinical Nutrition* describes the finding of a protective effect for vitamin C, beta-carotene, and magnesium against hearing loss, which frequently occurs during aging and affects approximately **17%** of US adults.\*

The current study included 2,592 participants in the National Health and Nutrition Examination Survey (NHANES) 2001-2004. Dietary recall interview responses were analyzed for the intake of beta-carotene, vitamin C, vitamin E, and magnesium from food and supplements. Audiometric examinations evaluated hearing thresholds at speech frequencies and high frequencies.

Increased intake of beta-carotene, vitamin C, or magnesium was associated with better hearing at both speech and high frequencies. When the joint effects of high versus low nutrient intake were considered, the combination of high beta-carotene or vitamin C with high magnesium was associated with increased protection against hearing loss at high frequencies.

**Editor's Note:** Authors Yoon-Hyeong Choi and colleagues remark that free radical formation in the inner ear is a key mechanism for hearing loss, and that animal studies have shown a protective effect for antioxidants against noise-induced free radical formation in this area.



—D. Dye

\* *Am J Clin Nutr*. 2013 Nov 6.

## Increased Calcium Intake Linked With Lower Risk Of Death From All Causes Over Median Of Nine Years

The journal *PLoS ONE* reported the finding of Hong Kong researchers of an association between increased calcium intake and a lower risk of mortality from all causes over a median of 9.1 years of follow-up.\*

The study included 3,139 Chinese men and women aged 65 years or older upon enrollment in a prospective study that examined risk factors for osteoporosis. Dietary questionnaire responses were analyzed for calcium intake from food consumed over the previous year. The subjects were additionally queried concerning whether or not they used calcium supplements.

Over a 9.1 year median, 529 deaths occurred, of which 114 were attributed to cardiovascular disease. A **37%** lower risk of dying from any cause was observed among subjects whose calcium intake was among the **top 25%** of participants in comparison with subjects whose intake was among the lowest **25%** of participants.

**Editor's Note:** An insignificant reduction in cardiovascular mortality was also associated with increased calcium intake. Additionally, a lower risk of dying from any cause over follow-up was found to be associated with calcium supplement use.

—D. Dye

\* *PLoS ONE*. 2013 Nov 5.



## Reduced Vitamin B12 Levels Linked To Increased Progression Of White Matter Lesions

The journal *PLoS ONE* reports the discovery of a protective effect for higher vitamin B12 levels against the progression of periventricular white matter lesions, a common feature of cerebral small vessel disease.\*

The study included 107 men and women diagnosed with a first time lacunar stroke. Blood samples obtained within three months of the event were assayed for plasma vitamin B12 levels. Magnetic resonance imaging of the brain at the beginning of the study and after two years was used to evaluate periventricular and deep white matter lesions.

The researchers observed a **42%** greater risk of periventricular white matter lesion progression for every **50 picomole per liter** decrease in vitamin B12. Subjects whose B12 levels were considered deficient had an approximately three times greater risk of periventricular white matter lesion progression in comparison with those whose levels were higher.

**Editor's Note:** Progression of the lesions has been associated with cognitive impairment, urinary disturbances and gait abnormalities.

—D. Dye

\* *PLoS ONE*. 2013 Oct 14.



## Calcium And Vitamin D Improve Bone Density As Well As Fracture-Preventing Drug In Men

The results of a trial reported in *Epilepsia* reveal a beneficial effect for calcium and vitamin D in helping to protect against the loss of bone density that is associated with the use of antiepileptic drugs.\*

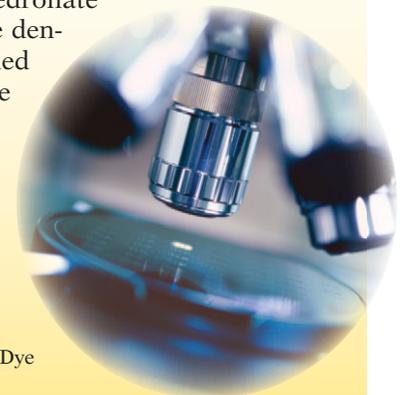
Fifty-three men treated with antiepileptic drugs for at least two years prior to enrollment in the Anti-Epileptic Drug and Osteoporosis Prevention Trial (ADOPT) were randomized to receive risedronate (a drug that helps prevent fractures) or a placebo for 12 weeks. All participants received **1,000 to 1,500 mg** calcium and **500 to 750 IU** vitamin D per day. Bone mineral density was assessed by dual energy x-ray absorptiometry before treatment, and at one and two years.

While participants who received risedronate experienced a **70%** improvement in bone density in comparison with values obtained prior to treatment, the improvement in the group that received calcium and vitamin D only (the placebo arm) was nearly as great, at **69%**.

**Editor's Note:** Although risedronate provided superior results in the current study, the authors caution that treatment with the drug should be limited to five years if possible, in order to avoid the associated risks of jaw osteonecrosis and atypical femoral fractures.

—D. Dye

\* *Epilepsia*. 2013 Sep 6.





### Mediterranean Diet Associated With Lower Risk Of Mortality Over 7 Years Of Follow-up In Men And Women With Cardiovascular Disease

An article published in the *American Journal of Clinical Nutrition* reports a protective effect for the Mediterranean diet against the risk of premature death from all causes in cardiovascular disease patients.\*

The study included 6,137 men enrolled in the Health Professionals Follow-Up Study initiated in 1986 and 11,278 women participating in the Nurses' Health Study established in 1976. Subjects in the current study were limited to those who had experienced a nonfatal cardiovascular event. Dietary questionnaire responses provided by the participants in 1980, 1984, 1986, 1990, 1994, 1998, 2002, and 2006 were used to score adherence to the Mediterranean diet.

Pooled analysis of the subjects revealed a **19%** lower risk of death from any cause among those whose adherence to the Mediterranean diet was among the top one-fifth of participants in comparison with those whose adherence was among the lowest fifth.

**Editor's Note:** The diet, which is characterized by a relatively high amount of fruit and vegetables, legumes, nuts, fish, and monounsaturated fatty acids, and a lower intake of meat and meat products, has been associated with several long-term benefits, including protection against cardiovascular disease, however, its effects in individuals with established disease had not been well studied.

—D. Dye

\* *Am J Clin Nutr.* 2013 Oct 30.

### Blueberries Could Help Protect Against Metabolic Syndrome Effects

Researchers from Maine report a protective effect for wild blueberries against some of the adverse effects related to metabolic syndrome, which increases the risk of heart disease and diabetes.

The study tested the effect of a blueberry-enriched diet in a rat model of metabolic syndrome. Thirty-six obese rats and an equal number of lean animals received a diet containing blueberries or a control diet for eight weeks. Aortic vessel vasoconstriction and vasorelaxation, which evaluate endothelial function, were assessed at the end of treatment.\* “Endothelial dysfunction is a landmark characteristic of metabolic syndrome, and the obese Zucker rat, an excellent model to study the metabolic syndrome, is characterized by vascular dysfunction,” noted lead researcher Dorothy Klimis-Zacas.

Obese rats underwent improvements in the balance between constricting and relaxing factors, indicating better endothelial function. Dr. Klimis-Zacas concluded that, “By normalizing oxidative, inflammatory response and endothelial function, regular long-term wild blueberry diets may also help improve pathologies associated with the metabolic syndrome.”

**Editor's Note:** Metabolic syndrome is a cluster of cardiovascular and diabetes risk factors that include central obesity, hypertension, dyslipidemia, and elevated fasting glucose.



—D. Dye

\* *Appl Physiol Nutr Metab.* 2013 Nov 6.

### Resveratrol Regenerated Following Metabolism

*Science Translational Medicine* reports the finding of researchers at England's University of Leicester that resveratrol, a compound that occurs in red grapes, is regenerated after being metabolized into other compounds in the body.\*

“It has been known for many years that resveratrol is rapidly converted to sulfate and glucuronide metabolites in humans and animals—meaning the plasma concentrations of resveratrol itself quickly become very low after administration,” explained lead researcher Karen Brown. “It has always been difficult to understand how resveratrol is able to have activity in animal models when the concentrations present are so low, and it has made some people skeptical about whether it might have any effects in humans. Researchers have hypothesized for a long time that resveratrol might be regenerated from its major metabolites in whole animals but it has never been proven.”

“Our study was the first to show that resveratrol can be regenerated from sulfate metabolites in cells,” she announced.

**Editor's Note:** “Importantly, we did all our work with clinically achievable concentrations so we are hopeful that our findings will translate to humans,” Dr. Brown noted.

—D. Dye

\* *Sci Transl Med.* 2013 Oct 2;5(205):205ra133.



## Trial Finds Reduced Inflammation In Heart Disease Patients Supplemented With Coenzyme Q10

The results of a randomized trial reported in *Nutrition Journal* found a reduction in inflammation and an increase in antioxidant enzyme activities in individuals with coronary artery disease who were supplemented with coenzyme Q10 (CoQ10).\*

Researchers in Taiwan divided 42 men and women who were being treated with statin drugs for coronary artery stenosis to receive **300 milligrams** CoQ10 per day or a placebo for twelve weeks. Blood samples collected at the beginning and end of the trial were analyzed for CoQ10, inflammation markers including C-reactive protein, tumor necrosis factor-alpha (TNF-alpha), and interleukin 6, and the antioxidant enzymes superoxide dismutase (SOD), catalase, and glutathione peroxidase.

Subjects who received CoQ10 experienced a reduction in interleukin-6 and TNF-alpha, indicating a decline in inflammation, as well as elevations in SOD, catalase, and glutathione peroxidase that resulted in a significant increase in comparison with the placebo group.

**Editor's Note:** The authors conclude that, "Coronary artery disease patients might benefit from using coenzyme Q10 supplements to increase their antioxidant and anti-inflammation capacity during statins therapy."

—D. Dye

\* *Nutr J.* 2013 Nov 6.



## Can Certain Herbs Stave Off Alzheimer's Disease?

A recent study performed at Saint Louis University found that enhanced extracts made from special antioxidants in spearmint and rosemary improve learning and memory.\*

"We found that these proprietary compounds reduce deficits caused by mild cognitive impairment, which can be a precursor to Alzheimer's disease," said Susan Farr, PhD, research professor of geriatrics at Saint Louis University School of Medicine.



Farr presented the early findings at Neuroscience 2013, a meeting of 32,000 people. She tested a novel antioxidant-based ingredient made from spearmint extract and two different doses of a similar antioxidant made from rosemary extract on mice that have age-related cognitive decline.

She found that the higher dose rosemary extract compound was the most powerful in improving memory and learning in three tested behaviors. The lower dose rosemary extract improved memory in two of the behavioral tests, as did the compound made from spearmint extract.

—M. Richmond

\* Available at: <http://www.slu.edu/x89155.xml>. Accessed November 19, 2013.

## Resveratrol Improves Glucose And Other Factors in Clinical Trial

A report published in the journal *Evidence-Based Complementary and Alternative Medicine* documents a randomized, double-blind, placebo-controlled trial which determined that supplementation with resveratrol was associated with a reduction in a number of factors associated with diabetes and cardiovascular disease.\*

The trial enrolled 66 type II diabetic men and women residing in Iran, a country that has a high prevalence of diabetes. Participants were supplemented with **1 gram** resveratrol or a placebo daily for 45 days. At the study's conclusion, subjects who received resveratrol had experienced lower systolic blood pressure, fasting blood glucose, hemoglobin A1C, insulin and insulin resistance, and demonstrated an increase in HDL cholesterol. While glucose declined by an average of **34.9 mg/dL** among those who received resveratrol, subjects who received the placebo experienced an average increase of **9.89 mg/dL** as well as a rise in LDL.



**Editor's Note:** "The present study supports the strong antidiabetic effect of resveratrol reported in numerous animal studies, as well as the effects observed in the human studies," authors Ali Movahed and colleagues write. "It also supports the case for resveratrol supplementation over a short-term."

—D. Dye

\* *Evid Based Complement Alternat Med.* 2013 Sep 1.

# VASCULAR BENEFITS OF A Mediterranean Diet

## VALIDATED IN HUGE NEW STUDY

A large, rigorous study published in the *New England Journal of Medicine* confirmed the health benefits of those who switch to a **Mediterranean diet** rich in **omega-3 fish oil** as well as protective nutrients called polyphenols found in **olive oil**, fruits, vegetables, nuts like walnuts, and wine.<sup>1</sup> 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.<sup>1</sup>

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.<sup>1</sup>

### 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.<sup>2</sup>

Olive oil contains polyphenol nutrients that have demonstrated wide-ranging health benefits.<sup>3-5</sup> 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**.

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**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.

### SUPER OMEGA-3 WITH SESAME LIGNANS AND OLIVE FRUIT EXTRACT

To ensure the purest, most stable, and easy-to-tolerate fish oil, **Super Omega-3 EPA-DHA** is *molecularly distilled*. It enjoys the highest **5-star rating** for **purity, quality, and concentration** from the renowned **International Fish Oil Standards** program.<sup>6</sup> The **sesame lignans** not only direct the omega-3s toward more effective pathways in the body, but guard the delicate fish oil from oxidation.<sup>2,7</sup>

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

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

<b>EPA</b> (eicosapentaenoic acid)	<b>1,400 mg</b>
<b>DHA</b> (docosahexaenoic acid)	<b>1,000 mg</b>
<b>Olive</b> (fruit and leaf) <b>Extract</b> [std. to 6.5% polyphenols (39 mg), 1.73% hydroxytyrosol/tyrosol (10.4 mg), 0.5% verbascoside/oleuropein (3 mg)]	<b>600 mg</b>
<b>Sesame Seed Lignan Extract</b>	<b>20 mg</b>



Item #01482

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

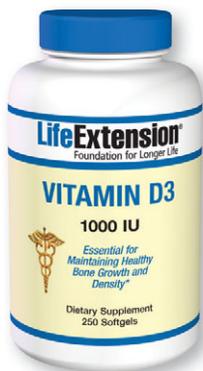
# D<sub>3</sub>

## VITAMIN D3 SOFTGELS FOR SUPERIOR ABSORPTION

Study after study confirms the vital importance of maintaining optimal levels of **vitamin D**. Research often indicates that a blood level between **50–80 ng/mL** of **25-hydroxyvitamin D** is ideal. Because people have individual requirements, Life Extension® has created a large selection of **vitamin D** supplements to ensure that you achieve your **vitamin D3** goals.

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

Vitamin D is now available in superior absorbing softgels. A recent study demonstrated that the use of one **5,000 IU** vitamin D softgel daily resulted in a near **30% increase** in vitamin D levels in just **60 days**.



### VITAMIN D3 1,000 IU 250 softgels

Retail: \$12.50

**Four-bottle Member Price  
during Super Sale: \$7.59 ea.**

Commercial companies offered only **400 IU** vitamin D products when Life Extension long ago introduced a **1,000 IU** version. For most people, this **1,000 IU** potency is *insufficient* to attain optimal vitamin D blood levels. For smaller individuals who obtain **2,000-3,000 IU** in their multi-nutrient formulas (and children), this potency of vitamin D may be suitable. **Item # 01751**

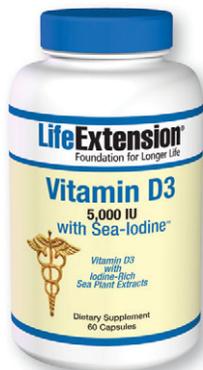


### VITAMIN D3 5,000 IU 60 softgels

Retail: \$11

**Four-bottle Member Price  
during Super Sale: \$6.68 ea.**

For those already obtaining **1,000-3,000 IU** of vitamin D in their multi-nutrient formulas, this **5,000 IU** potency is what many need to *achieve* optimal vitamin D blood levels. **Item # 01713**



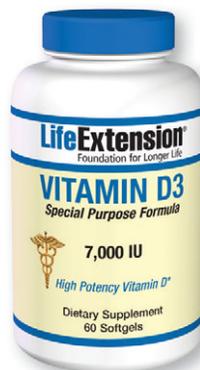
### VITAMIN D3 5,000 IU WITH SEA-IODINE™\* 60 capsules (non-softgel)

Retail: \$14

**Four-bottle Member Price  
during Super Sale: \$8.44 ea.**

Most people do not ingest enough vitamin D and iodine, especially those seeking to reduce their salt intake. Combining **5,000 IU** of **vitamin D3** and **1,000 mcg** of iodine into one capsule makes taking these two nutrients economical and convenient.

*Due to the source of kelp, this product may contain fish and shellfish.* **Item # 01573**

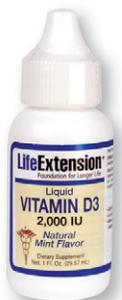


### VITAMIN D3 7,000 IU 60 softgels

Retail: \$14

**Four-bottle Member Price  
during Super Sale: \$8.51 ea.**

Some individuals (such as those weighing more than 180 pounds) may require higher potencies of vitamin D. When combined with **1,000-3,000 IU** obtained from multi-nutrient formulas, this **7,000 IU vitamin D3** softgel should enable these individuals to attain **25-hydroxyvitamin D** blood levels above the desired range of **50 ng/mL**. **Item # 01718**



### VITAMIN D3 LIQUID 2,000 IU (Natural mint flavor)

1 ounce

Retail: \$28

**Four-bottle Member Price  
during Super Sale: \$16.88 ea.**

For those rare individuals who have difficulty absorbing enough vitamin D3 from softgels, this liquid of vitamin D can be used. **Item # 01732**

Also available without mint. (Item# 00864)

**To order any of these high-potency  
vitamin D3 supplements, call 1-800-544-4440  
or visit [www.LifeExtension.com](http://www.LifeExtension.com)**

**CAUTION:** Individuals consuming more than 2,000 IU/day of vitamin D (from diet and supplements) should periodically obtain a serum 25-hydroxy-vitamin D measurement. Do not exceed 10,000 IU per day unless recommended by your doctor. Vitamin D supplementation is not recommended for individuals with high blood calcium levels.

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

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



# 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.<sup>1-5</sup>
- **PQQ:** This breakthrough micronutrient has been shown to trigger **mitochondrial biogenesis**—the growth of **new** mitochondria in aging cells!<sup>6</sup> PQQ also activates genes involved in protecting the delicate structures within the mitochondria.<sup>7-10</sup>
- **LUTEOLIN:** Systemic inflammation is involved in most undesirable consequences of aging. Culprits behind **inflammatory** reactions are pro-inflammatory **cytokines**, such as **interleukin-1** and **tumor necrosis factor-alpha**. Luteolin is a flavonoid that has been shown to help suppress these inflammatory cytokines.<sup>11-16</sup>
- **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.<sup>16-19</sup> Benfotiamine protects endothelial cell integrity from the effects of high glucose levels. In addition, benfotiamine exhibits direct antioxidative capacity and supports DNA function.<sup>20</sup>
- **PYRIDOXAL 5'-PHOSPHATE:** Aging results in the formation of **advanced glycation end products** throughout the body. **Pyridoxal 5'-phosphate** is the active form of vitamin B6 that has been shown to protect against both lipid and protein **glycation** reactions.<sup>21-24</sup>

- **R-LIPOIC ACID:** Destructive free-radical activity in the **mitochondria** plays a major role in the loss of cellular vitality. A **microencapsulated Bio-Enhanced® R-lipoic acid** facilitates youthful **mitochondrial energy output** while guarding against **free radicals**. Two forms of lipoic acid are sold on the supplement market, but **R-lipoic acid** is far more potent.<sup>25-28</sup>
- **ACETYL-L-CARNITINE ARGINATE:** The amino acid L-carnitine is required to transport fats into the **mitochondria** to be burned for cellular energy. **Acetyl-L-carnitine arginate** is a patented form of carnitine that also **supports neurites** in the brain.<sup>29</sup>

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

A bottle of **Mitochondrial Energy Optimizer with BioPQQ®** containing **120 capsules** retails for \$94. If a member buys four bottles during **Super Sale**, the price is reduced to **\$56.70** per bottle.

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

Carnosine	1000 mg
ArginoCarn® Acetyl-L-carnitine arginate DiHCl	675 mg
R-Lipoic acid (as microencapsulated Bio-Enhanced®)	150 mg
Benfotiamine	150 mg
Pyridoxal 5'-Phosphate	100 mg
BioPQQ®	10 mg
Luteolin	8 mg
Calcium	230 mg



Item # 01768

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To order Mitochondrial Energy Optimizer with BioPQQ®, call 1-800-544-4440 or visit [www.LifeExtension.com](http://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.

BY EDUARDO VASQUEZ

# Suppress BLOOD SUGAR Without Drugs

The research is conclusive—the longer you wait to tame age-related **blood sugar** increases, the greater your odds of succumbing to diabetes and its associated increased risk of heart attack, stroke, kidney failure, cancer, and blindness.<sup>1-3</sup> For the majority of aging individuals, urgent action is needed.<sup>1,2</sup>

The public has not yet recognized the **magnitude of damage** inflicted after consumption of what most consider only a moderate amount of **starch** or **sugar**.

A widely publicized study showed that drinking just one 12-ounce sugar-sweetened soda daily resulted in an **18-22% increased** risk of **type II diabetes**.<sup>4</sup> While health-conscious people may avoid sodas, there are so many **glucose-spiking** foods in our diets that virtually none of us are immune.

Hard science reveals that fasting **blood sugar** above **85 mg/dL** is associated with increased risks of death and disease. Unfortunately, most adult glucose levels are well above this range.<sup>1,2,5</sup>

Aging humans should take assertive steps before eating **carbohydrates** to impede the **absorption** of glucose into their bloodstream. Just as important, however, is the need to suppress excess production of **glucose** in our liver and to improve **uptake** of blood glucose into our muscle cells as opposed to it being stored as **fat**.

The breaking news for those who want to avoid **drugs** is the discovery of three plant-derived nutrients that target underlying reasons why **80%** of American adults today have **higher than optimal** glucose levels.<sup>6</sup> >





The **July 3, 2013** issue of the *Journal of the American Medical Association (JAMA)* examined the impact of **fructose** on human health.<sup>7</sup>

**High-fructose corn syrup** represents over **40%** of caloric sweeteners added to foods and beverages. It's often the sole caloric sweetener in soft drinks in the United States.<sup>8</sup>

The digestion and metabolic effects of **fructose** differ from that of **glucose**.<sup>7</sup> Fructose is metabolized in the liver in a way that favors formation of new **fat** (lipogenesis).<sup>7</sup> Unlike glucose, fructose does not induce normal satiety signals. Fructose thus contributes to **overeating** that can lead to **weight gain**.<sup>7</sup> The increased use of **high-fructose corn syrup** in the US mirrors the rapid **increase** in **obesity**.<sup>9</sup>

The *JAMA* review of **fructose** first explained the mistaken belief in the **1990s** that **obesity** was caused by over-consumption of dietary **fat**.<sup>7</sup> Back then, high **sugar** intake was considered neutral and possibly even protective against **obesity** by displacing dietary fat.<sup>7</sup>

A decade later, the *American Heart Association* urged drastic reductions in **sugar** consumption because of concern it was contributing to **weight gain**.<sup>7</sup> Experts now argue that **sugar** intake is the most important cause of what has become a worldwide epidemic of **diabetes** and **obesity**.

Focusing on fructose, the *JAMA* review described the adverse impact of high **fructose** consumption that includes **fatty liver**, **insulin resistance**, **elevated triglycerides**, and **fat deposition** into tissue.<sup>7</sup>

The *JAMA* review then discussed how **fructose** contained in **fruit** has not shown these unfavorable effects.<sup>7</sup> They report that even when human subjects consume huge amounts of **fructose** in **fruit**, there have been beneficial effects seen on blood pressure, lipids, insulin, and body weight. The reason is the slow digestion rate of **whole fruit** compared to a sugar-sweetened beverage.

The *JAMA* review pointed out that excess intake of refined **sugars** and high-glycemic **starches** plays a significant role in **obesity** and concluded that “...*public health efforts should focus on reducing intakes of all highly refined processed carbohydrates, not just refined sugar.*”<sup>7</sup>

This review, published in an internationally recognized medical journal, accompanied by corroborating research data from other studies, is a wakeup call for aging humans to initiate definitive steps to impede the **rapid absorption** of **sugar** into their bloodstream.<sup>7-10</sup>

### Why Most of Us Have Too Much Glucose

Elevated blood sugar is blamed on eating too many sweets. Yet **type II diabetes** can be caused by excess production of glucose *internally* as well as overconsumption of high-glycemic carbohydrates.

To put this in perspective, look at the primitive conditions that existed throughout **99%** of human history. Ancestral human diets typically consisted of low levels of refined **carbohydrates**...mainly just **protein** and **fat** from whatever the day's hunt yielded along with fibrous vegetables.<sup>11</sup> Yet our bodies require a continuous supply of **glucose** to sustain brain cell energy production.<sup>12</sup>

Once blood glucose levels drop below **50 mg/dL** we become severely hypoglycemic and are at significantly increased risk for adverse clinical outcomes and death!<sup>13</sup> So we adapted a survival mechanism by which our **liver** produces **glucose** from protein (and sometimes fat) in a process called **gluconeogenesis**.



**Gluconeogenesis** served us well when food was scarce, but in today's world of boundless calorie abundance, this glucose-generator conspires to spike our blood sugar to dangerous levels.

The medical profession has yet to recognize the magnitude of this epidemic problem. Conventional doctors wait until **fasting glucose** crosses the **125 mg/dL** threshold to label you as **diabetic** and only *then* recommend treatment. That is, if you're lucky enough to have a watchful physician. According to the **Centers for Disease Control**, the incidence of **type II diabetes** remains dangerously underreported and underdiagnosed.<sup>14</sup>

It is thus up to individuals to take control of their bodies and incorporate proven methods to reduce and protect against the devastating impact of surplus blood **glucose**.

Fortunately, researchers have identified three natural ingredients that can safely reduce the amount of extra sugar produced in the liver, reduce the rate of sugar absorption, and facilitate transporting sugar out of the bloodstream into energy-producing cells. Each of these three natural ingredients acts independently and complementarily to protect against age-related increases in blood sugar and insulin levels.

Together with lifestyle and behavioral changes, compounds that target mechanisms involved in excess blood sugar are vital if we are to achieve optimal longevity.

## NATURAL INGREDIENT #1:

### Mulberry Leaf Extract

An extract from the mulberry leaf has been used in Chinese traditional medicine to treat various problems, particularly those involving blood sugar control.<sup>21,24</sup> Scientists have discovered evidence to validate this traditional use.<sup>24</sup> It turns out that mulberry works to support healthy blood sugar levels via several effective mechanisms.

### Inhibiting The Alpha-Glucosidase Enzyme

**DNJ** (1-deoxynojirimycin) is a component found in **mulberry** that can fool the body into believing that it is a sugar molecule.<sup>24</sup>

By "mimicking" sugar, **DNJ** binds to the **alpha-glucosidase** enzyme whose job is to "look" for **starches** in your intestines to break them down into sugars.<sup>24,25</sup> When DNJ binds to **alpha-glucosidase**, the body can't process as much starch, so this starch (and its calories) passes through the intestine, rather than being absorbed into your blood as sugar.<sup>24,26</sup>



## What You Need To Know

### Broad-Spectrum Support For Blood Sugar

- You are at risk for vascular disease if you don't keep your blood glucose under control; even "high normal" levels are dangerous.
- Mainstream medicine is often not concerned with blood sugar levels that are over **85 mg/dL** yet not in the "diabetic range."
- A novel combination of three nutrients offers multiple mechanisms to support healthy blood sugar and insulin levels, without many of the side effects associated with synthetic medications.
- These supplements act in ways quite similar to the best existing and emerging drugs used to control blood sugar, but in a gentler, safer fashion.
- Sorghum slows starch digestion and activates PPAR-gamma, an insulin-sensitizing metabolic sensor in your cells.
- Mulberry leaf extract slows digestion of starch fragments and increases activity of cellular insulin sensitizers to facilitate better glucose uptake by muscle and liver.
- Phloridzin, from fruit tree bark, blocks the carrier proteins that absorb glucose into your body from your intestine and kidneys.



### How Vital Life Processes Can Work Against Us

Three necessities vital to sustaining human life are:

1. Oxygen
2. Energy
3. Blood

If our bodies did not evolve robust capacities to ensure continuous **oxygenation**, **energy metabolism**, and **blood pressure**, we would have long ago perished.

As we age, however, these vital life processes work **against** us in the forms of **hypertension**, excess **oxidation**, and too much energy-substrate, i.e. **glucose**.

Everyone knows that **high blood pressure** is dangerous, yet many people walk around with higher-than-optimal readings (above 115/75).<sup>15</sup> **Antioxidants** suppress damaging oxidative reactions, but the general public is largely in the dark about which nutrients are needed to adequately suppress free radicals.<sup>16</sup>

More than **80%** of American adults have **fasting glucose** over **85 mg/dL**. Even more dangerous are **after-meal** surges in blood **glucose/insulin** that damage our endothelium and increase disease risk.<sup>6,17,18</sup>

Fortunately, there are nutrients that when taken before carbohydrate-containing meals can blunt the **after-meal glucose** surge, reduce excess production of **glucose** in the liver, and facilitate transport of **glucose** out of the blood into energy-producing cells.<sup>19-23</sup>

The binding of **DNJ** to alpha-glucosidase thus allows you to reduce the sugar load in your bloodstream that is created every time you eat a starchy meal. Mulberry inhibits starch-related blood sugar rise in a similar fashion as **acarbose**, a prescription medication used for blood sugar control.<sup>27</sup> Acarbose helps reduce after-meal blood sugar spikes by inhibiting *alpha-glucosidase*. Studies demonstrate that **mulberry leaf extracts** reduce **after-meal** rises in glucose.<sup>24,28</sup>

Daily use of mulberry leaf extracts can even delay the onset of type II diabetes in experimental models, significantly lowering after-meal insulin and glucose levels and delaying the development of diabetes.<sup>28</sup>

The DNJ in mulberry also reduces the production of excess glucose in the liver (*gluconeogenesis*) as does the anti-diabetic drug **metformin**.<sup>29,30</sup> Because around **47%** of fasting sugar (after 14 hours of fasting) comes from the liver pumping out glucose, this inhibition can significantly lower the amount of excess glucose circulating in your bloodstream.<sup>31</sup>

A human study compared **mulberry** with a leading anti-diabetic drug called **glyburide**.<sup>32</sup> This drug lowers glucose by boosting pancreatic production of **insulin**.<sup>33</sup> We at **Life Extension** have long warned against this sulfonylurea drug because excess insulin boosts cancer risk and damages cells throughout the body.

In this experiment, 24 people with type II diabetes were treated either with mulberry extract or with glyburide for 30 days.<sup>32</sup> The researchers found that **mulberry leaf extract** lowered fasting blood sugar significantly more than **glyburide**.<sup>32</sup>

The patients in the mulberry-supplemented group had an impressive **27%** drop in their fasting blood sugar, from **153 mg/dL** down to **111 mg/dL**. Those taking glyburide saw only an **8%** drop in their fasting blood sugar levels, from **154 mg/dL** to **142 mg/dL**. Patients taking mulberry saw their hemoglobin A1c blood level (a long-term measure of blood sugar levels) fall **10%**.<sup>32</sup> Those taking glyburide showed no decrease at all.

And the health benefits of mulberry did not stop with reducing blood sugar levels. The study showed that mulberry also had a positive impact on lipid profiles such as cholesterol that affect cardiovascular health. Those treated with mulberry showed a **12%** decrease in total **cholesterol** and a **16%** decrease in **triglycerides**. In the glyburide group, there was no real improvement in any of the lipid measurements from baseline.<sup>32</sup>

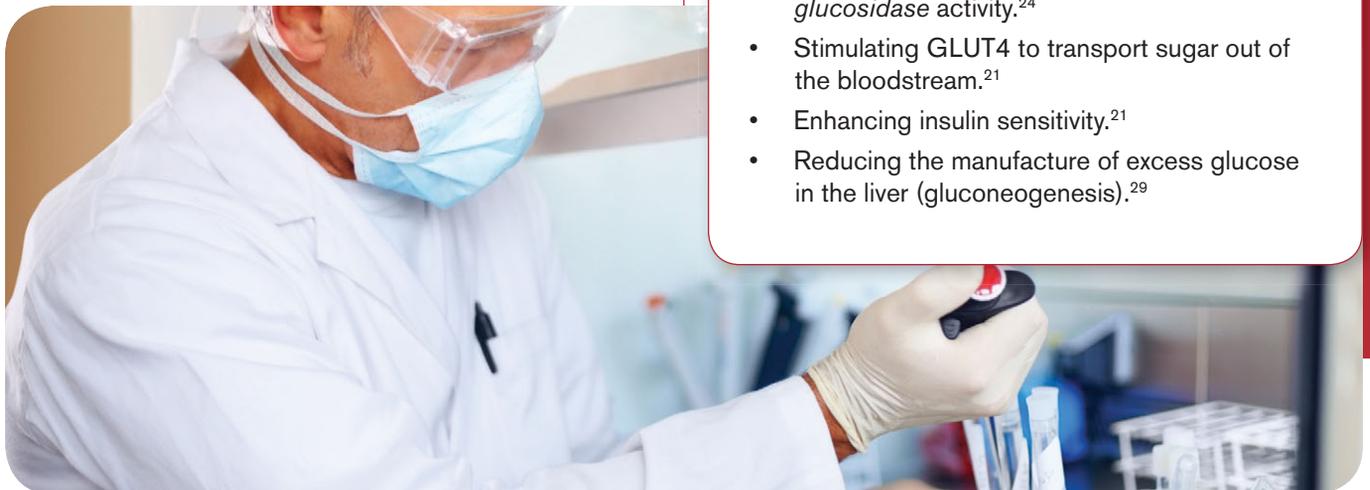
Patients taking mulberry saw their protective **HDL** levels rise by a significant **18%**, compared to just **3%** in the glyburide group.<sup>32</sup> Raising protective HDL levels has been a huge research target for the leading phar-

maceutical companies and so far their efforts have failed. Mulberry clearly demonstrated its ability to improve both metabolic and cardiovascular markers without boosting **insulin** levels, in contrast to the insulin-boosting drug glyburide.

In another impressive human trial, volunteers were given a mulberry leaf extract enriched with additional DNJ content. After taking the mulberry extract, the patients drank water containing **50 grams** (nearly 2 ounces) of sugar.<sup>20</sup> Mulberry extract suppressed the expected rise in glucose and kept insulin levels safely low, even in the face of this impressive ingestion of pure table sugar.

Additional human research shows that mulberry extract improves lipid profiles in non-diabetic volunteers as well. One study of non-diabetic people focused on those with mild lipid abnormalities who had tried to improve their lipids with diet and failed.<sup>34</sup> The results showed that **280 mg** of mulberry leaf extract three times a day decreased **triglycerides** by **10.2%** at 4 weeks and **12.5%** at 8 weeks. By the end of the 12-week study, total cholesterol was down by **4.9%**, triglycerides had fallen by **14.1%**, and **LDL** had decreased by **5.6%** from baseline values. Furthermore, beneficial **HDL** was increased by **19.7%**.<sup>34</sup>

A similar study involved a group of subjects who started out with very high triglycerides averaging **312 mg/dL**, more than double the upper limit of optimal.<sup>24</sup> In this study, subjects took the **DNJ-rich mulberry** extract (**12 mg** three times daily) before meals for 12 weeks. By the end of the study, the mean triglyceride level had fallen to **252 mg/dL**, which is still in the danger range. In **20%** of the subjects, however, triglycerides fell to below **150 mg/dL**—a reduction greater than **50%**!<sup>24</sup> There was a significant lowering in small or very low density **LDL**-cholesterol particles, which are especially dangerous because they are readily oxidized and are strongly associated with atherosclerosis.<sup>24</sup>



## Mulberry Increases Insulin Sensitivity Via GLUT4

In addition to suppressing *gluconeogenesis* and *alpha-glucosidase*, mulberry leaf extract functions in another important way. By enhancing **insulin sensitivity**, mulberry helps shuttle sugar out of the bloodstream and into cells where it can be utilized more readily. It accomplishes this improvement in insulin sensitivity and lowering of blood sugar levels by stimulating a cellular transporter called **GLUT4**.<sup>21</sup>

Mulberry increases not only the number of GLUT4 transporters but also facilitates their movement to the surface of the cell membrane, thus insulin sensitivity improves since glucose molecules are more readily moved into the cells of the body to enhance energy output.<sup>21</sup> In fact, **metformin**, one of the most impressive and well studied anti-diabetes drugs, works in part by increasing **GLUT4** in cells.<sup>35</sup>

In a laboratory study, researchers showed that they could increase glucose uptake in cells by as much as **54%** with **mulberry leaf** extract.<sup>21</sup>

Anti-diabetic drugs such as Actos® can sometimes induce unwanted weight gain.<sup>36</sup> An intriguing experiment with lab animals showed that mulberry leaf extract eliminated the body weight gain caused by pioglitazone (Actos®) treatment.<sup>36</sup> In the same study, mulberry leaf extract also increased the beneficial hormone *adiponectin*, which regulates glucose levels, reduces fat accumulation, and lowers damaging inflammatory mediators.<sup>36</sup>

### Mulberry's Mechanisms of Action

Mulberry helps control blood sugar levels by:

- Acting as a sugar mimic to prevent starch from turning into sugar by inhibiting *alpha-glucosidase* activity.<sup>24</sup>
- Stimulating GLUT4 to transport sugar out of the bloodstream.<sup>21</sup>
- Enhancing insulin sensitivity.<sup>21</sup>
- Reducing the manufacture of excess glucose in the liver (*gluconeogenesis*).<sup>29</sup>



## Sorghum's Mechanisms Of Action

Sorghum helps control blood sugar levels by:

- Reducing the release of sugar found in starch by inhibiting the enzyme, *alpha-amylase*.<sup>38,39</sup>
- Improving insulin sensitivity.<sup>41</sup>
- Reducing the manufacture of excess glucose in the liver (gluconeogenesis).<sup>19</sup>
- Activating the PPAR-gamma receptor to take up more blood glucose into energy producing cells.<sup>41</sup>

## NATURAL INGREDIENT #2:

### Sorghum Extract

**Sorghum**, a grass plant eaten in Egypt some 4,000 years ago and now cultivated in Africa and Asia, complements the sugar control benefits of mulberry by further improving insulin sensitivity and reducing *gluconeogenesis*, the creation of excess sugar molecules in the liver.<sup>19,37,38</sup>

At the earliest stages of starch digestion, **sorghum** inhibits the *alpha-amylase* enzymes that break down starch into sugar for absorption.<sup>39,40</sup> This means that less starch ends up as sugar in your bloodstream. Sorghum has also been shown to reduce the digestibility of starch molecules thus minimizing uptake as sugar.<sup>41</sup>

Researchers have recently discovered another mechanism behind sorghum's ability to reduce blood sugar levels. Sorghum *activates* the beneficial metabolic "thermostat" called **PPAR-gamma**. In the body, PPAR-gamma is a receptor that regulates glucose metabolism.<sup>38</sup> When sorghum activates PPAR-gamma, glucose is removed from the bloodstream and more effectively utilized by muscle cells and the liver.<sup>38</sup> PPAR-gamma also reduces the over-production of insulin by the pancreas, causing blood sugar levels to drop without an increase in insulin secretion.<sup>38</sup>

Sorghum extract appears to target PPAR-gamma to help support blood sugar levels somewhat differently than "glitazone" drugs. While glitazone drugs activate existing PPAR-gamma, sorghum increases its genetic expression, which then naturally results in more beneficial PPAR-gamma in the body's tissues.<sup>38</sup> More PPAR-gamma might equal better blood sugar control.

Sorghum provides another important benefit—it has been shown to reduce body fat. In an experimental study involving a high-fat diet, sorghum resulted in reductions of both blood **sugar** and **insulin**. The animals that were fed sorghum lost body fat and had reduced blood levels of lipids.<sup>38</sup> Animals not receiving sorghum did not show the notable drops in blood sugar and insulin.<sup>38</sup>

This weight loss effect may be due in part to sorghum's inhibition of fat cell development—an effect opposite to that produced by PPAR-activating drugs.<sup>42,43</sup> Further research needs to better clarify if sorghum has potent weight-loss effects in adult humans.

### Sorghum Reduces Excess Sugar Production In The Liver

Your liver can significantly raise your blood sugar level by producing excess **glucose** even though there is already enough sugar in your bloodstream.

**Sorghum** slows down the liver-induced *gluconeogenesis*—a process that can be especially problematic for diabetics.<sup>19</sup> The result is less new glucose entering the blood.<sup>19</sup> This beneficial mechanism of controlling sugar production in the liver is similar to the anti-diabetes drug *metformin*.<sup>30</sup>

In experimental studies, **sorghum** not only reduces the amount of blood sugar entering the bloodstream, but helps improve performance on *glucose tolerance tests*.<sup>19</sup> One such study gave **sorghum** to both healthy and experimentally-induced diabetic animals, while another group of diabetic animals were treated only by the anti-diabetic drug *glyburide*, which acts by increasing insulin secretion.<sup>19</sup>

Both the sorghum group and the glyburide group had reduced glucose levels, bringing glucose tolerance test results down to the healthy levels seen in non-diabetic animals.<sup>19</sup> Sorghum, however, did not raise insulin levels like the sulfonylurea drug did.<sup>19</sup>

Excess insulin levels are associated with increased disease and mortality risk, including cardiovascular disease and certain cancers.<sup>1,3</sup> This experiment showed that sorghum provided glucose control similar to the prescription sulfonylurea drug *glyburide* without boosting insulin levels.<sup>19</sup>

Other research has shown that a compound found in sorghum reduces **hemoglobin A1c**, a critical marker of long-term glucose control.<sup>44,45</sup>

### NATURAL INGREDIENT #3:

#### Phloridzin

**Phloridzin** is a natural polyphenol heavily concentrated in the skin of an apple. Phloridzin lowers blood sugar and enhances insulin sensitivity in several unique ways that complement the actions of **mulberry** and **sorghum** extract.<sup>23,46-48</sup>

Phloridzin, has been used in diabetes research and has a low incidence of side effects.<sup>49</sup>

#### Phloridzin Inhibits SGLT1 And SGLT2

One of the ways in which **phloridzin** reduces sugar in your blood is to inhibit the “carrier proteins” that absorb glucose from your intestine and kidney.<sup>46</sup> By stopping these carrier molecules from absorbing sugar into your bloodstream, the sugar is safely passed out of the body without being used.

**Phloridzin** inhibits two of these sugar carrier molecules called **SGLT1** and **SGLT2**.<sup>46</sup> Blocking SGLT1 prevents glucose absorption from the intestine, while blocking SGLT2 prevents it from being returned to the blood from urine forming in the kidney.

Phloridzin primarily inhibits SGLT1 in the intestine, thereby preventing glucose from being absorbed and entering the bloodstream. Eventually, the undigested sugar is flushed away.<sup>47</sup>

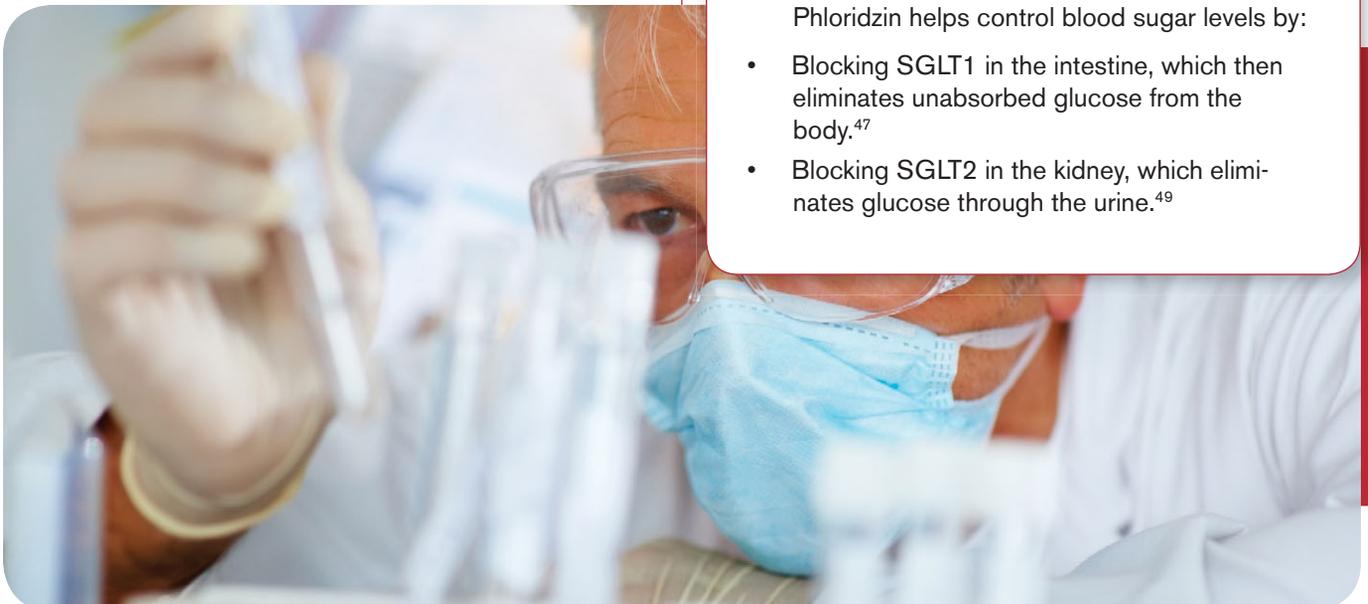
Inhibiting SGLT1 lowers the glycemic impact right from the beginning of the digestive process and reduces the dangerous **after-meal** glucose spike that’s associated with increased cardiovascular risk.<sup>17</sup> Since phloridzin blocks sugar uptake from the intestine, the sugar never gets a chance to spike in your blood following a meal.<sup>47</sup> Experimental data show that phloridzin causes significant reductions in postprandial (after-meal) blood sugar levels, with a reduction in the excessive drinking and urination that are typical in diabetes.<sup>46</sup>

Phloridzin normalizes blood glucose in experimental models of diabetes, restoring insulin sensitivity in cells and living tissues.<sup>23,46-48</sup> Phloridzin also inhibits SGLT2 in the kidney, but to a far lesser extent than many pharmaceutical drugs currently undergoing intensive research and development.<sup>49</sup> Phloridzin has been shown to decrease food consumption and body weight in diabetic animals.<sup>46</sup> Future research needs to evaluate if phloridzin’s weight loss effects are also effective in humans.

#### Phloridzin’s Mechanisms Of Action

Phloridzin helps control blood sugar levels by:

- Blocking SGLT1 in the intestine, which then eliminates unabsorbed glucose from the body.<sup>47</sup>
- Blocking SGLT2 in the kidney, which eliminates glucose through the urine.<sup>49</sup>



**TABLE: Sugar-Slashing Nutrients And The Drugs That Imitate Them**

<b>Nutrient</b>	<b>Mechanism Of Action</b>	<b>Beneficial Result</b>	<b>Drug(s) With Similar Mechanism</b>	<b>Potential Drug Side Effects</b>
SORGHUM	Reduces starch breakdown to sugar in intestine by inhibiting amylase and alpha-glucosidase <sup>39,40</sup>	Prevents glucose from reaching blood-stream	Acarbose <sup>27</sup>	Gastrointestinal symptoms (pain, gas, bloating) <sup>50</sup>
	Activates PPAR-gamma <sup>38</sup>	Increases insulin sensitivity, does not boost insulin secretion <sup>38</sup>	Thiazolidinediones ("glitazones") <sup>38</sup>	Fluid retention (edema), cardiovascular risk (rosiglitazone), bladder cancer (pioglitazone) <sup>51,52</sup>
	Reduces new sugar manufacture in liver (inhibits hepatic gluconeogenesis) <sup>19</sup>	Reduces contribution of newly-made sugar to fasting blood glucose <sup>19</sup>	Metformin <sup>53</sup>	Metformin and the potential risk of lactic acidosis is controversial but evolving. At present, more recent research suggests that metformin may be used cautiously by those with pre-existing heart, liver, kidney, or pulmonary disease assuming diligent medical monitoring, but should be avoided by those with severe end-organ disease (e.g. heart failure, kidney failure). <sup>61</sup>
MULBERRY LEAF EXTRACT, RICH IN DNJ	Stimulates GLUT4 transport of glucose out of blood and into working cells <sup>21</sup>	Reduces blood sugar and improves insulin sensitivity <sup>24</sup>	Metformin <sup>53</sup>	Metformin decreases vitamin B12 and folate levels, causing an increase in homocysteine level; research also indicates that supplementing with folate and vitamin B12 can protect against homocysteine increase caused by metformin. Metformin may decrease testosterone level in some individuals; <sup>54</sup> aging males should know their testosterone blood levels and take steps to restore testosterone to youthful ranges. Metformin may cause mild gastrointestinal upset (nausea, flatulence) in some individuals which can be minimized by consuming frequent, small, protein-rich meals with limited carbohydrate content. <sup>55-57,59,60</sup>
	Reduces new sugar manufacture in liver (inhibiting hepatic gluconeogenesis) without increasing insulin secretion <sup>29</sup>	Reduces contribution of newly-made sugar to fasting blood glucose <sup>29</sup>	Metformin <sup>53</sup>	
	DNJ mimics glucose and binds to alpha-glucosidase, blocking breakdown of starch and sugars <sup>24</sup>	Prevents glucose from reaching blood-stream <sup>24</sup>	Acarbose <sup>27</sup>	Gastrointestinal symptoms (pain, gas, bloating) <sup>50</sup>
PHLORIDZIN	Primarily inhibits glucose absorption (SGLT1; intestine) and to a lesser extent re-absorption (SGLT2; kidney) <sup>46</sup>	SGLT1 inhibition traps sugar in intestine, SGLT2 inhibition prevents sugar re-absorption from urine <sup>46</sup>	Canagliflozin (primarily inhibits SGLT2 in the kidney) <sup>58</sup>	Urinary tract infection <sup>58</sup>

## Summary

As we age, most of us experience rising blood sugar levels that cause or contribute to the development of degenerative disease.<sup>1</sup>

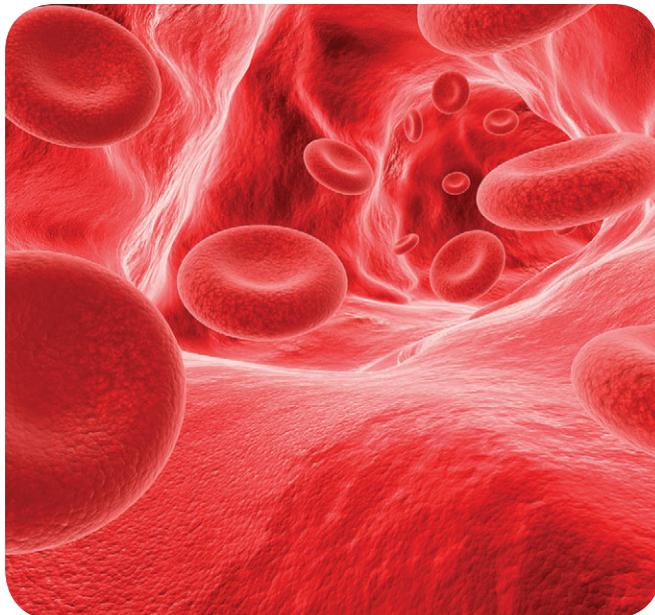
Using data collected from around the world, researchers have identified three natural glucose management ingredients: **mulberry** leaf extract, **sorghum** extract, and **phloridzin**. When combined, these plant extracts offer a broad spectrum of glucose control mechanisms.

**Mulberry leaf extract** contains the compound **DNJ** that impedes sugar-starch from being broken down as readily by the *alpha-glucosidase* enzyme.<sup>24</sup> Additionally, mulberry reduces the formation of excess glucose in the liver.<sup>29</sup>

Another way that mulberry extract lowers blood sugar levels is by stimulating the sugar transport molecule known as **GLUT4**, a similar mechanism manifested by the anti-diabetes drug metformin.<sup>21,35</sup> **GLUT4** beneficially facilitates glucose uptake by critical cells and tissues of the body for energy.

**Sorghum** is a grass found in Asia that naturally activates **PPAR-gamma** thereby regulating glucose metabolism.<sup>38</sup> Sorghum can reduce the amount of excess sugar molecules that your liver creates (gluconeogenesis), which further limits the amount of sugar entering your bloodstream.<sup>19</sup>

**Phloridzin**, which is found in the bark of certain fruit trees, inhibits sugar carrier proteins **SGLT1** and **SGLT2**.<sup>46</sup> Both SGLT1 and SGLT2 are the intense focus of new drug development. By inhibiting the activity of these two sugar carrier molecules, phloridzin impedes absorption and promotes elimination of sugar from the body.<sup>23,46-48</sup>



Combined, **mulberry leaf extract**, **sorghum extract**, and **phloridzin** work on numerous key mechanisms to improve insulin sensitivity, reduce blood glucose levels, safely escort glucose out of the body, and reduce the creation of new glucose in the liver.

If your **fasting glucose** blood level is over **85 mg/dL**, **hemoglobin A1c** over **5.0%**, or a **glucose tolerance test** reads over **120 mg/dL**, these three nutrients would be an important addition before every **carbohydrate-containing** meal. ●

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

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# New Absorption-Enhanced **MILK THISTLE** Now With **Advanced Phospholipid Delivery**

**Milk thistle** extract is one of nature's most potent weapons to support liver health. Until recently, however, the technology hasn't been available to fully harness this plant's full benefits.<sup>1</sup>

The problem has been that the star component of milk thistle, called **silybin**, does not dissolve well in water.<sup>2,3</sup> This makes it difficult for your body to **absorb** all of it.<sup>2,4,5</sup>

Scientists have developed a novel technology to overcome silybin's poor bioavailability. The solution is to mix **silybin** with a nutrient called **phosphatidylcholine**.

**Phosphatidylcholine** facilitates transport across the intestinal lining into the bloodstream, making it an ideal "carrier molecule" for **silybin**.<sup>4,5</sup> Scientists believe that phosphatidylcholine molecularly bonds to silybin, ushering it through the membranes of cells in the intestinal tract.<sup>4</sup>

This **new silybin-phosphatidylcholine** complex is absorbed nearly **5 times better** than silymarin alone, and its concentration in the liver, its target organ, is **10-fold greater** than silymarin alone.<sup>6-8</sup>

The suggested twice daily dosage of one softgel provides:

<b>Milk Thistle Phospholipid Proprietary Blend</b>	<b>760 mg</b>
<b>Milk Thistle Extract</b> (seed) [std. to 80% silymarin (480 mg), 30% Silybin (180 mg), and 8% Isosilybin A and Isosilybin B (48 mg)], Phospholipids	
<b>SILIPHOS® Phytosome Milk Thistle Extract</b> (seed)	<b>160 mg</b>
[std to 29.7% silybin (47.52 mg)]	

A bottle containing 60 softgels of the new **absorption-enhanced Milk Thistle** retails for **\$28**. If a member buys four bottles during **Super Sale**, the cost is reduced to only **\$16.88** per bottle—a savings of nearly one third!

This novel Milk Thistle extract with phosphatidylcholine contains standardized concentrations of **silybin** and **isosilybin A** and **B** not found in other milk thistle extracts! Compare the price of **Milk Thistle** to commercial silymarin supplements, and members will see that this new formula is available at one of the **lowest** costs per milligram.

Contains soybeans.

SILIPHOS® is a registered trademark of Indena S.p.A., Italy.

**To order European Milk Thistle with Advanced Phospholipid Delivery**  
call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)



Item# 01822

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

# 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.

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

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



Item # 01680

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

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

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

## JUST ONE SOFTGEL OF SUPER BOOSTER SUPPLIES:

Vitamin K2 (as menaquinone-7)	200 mcg	Gamma Tocopherol	197.45-296.25 mg
Vitamin K2 (as menaquinone-4)	1000 mcg	Lycopene	10 mg
Vitamin K1 (as phytonadione)	1000 mcg	Lutein	2 mg
Ginkgo extract	120 mg	Vitamin B12	300 mcg
Sesame lignans	20 mg	Vitamin C	95 mg
Chlorophyllin	100 mg		

A bottle of 60 **Super Booster** softgels retails for \$42. If a member buys four bottles during **Super Sale**, the price is reduced to **\$25.65** per bottle.

The **Super Booster** saves consumers **huge dollars** by combining a wide variety of costly nutrients into one daily softgel. If you add up the price of the individual ingredients contained in the **Super Booster**, you would spend **two to three times more** for this potency if taken separately.

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

Contains soybeans.

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

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

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# Multiple Mechanisms for the Support of Healthy Blood Sugar Levels

## Tri Sugar Shield™

Many aging individuals find themselves under assault from rising **blood sugar** levels.

Despite a healthy diet and exercise, blood sugar levels can rise due to a number of factors including excess **gluconeogenesis** whereby the liver produces glucose from protein. Another issue is the rapid conversion of any **starch**, including whole grains, into **glucose**. The result is that even health-conscious, active people can experience higher-than-desired blood sugar levels as they age.<sup>1,2</sup>

An all-natural, **multi-pronged** approach has been designed to support the natural balance of key **glucose pathways!**

**Tri Sugar Shield™** provides three plant-derived nutrients that—through their **rich array of complementary mechanisms**<sup>3-18</sup>—afford an **unrivalled** level of optimal, broad-spectrum support for healthy glucose metabolism in aging individuals within normal range.

### MULTI-PRONGED APPROACH

**Life Extension® Tri Sugar Shield™** contains the following three nutrients:

#### Sorghum Extract

Sorghum has long been cultivated in Asia (and now is grown in Africa, India, China, Australia and the USA) and helps maintain healthy blood sugar levels, among those in the normal range, by modulating **four** different mechanisms:

- Balances the rate of sugar manufacture in the liver (*gluconeogenesis*).<sup>5</sup>
- Promotes insulin sensitivity.<sup>6</sup>
- Regulates *PPAR-gamma*, a metabolic thermostat controlling glucose metabolism.<sup>6,7</sup>
- Regulates the enzyme *alpha-amylase*, which in turn controls the release of sugar found in starch.<sup>3,4</sup>

#### Mulberry Leaf Extract

Mulberry leaf has been used in Chinese traditional medicine for centuries. Like sorghum, mulberry leaf extract targets **three** different mechanisms:

- Targets the *alpha-glucosidase* enzyme to regulate conversion of starch into glucose.<sup>8-10</sup>
- Supports glucose transporter *GLUT4* that moves glucose out of the bloodstream and into muscle and liver cells.<sup>11,12</sup>
- Promotes insulin sensitivity.<sup>13</sup>

#### Phloridzin

Phloridzin is a natural polyphenol found in various fruit trees.<sup>14</sup> Phloridzin helps maintain healthy blood sugar levels, among those in the normal range by:

- Targeting carrier protein *SGLT1*, in turn helping to block the absorption of glucose into the bloodstream.<sup>15,16</sup>
- Targeting carrier protein *SGLT2*, in turn supporting glucose elimination via urine.<sup>17,18</sup>

By targeting **all** of these diverse glucose pathways, **Life Extension® Tri Sugar Shield™** delivers the **widest possible support** to help naturally stabilize already healthy glucose levels!

The suggested daily dose of **one** vegetarian capsule taken before the heaviest carbohydrate or sugar containing meals/drinks of the **new Tri Sugar Shield™** provides:

<b>Sorghum bran (<i>Sorghum bicolor</i>) extract</b> [providing proanthocyanidins (540 mg)]	<b>600 mg</b>
<b>White mulberry extract (leaf)</b> [providing 1-deoxynojirimycin (DNJ) (15 mg)]	<b>300 mg</b>
<b>Phloridzin [from apple extract (root bark)]</b>	<b>100 mg</b>

A bottle of 60 vegetarian capsules of **Life Extension® Tri Sugar Shield™** retails for \$36. If a member buys four bottles during **Super Sale**, the price is reduced to **\$21.60** per bottle.



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To order **Life Extension® Tri Sugar Shield™**, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

BY MICHAEL DOWNEY

# Targeting *APPETITE* HORMONES To Prevent FOOD CRAVINGS

Obesity is a rising global epidemic with over 1 billion adults already overweight.<sup>1</sup>

Inducing **weight loss** is one of modern medicine's greatest challenges.

When **appetite hormones** are out of balance, achieving meaningful **fat reduction** can be extremely difficult.

Appetite hormone imbalance can potentially lead to **weight gain** caused by increased hunger leading to snacking, a lack of feeling full, and unhealthy food choices.<sup>1</sup> Your body wants to keep eating because your hormones continue to send hunger signals.

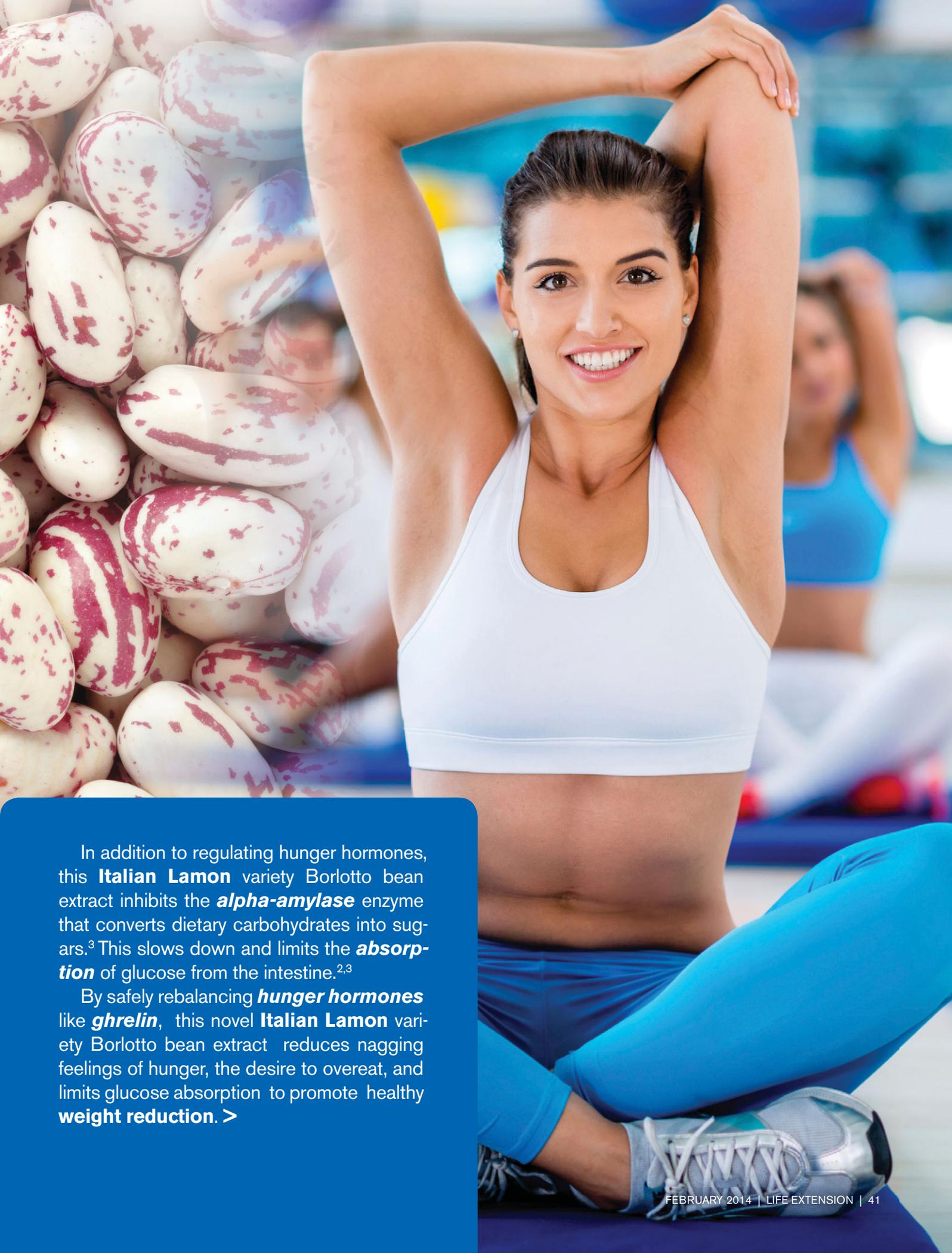
Results from groundbreaking human studies demonstrate that a proprietary extract of the **Italian Lamón** variety Borlotta bean reduces appetite, increases feelings of fullness, and likely modulates appetite hormones, such as **ghrelin**.<sup>2,3</sup>

The reason **ghrelin** control is essential is that this hormone increases hunger urges and results in weight gain.<sup>4</sup> Therefore, controlling **ghrelin** can block hunger, increase feelings of fullness, and facilitate weight loss.

An anti-obesity **vaccine** that attacks **ghrelin** is now being tested, but you don't have to wait for it to be approved as a drug.<sup>5</sup> This **ghrelin-suppressing** effect is available now in an **Italian Lamón** variety Borlotta bean extract nutritional supplement.

APPETITE HORMONES





In addition to regulating hunger hormones, this **Italian Lamon** variety Borlotto bean extract inhibits the **alpha-amylase** enzyme that converts dietary carbohydrates into sugars.<sup>3</sup> This slows down and limits the **absorption** of glucose from the intestine.<sup>2,3</sup>

By safely rebalancing **hunger hormones** like **ghrelin**, this novel **Italian Lamon** variety Borlotto bean extract reduces nagging feelings of hunger, the desire to overeat, and limits glucose absorption to promote healthy **weight reduction.** >

## How Hunger Hormones Contribute To Obesity

Normally, as our stomach and intestines fill up with a meal, they secrete “*satiety hormones*” that circulate to the brain to shut off the desire to continue to eat.<sup>4,6</sup>

Satiety hormones include **cholecystokinin (CCK)**, **glucagon-like peptide-1 (GLP-1)** and **peptide YY (PYY)**.<sup>7</sup> These satiety hormones subside as the gut empties and the body’s need for additional calories rises.

Conversely, the hunger-inducing hormone **ghrelin** is secreted in response to an empty stomach, which stimulates feeding behavior.<sup>8</sup> *Ghrelin* acts on the same brain receptors that incite pleasurable rewards.<sup>9</sup> When *ghrelin* is over-activated, it induces **food cravings**.<sup>10,11</sup>

A key factor in many cases of obesity is loss of sensitivity to **appetite-regulating hormones**, which can lead to increasing food intake despite what should be normal “stop” signals.<sup>4,12</sup> In many obese individuals trying to lose weight, *ghrelin* levels increase, which triggers more eating, less satiety, and provides the brain a feeling of reward for bad behavior.<sup>9,13,14</sup>

An approach to healthy weight loss is to lower *ghrelin* to reduce **appetite**, while restoring sensitivity to satiety-inducing hormones **CCK**, **GLP1**, and **PYY**. That way, there would be reduced hunger — and reduced psychological reward for consuming excess calories.

## Restoring Appetite Hormone Balance

To date there are few available methods that can safely and effectively suppress *ghrelin*. Studies have shown that the surgical procedure known as **bariatric surgery** induces massive **weight loss**, making it one of the most effective forms of weight reduction.<sup>15</sup> Some types of bariatric surgery, in particular a type of gastric bypass surgery known as Roux-en-Y gastric bypass, also reduce *ghrelin* levels, likely contributing to the reduced hunger in these bariatric surgery patients following the procedure.<sup>16</sup>

For many years, physicians believed that bariatric surgery facilitated weight loss only because it reduces the volume of the stomach.<sup>15</sup> The idea being that the stomach takes in less food and therefore patients lose weight. But scientists have recently found that, in addition to limiting the volume of food intake, certain types of the most successful forms of bariatric surgery like Roux-en-Y gastric bypass can reduce much of the *ghrelin*-producing tissue in the stomach and increase the appetite-suppressing hormones **CCK**, **GLP1**, and **PYY**.<sup>17-22</sup> Patients also typically experience healthful food preferences due to this hormonal re-balancing.<sup>19</sup>

Bariatric surgery like the Roux-en-Y gastric bypass is costly, uncomfortable, and carries with it **substantial risks**.<sup>15</sup> So scientists recognized a need for a non-surgical alternative.

Fortunately, researchers have discovered a natural method to **mimic** many of the favorable **hormonal** effects of certain types of bariatric surgery without the need for undergoing this procedure.

A novel **Italian Lamon** variety Borlotto bean extract mimics the typical hormonal effect of some types of bariatric surgery by rebalancing the appetite hormones. This unique bean extract suppresses **ghrelin** while promoting **CCK**, **GLP1**, **GLP2**, and **PYY**.<sup>2,23-25</sup> This in turn reduces food intake, body weight, accumulation of blood lipids, glucose, and the impulse that drives snacking.<sup>26</sup> *Ghrelin* suppression may also reduce the inappropriate addiction-like reward response when excess calories are consumed.<sup>9</sup>

As you will read next, supplementation with this proprietary Italian **Lamon** variety Borlotto bean extract has produced impressive **weight loss** effects.<sup>27,28</sup> It reduces fat accumulation without loss of muscle mass, in a fashion similar to that produced by some types of bariatric surgery, which is the most effective means of facilitating meaningful weight loss.<sup>27</sup>



## Remarkable Findings In Human Studies

In **2013**, a brand new randomized-crossover study examined the effects of eating a meal of just the **Italian Lamón** variety Borlotto beans—not the extract—and compared the results to a meal of white wheat bread containing the same amount of available starch.<sup>25</sup>

Compared to the control meal, the bean meal resulted in decreased levels of the appetite-promoting hormone **ghrelin** and reduced **hunger**. Additionally, the people eating Italian **Lamón** variety Borlotto beans had **15% lower glucose** and **16% lower insulin** levels.<sup>25</sup>

Scientists then reasoned that a concentrated and standardized Italian Lamón variety Borlotto bean extract should produce a much more potent effect.

So, in a study published the same year as the bean experiment, researchers enlisted 12 healthy, non-overweight human volunteers for a randomized, double-blind, placebo-controlled study. Each subject took either a placebo or **100 milligrams** of Italian Lamón variety bean extract after a 12-hour overnight fast. The study subjects then ate a normal meal made up of various food items.<sup>2</sup>

As expected, the Italian Lamón variety Borlotto bean extract produced a significant impact on appetite signaling.<sup>2</sup>

Within three hours, levels of the appetite-promoting hormone **ghrelin** and the desire to eat were both significantly lower in the Italian Lamón variety Borlotto bean extract group compared to the placebo arm.<sup>2</sup> Correspondingly, the sensation of satiety (fullness) after three hours was higher in the Italian Lamón variety Borlotto bean extract group.<sup>2</sup>

In the Italian Lamón variety Borlotto bean extract supplemented group, the increase in **blood sugar** was **41% lower** than the placebo group thirty minutes after the meal. The increase in **insulin** between 45 and 120 minutes after the meal was **26% lower**.<sup>2</sup> Reducing after-meal levels of **glucose** and **insulin** is important not only for **weight management**, but also for slashing the risk of a number of degenerative and potentially fatal diseases.<sup>29-34</sup>

Next, researchers investigated the **weight-loss** effects of Italian Lamón variety Borlotto bean extract on overweight individuals. In a not-yet published study, 60 participants with a body-mass index (BMI) between 25 and 30 took either placebo or a total of **200 milligrams** of extract daily, in two divided doses.<sup>3</sup> All participants were instructed not to make any dietary changes or start any new exercise routines. Subjects were assessed for changes in weight, waist size, and an established measurement of appetite and satiety.



## What You Need To Know

### Modulating Appetite Hormones To Reduce Weight

- Successful weight loss can literally be a matter of life and death.
- But **disordered appetite hormones** sabotage weight loss—increasing hunger, reducing satiety, and promoting cravings for poor food choices.
- In breakthrough clinical studies, a proprietary Italian Lamón variety Borlotto bean extract was shown to be a safe, effective nutritional supplement that modulates appetite hormones—**blocking hunger** and increasing feelings of food satisfaction and fullness.
- **This remarkable extract also inhibits** the enzyme that converts carbohydrates into sugar, **inhibiting the lethal glycemic effects of carbohydrates—which can include** metabolic syndrome, diabetes, Alzheimer's, cardiovascular disease, cancer, and kidney failure.
- It is now possible for aging individuals to achieve healthy body weight and optimal glucose control—resulting in reduced disease risks, improved appearance, and longer life!



*The scientists found that the Italian Lamón variety Borlotto bean extract supplemented participants lost far more weight compared to the placebo group!*<sup>3</sup>

At the end of **12 weeks**, the group receiving the **Italian Lamón variety Borlotto bean extract** showed the following improvements:<sup>3</sup>

1. **Reduction** in **total body weight** of almost **9 pounds** versus only **.25 pounds** in the placebo group.
2. **Reduction** of about **2.5 inches** in **waist circumference** versus only **.6 inches** in the placebo group.
3. **Reduction** in **appetite** levels from baseline values. The placebo group showed *no* improvement.
4. **Increase** in **satiety** from baseline. The placebo group showed *no* improvement.

The study authors concluded that the Italian Lamón variety bean extract supplement “*was demonstrated to be effective in treatment of overweight people without the need to resort to particular diet restrictions or increased physical exercise. Clearly, it is suggested that a moderate modification in the diet and in physical exercise pattern can produce even more noticeable effects.*”<sup>3</sup>

All of the indicated benefits of **Italian Lamón variety Borlotto bean extract** in these human trials (reduced appetite, cravings, body weight levels, blood sugar, and insulin) are linked with decreased risks of a variety of potentially fatal diseases.<sup>29-34</sup> No significant adverse events or side effects were reported in any study.<sup>3</sup>

### **Animal Data Supports Lamón Extract**

The early studies on the Italian Lamón variety Borlotto bean extract were conducted on laboratory animal models.

Different rat groups were supplemented with very high doses of Lamón variety bean extract and then provided with access to regular food pellets, a starch-enriched diet, and a highly palatable chocolate-flavored beverage.<sup>23</sup> The results showed that there were decreases in blood glucose levels, food intake, and body weight gain, all varying by the dose of Italian Lamón variety Borlotto bean extract.<sup>23</sup>

In one of these experiments, scientists pretreated rats with a drug that interferes with receptors for the appetite-suppressing hormone **CCK**. The drug blocked Lamón bean extract’s food reduction effect, demonstrating that Lamón extract works in part by modulating **CCK signaling**.<sup>23</sup>

To learn more about the hunger-reducing effects of Italian Lamón variety Borlotto bean extract, scientists

conducted additional studies. Rats were trained to press a lever to receive as much of a chocolate-flavored beverage as they wished.<sup>35</sup> Then Lamon variety bean extract was administered in differing dosage ranges. In a dose-dependent manner, Lamon bean extract reduced lever-pressing by up to **40%** indicating that the rats had a sense of satiety and did not want more of the chocolate-flavored beverage.<sup>35</sup>

This finding was repeated in two almost-identical studies, one of which also found an up to **30%** reduction in food intake—a reduction that persisted for a full **24 hours**.<sup>36,37</sup>

This appetite-suppressing effect was further tested on **obese** rats. They were weighed after each of three separate rounds of 5-day treatment periods followed by a 20-day washout period.<sup>26</sup> After each treatment period, in a dose-dependent manner, the different doses of Italian Lamon variety Borlotto bean extract reduced daily food intake by an average of **20-35%** and resulted in **reduced body weight**.<sup>26</sup>

When rats are fed carbohydrates, they experience blood sugar spikes—just as humans do. Researchers reported that the Italian Lamon variety Borlotto bean extract effectively blocks absorption of carbohydrates in animals by inhibiting the **alpha-amylase** enzyme.<sup>26</sup>

In one experiment on after-meal glucose response, scientists first put obese rats through a food-deprivation period. Then, they were given different doses of the Italian Lamon variety Borlotto bean extract and immediately allowed access to a fixed amount of starch-enriched chow.<sup>26</sup> Testing after the meal showed that in a *dose-dependent* manner, the Italian Lamon variety Borlotto bean extract **suppressed** carbohydrate-induced after-meal **glucose spikes**.<sup>26</sup>

The doses used in these rat studies were far higher than needed in the successful human clinical trials. This helped demonstrate the *safety* of the Italian Lamon variety Borlotto bean extract. The impressive human studies only required **100 mg** of the Italian Lamon variety Borlotto bean extract taken two times daily.<sup>3</sup>

### Inhibiting Carbohydrate Absorption

**Appetite hormones** are not the only factor in weight gain. Excess **carbohydrate** calories in the modern Western diet undermine the best efforts to maintain healthy levels of body weight.<sup>38</sup>

Excess blood glucose leads to increased **insulin**—and increased insulin contributes to greater difficulty burning stored body fat as fuel.<sup>39</sup> It is also involved in the body storing more excess carbohydrate calories as unsightly **fat**.<sup>39</sup> Rapid sugar absorption contributes to after-meal **glucose** surges, impaired sugar control, and sharply increased disease risk.

### NEW! Italian Lamon Variety Borlotto Bean Extract

For many years, various bean extracts have been used in high doses to suppress **alpha-amylase**.<sup>3,23</sup>

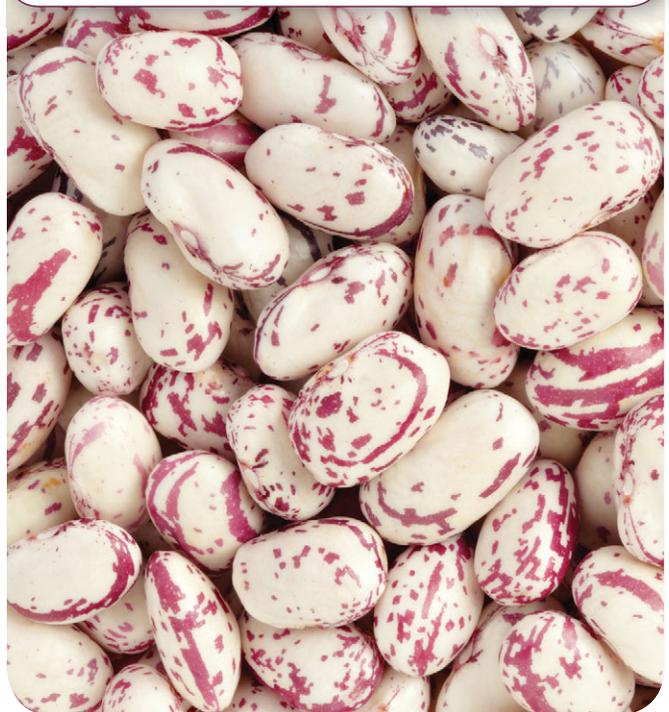
While this is one mechanism that can help facilitate **fat loss**, it does not affect **hunger hormones** that are a root cause of unwanted weight gain.

Scientists have developed a novel extract from the Italian **Lamon** variety Borlotto bean that provides specific constituents (phytoagglutinins) that suppress **ghrelin** and promote **CCK, GLP1** and **PYY** to help keep food cravings and hunger under control.<sup>2,3,23-25</sup>

This new Lamon variety Borlotto bean extract also provides the constituent responsible for **alpha-amylase** inhibition.<sup>3</sup>

The Italian Lamon variety Borlotto bean extract is obtained from a selected breed of beans characterized by a specific ratio between amylase-inhibiting and satiety-inducing factors. It is then highly purified and standardized to maximize efficacy for optimal appetite hormone balance using a low dose (**100 mg** twice a day).<sup>3</sup>

By suppressing **ghrelin**, promoting **CCK, GLP1, PYY**, and inhibiting **amylase**, long term weight loss compliance with success is now more easily attainable.<sup>2,3,23-25</sup>



The good news is that in addition to its ability to rebalance **appetite hormones**, Italian Lamón variety bean extract also impedes the enzyme **alpha-amylase** which breaks down dietary starch into simple sugars that are rapidly absorbed in the small intestine.<sup>3,23</sup>

Blocking **alpha-amylase** inhibits the breakdown of starches and slows the rate at which free sugars are absorbed, thereby blunting glucose spikes.<sup>26</sup> This provides a practical approach to help lower glucose levels, improve age-related markers of health, and regain glycemic control.

**Italian Lamón variety Borlotto bean extract** helps counteract undesired weight gain through two distinct mechanisms: it **rebalances appetite signaling hormones** and it **inhibits excess carbohydrate absorption**.

### Summary

Since **obesity** involves a higher mortality risk than being of normal weight,<sup>40</sup> successful weight loss can be a matter of life and death.

But disordered **appetite hormones** sabotage weight loss by causing chronic hunger, a reduced feeling of satiety, and greater cravings for unhealthy food choices. The most effective option to regulate appetite hormones is gastric bypass surgery—which is costly, uncomfortable, and substantially risky.

Clinical studies now demonstrate that a proprietary extract from the Italian Lamón variety Borlotto bean is a safe, effective nutritional supplement that modulates **ghrelin** and other appetite hormones, effectively **blocking hunger** while increasing feelings of food satisfaction and fullness.<sup>2,3,23-25</sup>

Italian Lamón variety Borlotto bean extract also inhibits the enzyme (alpha-amylase) that converts carbohydrates into sugar.<sup>3,23</sup> This impedes the after-meal glucose surge that has been implicated in increased risks of a number of degenerative conditions.<sup>29-34</sup>

Based on clinical trial data, this new Italian Lamón variety Borlotto bean extract may help aging individuals achieve healthy body weight and optimize glucose control, thereby reducing disease risks, improving appearance, and boosting **longevity!** ●

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

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# BIO-COLLAGEN WITH PATENTED UC-II®

## CONCENTRATED SUPPORT FOR JOINT COMFORT!

Tender, sensitive joints can limit everyday activities. As you age and continue to put stress on your joints, you can compromise joint cartilage—which exposes **small collagen fibers**.

Your body's immune system mistakenly identifies these collagen fibers as "**foreign cells**." This triggers an inflammatory response against the **collagen-containing** cartilage in *your own* joints. Inflammation and joint discomfort can soon follow.

Data shows that a patented collagen provides targeted support for the immune issues related to joint discomfort.<sup>1</sup>

To meet this urgent need, **Life Extension®** offers **Bio-Collagen** with **Patented UC-II®**—a novel form of **undenatured** type II collagen from chicken cartilage.

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

### ADVANCED MOLECULAR STRUCTURE

Not just *any* form of collagen will do. Normally, when chicken collagen is **processed**, its molecular shape is changed. It loses bioactivity and becomes **denatured**—which researchers found has *no beneficial effect*<sup>2</sup> on the immune system.

Fortunately, a **unique processing technique preserves the correct molecular shape** of the collagen<sup>3,4</sup>—and preserves its *bioactivity*<sup>5</sup>—producing a form known as **undenatured collagen**.

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

### SCIENTIFICALLY VALIDATED

Scientific studies have found that **UC-II® reduced sensitive joint discomfort** and **eased joint function**.<sup>1,6-10</sup> One double-blind, placebo-controlled study on patients found that **UC-II® provided relief by 33%** and **decreased joint discomfort scores by a remarkable 40%—in just 90 days!**<sup>1</sup>

### CONVENIENT ONE-PER-DAY DOSE

The suggested daily serving of one capsule of **Bio-Collagen** with **Patented UC-II®** supplies **40 mg** of UC-II® standardized chicken cartilage.

The retail price of a bottle of 60 capsules of **Bio-Collagen** with **Patented UC-II®** is \$36. If a member buys four bottles during **Super Sale**, the price is reduced to **\$21.60** per bottle.

**To order Life Extension® Bio-Collagen  
with Patented UC-II®, call 1-800-544-4440  
or visit [www.LifeExtension.com](http://www.LifeExtension.com)**

UC-II® is a registered trademark of Inter Health N.I. U.S. Patents 7,846,487; 7,083,820 and EPO patent EP 1435906B1; Canadian patent CA 2459981C; and Japanese patent JP 4800574B2.



Item # 01631

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UC-II® is a registered trademark of InterHealth Nutraceuticals, Inc. US Patent Nos. 5,645,851, 5,637,321, 5,529,786, 5,750,144, 7,083,829, 7,846,487, EP1435906 81 and worldwide patents pending.

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.

# NATURAL APPETITE CONTROL

## WITHOUT STIMULANTS

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.<sup>1</sup>

**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.<sup>2,3</sup> The result is reduced desire for food and less food intake.<sup>3,4</sup>

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.<sup>1,5</sup>

**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**.<sup>2,3,6,7</sup> This helps reduce food intake and supports normal, healthy levels of hunger and fullness.<sup>4,8</sup>

This extract also modulates **alpha-amylase**, the enzyme that converts dietary starch into simple sugars.<sup>3</sup> This can affect the rate at which free sugars are absorbed from the digestive tract into the blood stream.<sup>3,4,8</sup>

### 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!<sup>8</sup>

The supplemented subjects also lost **2.5 inches** in waist size—a **4.2 times greater reduction** than the placebo subjects.<sup>8</sup>

The supplemented participants had reduced appetite levels and increased satiety, and no significant side effects were reported.<sup>8</sup>

**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:

**European (Italian Borlotto variety) white kidney bean extract 200 mg**

A bottle of 60 vegetarian capsules of the new **Advanced Natural Appetite Suppress** retails for \$38. If a member buys four bottles during **Super Sale**, the price is reduced to **\$22.95** per bottle.

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

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

**To order Advanced Natural Appetite Suppress, call 1-800-544-4440 or visit [www.LifeExtension.com](http://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.

BY PAUL MCGLOTHIN AND MEREDITH AVERILL

# How **GLUCOSE** *Mediates* Life And Death By Turning Genes **ON** And **OFF**

Are you happy with the color of your eyes? Your eye color and many other physical characteristics that give you your own distinctive look are determined by genes, inherited from your parents. Genes are powerful. They control how cells function and when those functions are carried out.<sup>1</sup> While influencing all the genes that regulate cellular function is not yet possible, you can control many genes that affect your disease risk, as well as length of life – just by managing **glucose** (blood sugar) levels.<sup>2,3</sup>

**The CR Way**, the holistic lifestyle for living better and longer, calls for keeping blood glucose low for optimal health. Fasting glucose in the **80s (mg/dL)** or below and postprandial (post-meal) glucose below **120 mg/dL** are the goal levels.

Maintaining glucose in these lower ranges has long been suggested in the *CR Way to Great Glucose Control* classes and is strongly advocated by **Life Extension**.

What most doctors don't yet know is that controlling **glucose** within these lower levels helps activate **genes** associated with **longevity** and reduced **disease risk**.<sup>4</sup> Here we introduce some of these genes and explain how glucose and insulin mediate life and death by turning them on or off.





**Paul McGlothlin and Meredith Averill.**  
Activation of longevity genes  
begins with delicious foods and  
recipes that help control glucose.

Some genetic activity can be altered beneficially by diet and lifestyle.<sup>5,6</sup> When long-term, serious calorie-restricted humans were tested at Washington University School of Medicine, their fasting glucose and insulin levels were lower than sex- and age-matched cohorts of runners and of subjects who followed a standard western diet.<sup>7</sup>

A later study, made possible in part by the **Life Extension Foundation**<sup>®</sup>, found that long-term calorie restriction in humans *activates longevity genes* proven to be associated with the insulin/IGF-I pathway.<sup>8</sup>

## Insulin

Insulin is a well-known hormone. Most people think of it as part of managing glucose.<sup>9</sup> However, it promotes the absorption of fatty acids and amino acids into cells, as well.<sup>9</sup> Moreover, it facilitates cellular replication and, thus, growth.<sup>9</sup>

When blood glucose rises, usually after eating, pancreatic beta cells produce insulin.<sup>9</sup> It circulates through the blood – binding to insulin receptors on cell surfaces, where it moves glucose into the cells. Insulin stimulates the body to store excess glucose as glycogen and promotes the synthesis of fatty acids which are stored in the fat cells of adipose tissues.<sup>9</sup>

**FOOD becomes GLUCOSE**  
**GLUCOSE stimulates INSULIN**  
**INSULIN facilitates CELLULAR ACCESS TO ENERGY**  
 Glycogen Generation and Storage, Fat Storage  
**ACCESS TO ENERGY Leads to**  
 Cell Division and Growth and Sometimes Cancer

People usually don't think about managing their diet to keep glucose or insulin at healthful levels unless they develop diabetes. But by then it may be too late. **Excess** blood **glucose** causes **unfavorable gene expression** that can lead to excess insulin production, sustained activation of inflammatory pathways, and increased risk of developing disease complications.<sup>10-12</sup>

When glucose levels are kept within healthful levels in the bloodstream, genes that regulate insulin production are activated.<sup>12</sup> Optimal function of these genes may provide some protection from diabetes.

Some of the following paragraphs will appear technical to the lay reader, but it is important for the scientists who rely on Life Extension magazine to understand the important genes influenced by blood glucose levels:<sup>12</sup>

**Pdx-1** (pancreatic and duodenal homeobox-1) directly regulates signals that trigger insulin production.<sup>13</sup> Pdx-1 also activates glucose transporter-2, which helps transport glucose from the blood into the cell.<sup>13</sup> **NeuroD1** (neurogenic differentiation 1) helps regulate brain cell differentiation and insulin release. Defects in NeuroD1 have been implicated in diabetes.<sup>14</sup> **MafA** (Beta cell nuclear MusculoAponeurotic Fibrosarcoma oncogene family A) interacts with Pdx-1 and NeuroD1, and stimulates pancreatic B-cells to produce insulin – particularly when glucose levels are high.<sup>13</sup>

Genetic and other insulin-regulating signals can be turned “down or off” when exposed chronically to high glucose levels.<sup>15</sup> This is thought to be a potential cause of type II diabetes.

## Insulin And IGF-I

Like insulin, IGF-I regulates growth-related functions, which are essential for life.<sup>16</sup> However, insulin and IGF-I levels are also linked to cancer and accelerated aging.<sup>17,18</sup> Genetic manipulations that reduce the intensity of insulin and IGF-I signaling consistently extend life span in worms, flies, and mice.<sup>19</sup>

When insulin binds to its receptor, it activates a chain reaction of signals, beginning with the insulin receptor itself and including key enzymes involved in glucose homeostasis.<sup>20</sup> These enzymes include Protein Kinase B (PKB/Akt), which regulates many signals,



such as the FoxO (Forkhead box O) family of transcription factors (proteins that control whether a gene becomes active).<sup>18</sup>

**FOOD → GLUCOSE → INSULIN**  
**INSULIN → PKB/AKT → FOXO**

FoxO transcription factors play a pivotal role in metabolism and life span. “Glucose reduction and/or calorie restriction causes FoxO factors to take over to determine the fate of a cell: long-term survival in a quiescent state, or programmed cell death.”<sup>21</sup>

When food is scarce, FoxO factors shuttle from the cytoplasm back into the nucleus and activate longevity genes, which help the organism make it through lean times until food is available. When food is plentiful, FoxO stays in the cytoplasm of the cell and thus cannot perform its longevity enhancement.<sup>22</sup>

One member of the FoxO family, FoxO3A, is associated with extended life span and has been identified in centenarian research.<sup>23</sup>

### Preserving Cellular Energy Producers With SIRT3

Mitochondria, the cellular energy producers that provide the fuel for the cells’ function(s), are very vulnerable to age-related decline.<sup>24</sup> Glucose restriction may slow age-related mitochondrial deterioration by activating the SIRT3 gene,<sup>25</sup> a member of the sirtuin family of genes – known to protect against age-related hearing loss.<sup>26</sup> SIRT3 hooks up with FoxO3A and the ancient enzyme and energy sensor, AMPK (AMP-activated protein kinase), to form an energy-producing complex in mitochondria.<sup>26</sup> This facilitates the energy-enhancing formation of *new* mitochondria.<sup>27,28</sup>

### Low Glucose: Different Reactions In Genes Of Healthy Vs. Cancer Cells

Cancer cells are glucose gluttons because they need this simple form of energy to fuel their rapid growth rates. So, making energy easily available by maintaining high glucose levels increases both cancer risk and rate of metastasis.<sup>29</sup>

Maintaining low glucose levels has been shown to extend the life span of healthy cells.<sup>30</sup>

Low blood glucose also provides the benefit of activating hTERT (human telomerase reverse transcriptase) an enzyme that keeps **telomeres** from shortening when cells divide. Longer telomeres are associated with increased life span in animal and human studies.<sup>31</sup> Protection of mitochondria under mild stress is another important benefit of hTERT.<sup>32</sup>



### What You Need To Know

#### Glucose And Your Genes

- Genes exert powerful control over how cells function and when those functions are carried out.
- Some genetic activity can be altered beneficially by diet and lifestyle.
- Excess blood glucose causes unfavorable gene expression that can lead to excess insulin production, sustained activation of inflammatory pathways, and increased risk of developing disease complications.
- Genetic and other insulin-regulating signals can be turned “down or off” when exposed chronically to high glucose levels.
- Low blood glucose provides the benefit of activating hTERT (human telomerase reverse transcriptase) an enzyme that keeps telomeres from shortening when cells divide.
- Maintaining low glucose levels has been shown to extend the life span of healthy cells.

## Glucose And Dementia: Can One Gene Restore Memory?

As people age, they become increasingly vulnerable to dementia.<sup>33</sup> This usually means memory loss, along with impaired judgment and/or reduced language skills.<sup>33</sup> Loss of everyday skills, such as the ability to manage a bank account or drive safely, is demoralizing.

The RbAp48 gene became famous instantly when it was linked to memory restoration.<sup>34</sup> Scientists at Columbia University knocked out RbAp48 in mice and found that they experienced memory loss. When the researchers increased the level of RbAp48 in old mice – their memories returned to the level of much younger mice!

Apparently, the dentate gyrus, a part of the hippocampus region of the brain, is important for memory formation and is targeted during aging. RbAp48 is less abundant in the dentate gyrus of older mammals versus younger ones.<sup>34</sup> Moreover, the dentate gyrus is extremely sensitive to damage by **high blood glucose** levels, which may result in dementia.<sup>35</sup>

### Summary

Making dietary mistakes that send glucose and insulin soaring is easy to do. So living a lifestyle that is fun, easy to follow, and known to activate longevity genes that are associated with longer life makes a big difference. This drove the development of the **CR Way**, which emphasizes delicious, low-calorie meals that help control glucose and insulin levels. Published and soon-to-be-published studies indicate that the CR Way approach to calorie restriction activates genes, associated with longer life and reduced disease risk.<sup>8,36</sup> ●

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

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### THE CR WAY TO GREAT GLUCOSE CONTROL Helps Lower Glucose Naturally

Offered in partnership with the Life Extension Foundation®, this adult education course features foods, recipes, and unique meal plans that provide glucose guidance for every hour of your day, giving you lots of opportunities to lower your glucose. It includes two friendly classes via live teleconference with Paul McGlothlin, Meredith Averill, and others who share your passion for healthful living.

To find out more about *The CR Way To Great Glucose Control Program* and *The CR Way Optimal Health Membership*, please visit [www.lef.org/CRWay](http://www.lef.org/CRWay).

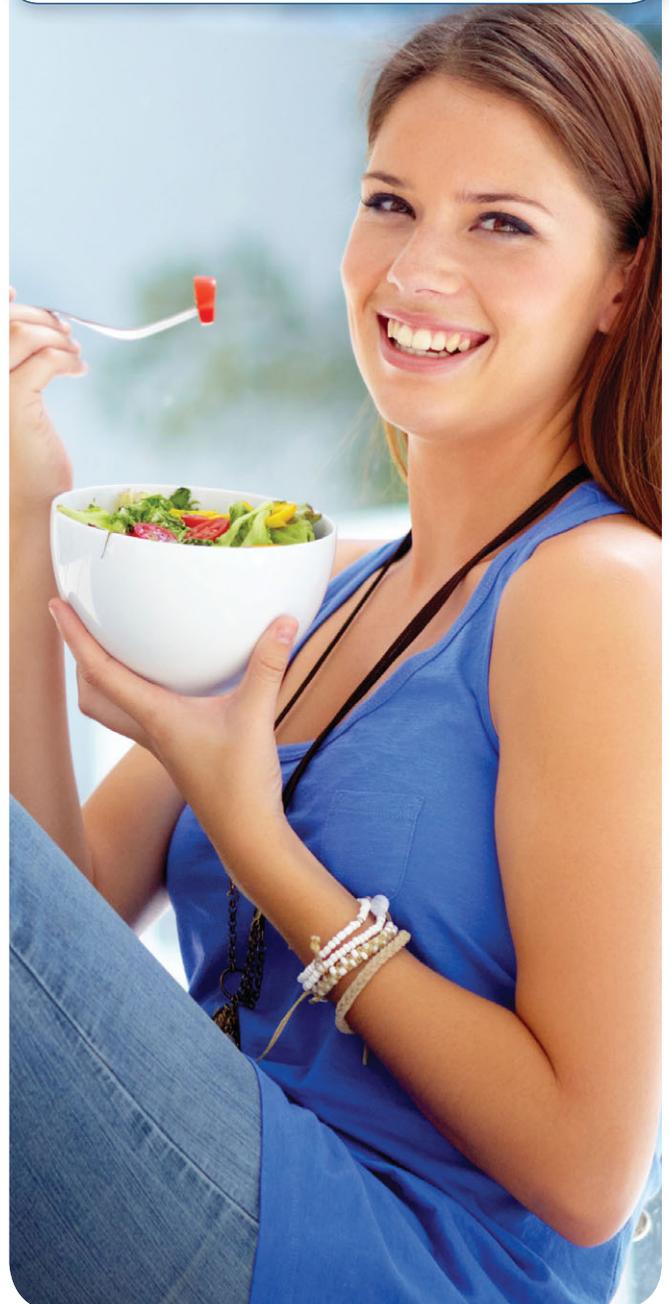
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## Further Resources For Glucose Control

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	Our Low Retail Price	<b>SUPER SALE</b> Member-Volume Discount Price Per Bottle
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BY ARAM STEPOVICH

# BEAT FATIGUE And Boost ATP Production With Powerful HERBAL DUO

Do you ever wish you could just recharge your batteries? Most of us do, especially as we grow older.

Fatigue is a major problem in American adults, accounting for millions of office visits each year.<sup>1</sup> The complaints are similar: groggy for much of the morning, can't sleep well or long enough at night, lack the energy for daily tasks and even enjoyable diversions.

Doctors hear these complaints all the time, and are nearly as frustrated as their patients at their powerlessness to do anything about it.

What's worse, the only drugs available to combat fatigue have a daunting side effect profile, including the real possibility of dependence (addiction).<sup>2,3</sup> Caffeine-laden "energy drinks" are now on the market, and while modest amounts of caffeine are likely to be harmless,<sup>4</sup> large doses, especially in combination with sugar and other additives, can result in caffeine toxicity or overdose-related side effects.<sup>5-7</sup>

Surprisingly, drugs and caffeine don't truly provide meaningful energy; they temporarily squeeze adrenaline from your adrenal glands and in the long run can wear down your defenses still further.<sup>8</sup>

But you can, in fact, literally recharge your batteries, with a pair of new supplements that work in combination to restore your natural energy levels. Cordyceps and fermented ginseng, both age-old life-giving supplements, are capable of boosting your body's levels of adenosine triphosphate, or ATP.<sup>9,10</sup> >





ATP molecules store energy in their chemical bonds, similar to the way a battery stores energy when it is charged up. Whether you are moving, thinking, speaking, relaxing—literally everything you do depends on a full charge of ATP.

And when we slow down with aging, it's now clear that we are simply running low on ATP. We make ATP in our mitochondria, where we burn fuel for energy, but that process grows increasingly inefficient with age.<sup>11</sup> While fatigue has many causes, both biological and psychosocial, insufficient ATP is a key factor in aging: either we don't make it as efficiently as we did in youth, or we use more of it to do simple tasks that we could previously do with less effort.

**TABLE: The Many Causes Of Age-Related Fatigue<sup>51</sup>**

Biological Causes	Psychosocial Causes
Changes in skeletal muscle function	Depression
Cardiovascular impairment	Anxiety
Anemia	Pain
Dehydration and electrolyte disorders	Interpersonal conflict
Increased inflammatory mediators (cytokines)	Stress
Nutritional deficiencies	Cognitive impairment

Let’s take a hard look at cordyceps and ginseng to understand how they work in tandem to recharge your ATP levels, restore your energy, and beat fatigue. You don’t have to take aging lying down!

### Cordyceps

*Cordyceps sinensis* is considered one of the most valuable medicinal fungi in China.<sup>12</sup> The fungi live on, and ultimately kill caterpillars of the “ghost moth” and other insects, replacing the dead caterpillar’s tissues with their own fungal structures.<sup>12</sup> Formerly collected only in the wild at great expense, cultured, fermented versions are now available that have equal potency.<sup>13,14</sup>

Cordyceps has historically been used in traditional Chinese medicine, among other purposes, for its metabolic and energy-producing effects.<sup>15</sup> A standardized, fermented extract of the fungus called “Cordyceps” is now available to consumers.

Studies show that cordyceps extract increases available energy in muscle and other tissues by boosting levels of ATP, the tiny “batteries” that our bodies use to store and move energy. Mice given cordyceps supplements, for example, demonstrated an **18.4%** increase in liver ATP levels.<sup>16,17</sup> This was accompanied by a drop in the building blocks of ATP, indicating that the body was using them up to create new energy-rich ATP molecules.

Cordyceps is especially effective at raising ATP levels under conditions of stress that produce fatigue. For example, in animals with iron deficiency anemia, a common cause of fatigue in humans, cordyceps boosted both ATP levels and blood flow, another measure of energy metabolism.<sup>9</sup>

And cordyceps reduces accumulation of toxic lactic acid, the substance that produces fatigue in overstressed muscles.<sup>18</sup> Our muscles produce lactic acid when they are forced to burn glucose without sufficient oxygen, such as when we sprint or do other intense exercise without enough time to breathe. This has direct bearing on exercise capacity; when rats are forced to swim until exhaustion, they show lower lactic acid levels, and swim longer, if they are supplemented first with cordyceps.<sup>18,19</sup> Studies show that supplementation can increase swimming time by as much as **88%**.<sup>18-20</sup>

Another way that cordyceps enhances your available energy is by increasing insulin sensitivity.<sup>15,21</sup> The more sensitive your cells are to insulin, the faster and more completely they take up sugar from your blood. That has the short-term effect of allowing your cells access to more energy, and the long-term effect of lowering your risk of diabetes, heart disease, and other chronic conditions.

Cordyceps has been demonstrated to increase both immune cell production and heart muscle mitochondrial ATP production.<sup>14,22</sup>



*Cordyceps sinensis*

In an impressive human study, 20 healthy adults aged 50-75 were supplemented with cordyceps extract, **333 mg** three times daily for 12 weeks, or a matching placebo.<sup>23</sup> Every day they performed exercise testing on a stationary bicycle to maximal levels, and had their physiological parameters measured continuously. By the end of the study period, the placebo patients performed no better than at baseline, but the supplemented subjects had a **10.5%** improvement in the time until muscle fatigue was perceived (as measured by lactic acid levels in muscle). Their ability to work out until they were “out of breath,” increased by **8.5%** as well.<sup>23</sup>

Cordyceps makes a contribution to energy levels by supporting maximal quantities of energy-storing ATP, the little “batteries” that run our bodies. Let’s turn now to ginseng to see how it is the ideal complement to cordyceps.

### Ginseng

Like cordyceps, ginseng has a long history of traditional use in China, where it is considered to have “qi-invigorating” properties.<sup>10</sup> The concept of “qi” is that of “energy flow” or “vital energy;” its deficiency is associated with heart disease and lethargic blood flow.<sup>24,25</sup>

Not surprisingly, then, studies show that ginseng increases ATP production in the mitochondria, in this case in part because of powerful antioxidant effects that shield mitochondria from the fierce energy-rich environment in which they must function.<sup>10,26,27</sup> It has recently been demonstrated that ginseng activates multiple enzymes in the so-called tricarboxylic acid cycle (or Krebs cycle), enabling mitochondria to extract maximum energy (in the form of ATP) from their glucose fuel in the presence of oxygen.<sup>28</sup>

Ginseng is also considered an adaptogen, namely, a compound that helps the body adapt to a wide variety of stresses and extremes.<sup>29-31</sup> Unfortunately, most forms of ginseng require fermentation in the human intestine before they can be absorbed, which can limit their potential usefulness. An advanced formulation of ginseng, GS15-4, surmounts that obstacle by naturally fermenting premium *Panax ginseng*, which has been shown to increase absorption of the essential **compound K** (a ginsenoside metabolite) by more than **15-fold**.<sup>32</sup>

In the laboratory, rats treated with a single dose of energy-boosting ginseng increased the time they could run on a treadmill by **132%**; after 7 days it had increased by **179%**.<sup>33</sup> This study traced the source of the benefit to enhanced adaptation of the pituitary-adrenal gland system, enabling production of appropriate



### What You Need To Know

## Conquer Fatigue And Boost Mental Stamina

- Low energy levels and fatigue plague millions of Americans, especially as we age.
- While fatigue has many different physical and mental causes, it ultimately comes down to insufficient levels of ATP, the tiny molecular batteries our bodies use to store and transport energy.
- Mainstream medicine and popular culture have conspired to produce a toxic response to fatigue in the form of stimulant drugs or caffeine/sugar combinations that have potentially addictive, and even fatal, adverse effects.
- Both cordyceps and ginseng have hundreds of years' worth of proven energy-boosting benefits without addictive or toxic potential.
- Both supplements are now known to act by raising ATP levels, making more energy available to brain, muscle, and other vital organs, restoring more youthful energy levels.
- Choose a fermented ginseng product; these have been shown to increase absorption of the active ginsenoside molecules by more than **15-fold**.

amounts of stress hormones until the animals' bodies had adapted to the exercise regimen. In fact, studies of chronically stressed animals demonstrate that ginseng supplementation beneficially lowers plasma levels of the stress hormone cortisol, and reverses disturbances in neurotransmitter precursor balance and fatty acid metabolism that contribute to stress-induced fatigue.<sup>34,35</sup>

Multiple other studies have now confirmed that ginseng supplements prolong aerobic exercise endurance in even untrained animal models.<sup>26,34,36-38</sup> Some of this effect appears to arise from a reduction in fatigue of the diaphragm, the large, sheet-like muscle that we use to draw in breath;<sup>39</sup> fatigue of the diaphragm is a sure way of ending an exercise session.

Studies of the effects of ginseng in depression reveal potent antidepressant effects that contribute to improved energy.<sup>37</sup> And studies of obese animals demonstrate down-regulation of a host of genes involved in lipid and energy metabolism, an important finding in light of the fact that obesity contributes to fatigue.<sup>1,40</sup>

In human subjects, fermented ginseng reduces anxiety and improves sleep, which of course makes for improved energy levels. One study showed that a total dose of **1,845 mg/day** of fermented ginseng (three capsules of **205 mg** each, three times daily for 8 days) improved the so-called "first night effect" in which sleep in an unfamiliar environment is disturbed.<sup>41</sup>

The same researchers identified an anti-anxiety effect produced by improvements in levels of the calming neurotransmitter GABA, suggesting that the sleep improvements may have been related to reductions in anxiety, another cause of fatigue.<sup>41</sup>

In a similar fashion, stressful cognitive tasks can produce mental fatigue (perhaps through anxiety production), and a single **200 mg** dose of a standardized ginseng extract significantly reduced mental fatigue while improving cognitive performance on mental arithmetic tasks in a group of healthy volunteers.<sup>42</sup>

In a subsequent study, researchers gave healthy volunteers either **200 mg** of the ginseng extract, or a placebo, immediately followed by a battery of cognitively demanding tasks, and then 30 minutes later by either **25 grams** (nearly an ounce) of glucose or a placebo.<sup>43</sup> While both ginseng and glucose improved performance on arithmetic and reduced feelings of fatigue, there was no synergistic effect.<sup>43</sup> However, because ginseng lowered blood sugar, while the glucose obviously raised it, the researchers concluded that ginseng was both glucoregulatory and provided the mental stamina necessary to engage in extended cognitive processes.<sup>43</sup>

### Why You Need Fermented Ginseng

Ginseng has numerous health benefits, but it is poorly absorbed from the digestive tract in its native form. It is not absorbed in the stomach or small intestine (sites where we normally absorb nutrients and drugs), requiring fermentation by microbes in the human large intestine (colon) to be converted into a bioavailable form.<sup>45-48</sup> But because our colonic bacterial populations shift as we age, we potentially lose the ability to efficiently convert and absorb the active ginsenoside molecules.<sup>49</sup>

Innovative research in Korea, home to the world's most potent ginseng supplies, has now demonstrated the utility of fermenting premium ginseng in customized fermenters.<sup>50</sup> Studies in humans reveal that, compared with standard ginseng extracts, GS15-4 fermented ginseng extract is absorbed **15.5 times** as much in 24 hours, achieves a **27-fold** higher peak concentration in blood, and reaches that peak in roughly a quarter of the time.<sup>32</sup>

Fermented ginseng is so potent that it can almost be considered a different biological product, one that can bring the myriad laboratory-proven benefits of ginseng to ordinary people who could use a little more energy in their lives.



And in still another study, a standardized ginseng extract, **400 mg/day** for 8 days, improved feelings of calmness in healthy young adults, compared with placebo recipients.<sup>44</sup> On both the first and the 8<sup>th</sup> day, supplemented subjects also performed better on mental arithmetic tasks as well.<sup>44</sup>

### Summary

Fatigue is like pain—it has many different causes, is difficult for others to assess objectively, leading to undertreatment, and is potentially debilitating.<sup>1</sup>

Yet fatigue, both mental and physical, can be traced to insufficient levels of the tiny battery-like ATP molecules in which we store the energy our bodies derive from foods, mainly fats and sugars. By restoring ATP levels, we literally “recharge our batteries,” relieving fatigue and restoring more youthful energy levels. Cordyceps and ginseng work in a complementary fashion to boost ATP levels and charge up our bodies’ energy stores.<sup>9,10</sup>

If you are one of the millions of Americans whose batteries seem chronically run down, who could use a safe, non-addictive, and biologically-proven energy boost, don’t turn to caffeinated energy drinks or prescription drugs, laden as they are with toxic side effects.<sup>1-3,5-7</sup> Instead, choose a natural energy-restoring combination of cordyceps and fermented ginseng to optimize energy production and re-invigorate both body and mind. ●

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

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**Astaxanthin** is a fat-soluble carotenoid compound. The challenge to deriving maximum benefits is its normally limited absorption—as low as about **50%**.<sup>1,2</sup> Assimilation of astaxanthin is impeded by limited uptake and intestinal degradation.

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

By incorporating phospholipids, scientific study shows that carotenoid **absorption** may be enhanced **several-fold**.<sup>3</sup>

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

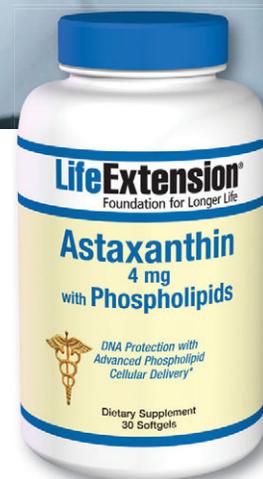
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A bottle of 30 softgels of **Astaxanthin 4 mg with Phospholipids** retails for \$16. If a member buys four bottles during **Super Sale**, the price is reduced to **\$9.45** per bottle. **Contains soybeans.**

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Item # 01596

## Your Skin's Internal Moisturizer

**Ceramides** are essential for preserving healthy-looking skin.<sup>1,2</sup> That's why they're included in so many anti-aging face creams.

Your body's production of **ceramides** declines with age.<sup>3</sup> That's bad news, since ceramides make up **35-40%** of the binding matrix that maintains moisture balance and protects the skin's surface.<sup>4</sup> It's therefore critical that ceramides lost to aging are replaced.

### Restore Ceramides Naturally from Within!

The **ceramides** that young skin naturally produces to retain its supple appearance are identical to those present in **wheat!**

Wheat-derived oils have been used *topically* for centuries as a natural moisturizer. But you can't get enough ceramides from topically applied wheat oil to have a long-term impact on your skin's appearance. And they don't appear in sufficient concentration in your diet.

That's why **Life Extension**® brought together these skin-nourishing oils in a concentrated **oral formula** called **Skin Restoring Phytoceramides with Lipowheat**®.

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

### The Moisturizing Pill the Japanese Have Enjoyed for a Decade!

**Lipowheat**® ceramides have been available to Japanese women as a functional food since 2000.<sup>5</sup> 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 during **Super Sale**, the price is reduced to **\$15.53**. Contains wheat.

Lipowheat® is a registered trademark of LAVIPHARM Group of Companies.

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

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Stimulant-Free Natural Energy

# ASIAN ENERGY BOOST

Most people rely on stimulants, particularly caffeine, to boost sagging energy levels during the day.<sup>1</sup> The result is often a roller coaster of intense energy followed by deep lulls that can lead to further exhaustion. But there is a better way. For sustained vigor, the secret is to boost the body's own energy source, **ATP (adenosine triphosphate)**.

**Asian Energy Boost** is specifically designed to provide all-natural support for cellular and physical energy levels to help you stay alert without negative effects, such as crashing or uncomfortable jitters.

## Support for Energy Homeostasis

Your body's natural mechanism of **homeostasis** maintains normal balance during daily challenges, helping you remain energized and focused—*when properly supported*. Ongoing stress, however, means your body seldom gets time to restore your natural equilibrium.

For individuals seeking optimum homeostasis and sustainable energy, **Asian Energy Boost** combines the potent Asian mushroom **Cordyceps sinensis** and a specially fermented form of the **Panax ginseng** root. Combined, they deliver potent energy support.

## Cordyceps sinensis

One of the most valued medicinal mushrooms in China, **Cordyceps sinensis** has been revered traditionally for its multiple benefits, including support for energy and endurance.<sup>2,3</sup> Studies show that the **Cordyceps** in **Asian Energy Boost** supports energy levels by promoting healthy levels of ATP<sup>3,4</sup>—the energy currency used throughout the body.

**Cordyceps** also supports healthy insulin sensitivity in those already within normal range,<sup>5,6</sup> allowing your cells to efficiently take up sugar from your blood to enable stable energy output.

In one study, healthy adults age 50-75 took **333 milligrams** of Cordyceps extract **three times daily** for 12 weeks. These study subjects were able to perform a stationary bicycle exercise at maximal levels for over **10% longer** before muscle fatigue could be scientifically detected.<sup>7</sup>

## Panax ginseng

**Panax ginseng** is an important adaptogenic herb that can improve our ability to manage stress.<sup>8,9</sup> Recognized as one of the most beneficial ginsengs available, it is the species traditionally used in China and Asia. For enhanced potency, **Asian Energy Boost** uses **Panax ginseng** that has been naturally fermented, a process shown to **increase absorption** of the active compound—Compound K (*Ginsenosides metabolite*)—by over **15-fold**.<sup>10</sup>

Evidence indicates that ginseng supports **ATP production** in the **mitochondria**.<sup>11,12</sup> Studies have shown that this extract promotes both physical *and* mental energy, including cognitive performance.<sup>13-18</sup>

## Complementary Effects

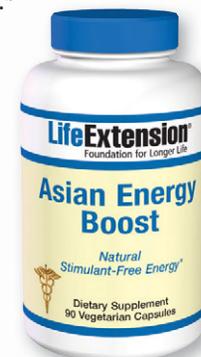
The **Cordyceps** and fermented **Panax ginseng** in **Asian Energy Boost** work in a **complementary** fashion to help maintain ATP levels and your body's energy stores.

**Cordyceps** extract supports ATP production when oxygen availability is insufficient.<sup>3</sup> **Panax ginseng** supports ATP production at the much higher levels possible when more sufficient oxygen is available—such as a challenging but prolonged task.<sup>19</sup>

The suggested daily dosage of three vegetarian capsules of **Asian Energy Boost** provides:

<b>Cordyceps (<i>Paecilomyces hepiali</i>) extract (mycelia)</b>	<b>1,000 mg</b>
[providing 70 mg cordycepic acid]	
<b>GS15-4™ Fermented Asian ginseng extract (root)</b>	<b>165 mg</b>

A bottle of 90 vegetarian capsules of **Life Extension® Asian Energy Boost** retails for \$24. If a member buys four bottles during **Super Sale**, the price is reduced to **\$14.85** per bottle. Contains soybeans.



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BY MICHAEL DOWNEY

# Bio-Enhanced TURMERIC COMPOUNDS Block Multiple Inflammatory Pathways

Millions of Americans suffer from chronic pain caused by inflammation, while millions more suffer diseases caused by **chronic inflammation** such as cancer and atherosclerosis.<sup>1,2</sup>

Prescription options—**non-steroidal anti-inflammatory drugs (NSAIDs)** and **glucocorticoids**—target only **part** of the overall chronic inflammatory response. Worse, they have substantial side effects and are not meant for long-term use.<sup>3,4</sup>

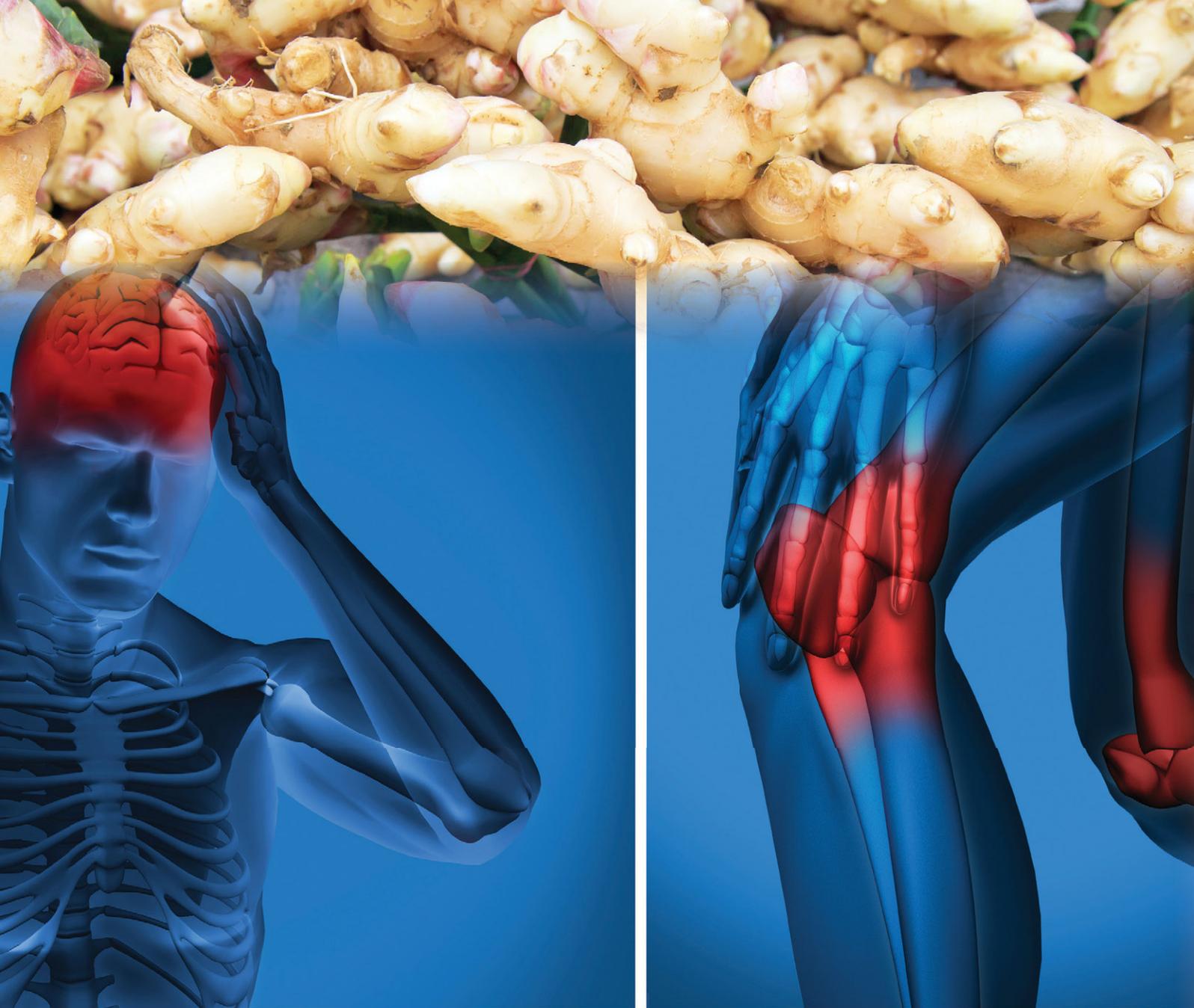
After combing through scores of nutrients, scientists have identified three compounds: **curcumin**, **ginger**, and **turmeric oil** that inhibit **multiple** underlying factors behind inflammation—safely reducing both chronic pain and long-term disease risk.

Numerous studies have confirmed that—by targeting the inflammatory **origins**—these natural extracts reduce the symptoms, risk profiles, and mediating factors of arthritis,<sup>5-12</sup> cardiovascular disease,<sup>5,13-17</sup> cancer,<sup>18-22</sup> and other diseases...and some of these effects are observable in a matter of **weeks**.<sup>9,16,18,23</sup>

Even more exciting, scientists have discovered a novel way to deliver more of these three extracts to your bloodstream—almost **seven times as much!**<sup>24-27</sup> These groundbreaking discoveries enhance the ability of these compounds to block the origins of **chronic inflammation**. >

CURCUMIN AND INFLAMMATION

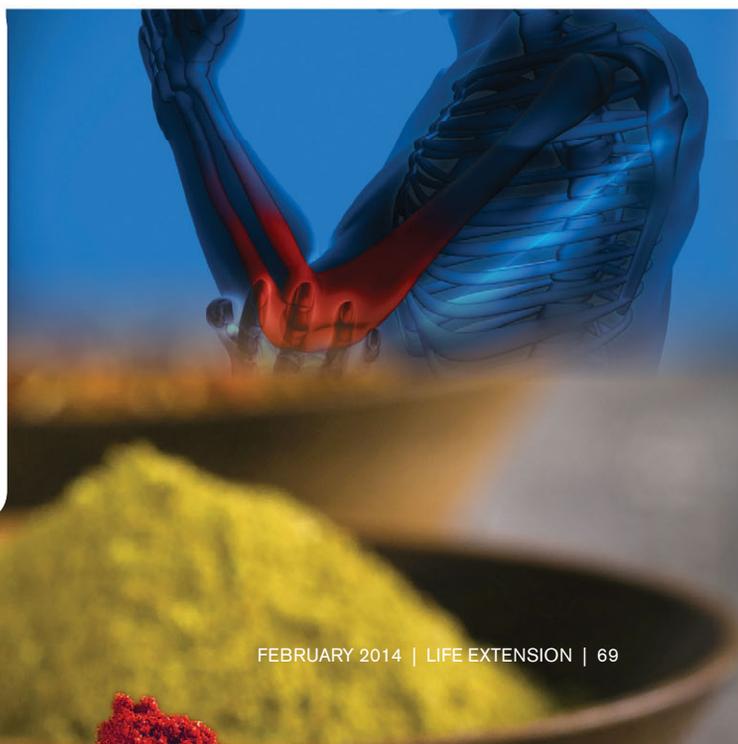




### **An All-Out Assault On Chronic Inflammation**

When levels of certain cellular enzymes are increased, the result is chronic inflammation created by a complex “domino effect” of signaling molecules known as **prostaglandins** and **leukotrienes**.<sup>28-30</sup> As scientists now know, the more **inflammation**, particularly chronic inflammation, you have, the more rapidly your body ages.<sup>1</sup>

In fact, we know that almost all chronic diseases—from arthritis, to heart disease, to diabetes, to Alzheimer’s disease—have one thing in common: destructive, unchecked inflammation.<sup>31</sup>



Doctors have long known of individual compounds that can inhibit **one** of the steps involved in chronic inflammation, producing some anti-inflammatory response. For example, NSAIDs inhibit the production of prostaglandin signaling molecules by blocking enzymes known as **COX-1** and **COX-2**. But they are not well characterized in terms of their ability to inhibit production of leukotriene signaling molecules, which requires blocking the **LOX** enzyme.<sup>32</sup>

Researchers sought natural compounds that could inhibit the **multiple** steps behind prostaglandin and leukotriene production to deliver *broad-spectrum* protection against chronic inflammation.

Unlike current medications, **turmeric oil**, **ginger oil**, and **curcumin** work through multiple mechanisms to block multiple pathways of the *inflammation-signaling* process.<sup>5,32-40</sup>

It makes sense that these extracts have similar anti-inflammatory effects—they belong to the same plant family, known as *Zingiberaceae*.<sup>41</sup>

### Turmeric Root Compounds

**Curcumin** is packed with potent chemicals, collectively known as *curcuminoids*.<sup>42</sup>

**Turmeric oil** - the liquid produced during curcumin extraction<sup>43,44</sup> - is rich in compounds known as *aromatic turmerones*.

### Ginger Root Compounds

**Ginger oil** contains *gingerols*, *shogaols*, and *sesquiterpenes*, which are powerful anti-inflammatory active compounds.<sup>45</sup>

To illustrate a key element of their dramatically *broader* effectiveness against inflammation, these natural ingredients deliver a potent benefit that no

currently available drug can—they **block both COX and LOX enzymes**, which in turn inhibits synthesis of *both* prostaglandin and leukotriene signaling molecules!<sup>32-40</sup>

This is of vital importance, because scientists have now discovered that agents that trigger *dual* inhibition of COX and LOX enzymes potentially provide “a better therapeutic profile” and produce almost no side effects compared to NSAIDs.<sup>32</sup>

Remarkably, when these three extracts are combined, they help prevent chronic inflammation by favorably modulating the activity of the following pathways. They:

- **Inhibit COX-1 and COX-2 enzymes**,<sup>33-35</sup>
- **Inhibit LOX enzyme**,<sup>36-38</sup>
- **Inhibit inducible nitric oxide (iNOS)**;<sup>33,36-38</sup>
- **Inhibit NF-kappaB**,<sup>34,37,46</sup>
- **Inhibit degradation of IkappaB-alpha**;<sup>46</sup>
- **Exert potent antioxidant activity**—scavenging *superoxide* and *hydroxyl radicals* and reducing *lipid peroxidation*, early steps in the inflammation cascade,<sup>5,37</sup> and inhibiting transcription of *cell surface receptors* for oxidized LDL cholesterol;<sup>47</sup>
- **Inhibit stimulated increase of prostaglandin E2 (PGE2)**.<sup>33</sup>

How these natural ingredients work at the cellular level may seem technical, but what you need to remember is that they are not synthetic drugs that are alien to your body’s systems. Instead, they **work with** your body’s own processes to help bring back natural function. Before we look at the many health benefits of



these extracts, let's learn how scientists have **combined all three**—in a novel formulation that also delivers a *further* potent advantage: it naturally **enhances absorption**.

### Enhanced-Absorption Formula

Curcumin has long been known to have poor bioavailability, requiring high doses to achieve desired blood levels.<sup>48-59</sup> A new formulation solves this problem in two ways:

Instead of using standard curcumin, this formulation utilizes a curcumin extract that provides better bioavailability than ever thought possible. This “**next generation curcumin**” is far more readily absorbed. Its potency is the synergy between the standard extracted curcuminoids plus the *added-back*, original turmeric compounds that are often removed in commercial processing. These novel, lipid-soluble active compounds called **turmerones** have been shown in human research to enhance curcumin absorption.<sup>27</sup> In fact, two studies showed that it increases curcumin absorption almost **7-fold** over a standard curcumin supplement.<sup>25,26</sup>

The second way this formulation boosts absorption is by including a special kind of molecule called **phospholipids**. They act as emulsifiers—agents that help oil molecules mix with water—and have been shown to enhance absorption of *various* nutrients.<sup>60</sup> A study confirmed that phospholipids boost *curcumin* absorption into intestinal cells.<sup>61</sup>

Let's now examine some of the health benefits of curcumin, ginger, and turmeric that result from their ability to block the **multiple** pathways of deadly chronic inflammation.

### Cancer

Cancer is the second leading cause of death in the United States,<sup>62</sup> and according to the American Cancer Society,<sup>63</sup> **one of every three** women in the US risks developing some form of cancer over the course of their lives. For men, that number rises to **one in two**. And inflammation is a major trigger.<sup>64</sup>

When normal inflammation continues over time and becomes prolonged or chronic, it can cause a multitude of pathologies—including cancers.<sup>63</sup> Your body has a natural ability to fight cancer through the activity of tumor-suppressing **genes**. The science of epigenetics now indicates that both **curcumin** and **gingerol** (a key compound in ginger) can—in addition to inhibiting inflammation and modulating cell signaling pathways—reawaken these tumor-suppressing genes, **turning them back on to block cancer!**<sup>65,66</sup>



### What You Need to Know

#### Blocking Chronic Inflammation

- Millions of Americans endure the pain of chronic inflammation; even when pain is not apparent, millions more run the risk of serious diseases triggered by subclinical levels of chronic inflammation.
- Mainstream medicine offers only drugs that typically target a single aspect of acute inflammatory pain, and that are typically not suitable for long-term use due to substantial side effects.
- Researchers have found three natural ingredients that block inflammation at multiple stages of the process—inhibiting chronic inflammation at its root.
- A wealth of clinical trials demonstrates that **curcumin, ginger, and turmeric oil** safely reduce both chronic pain and slash long-term disease risk, often in only a few weeks.
- These three extracts have now been combined in a groundbreaking formulation that boosts absorption as much as **7-fold!**



### The Power Of Three

**Ginger** (*Zingiber officinale*) and **curcumin** (*Curcuma longa*) are close botanical relatives. Both are rhizomes in the *Zingiberaceae* family.<sup>41</sup> Because of observed “overlapping, but complementary, activities”<sup>115</sup>—scientists have increasingly focused on the therapeutic effects of **combining** these two plants.<sup>116</sup>

They found that “multiple mechanisms of protection against inflammation and oxidative damage make **ginger and curcumin** particularly promising natural agents in fighting the ravages of aging and degenerative diseases...”<sup>116</sup>

**Turmeric oil** is obtained from the potent liquid remaining after curcumin extraction.<sup>43,44</sup> Aside from turmeric oil’s own strong anti-inflammatory and antioxidant effects, research revealed that its rich content of compounds called **aromatic turmerones** massively enhances the absorption of curcumin.<sup>27</sup> When turmeric oil was included, a human study demonstrated a **6.93-fold enhancement** of bioavailability compared to normal curcumin.<sup>25</sup>

A newly developed formulation also boosts bioavailability—almost **7-fold**—by using an advanced form of curcumin known as **BCM-95®** that includes lipid soluble active compounds called Turmerones, which are normally left behind after curcumin extraction.<sup>25</sup>

This formulation also contains **phospholipids**, a type of emulsifying molecule that enhances absorption of poorly soluble active compounds.<sup>60,61</sup>

Over two thousand published studies have evaluated the effects of curcumin on many cancers—such as those of the breast, prostate, liver, skin, colon, and lung cancer<sup>20,67</sup>—by interfering at **every stage** of the complex sequence of their development, progression, and spread.<sup>68</sup> While anticancer drugs often weaken the immune system, curcumin modulates it,<sup>68,69-78</sup> serving as an “immune-restorer.”<sup>70</sup>

In just one of many **curcumin** studies on animals, scientists grafted human prostate-cancer cells onto special mice that subsequently developed tumors.<sup>79</sup> The mice were fed curcumin or placebo five days weekly for four weeks. Afterward, curcumin-fed mice were divided into three groups: one continuing to receive curcumin alone, a second receiving curcumin plus the cancer chemotherapy drug, **gemcitabine**, and the third receiving curcumin plus radiation treatment.<sup>79</sup>

Curcumin inhibited cancer growth and enhanced antitumor effects of the drug and radiation. And in an exciting breakthrough, researchers traced these results to a **newly discovered mechanism!** They found that curcumin reduces expression of a molecule called **MDM2**—a **gene** that promotes cancer development, survival, and growth. This mechanism “may be essential for its chemopreventive and chemotherapeutic effects.”<sup>79</sup>

**Ginger** research on animals included a study in which scientists orally fed whole **ginger** extract to mice with prostate cancer. Ginger inhibited tumor growth and progression by **56%**, with *no detectable toxicity*.<sup>80</sup> In another study, the active ginger compound **6-gingerol** suppressed growth of colorectal cancer cells and tumors in mice by inhibiting synthesis of the signaling molecule leukotriene A4.<sup>81</sup>

When **turmeric oil** was combined with curcumin in a novel complex, it enhanced bioavailability and **completely abolished tumor formation** in a mouse model of inflammation-associated colon carcinogenesis.<sup>82</sup>

These studies demonstrate that the **three** natural ingredients effectively block multiple pathways of cancer in animals. The real challenge, however, was whether these same plant extracts would be as effective in **humans**.

**Curcumin** was given to five patients with Crohn’s disease; an inflammatory condition associated with increased colorectal cancer risk.<sup>83</sup> In all but one patient, both disease activity scores and sedimentation rates—a measure of inflammation—improved.<sup>84</sup>

In *familial adenomatous polyposis* (FAP), hundreds of colonic polyps form, some of which progress to colorectal cancer. Scientists gave five patients with *familial adenomatous polyposis* **480 milligrams** of

curcumin plus **20 milligrams** of quercetin **three times daily** for an average of six months. There was an average **51% decrease** in the size of the polyps, and **60% decrease** in the number of polyps.<sup>85</sup> There was no noticeable toxicity.

Curcumin combined with either soy isoflavones or placebo was given to **85 men** and those with high levels of prostate-specific antigen (PSA) were assessed separately. High PSA reflects inflammation and potential prostate cancer risk. After six months, PSA levels were significantly suppressed in the curcumin-isoflavones group.<sup>86</sup>

**Ginger** extract was given to one group of healthy volunteers in dosages of **2 grams** daily, while others took placebo. On day 28, a colonic biopsy was taken on all participants. There was substantial reduction in average colonic mucosal levels of the inflammation signaling molecule *prostaglandin E2* in the ginger subjects. They also had decreased average levels of an intermediate compound called 5-HETE, which is a potent survival factor that certain cancers use to escape destruction.<sup>18,125</sup>

**Turmeric oil** in dosages of **600 milligrams**, mixed with **3 grams** of **turmeric extract**, was given daily to patients with aggressive *pre-malignant* mouth lesions (oral submucous fibrosis), in a pilot study. Subjects showed a substantial decrease in the number of damaged, pre-malignant cells in both the mucous-membrane mouth lining and in circulating lymphocytes.<sup>19</sup>



## Cardiovascular Disease

Inflammation plays a key role in the development of cardiovascular disease, which is responsible for almost **one-in-four** American deaths every year.<sup>87</sup>

**Curcumin** given to animals on a high-cholesterol diet decreased their total serum cholesterol **21%** and their harmful low-density lipoprotein (LDL) by almost **43%**, but **increased** their beneficial high-density lipoprotein (HDL) by **50%**!<sup>15</sup> Its lipid modulating effects have not been shown to work this well in humans.<sup>88</sup>

### How To Know If You Have Chronic Inflammation

A growing consensus among scientists is that numerous common disorders are caused in part by chronic inflammation.<sup>31</sup> For example, when inflammatory cytokines destroy joint cartilage and synovial fluid, **arthritis** results.<sup>92</sup> If cytokines induce an autoimmune attack, they can trigger **lupus**.

The target of the chronic inflammatory response determines the disease risk. For instance, inflammation can result in brain cell damage and death (resulting in neurodegenerative disease), heart muscle wasting (contributing to congestive heart failure), or coronary atherosclerosis (potentially triggering a heart attack).<sup>117-119</sup>

Even **obesity** is related to chronic inflammation.<sup>120</sup>

Taking action to reduce chronic inflammation can dramatically minimize cellular **aging** and risk for lethal, age-related **diseases**.

#### Testing Inflammation Levels

So how do you **know**—before it's too late—if your body is in a state of chronic inflammation?

**Life Extension**® long ago advised members to have an annual **C-reactive protein blood test** to detect potentially high levels of systemic inflammation that may be boosting your risk of a host of age-related diseases.<sup>31,121</sup>

If testing results show your C-reactive protein level is over **1.0 milligrams per liter (1.0 mg/L)**, this likely indicates that you have inflammatory activity occurring in your body and may be at increased risk for any number of serious medical conditions.<sup>122,123</sup>



**Ginger extract** given to diabetic rats, significantly suppressed—in just seven weeks—cholesterol and triglycerides, high levels of which contribute to cardiovascular disease.<sup>16</sup> It also significantly lowered blood sugar levels. In another study, ginger extract injected intravenously into rats was shown to significantly lower blood pressure and in a dose-dependent fashion.<sup>17</sup>

Stents that slowly release **turmeric oil** were implanted in dogs with blocked arteries. Scientists found that this turmeric-laced stent inhibited the infiltration of dangerous inflammatory cells. It also reduced various factors that often cause *new* arterial blockages to occur (**restenosis**).<sup>89</sup>

After these compelling findings, scientists turned their attention to *human* trials.

Given to clinical trial volunteers in dosages of **500 milligrams** daily, **curcumin** showed a remarkable **29% increase** in HDL cholesterol levels after just seven days.<sup>88</sup> Even a *one percent increase* in this “good” form of cholesterol can reduce heart disease risk—so this finding is important.<sup>90</sup>

**Ginger** was shown to enhance efficacy of the anti-hypertensive drug **nifedipine (Procardia®)** in human subjects. Combining **one gram** of ginger with **10 milligrams** of the drug **daily** significantly boosted the anti-platelet aggregation effect in both normal and hypertensive persons.<sup>13</sup> This is the tendency of blood cells to clump together, potentially producing a dangerous clot and pathological cardiovascular and cerebrovascular complications.

## Blocking Inflammation Can Prevent Obesity And Diabetes

In a study released June 18, 2013, ahead of print publication in the journal *Molecular Therapy*, scientists at the University of Georgia have demonstrated that blocking inflammation can **prevent obesity** and the early, obesity-related symptoms of **diabetes**.<sup>14</sup>

To block inflammation in test animals, researchers sometimes inject **interleukin 10 (IL10)**, an immune-regulating molecule naturally produced by the body to control inflammation.

In this experiment, two groups of mice were fed the same amounts of a **high-fat diet**. One group was also treated with injections of IL10.

While untreated mice fed a high-fat diet gained weight quickly and began to show the early symptoms of diabetes, those on the diet that were treated with IL10 maintained **healthy fat levels** and showed **no signs of insulin resistance**.<sup>124</sup>

This finding illustrates that lowering **chronic inflammation** levels in the body may inhibit **two** of the greatest epidemics of our time—**obesity** and **diabetes**—as well as the many other conditions associated with each of these diseases.

## Arthritis

People over age 65 make up **65%** of all American arthritis patients.<sup>91</sup> The hallmarks of the most common form of this joint disease, osteoarthritis, are inflammation and cartilage destruction.<sup>92</sup> Fortunately, while both ginger and curcumin block inflammation—**curcumin also inhibits cartilage breakdown by the body!**<sup>93</sup> It does this by protecting the cells found in cartilage called *chondrocytes* from the inflammatory compounds (IL-1beta and MMP-3) that break them down in arthritis, as well as via other pathways.<sup>93</sup>

**Curcumin** strongly blocked rheumatoid arthritis symptoms in animal studies by inhibiting joint inflammation as effectively as **methotrexate**,<sup>6</sup> a drug with serious and sometimes fatal side effects.<sup>94</sup> Curcumin improved arthritis scores in mice<sup>7</sup> and suppressed osteoarthritis inflammation in dogs.<sup>95</sup>

**Ginger** extract blocked inflammatory mediators in a cell culture study—notably the signaling molecule prostaglandin E2—and reduced inflammatory swelling (edema). Researchers described the results as, “a potent suppressive effect on acute and chronic inflammation.”<sup>11</sup>

Clinical trials have now confirmed these results in *humans*.

**Curcumin** in doses of **500 milligrams daily** was given to one group of rheumatoid arthritis patients. The NSAID drug *diclofenac* in doses of **50 milligrams daily** was given to a second group. And a combination of the two was given to a third group. The group receiving curcumin-only had the greatest reduction in joint pain and swelling, with no adverse effects. By contrast, nearly **14%** of participants in the drug-only group dropped out due to adverse effects!<sup>8</sup>

**Ginger** or placebo was given to 29 patients with symptomatic knee arthritis in dosages of **four daily** capsules of **250 milligrams** each. After three months, those taking placebo switched to ginger and those taking ginger switched to placebo, and then the study continued for an additional three months. After a total of six months, the patients experienced significantly less pain and handicap during their **ginger-supplemented months** than during their placebo months—and reported improvements on a standardized scale used to assess mobility.<sup>12</sup>

Also, ginger extract given to osteoarthritis patients in doses of **340 milligrams daily** for 4 weeks proved equally as effective as **100 milligrams** of the drug *diclofenac*.<sup>9</sup> However, the drug group experienced an increase in digestive pain (dyspepsia) and *degeneration* of their stomach mucosa.<sup>9</sup>

## Diabetes

Among Americans 65 or over, **26.9%** have diabetes.<sup>96</sup> Diabetics are at risk for pain associated with nerve damage (neuropathic pain),<sup>97</sup> accelerated brain aging and cognitive decline (diabetic encephalopathy)<sup>98,99</sup> and, of course, high blood sugar. However, the powerful plant extracts we've been discussing have the potential to prevent or *reverse* many of these complications.

**Curcumin** successfully attenuated experimentally-induced neuropathic pain response—recognized as one of the most difficult types of pain to treat—to mild stimuli (hyperalgesia) in diabetic rats.<sup>100</sup> This powerful action is likely due to curcumin's ability to reduce inflammation signaling molecules called cytokines, reduce the activation of pain signaling molecules and receptors, and reduce the depressive effect of pain.<sup>101-107</sup> Also, chronic curcumin treatment reversed much of the extreme inflammation and oxidation damage in the brains of diabetic rats and substantially boosted their performance on memory and cognition tasks.<sup>99</sup>

**Ginger** extract was given to diabetic rats, and after just seven weeks, their fasting glucose levels —

the blood sugar reading between meals — were significantly reduced.<sup>16</sup> The researchers suggested that “ginger may be of great value in managing the effects of diabetic complications of diabetes in human subjects.”<sup>16</sup>

## Dementia

Memory and cognitive decline often starts about age 50, and by age 80, it is estimated nearly **half** of all individuals will have some form of cognitive change or dementia.<sup>108</sup> As you'll see, curcumin and ginger offer great promise to stave off this tragedy.

**Curcumin** administered in animal models of Alzheimer's has been shown to enhance clearance of *amyloid-beta* from the brain. This is a malformed protein, the accumulation of which is strongly associated with Alzheimer's. Curcumin crosses the blood-brain barrier and appears to directly bind to the plaque!<sup>109</sup>

Scientists fed **ginger** extract to rats for two weeks before they blocked (occluded) an artery in the brain, and for three weeks afterward. Cognitive testing was done at the end of each of the three weeks following arterial blockage. Researchers found that the **ginger extract** significantly increased cognitive function and neuron density (in the brain area known as the hippocampus) while significantly decreasing the area of damaged brain tissue—or brain infarct.<sup>110</sup>

A study team incubated **curcumin** with macrophages (immune cells) taken from **human** Alzheimer's patients. These macrophages are immune cells that normally identify, engulf, and destroy amyloid-beta, but in Alzheimer's patients these macrophages failed to handle this function.<sup>111</sup> In the laboratory, after being treated with curcumin, macrophages from half of the patients significantly increased the amount of amyloid-beta they were able to absorb (uptake).<sup>112</sup> These data demonstrate that curcumin may be able to defend against—and even *reverse*—the Alzheimer's disease process.

**Ginger** was tested in a study of 60 healthy middle-aged women who were given **400** or **800 milligrams** of the extract, or placebo, **daily** for two months. Their working memory and cognition were tested before supplementation and after one and two months. The ginger participants showed significantly enhanced working memory, and brain activity consistent with boosted cognitive capability. This suggests that ginger may defend against, and *reverse* middle-aged cognitive function.<sup>113</sup>

**Turmeric oil** was found to exhibit powerful and broad antioxidant activity,<sup>5</sup> and data suggest it may suppress neuroinflammation in neurodegenerative diseases, including Alzheimer's.<sup>46,114</sup>

## Summary

Even when pain is not initially apparent, **chronic inflammation** can eventually lead to serious diseases such as cancer.<sup>1,2</sup>

Drugs that target *acute* inflammation are often not suitable for long-term use, and may involve substantial side effects.<sup>3,4</sup>

In a significant breakthrough, three natural ingredients have been identified that powerfully block the signaling molecules that trigger chronic inflammation.<sup>5,32-40</sup>

**Ginger, curcumin, and turmeric oil** block inflammation at multiple points of the process, safely minimizing long-term disease risk.<sup>5,32-40</sup>

Multiple studies demonstrate that these three extracts combat an array of disorders, including cancer, cardiovascular disease, and arthritis.<sup>5-22</sup>

These three extracts have been combined in a groundbreaking formulation that greatly boosts absorption!<sup>25,27,60,61</sup> ●

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

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# SUPPORT FOR THE IMMUNE SYSTEM



**Reishi mushroom** has been traditionally used to boost immune system vitality. Its broad-spectrum benefits have been demonstrated in thousands of studies.<sup>1</sup>

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

## REISHI SUPPORTS A HEALTHY IMMUNE SYSTEM

An abundance of evidence demonstrates that **Reishi** constituents enhance the protective activity of the body's **hematopoietic stem cells, T-cells**, and other crucial immune factors.<sup>2-9</sup>

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

The **Reishi** mushroom also supports the body's production of endogenous antioxidant enzymes—such as **superoxide dismutase (SOD), catalase**, and **glutathione**—which, in turn, support the body's natural immune defenses against free radical damage!<sup>13,14</sup>

## ADVANCED EXTRACTION TECHNOLOGY

**Reishi Extract Mushroom Complex** delivers powerful compounds and represents the **next generation** of natural immune support. Reishi extracts standardized to polysaccharides have been available for years, but most do not standardize for triterpenes and include the spores. This full-spectrum extract has multiple components that have shown to support healthy immune function and enhanced longevity in a natural experimental aging model.<sup>15</sup>

The suggested 2 capsules a day of

**Reishi Extract Mushroom Complex** provide:

<b>Reishi mushroom</b> ( <i>Ganoderma lucidium</i> ) extract ( <b>Fruit body</b> )	<b>980 mg</b>
[standardized to 13.5% polysaccharides (132.3mg) and 6% triterpenes (58.8mg)]	
<b>Shell-broken Reishi mushroom</b> ( <i>Ganoderma lucidium</i> ) spore	<b>150 mg</b>

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

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To order Reishi Extract Mushroom Complex, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com).

ADVANCED

Item # 01430



# Resveratrol Formula

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

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

Compelling evidence reveals that certain compounds found in berries, such as **pterostilbene** and **fisetin**, possess potent "longevity gene" activators that work in synergy with **resveratrol**. For example, **fisetin** (found in strawberries) has been shown to **stabilize** resveratrol in the body by shielding it from metabolic breakdown,<sup>1-10</sup> thus extending its beneficial effects.

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

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## High-Potency Resveratrol with Synergistic Activators

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

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

The suggested dose of one capsule a day provides:

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

To order **Optimized Resveratrol with Synergistic Grape-Berry Actives**, call 1-800-544-4440 or visit [www.LifeExtension.com](http://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.

# How Much Curcumin Are You Absorbing?



**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,<sup>1-6</sup> including its support for the body's natural inflammatory response system.<sup>7</sup> But most curcumin is neither *absorbed well nor retained well* in the blood—posing a challenge to those who wish to maximize its benefits.<sup>8</sup>

**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.<sup>8</sup>

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!<sup>9,10</sup>

## 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**.<sup>11,12</sup> Combining **BCM-95**® with a high content of **turmerones** provides health consumers with **more** beneficial **turmeric** compounds that further multiply absorption.<sup>9</sup> Scientists have shown that these potent **turmerones** not only support curcumin absorption, but significantly increase the amount of curcumin **inside** the cell as well!<sup>9</sup>

**2. Ginger:** Curcumin and **ginger** are close botanical relatives. Research demonstrates that they have overlapping and complementary health benefits,<sup>13</sup> and scientists are focusing on the therapeutic effects of *combining* these two plants.<sup>14,15</sup> **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.<sup>10</sup>

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:

<b>Turmeric Phospholipid Blend</b>	<b>630 mg</b>
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	
<b>Ginger CO<sub>2</sub> extract (root)</b>	<b>200 mg</b>
[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 during **Super Sale**, the price is reduced to **\$18.23** per bottle. Contains soybeans.

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



Item# 01808

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# Brain Tumor Treatment **BREAKTHROUGH!**

PREAMBLE BY WILLIAM FALOON

BRAIN TUMOR TREATMENT

Perhaps the most frightening *malignancy* one can be diagnosed with is a form of **brain cancer** called *glioblastoma multiforme*.

This type of brain cancer has a **dismal prognosis**, with median overall survival of **12 to 15 months**, and a 2-year survival rate of **15% to 26%**.<sup>1</sup>

You may remember that **Senator Ted Kennedy** was diagnosed with *glioblastoma multiforme* in **May 2008**. Despite intervention by brain tumor experts, Sen. Kennedy died in **August 2009** — a mere **15 months** later.

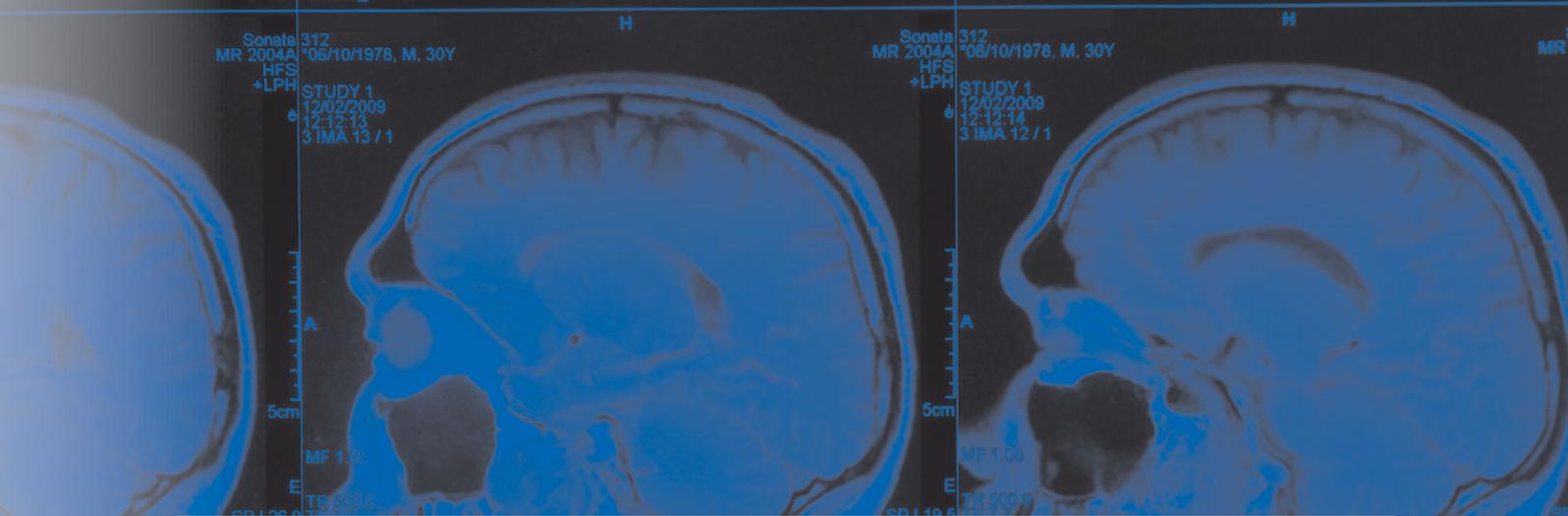
We at **Life Extension**® have long-been evaluating new approaches to treat this deadly malignancy. We've been frustrated by the paucity of meaningful progress and our inability to make better treatment recommendations.

A study published in the **September 5, 2013** edition of the *New England Journal of Medicine* may represent the **most significant advance** yet discovered in treating *glioblastoma multiforme*.

What follows is an overview of this therapy that is available right now to **brain tumor** patients:

- The *cytomegalovirus* has been suspected as facilitating the initiation and promotion of brain cancers.<sup>2-4</sup> From **50%** to as many as **80%** of adults in the United States show exposure to cytomegalovirus, but relatively few harbor active viral infection.<sup>5</sup>

- Doctors followed **75 glioblastoma multiforme** patients and found the median overall survival of those with low-grade cytomegalovirus infection was **33 months**. In patients with high-grade cytomegalovirus infection, median overall survival was only **13 months**.<sup>1</sup>
- All but one of the **75 glioblastoma multiforme** patients studied had active cytomegalovirus infection, indicating that this virus may be involved in the development of this lethal malignancy.<sup>1</sup>
- In *glioblastoma multiforme* patients with high-grade cytomegalovirus infection, median **2-year survival** was **17.2%**. Patients with low-grade cytomegalovirus infection had median **2-year survival** rates of **63.6%**. This suggests that high-grade active cytomegalovirus infection accelerates tumor progression.<sup>1</sup>
- **Valganciclovir (Valcyte®)** is an FDA-approved drug used to treat *cytomegalovirus* infection.<sup>1</sup>
- In a double-blind clinical trial of valganciclovir involving **42** patients with glioblastoma, an exploratory analysis of **22** patients receiving at least 6 months of antiviral therapy showed **50%** overall survival at two years compared with **20.6%** of



contemporary controls. This study showed that valganciclovir-treated patients have a median overall survival of **24.1** months compared to **13.7** months in patients not treated with valganciclovir.<sup>1</sup>

- Owing to the promising results of this pilot study, *glioblastoma multiforme* patients at the world famous **Karolinska University Hospital** received **valganciclovir** and results were then compared to a control group. Both groups received standard conventional therapy and both groups had a similar disease stage and surgical-resection grade.<sup>1</sup>
- The researchers retrospectively analyzed the data on **50** of these brain cancer patients and found the **2-year** rate of survival in the **valganciclovir** group was **62%**, whereas **2-year** survival was only **18%** in the **control group**.<sup>1</sup>
- In **40** *glioblastoma multiforme* patients who received **valganciclovir** for at least 6 months, the 2-year survival rate was **70%**, with a median overall survival of **30.1** months.<sup>1</sup>
- **25** *glioblastoma multiforme* patients that received continuous **valganciclovir** treatment after the first **6 months** had a **2-year** survival rate of **90%**, with median overall survival of **56.4** months (**4.7 years**)!<sup>1</sup>
- Recall that current median survival of *glioblastoma multiforme* patients is only **12–14 months**.<sup>1</sup>
- Also recall the efforts made to prolong **Sen. Kennedy's** life and the best the experts at **Duke University Medical Center** could do was **15 months**.<sup>1</sup>

The implication from these findings is that treating active *cytomegalovirus* infections may dramatically reduce progression, and significantly increase survival time, in patients suffering from the deadly brain cancer *glioblastoma multiforme*. Most exciting is the intriguing data from this retrospective study that **valganciclovir** treatment in patients with active cytomegalovirus produced an unheard of median survival of **56.4 months (4.7 years)** in *glioblastoma multiforme* patients.<sup>1</sup>

Not only does this retrospective data involving the continuous use of **valganciclovir** extend survival in *glioblastoma multiforme* patients, but it provides an opportunity to add in additional complementary therapies (like **metformin**) that could improve outcomes even more!

### What Brain Tumor Patients Should Do

At the time of surgical resection of the brain tumor, a specimen should be sent for immunohistochemical analysis to evaluate presence and activity of *cytomegalovirus*.

In *glioblastoma multiforme* patients with evidence of *cytomegalovirus*-positive tumor tissue, those who wish to follow the protocol that resulted in unprecedented survival improvements should consult with their oncologist and consider **900 mg** of **valganciclovir** twice a day for three weeks followed by a maintenance dose of **450 mg** twice a day indefinitely to be adjusted for side effects such as kidney impairment and bone marrow suppression.<sup>1</sup>

**Valganciclovir** should be taken with fatty meals to enhance its absorption/bioavailability.

The price of **valganciclovir** is beyond outrageous, with the annual cost being around **\$50,000**.

Those who have already had surgery should have their blood tested to help determine *cytomegalovirus* activity. Patients whose blood test reveals active *cytomegalovirus* (CMV) infection, which appears to be an important risk factor in some

*glioblastoma multiforme* patients, should have the cost of *valganciclovir* covered by their medical insurance.

Cancer patients can often have blood tests covered by their medical insurance as long as their oncologist prescribes the tests.

### Will Historic Human Carnage Repeat?

*Glioblastoma multiforme* is a death sentence. Virtually no one survives long-term. It kills **12,000** Americans each year and many more throughout the world.

The findings from this study showing vast survival improvement in brain cancer patients were published in the prestigious *New England Journal of Medicine*. Previous published studies corroborate the role that *cytomegalovirus* may have in human cancers and the potential benefit of *valganciclovir*.

Since **1980**, **Life Extension** has been at the forefront of identifying off-label cancer drugs like **cimetidine**, **aspirin**, and **metformin**, but medical authorities largely ignore us. When properly used, there is intriguing evidence that suggests metformin, aspirin, and cimetidine could spare tens of thousands of Americans from agonizing cancer deaths each year, yet virtually no oncology group routinely prescribes them.

The benefits reported in the *New England Journal of Medicine* represent the most significant survival advance against this deadly brain malignancy in history, yet these findings were virtually ignored by the mainstream media even though the life-sparing drug (*valganciclovir*) is available right now.

It is illegal for the maker of *valganciclovir* to promote it as a treatment for brain cancer. The regulatory system in the United States requires that the maker of a drug conduct extensive clinical trials for each disease a drug is claimed to treat and then submit the trial results to the FDA for approval.

While it is legal for doctors to prescribe *valganciclovir* off-label—that does not protect a doctor’s medical license if a patient has an adverse reaction. So many oncologists may refuse to prescribe *valganciclovir* despite findings that it may improve survival of *glioblastoma multiforme* patients more than **three-fold**.

So there is the real possibility **12,000 Americans** will continue to perish from *glioblastoma multiforme* each year despite impressive findings showing that *valganciclovir* could spare many of them from premature death.

*Glioblastoma multiforme* patients whose tumor specimen reveals immunohistochemical evidence of active CMV infection, or whose blood test is CMV positive for active infection, should ask their oncologist to consider **valganciclovir**.

My greatest concern is that this *valganciclovir* study published in the *New England Journal of Medicine* will be relegated to medical archives and not be utilized to save cancer patients, just as hundreds of published studies on **metformin**, **aspirin**, and **cimetidine** have been ignored by the medical establishment for the past four decades.

The article on the next page provides a more in-depth review of the role that CMV infection plays in the development and progression of brain and other cancers.

For longer life,



William Faloon



## Common Virus Linked to Deadly Brain Cancer

BY LISA ANTONE

Few people would ever suspect that one of the most deadly forms of brain cancer is caused by a common **virus** carried by the majority of people. Yet that's exactly the case, according to a number of new studies in prestigious medical journals.

In the same way that cervical cancer and head and neck cancer has been linked to certain strains of the HPV virus, the most common and deadly type of brain cancer, **glioblastoma**, has been linked to a virus in the herpes family called CMV (short for cytomegalovirus).<sup>6,7</sup>

A diagnosis of glioblastoma means certain death, with population studies indicating typical overall survival rates of *less than a year*.<sup>8</sup> And unfortunately, this deadly form of brain cancer is the most common malignant brain tumor in the US.<sup>8</sup>

Establishing a link between this deadly cancer and a common virus is an enormous step in understanding how to treat, and potentially to prevent, early and unnecessary deaths. And more importantly, it led to the discovery of a drug that can **quadruple** the life span of those who have already been diagnosed with this deadly disease!<sup>1</sup>

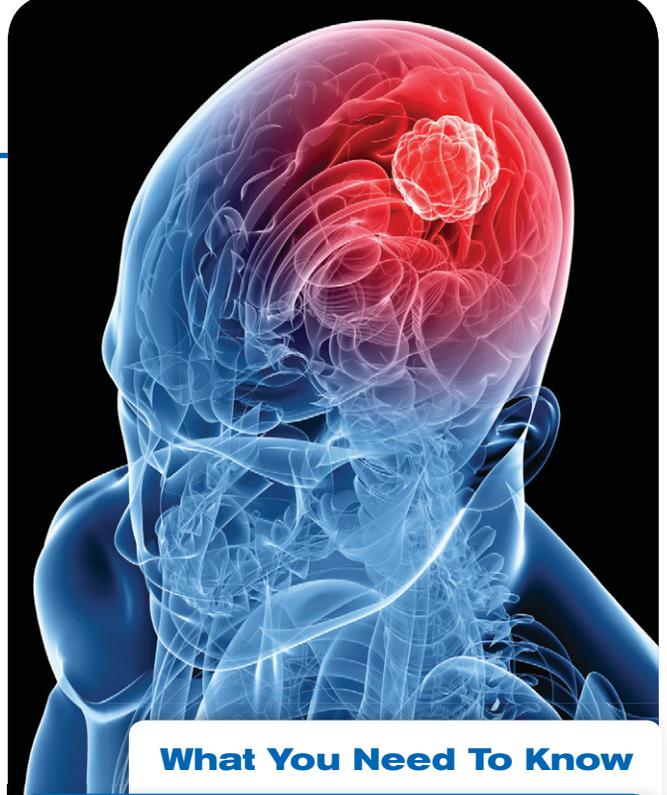
### The Dangers Of The CMV Virus

Cytomegalovirus, or CMV, may be the most important virus you've never heard of. The prevalence of *latent* CMV infection is up to **100%** in most populations of adults worldwide with increasing prevalence in the elderly, and is now considered to play multiple roles in **immunosenescence**, the gradual fading of immune function with age.<sup>9,10</sup>

This is a serious problem. Latent CMV infections are strongly associated with frailty in the elderly and dramatically increases mortality risk.<sup>11,12</sup> CMV has also been associated with accelerated aging in general, and even with shortening of telomeres (the age-regulating bits of DNA that govern each cell's lifespan).<sup>13</sup> Indeed, a 2013 study found disturbing early signs of immunosenescence in young people who tested positive for CMV, compared with their CMV-negative peers.<sup>14</sup>

And of course, waning immune function also opens the door for cancers to develop, freed of the ever-present surveillance carried out by a younger, more robust immune system.

And that's just with the *latent* form of the virus; the *active* form is far worse. *Active* CMV disease in older patients or in those with compromised immune



### What You Need To Know

#### CMV And Brain Cancer: The Deadly Connection

- The deadly brain cancer, glioblastoma, has now been convincingly linked to a common virus, cytomegalovirus (CMV).
- Most people are infected with CMV, but latent disease carries no symptoms.
- Strong evidence suggests that CMV lying latent can become reactivated and trigger cancerous growth in the brain and other organs.
- A dramatic pair of recent studies shows that treating CMV in glioblastoma patients significantly prolongs survival, nearly doubling it at 6 months and more than quadrupling it with prolonged treatment.
- Antiviral drug treatment, however, is not for otherwise healthy people; it is hideously expensive and produces major side effects.
- But healthy people can take major steps: get tested for CMV, and then start one or more of the supplements known to support healthy immunity and resistance to re-activation of CMV.

systems is a devastating disease. It can cause hepatitis leading to liver failure, retinitis leading to blindness, severe colitis (large bowel inflammation), pneumonitis (viral pneumonia), esophageal inflammation, and disorders of the central and peripheral nervous systems.<sup>15,16</sup>

But unlike other herpes viruses, CMV rarely produces detectable symptoms in otherwise healthy people.<sup>16</sup> That makes it difficult to diagnose, and dangerously easy to spread. Diagnosing CMV often requires two separate blood tests, several weeks apart, as well as a high index of suspicion by both patient and provider (see sidebar on the next page for an understanding of test results).<sup>17</sup> CMV spreads the way other herpes viruses do: by contact with bodily secretions, especially saliva.<sup>18</sup>

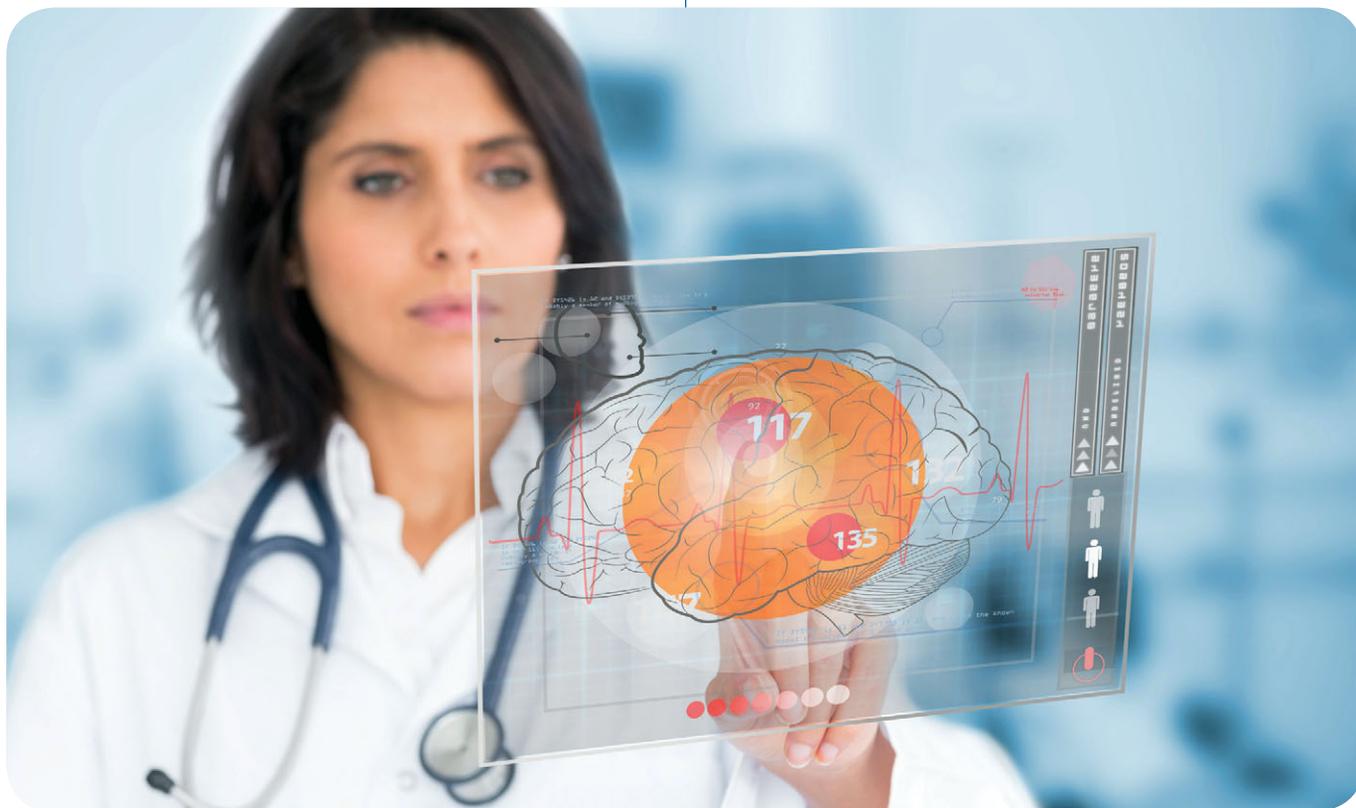
The ease of spread and the absence of symptoms in healthy adults accounts for the very widespread prevalence of CMV.<sup>18</sup> Estimates vary, depending on geography, socioeconomic status, and other variables, but at least **35%**, and up to **100%** of people in some communities, will test positive for CMV.<sup>19-21</sup>

### CMV: The Cancer Connection

Over the past decade, scientists have become increasingly concerned at the growing association of CMV with certain cancers. While it is too early to label

CMV a true cancer-causing virus,<sup>22</sup> evidence implicating CMV as a contributor to cancer comes from several observations:

- Studies show a strong correlation between cancer incidence and the percentage of adults who test positive for CMV.<sup>23,24</sup>
- CMV proteins and DNA have been found in **90-100%** of malignant cells from a variety of cancers, especially those of the brain, breast, prostate, liver, lung, and colon.<sup>1,25-33</sup>
- CMV genes, once inserted into the host's own DNA, increase inflammation-generating genes that promote cancer growth.<sup>34,35</sup>
- CMV genes are known to induce mutations in host tumor-suppressor genes, increasing the risk that a new cancer will develop.<sup>36</sup>
- CMV may help cancer cells avoid detection by the immune system by several mechanisms including increased secretion of immune suppressive cytokines.<sup>22</sup>
- CMV-infected cells produce more of the growth factors and chemical receptors needed for tumor development and invasion, compared to non-infected cells.<sup>32,33,37</sup>



The evidence for a direct connection between CMV and malignancy is by far the greatest in the case of the deadly brain tumor called **glioblastoma multiforme** (often simply “glioblastoma”). This tumor is the most common and aggressive brain cancer, and it carries a dismal prognosis.<sup>38,39</sup>

Most patients die within the first 15 months of diagnosis, with few surviving past 3 years.<sup>40-42</sup>

Glioblastomas occur most commonly in the frontal and temporal (side) lobes of the brain, where they produce disturbing symptoms that include persistent headaches, double or blurred vision, vomiting,

changes in mood and personality, changes in cognition, seizures, and speech difficulty.<sup>42</sup>

In addition to their aggressive growth, glioblastomas are notoriously difficult to treat because of their location within the brain, where efforts to extract them are complicated by their deep invasion of healthy brain tissue and the brain’s limited ability to repair itself.<sup>40,42</sup> Patients with glioblastomas frequently experience a number of clinical complications including seizures, blood clots, fluctuating neurological symptoms as well as side effects from powerful corticosteroids and chemotherapeutic drugs.<sup>43</sup>

## Testing Your Blood For CMV

**Cytomegalovirus** (CMV) is part of the herpes virus family, which means that this virus is almost never completely cleared from the body following infection.<sup>77</sup> The maintenance of suppression of viral infection is dependent upon a strong immune system.

**Cytomegalovirus** can lie dormant in your body for decades before emerging in response to a weakening of the immune system.<sup>77</sup>

The steps that aging **Life Extension** members take to protect against **immunosenescence** such as maintaining youthful levels of **DHEA**, suppressing **oxidative stress**, and taking immune boosters like **garlic** and **reishi** mushroom extracts should help keep cytomegalovirus in check. But each individual is different, and reemergence of CMV infection is often asymptomatic in normally aging people.

The regular member price for the blood test called **CMV IgM** that detects acute, initial **cytomegalovirus** infection is \$125. The antibody test for past/prior infection is called **CMV IgG** and it normally costs Life Extension members \$59. We’re making both of these tests available to members for a limited time for only **\$169**. When calling about this, please mention code: BTA422D so the operator knows to give you this special price.

If you order any CMV tests, we’ll include at no additional charge, a comprehensive blood count and blood chemistry test that includes glucose, cholesterol, LDL, HDL, triglycerides, liver-kidney, immune cell counts, and many other tests.

To ascertain if you have evidence of acute, initial, or past/prior **cytomegalovirus** infection, you should order both the **CMV IgM** and **IgG** tests. At the discounted price of **\$169** plus the free CBC/Chemistry panel you save **\$50** compared to if all three tests were ordered separately. When ordering these tests, call **1-800-208-3444** (24 hours). Please mention code: BTA422D.

### Understanding Your CMV Test Result

The most-commonly used test for CMV is a blood test looking for evidence that your body has encountered the virus. The test for prior infection looks for the antibody called **IgG**. If it is negative, you don’t have (and never had) CMV infection.<sup>77</sup>

If the IgG test is positive, however, it only indicates that your body has, at some time in the past, been invaded.<sup>77</sup> It means the virus is still latent in your body, but is not active at present. To identify active infection, you need to test your blood for the antibody called **IgM**.<sup>77</sup>

If you test positive for IgM, you may be recently infected with CMV, or you may recently have been re-exposed to the virus. Or, your body may be experiencing re-activation of the virus as a consequence of immunosenescence or another cause of reduced immunity. But IgM alone is not used to diagnose active CMV infection.<sup>77</sup>

Instead, test for both IgG and IgM. If both are negative, your body has never seen CMV. If IgG is positive, and IgM negative, you’re carrying the virus but it isn’t active. If both are positive, it suggests either a recent first-time exposure to CMV, or a reactivation of a latent infection. In this case you can confirm the result with an additional IgG test in 4-6 weeks. A 4-fold or greater rise in IgG level makes it near-certain that active CMV infection is going on in your body and **valganciclovir** drug therapy should be considered.<sup>78</sup>

If you have questions, call a  
**Life Extension Health Advisor**  
at **1-866-864-3027**.

Glioblastomas leak fluid, increasing the pressure on brain tissue; they also disrupt the blood supply, making it difficult for anti-cancer drugs to reach them.<sup>42</sup>

All of this accounts for the fact that, despite three decades of research, we have managed to increase overall survival in cases of glioblastoma by only about 3 months.<sup>42,44</sup> Making matters worse, the tumor strikes at the prime of life, occurring mainly in adults between 45 and 70, with a median age at death of 64 years.<sup>42</sup>

The high incidence of glioblastoma, coupled with the difficulty of its treatment, has made the search for causes and preventive measures paramount. That's why this emerging evidence about the link between CMV and malignant brain tumors is exciting to so many researchers.<sup>34</sup>

### Strong Link Between CMV And Brain Cancer

There are a number of lines of evidence closely linking CMV with glioblastomas specifically, as well as to cancer in general. Virtually all glioblastomas have been found to contain CMV particles, proteins, and DNA (in one study of 250 patients, only one was CMV-negative).<sup>1,2,45</sup> In fact, the amount of CMV in a glioblastoma is closely correlated with the tumor stage: More advanced tumors contain more CMV.<sup>22</sup> Recent studies show that the amount of CMV in a tumor can accurately predict survival time in glioblastoma victims, with those carrying the most virus dying significantly earlier (average 13 months) than those with lower viral burden (average 33 months).<sup>45,46</sup>

Ironically, and tragically, further evidence of CMV involvement in glioblastoma comes from treatment misadventures with the cancer chemotherapy drug **temozolomide**. This drug, one of the few approved for treating glioblastoma, is powerfully immunosuppressive.<sup>47</sup> In glioblastoma patients being treated with temozolomide, reports are now appearing of the emergence of active and devastating CMV disease, indicating that the virus had lain dormant until the patients' immune systems were suppressed by this chemo drug.<sup>47,48</sup>

There's a glimmer of hope on the horizon, however, the direct result of our understanding of the CMV/glioblastoma connection.

### Antiviral Drug Quadruples Life Span!

Researchers at the internationally acclaimed Karolinska Institute in Sweden recently made medical headlines with their findings about the use of an antiviral drug **quadrupling** the lives of patients with glioblastomas.<sup>1</sup> The drug, **valganciclovir**, is widely used in treatment of active CMV infection in immunocompromised patients.

Beginning with an animal model, the researchers found that they could reduce the growth of medulloblastomas (the main group of brain tumors to which glioblastomas belong) by **72%** using a drug combination including valganciclovir to combat CMV infection.<sup>34</sup>

Next, they wanted to determine how effective valganciclovir would be as an add-on to chemotherapy. In a double-blind clinical trial, researchers gave valganciclovir to 42 glioblastoma patients already receiving standard chemotherapy.<sup>49</sup> Although tumor sizes were smaller in treated than in non-treated patients, the difference was not statistically significant. There were no significant differences in survival over the 6 months of the study period.

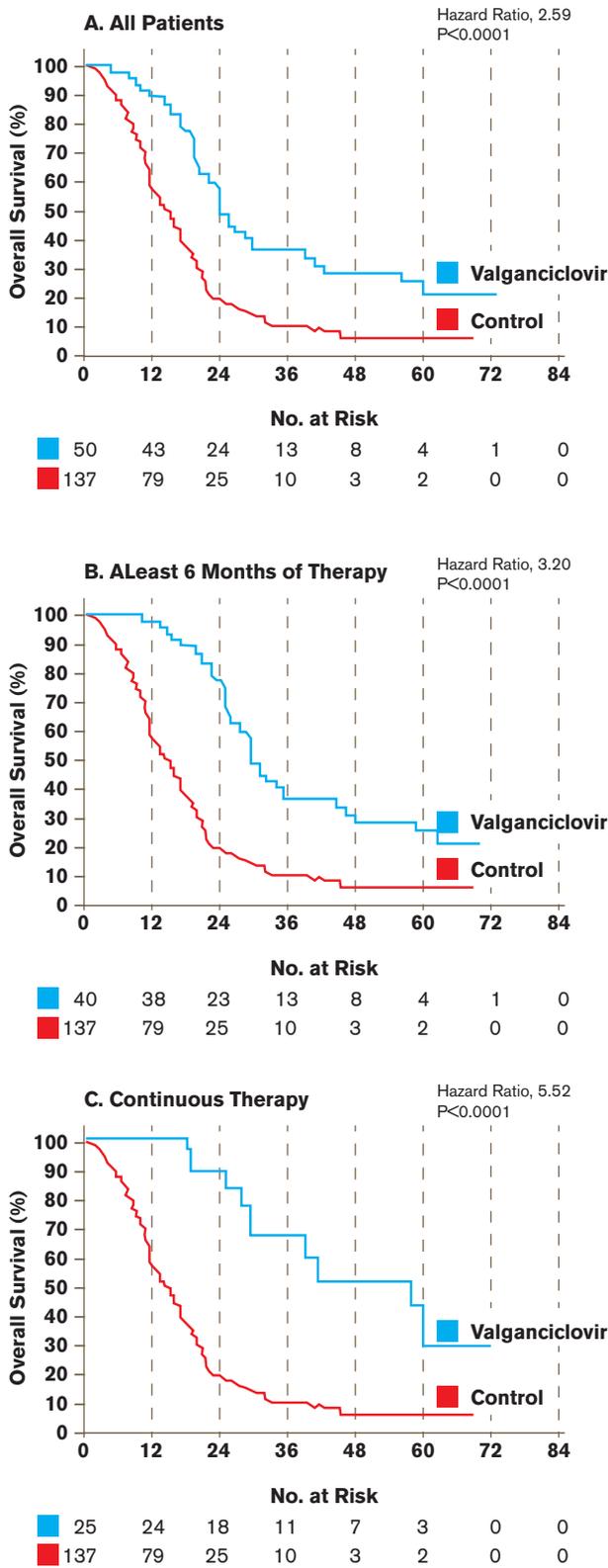
However, that all changed when patients were allowed to continue taking the drug after the study phase. Analyses showed that patients taking valganciclovir for longer than 6 months had an overall survival of **24.1 months**, compared with just **13.1 months** (a typical survival time) in patients taking the drug for 0 to 6 months.<sup>49</sup> By 4 years (an eternity for glioblastoma patients), **27.3%** of long-term valganciclovir patients survived, compared with just **5.9%** of controls.

Encouraged by these results, the researchers immediately undertook another study, again providing valganciclovir as add-on to regular chemotherapy—but this time, extending the study period beyond the original 6-month time frame.<sup>1</sup> Fifty patients were treated and compared with controls who received only standard care. In the authors' own words, "The rate of survival of treated patients was remarkably high"—an understatement considering the facts. Take a look:

- At 2 years, **62%** of all treated patients were still alive, compared with just **18%** of controls with comparable cancers.<sup>1</sup> Median overall survival was **25 months**, vs. **13.5 months** in controls (Figure 1A).
- Among those who received at least 6 months of valganciclovir, the 2-year survival rate was **70%** and median overall survival was **30.1 months** (Figure 1B).<sup>1</sup>
- And, among the 25 patients who received continuous valganciclovir treatment after the first 6 months, **90%** of patients were alive at 2 years, and median overall survival was an incredible **56.4 months**—that's more than **4½ years**, or a **4.2-fold** increase over the **13.5 months** in control patients.<sup>1</sup> (Figure 1C)

In other words, even short-term treatment with valganciclovir nearly **doubled** overall survival

**FIGURE 1: Results of Valganciclovir Treatment in Glioblastoma Patients**



“Survival Curves” showing the percent of glioblastoma patients surviving over time. The red curves are survival of control patients; blue curves indicate survival of patients treated with valganciclovir.<sup>1</sup>

time; medium-term therapy nearly **tripled** survival time, and long-term, continuous therapy more than **quadrupled** it.

These are compelling results. At this point, anyone with a diagnosis of glioblastoma and a desire to extend their lives as much as possible should demand therapy with oral valganciclovir, at **900 mg/day** twice daily, followed by a maintenance dose of **450 mg** twice daily, with adjustments as needed for impaired kidney function and bone marrow suppression.

### What About The Rest Of Us?

As exciting as the results of this study were for those battling glioblastoma, valganciclovir is prohibitively expensive to use as a preventive drug. It can cost upwards of **\$50,000/year** and has myriad side effects, including plummeting white blood cell counts.<sup>50</sup>

There are no known drugs or supplements that can prevent primary infection with CMV in humans. However, if you are CMV-positive (like so many Americans), there are a number of ways you can protect yourself against the effects of the virus, including protecting against immunosenescence, the immune aging that triggers CMV activation.



## Fight CMV-Related Immunosenescence Naturally

Although no human data exist yet, there's striking evidence that certain natural compounds can inhibit the replication and spread of CMV in animal and basic lab studies.

These include *Urtica dioica* (stinging nettle), garlic extract, *Terminalia chebula* (an Asian tree), ginger extracts, flavones from ginger-like *Kaempferia parviflora*, a variety of seaweed extracts, and oil from *Nigella sativa* (black cumin seed).<sup>51-58</sup> Black cumin seed oil in particular was so effective in mice that, after 10 days of treatment, no virus was detected in treated animals, while it was readily detectable in control mice.<sup>55</sup>

Other nutrients can fight the CMV that may already be in your body by enhancing your immune system's resources to fight CMV, as well as other infections that arise when immunosenescence sets in. These include the following:

- **Probiotics** and **prebiotics**, by balancing the intestinal microbial population, have powerful immune-stimulating properties.<sup>59,60</sup> Studies show that probiotic/prebiotic therapy produces improvements in natural killer cell activity, activated T-lymphocytes (including "memory" cells responsible for recognizing old enemies), and cell signaling molecules called cytokines.<sup>61-64</sup>
- Elderly people are more likely to be deficient in zinc, a trace element absolutely required for normal immunity.<sup>65</sup> **Zinc** supplementation fights immunosenescence by enhancing the appropriate immune response to stress in older humans and by increasing appropriate cytokine signaling to mobilize response to infection.<sup>66,67</sup>
- Sulfur-containing antioxidants such as **N-acetylcysteine** help replenish the body's normal stores of natural antioxidants, which helps keep immune system cells fresh and vigorous. These supplements improve white blood cell function, increasing their ability to track and attack invaders, and increasing white cell proliferation in response to invasion.<sup>68</sup> Aged mice fed a diet rich in N-acetylcysteine and thioproline for 5 weeks showed an improvement in all immune functions, with values becoming close to those of young adult animals.<sup>69</sup>
- **Spirulina**, a blue-green algae, increases the microbe-eating activity of white blood cells

called macrophages, while stimulating antibody production and activating killer T-cells that destroy viruses and fungi.<sup>70-72</sup>

- Finally, the prescription drug **metformin** (which is in fact a natural derivative of the French lilac) has shown great promise in reducing immunosenescence and fighting CMV and CMV-related cancers.<sup>73</sup> Metformin has shown surprisingly beneficial results in combination with standard treatments for breast cancer,<sup>74</sup> and is now being closely investigated as an additional treatment for glioblastoma. Similar studies showed that metformin inhibits growth and migration of glioblastoma cells, a property that would reduce the tumor's invasiveness in patients' brains.<sup>75</sup> Excitingly, metformin has now also been shown to promote differentiation of glioblastoma-initiating cells into non-cancer-producing cells in lab cultures.<sup>76</sup>

### Summary

Recent research has established a surprising connection between a common virus, **CMV**, and a deadly brain tumor, **glioblastoma**. This relationship opens the door to a variety of forms of treatment and prevention of brain and other cancers.

At present, even with chemotherapy, survival in glioblastoma patients is rarely more than 15 months after diagnosis.<sup>42</sup>

But CMV proteins and DNA are found in the vast majority of glioblastomas removed at surgery, and the amount of CMV has been found to correlate closely with the severity of the tumor.<sup>1,2,22,45</sup> This suggests that anti-CMV treatment might ameliorate glioblastoma and improve prognosis.

Indeed, treatment with valganciclovir, a specific anti-CMV drug, has been shown to dramatically increase overall survival in two studies of glioblastoma patients—as much as quadrupling life span!<sup>1,49</sup>

However, for those with the CMV virus, but without glioblastoma, there are a few supplements that may help fight CMV infection and can mitigate its impact on your body.<sup>51-58</sup>

You should consider being tested for CMV, by means of a blood test described in the sidebar on page 87. If you test positive, then start some of the recommendations made in this article.

The comforting news for **Life Extension**® members is that they have been supplementing with immune boosting nutrients for many decades. ●

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

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# Super Potent Multi-Nutrient Formula

## Compare CENTRUM® to TWO-PER-DAY:

Sample Ingredient Comparison	Life Extension® Two-Per-Day	Centrum® Silver® Adults 50+
Vitamin C	500 mg	60 mg
Vitamin D3	2,000 IU	500 IU
Vitamin B1	75 mg	1.5 mg
Vitamin B2	50 mg	1.7 mg
Vitamin B6	75 mg	3 mg
Vitamin B12 (as methylcobalamin)	300 mcg	25 mcg
Niacin (as niacinamide)	50 mg	20 mg
Pantothenic acid	100 mg	10 mg
Vitamin E	100 IU (natural)	50 IU (synthetic)
Natural Folate	400 mcg	400 mcg (synthetic)
Zinc	30 mg	11 mg
Selenium	200 mcg	55 mcg
Lutein	5,000 mcg	250 mcg
Lycopene	2,000 mcg	300 mcg
Biotin	300 mcg	30 mcg
Boron	3,000 mcg	150 mcg
Chromium	200 mcg	45 mcg
Molybdenum	100 mcg	45 mcg
Magnesium	100 mg	50 mg
Manganese	2 mg	2.3 mg
Iodine	150 mcg	150 mcg
Potassium	25 mg	80 mg
Vitamin A (as beta-carotene)	4,500 IU	1,000 IU
Vitamin A (preformed)	500 IU	1,500 IU
Choline (as bitartrate)	20 mg	(none)
Inositol	50 mg	(none)
Calcium	12 mg	220 mg
Alpha Lipoic Acid	25 mg	(none)
Natural Mixed Tocopherols (providing gamma, delta, alpha, and beta tocopherols)	20 mg	(none)

Commercial "one-a-day" supplements provide very low potencies.

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

Compared to "one-a-day" products, **Life Extension® Two-Per-Day** contains up to **50 times more** potency! This **Two-Per-Day** formula is available in tablet or capsule form.

Commercial supplements often contain the cheapest form of nutrients that fail to provide optimal benefits. For example, the 50 IU of synthetic vitamin E contained in **Centrum® Silver® Adults 50+** may provide relatively little vitamin E to the bloodstream compared to the 100 IU of natural vitamin E in **Two-Per-Day**.

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

\*



Item# 01814  
Capsules



Item# 01815  
Tablets

Compared to Centrum® Silver® Adults 50+,  
**Two-Per-Day Tablets or Capsules provide about:**

- 4 times more Vitamin D
- 8 times more Vitamin C
- 2 times more Vitamin E
- 10 times more Biotin
- 20 times more Boron
- 4 times more Selenium
- 25 times more Vitamin B6
- 50 times more Vitamin B1
- 12 times more Vitamin B12
- More than twice as much niacin, zinc, and many other nutrients

A bottle containing 120 tablets of **Two-Per-Day Tablets** retails for \$20. If a member buys four bottles during **Super Sale**, the price is reduced to **\$12.15** per bottle. (Item #01815)  
A bottle containing 120 capsules of **Two-Per-Day Capsules** retails for \$22. If a member buys four bottles during **Super Sale**, the price is reduced to **\$13.50** per bottle. (Item #01814)

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

**To order Life Extension Two-Per-Day Tablets or Two-Per-Day Capsules, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)**

**Caution:** Individuals consuming more than 2,000 IU/day of vitamin D (from diet and supplements) should periodically obtain a serum 25-hydroxy vitamin D measurement. Vitamin D supplementation is not recommended for individuals with high blood calcium levels.

\* The new two-per-day provides a small amount of gamma tocopherol as part of natural mixed tocopherols which includes natural vitamin E.



Ratings based on results of the 2013 ConsumerLab.com Survey of Supplement Users. More information at [www.consumerlab.com](http://www.consumerlab.com).

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

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

# ULTIMATE 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).<sup>1-9</sup>
- **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.<sup>10-12</sup>
- **AprèsFlex®**, supports normal inhibition of *5-lipoxygenase* or *5-LOX*, an enzyme that is associated with undesirable cell division changes.<sup>13,14</sup>
- **Stinging and Dwarf nettle root extracts** help support prostate cells against excess estrogen levels.<sup>15,16</sup>
- **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.<sup>17-20</sup>
- **Pygeum** (*Pygeum africanum*) extract helps suppress prosta-glandin production in the prostate and supports healthy urination patterns.<sup>21,22</sup>
- **Pumpkin seed oil**, from select pumpkins, enhances the composition of free fatty acids and augments saw palmetto's benefits.<sup>23-25</sup>
- **Beta-sitosterol** enhances the protective effects of other botanical extracts and helps improve quality of life.<sup>26-28</sup>
- **Graminex® Flower Pollen Extract™**, has been shown to help relax the smooth muscles of the urethra and help regulate inflammatory reactions.<sup>29-31</sup>
- **Boron** has been shown to slow elevation of prostate-specific antigen (PSA).<sup>32-34</sup>
- **Lycopene**, supports efficient cellular communication, helps maintain healthy DNA, regulates hormonal metabolism, and promotes healthy prostate size and structure.<sup>35-41</sup>

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Item # 01895

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

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

<sup>1</sup> 3-O-acetyl-11-keto-β-boswellic acid

A bottle of 60 softgels of **Ultra Natural Prostate** retails for **\$38**. If a member buys four bottles during **Super Sale**, the price is reduced to **\$23.63** per bottle. If a member buys 12 bottles during **Super Sale**, the price is **\$21.60**.

Contains soybeans.

AprèsFlex® is a registered trademark of Laila Nutraceuticals exclusively licensed to PL Thomas- Laila Nutra LLC. International 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.

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To order **Ultra Natural Prostate**, call **1-800-544-4440** or visit **www.LifeExtension.com**

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## SUPER FOODS

BY ROBERT IAFELICE

# Sweet As Sugar

## Health Benefits Of Stevia And Xylitol

In 1991, reacting to an anonymous trade complaint, the **US Food and Drug Administration (FDA)** deemed the sweetener stevia unsafe and issued an Import Alert, banning all stevia from entering the United States.<sup>1-3</sup> While the FDA cited inadequate toxicological evidence of its safety, the ban was not based on any consumer complaints or reported adverse effects.<sup>2</sup>

Extracts of the South American stevia plant, called **steviol glycosides**, are up to **300 times** sweeter than sugar and have little aftertaste, **zero calories**, and no effect on blood sugar.<sup>3</sup> At the time of the FDA ban, supporters of stevia argued without success that stevia, with its long history of food use, should qualify as having **GRAS (Generally Recognized as Safe)** status in the same manner as coffee, tea, sugar, fruit, etc. A history of safe use is one condition that must be met to qualify for GRAS, and this was actually acknowledged in the FDA's Import Alert for stevia!<sup>4</sup> The FDA not only banned a safe and natural sweetener in stevia, but one that appears to provide health benefits as well, most notably for regulating blood sugar and blood pressure.<sup>3,5</sup>





The controversial ban on the importation of stevia in the US continued until 1995 when the **Dietary Supplement Health and Education Act of 1994** forced the FDA to allow stevia to be imported and marketed as a dietary supplement, but not as a sweetener or other food additive purpose.<sup>1</sup> The FDA's policy to classify stevia to be safe for consumption as a "supplement," but potentially harmful as a sweetener just added to the controversy and confusion.

In 2008, after a rigorous review of the scientific evidence, the FDA granted stevia sweeteners GRAS status.<sup>6</sup> It was also approved by the European Union in 2011.<sup>7</sup>

Today, hundreds of foods and beverages throughout the world are sweetened with stevia sweeteners. Among these are Vitamin Water®, Coke Zero®, Sprite Green®, Gatorade's G2® and Crystal Light®, Coca-Cola® and Pepsi Cola® have both disclosed their intentions to use **rebaudioside A**, the sweetest stevia extract, as a **zero-calorie** soft-drink sweetener in the US.<sup>3</sup>

## Health Benefits

While stevia has been documented to have medical purposes as an antimicrobial, anti-diarrheal, anti-tumor, diuretic, anti-inflammatory, and immunomodulatory actions, the scientific evidence is strongest, and its use is most promising for two indications: (1) high blood sugar/insulin resistance and (2) high blood pressure.<sup>3,5,8</sup>

### Stevia May Help Control Blood Sugar And Insulin Levels

Extracts from stevia leaves have been used for centuries as a medicinal herb in the traditional treatment of diabetes in South America.<sup>5,9</sup> Today, scientific evidence on stevia supports its historic precedent in the regulation of blood sugar and insulin.

Avoiding excess elevation of blood sugar and insulin after meals is perhaps the most important dietary measure you can take to reduce your risk for heart disease, cancer, and other age-related disorders. In a recent study in type II diabetic subjects, **stevioside**, one of the stevia extracts, reduced after-meal blood glucose levels by an average of **18%**.<sup>10</sup>

When compared to sugar, stevia consumption before meals results in far lower after-meal glucose and insulin levels.<sup>11</sup> Even when compared to aspartame, stevia resulted in lower post-prandial insulin levels.<sup>11</sup> The comparison with aspartame is more impressive because the change in glucose and insulin levels cannot be due to a difference in calories, as with sugar. A key finding from this study was that participants eating stevia felt satisfied with fewer calories and did not eat more food throughout

the day to compensate.<sup>11</sup> This is an indication of stable blood sugar and insulin levels.

At the root of many cases of chronically elevated glucose and insulin levels is **insulin resistance**. In rats fed a fructose-rich diet for four weeks to induce insulin resistance, stevioside lowered high blood glucose levels in a dose-dependent manner and delayed the development of insulin resistance.<sup>12</sup>

Studies have evaluated the effects of stevioside on animal models of both type I and type II diabetes: elevated blood glucose levels were lowered, and less insulin medication was needed for the same effect. This research clearly demonstrates that stevia has the ability to increase cellular insulin sensitivity and help reverse insulin resistance.<sup>12,13</sup>

Interestingly, the mechanism for stevioside's hypoglycemic effect in the latter group of rats with insulin dependent type I diabetes was determined to be slowing down **gluconeogenesis** (the synthesis of glucose in the liver from non-carbohydrate sources).<sup>13</sup> Another plant compound very familiar to readers of Life Extension magazine®, **chlorogenic acid** from coffee beans, also down-regulates gluconeogenesis. Coffee sweetened with stevia may pack quite a one-two punch for blood sugar control!

The effect of stevia on blood sugar has only been observed when plasma glucose levels are elevated. It does not lower normal blood sugar levels in healthy individuals.<sup>5</sup>

Stevia is not just a safe sugar substitute, but a natural insulin sensitizer that may help maintain normal sugar and insulin levels in diabetics and nondiabetics alike. Since stevia extract also decreases oxidized LDL cholesterol<sup>14</sup> and

triglycerides,<sup>15</sup> and lowers high blood pressure<sup>3,5</sup>—all metabolic risk factors—it has great potential for the treatment of *metabolic syndrome*.

### Stevia May Lower Blood Pressure

A double-blind, placebo-controlled study demonstrated that oral stevioside taken at doses of **250 mg, three times a day** for one year resulted in significant, lasting decreases in both systolic and diastolic blood pressure in patients with mild to moderate hypertension.<sup>16</sup> A longer, subsequent study by the same research team that lasted two years and with an increased dose of stevioside (**1,500 mg**) replicated the decreases in blood pressure found in the initial study.<sup>17</sup>

The stevioside treatment was well-tolerated and no side effects were reported or detected. Moreover, the stevioside treatment group reported significantly higher quality of life scores than the placebo group.<sup>17</sup> On the other hand, it was noted that more patients in the placebo group developed *left ventricular hypertrophy*,<sup>17</sup> an abnormal thickening of the heart muscle often caused by high blood pressure.

Though the effect of stevioside was not better than drugs, it appears comparable and nearly everyone taking stevioside had significant lowering of blood pressure. As in the case of blood sugar, stevioside lowers elevated blood pressure, but not normal blood pressure.<sup>5</sup>

As a natural plant compound with no demonstrated side effects, stevia may offer an alternative or supplementary therapy for high blood pressure, and with possibly better compliance.

### Xylitol: A Sweetener That's Good For Your Teeth

Another sugar substitute with beneficial health properties that is growing in popularity is xylitol. While xylitol is a natural substance found in fruits and vegetables, it is also naturally produced in our bodies during normal carbohydrate metabolism. An average-size adult makes up to **15 grams** of xylitol daily.<sup>18,19</sup>

Xylitol is classified as a *sugar alcohol* (like sorbitol, mannitol, erythritol, etc) because its chemical structure partially resembles sugar and partially resembles alcohol.<sup>20</sup> It is actually a carbohydrate that looks and tastes remarkably like table sugar with **40%** fewer calories and practically no after-taste.<sup>21</sup> It is used as a sweetener in

chewing gums, mints, beverages, sweets, toothpaste and in tabletop granular form. It has been approved for use in foods, pharmaceuticals and oral health products in more than **35** countries worldwide, including the US.<sup>21</sup>

### Xylitol Fights Cavities

Though largely preventable, tooth decay (cavities) is one of the most prevalent chronic diseases among both adults and children, with **1 in 5 Americans** reported to have untreated cavities according to the Centers for Disease Control (CDC).<sup>22</sup> In **2010**, roughly **\$108 billion** dollars were spent on dental services in the US.<sup>23</sup>

By providing fuel for acid-forming bacteria in the mouth, sugar consumption sets up an

### History Of Stevia

Stevia is a perennial shrub with over **200** species belonging to the *Aster (sunflower)* family and indigenous to South America.<sup>46</sup> For centuries, the Guarani tribes of Paraguay and Brazil used the leaves of stevia, which they called *ka'a he'e ("sweet herb")* to sweeten yerba mate tea and various foods. It was also used medicinally as a treatment for diabetes,<sup>47</sup> hypertension, and obesity.<sup>5</sup>

Stevia has been used in Europe and Asia since the sixteenth century when it was discovered by the Spanish Conquistadors.<sup>48</sup> The particular species used as a sweetener, *Stevia rebaudiana Bertoni*, was named after botanist *Moises Santiago Bertoni*, who "rediscovered" stevia and scientifically classified the plant in 1899, describing its sweet taste in detail. The compounds in the stevia leaf that give the plant its sweet taste, *stevioside* and *rebaudioside A*, were isolated in 1931 by French chemists.<sup>2</sup>

During World War II, England began to investigate stevia as an alternative to sugar, which was in short supply.<sup>49</sup> In the 1970s, the Japanese began to use stevia to replace the banned artificial sweetener, saccharin. It became their chosen sugar alternative to sweeten food and beverages, so much so that Japan is now the largest consumer of stevia.<sup>2</sup> Today, stevia can be found growing in China, South America, India, South Korea, Taiwan, and Israel, and is used in many countries around the globe.

ideal acidic condition that promotes decay and demineralization of teeth. Xylitol, conversely, is non-fermentable and does not feed acid-forming oral bacteria. Regular use of xylitol causes cavity-forming bacteria, most notably *Streptococcus mutans* (*S. mutans*), to starve and die off by as much as **73%**, decreasing the level of acidic byproducts formed when bacteria ferment sugars.<sup>24</sup> Xylitol also increases salivary flow which helps to buffer these acids.<sup>25</sup> A more alkaline environment is created, leading to less tooth decay and plaque, and enhanced tooth remineralization. Untreated cavities, especially small decay spots, can harden and become less sensitive from exposure to xylitol.<sup>26</sup>

Considerable research conducted since the early 1970s has established that consuming xylitol products results in reduction in tooth decay rates ranging from **30%** up to levels in excess of **80%**.<sup>27</sup> What's more, the protective effects of xylitol are long-lasting. In a study of nearly **300** children who chewed xylitol gum habitually for over **two** years and then stopped, some experienced a reduction in their tooth decay rate over the next **five** years.<sup>28</sup> Xylitol-sweetened gum even reduces transmission of cavity-causing bacteria from mother to child.<sup>29</sup>

According to newer research, the number of exposures to xylitol throughout the day is more important than the quantity of xylitol.<sup>30</sup> Consider chewing xylitol gum after each meal, sweetening your tea or coffee with xylitol granules and using xylitol toothpaste once or twice a day. Several dental associations, including the *American Dental Association*<sup>31</sup> and the *American Academy of Pediatric Dentistry*,<sup>32</sup> support the use of xylitol in caries control and prevention.

### Xylitol Benefits Diabetes And Metabolic Syndrome

Because xylitol is slowly emptied from the stomach, and only about **50%** of it is absorbed, it has negligible effects on blood sugar and insulin secretion.<sup>33,34</sup> Xylitol has a considerably lower glycemic index (**13**) when compared with sucrose (**65**) and glucose (**100**).<sup>33</sup> It even compares favorably with foods such as legumes and milk.<sup>35</sup>

In a recent animal study examining the antidiabetic potential of xylitol, animals fed xylitol had significantly better *glucose tolerance* (more stable blood sugar levels), less weight gain and significantly lower food intake (suppressed appetite) than both the sugar and control groups.<sup>36</sup> Data from this study and others confirm that xylitol is an ideal low-calorie sweetener for people with diabetes, metabolic syndrome, obesity, and other metabolic disorders.<sup>34,36,37</sup>

Of course, like stevia, xylitol can be used by anyone to help maintain low blood sugar and insulin levels, thereby reducing risk to age-related disease.

### Xylitol Helps Prevent Ear And Upper Respiratory Infections

Xylitol not only suppresses *S. mutans*, the cavity-promoting bacterium, but it also inhibits the growth of *Streptococcus pneumoniae* (*S. pneumoniae*), a major cause of middle ear infections and sinusitis.<sup>38,39</sup> Owing to its unique structure, xylitol also has the ability to interfere with *S. pneumoniae*'s ability to stick to tissues and form colonies of bacteria called *biofilms*, making the germ more vulnerable to treatment.<sup>40</sup>

In clinical trials, xylitol given in the form of chewing gum or syrup reduced middle ear infections in daycare children by **30-40%**.<sup>38,41,42</sup> This safe and great-tasting sweetener offers the possibility of preventing ear infections in children and thus lessening the need for antibiotics.

### Xylitol Strengthens Bone

Since xylitol appears to induce remineralization of tooth enamel, researchers are also now investigating its ability to remineralize bone tissue. Several animal studies show that xylitol increases bone density,<sup>43-45</sup> suggesting that xylitol shows promise in the treatment or prevention of osteoporosis. Clinical trials are needed to confirm these potential benefits.

### Summary

Stevia and xylitol are not only safe and tasty sugar alternatives, but also potent natural compounds that provide multiple health benefits.<sup>3,5,8,27,34,36-38,43-45</sup> While both sweeteners improve glucose tolerance and reduce insulin needs, stevia can also lower elevated blood pressure while xylitol can help prevent cavities and ear infections, and possibly strengthen bones.<sup>3,5,8,27,34,36-38,43-45</sup>

Add some stevia to your favorite beverage and chew xylitol gum after meals. Enjoy the sweet taste and gain important health dividends as well. ●

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

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The controversial ban on the importation of stevia in the US continued until 1995 when the **Dietary Supplement Health and Education Act of 1994** forced the FDA to allow stevia to be imported and marketed as a dietary supplement, but not as a sweetener or other food additive purpose.<sup>1</sup> The FDA's policy to classify stevia to be safe for consumption as a "supplement," but potentially harmful as a sweetener just added to the controversy and confusion.

In 2008, after a rigorous review of the scientific evidence, the FDA granted stevia sweeteners GRAS status.<sup>6</sup> It was also approved by the European Union in 2011.<sup>7</sup>

Today, hundreds of foods and beverages throughout the world are sweetened with stevia sweeteners. Among these are Vitamin Water®, Coke Zero®, Sprite Green®, Gatorade's G2® and Crystal Light®, Coca-Cola® and Pepsi Cola® have both disclosed their intentions to use **rebaudioside A**, the sweetest stevia extract, as a **zero-calorie** soft-drink sweetener in the US.<sup>3</sup>

## Health Benefits

While stevia has been documented to have medical purposes as an antimicrobial, anti-diarrheal, anti-tumor, diuretic, anti-inflammatory, and immunomodulatory actions, the scientific evidence is strongest, and its use is most promising for two indications: (1) high blood sugar/insulin resistance and (2) high blood pressure.<sup>3,5,8</sup>

### Stevia May Help Control Blood Sugar And Insulin Levels

Extracts from stevia leaves have been used for centuries as a medicinal herb in the traditional treatment of diabetes in South America.<sup>5,9</sup> Today, scientific evidence on stevia supports its historic precedent in the regulation of blood sugar and insulin.

Avoiding excess elevation of blood sugar and insulin after meals is perhaps the most important dietary measure you can take to reduce your risk for heart disease, cancer, and other age-related disorders. In a recent study in type II diabetic subjects, **stevioside**, one of the stevia extracts, reduced after-meal blood glucose levels by an average of **18%**.<sup>10</sup>

When compared to sugar, stevia consumption before meals results in far lower after-meal glucose and insulin levels.<sup>11</sup> Even when compared to aspartame, stevia resulted in lower post-prandial insulin levels.<sup>11</sup> The comparison with aspartame is more impressive because the change in glucose and insulin levels cannot be due to a difference in calories, as with sugar. A key finding from this study was that participants eating stevia felt satisfied with fewer calories and did not eat more food throughout

the day to compensate.<sup>11</sup> This is an indication of stable blood sugar and insulin levels.

At the root of many cases of chronically elevated glucose and insulin levels is **insulin resistance**. In rats fed a fructose-rich diet for four weeks to induce insulin resistance, stevioside lowered high blood glucose levels in a dose-dependent manner and delayed the development of insulin resistance.<sup>12</sup>

Studies have evaluated the effects of stevioside on animal models of both type I and type II diabetes: elevated blood glucose levels were lowered, and less insulin medication was needed for the same effect. This research clearly demonstrates that stevia has the ability to increase cellular insulin sensitivity and help reverse insulin resistance.<sup>12,13</sup>

Interestingly, the mechanism for stevioside's hypoglycemic effect in the latter group of rats with insulin dependent type I diabetes was determined to be slowing down **gluconeogenesis** (the synthesis of glucose in the liver from non-carbohydrate sources).<sup>13</sup> Another plant compound very familiar to readers of Life Extension magazine®, **chlorogenic acid** from coffee beans, also down-regulates gluconeogenesis. Coffee sweetened with stevia may pack quite a one-two punch for blood sugar control!

The effect of stevia on blood sugar has only been observed when plasma glucose levels are elevated. It does not lower normal blood sugar levels in healthy individuals.<sup>5</sup>

Stevia is not just a safe sugar substitute, but a natural insulin sensitizer that may help maintain normal sugar and insulin levels in diabetics and nondiabetics alike. Since stevia extract also decreases oxidized LDL cholesterol<sup>14</sup> and

triglycerides,<sup>15</sup> and lowers high blood pressure<sup>3,5</sup>—all metabolic risk factors—it has great potential for the treatment of *metabolic syndrome*.

### Stevia May Lower Blood Pressure

A double-blind, placebo-controlled study demonstrated that oral stevioside taken at doses of **250 mg, three times a day** for one year resulted in significant, lasting decreases in both systolic and diastolic blood pressure in patients with mild to moderate hypertension.<sup>16</sup> A longer, subsequent study by the same research team that lasted two years and with an increased dose of stevioside (**1,500 mg**) replicated the decreases in blood pressure found in the initial study.<sup>17</sup>

The stevioside treatment was well-tolerated and no side effects were reported or detected. Moreover, the stevioside treatment group reported significantly higher quality of life scores than the placebo group.<sup>17</sup> On the other hand, it was noted that more patients in the placebo group developed *left ventricular hypertrophy*,<sup>17</sup> an abnormal thickening of the heart muscle often caused by high blood pressure.

Though the effect of stevioside was not better than drugs, it appears comparable and nearly everyone taking stevioside had significant lowering of blood pressure. As in the case of blood sugar, stevioside lowers elevated blood pressure, but not normal blood pressure.<sup>5</sup>

As a natural plant compound with no demonstrated side effects, stevia may offer an alternative or supplementary therapy for high blood pressure, and with possibly better compliance.

### Xylitol: A Sweetener That's Good For Your Teeth

Another sugar substitute with beneficial health properties that is growing in popularity is xylitol. While xylitol is a natural substance found in fruits and vegetables, it is also naturally produced in our bodies during normal carbohydrate metabolism. An average-size adult makes up to **15 grams** of xylitol daily.<sup>18,19</sup>

Xylitol is classified as a *sugar alcohol* (like sorbitol, mannitol, erythritol, etc) because its chemical structure partially resembles sugar and partially resembles alcohol.<sup>20</sup> It is actually a carbohydrate that looks and tastes remarkably like table sugar with **40%** fewer calories and practically no after-taste.<sup>21</sup> It is used as a sweetener in

chewing gums, mints, beverages, sweets, toothpaste and in tabletop granular form. It has been approved for use in foods, pharmaceuticals and oral health products in more than **35** countries worldwide, including the US.<sup>21</sup>

### Xylitol Fights Cavities

Though largely preventable, tooth decay (cavities) is one of the most prevalent chronic diseases among both adults and children, with **1 in 5 Americans** reported to have untreated cavities according to the Centers for Disease Control (CDC).<sup>22</sup> In **2010**, roughly **\$108 billion** dollars were spent on dental services in the US.<sup>23</sup>

By providing fuel for acid-forming bacteria in the mouth, sugar consumption sets up an

### History Of Stevia

Stevia is a perennial shrub with over **200** species belonging to the *Aster (sunflower)* family and indigenous to South America.<sup>46</sup> For centuries, the Guarani tribes of Paraguay and Brazil used the leaves of stevia, which they called *ka'a he'e ("sweet herb")* to sweeten yerba mate tea and various foods. It was also used medicinally as a treatment for diabetes,<sup>47</sup> hypertension, and obesity.<sup>5</sup>

Stevia has been used in Europe and Asia since the sixteenth century when it was discovered by the Spanish Conquistadors.<sup>48</sup> The particular species used as a sweetener, *Stevia rebaudiana Bertoni*, was named after botanist *Moises Santiago Bertoni*, who "rediscovered" stevia and scientifically classified the plant in 1899, describing its sweet taste in detail. The compounds in the stevia leaf that give the plant its sweet taste, *stevioside* and *rebaudioside A*, were isolated in 1931 by French chemists.<sup>2</sup>

During World War II, England began to investigate stevia as an alternative to sugar, which was in short supply.<sup>49</sup> In the 1970s, the Japanese began to use stevia to replace the banned artificial sweetener, saccharin. It became their chosen sugar alternative to sweeten food and beverages, so much so that Japan is now the largest consumer of stevia.<sup>2</sup> Today, stevia can be found growing in China, South America, India, South Korea, Taiwan, and Israel, and is used in many countries around the globe.

ideal acidic condition that promotes decay and demineralization of teeth. Xylitol, conversely, is non-fermentable and does not feed acid-forming oral bacteria. Regular use of xylitol causes cavity-forming bacteria, most notably *Streptococcus mutans* (*S. mutans*), to starve and die off by as much as **73%**, decreasing the level of acidic byproducts formed when bacteria ferment sugars.<sup>24</sup> Xylitol also increases salivary flow which helps to buffer these acids.<sup>25</sup> A more alkaline environment is created, leading to less tooth decay and plaque, and enhanced tooth remineralization. Untreated cavities, especially small decay spots, can harden and become less sensitive from exposure to xylitol.<sup>26</sup>

Considerable research conducted since the early 1970s has established that consuming xylitol products results in reduction in tooth decay rates ranging from **30%** up to levels in excess of **80%**.<sup>27</sup> What's more, the protective effects of xylitol are long-lasting. In a study of nearly **300** children who chewed xylitol gum habitually for over **two** years and then stopped, some experienced a reduction in their tooth decay rate over the next **five** years.<sup>28</sup> Xylitol-sweetened gum even reduces transmission of cavity-causing bacteria from mother to child.<sup>29</sup>

According to newer research, the number of exposures to xylitol throughout the day is more important than the quantity of xylitol.<sup>30</sup> Consider chewing xylitol gum after each meal, sweetening your tea or coffee with xylitol granules and using xylitol toothpaste once or twice a day. Several dental associations, including the *American Dental Association*<sup>31</sup> and the *American Academy of Pediatric Dentistry*,<sup>32</sup> support the use of xylitol in caries control and prevention.

### Xylitol Benefits Diabetes And Metabolic Syndrome

Because xylitol is slowly emptied from the stomach, and only about **50%** of it is absorbed, it has negligible effects on blood sugar and insulin secretion.<sup>33,34</sup> Xylitol has a considerably lower glycemic index (**13**) when compared with sucrose (**65**) and glucose (**100**).<sup>33</sup> It even compares favorably with foods such as legumes and milk.<sup>35</sup>

In a recent animal study examining the antidiabetic potential of xylitol, animals fed xylitol had significantly better *glucose tolerance* (more stable blood sugar levels), less weight gain and significantly lower food intake (suppressed appetite) than both the sugar and control groups.<sup>36</sup> Data from this study and others confirm that xylitol is an ideal low-calorie sweetener for people with diabetes, metabolic syndrome, obesity, and other metabolic disorders.<sup>34,36,37</sup>

Of course, like stevia, xylitol can be used by anyone to help maintain low blood sugar and insulin levels, thereby reducing risk of age-related disease.

### Xylitol Helps Prevent Ear And Upper Respiratory Infections

Xylitol not only suppresses *S. mutans*, the cavity-promoting bacterium, but it also inhibits the growth of *Streptococcus pneumoniae* (*S. pneumoniae*), a major cause of middle ear infections and sinusitis.<sup>38,39</sup> Owing to its unique structure, xylitol also has the ability to interfere with *S. pneumoniae*'s ability to stick to tissues and form colonies of bacteria called *biofilms*, making the germ more vulnerable to treatment.<sup>40</sup>

In clinical trials, xylitol given in the form of chewing gum or syrup reduced middle ear infections in daycare children by **30-40%**.<sup>38,41,42</sup> This safe and great-tasting sweetener offers the possibility of preventing ear infections in children and thus lessening the need for antibiotics.

### Xylitol Strengthens Bone

Since xylitol appears to induce remineralization of tooth enamel, researchers are also now investigating its ability to remineralize bone tissue. Several animal studies show that xylitol increases bone density,<sup>43-45</sup> suggesting that xylitol shows promise in the treatment or prevention of osteoporosis. Clinical trials are needed to confirm these potential benefits.

### Summary

Stevia and xylitol are not only safe and tasty sugar alternatives, but also potent natural compounds that provide multiple health benefits.<sup>3,5,8,27,34,36-38,43-45</sup> While both sweeteners improve glucose tolerance and reduce insulin needs, stevia can also lower elevated blood pressure while xylitol can help prevent cavities and ear infections, and possibly strengthen bones.<sup>3,5,8,27,34,36-38,43-45</sup>

Add some stevia to your favorite beverage and chew xylitol gum after meals. Enjoy the sweet taste and gain important health dividends as well. ●

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

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Look at the labels of foods you use every day and see how many harmful ingredients they contain. There is no reason to continue injuring yourself. Consumers now have access to natural ingredients with documented health benefits.



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A 2 oz bottle of **Better Stevia™ Organic Liquid** retails for **\$11**. During **Super Sale**, members pay **\$7.43** per bottle. Each bottle provides about 482 servings.

## Xyliwhite™ Mouthwash

16 fl. oz. (473 mL) • Item# 00409

Xyliwhite™ Mouthwash is a fluoride-free oral rinse that works in unique ways to help you achieve a smile that's healthier and brighter than ever before! Xyliwhite™ Mouthwash gets its cleansing properties from xylitol - a naturally occurring sugar alcohol that has been shown in clinical studies to help promote dental health; effectively rinsing debris, such as food particles containing bacteria from mouth surfaces. Xylitol also helps safeguard healthy tooth enamel surfaces. By preventing the mouth's pH levels from falling below their normal range, Xyliwhite™ Mouthwash protects the enamel surface of teeth.

A 16 ounce bottle of Xyliwhite™ Mouthwash retails for **\$10**. During **Super Sale**, members pay **\$6.75** per bottle.

**Ingredients:** De-ionized Water, Xylitol, Vegetable Glycerin, Natural Essential Oil Flavor Blend (Peppermint Oil, Eucalyptus Oil, Thyme Oil, Tea Tree Oil, Natural Menthol Crystals, Spearmint Oil, Wintergreen Oil), Aloe Leaf, Grapefruit Seed Extract and Citric Acid



## Rich Rewards™ Dark Chocolate

Item# 01809

Rich Rewards™ **Dark Chocolate** is a unique **70%** dark chocolate that is **100%** sweetened with nature's own sweetener—**xylitol**—without the harmful sugar. Unlike many carbs, natural xylitol sweetener does not cause rapid rises in blood glucose.\* The caloric impact of xylitol is typically about **40%** lower than other carbohydrates. In addition, xylitol may reduce the risk of tooth decay, making it a healthy addition to any diet.\*

**Rich Rewards™ Dark Chocolate** is made using only USDA organic certified cocoa butter and organic cocoa liquor. The retail price for a 15-piece bag is **\$15**. If a member buys four or more bags during **Super Sale**, the price is reduced to **\$8.75** per bag of delicious xylitol-sweetened dark chocolate.



**Reference:** \*Available at: <http://www.xylitol.org/questions-about-xylitol>. Accessed September 26, 2013.

## Better Stevia™ Extract

1 gram 100 packets • Item# 00432

Stevia extract (stevioside) is an extract of *Stevia rebaudiana*, a small plant native to Paraguay and Brazil. Stevioside is 250 times sweeter than table sugar,<sup>1</sup> and is a safe supplement for the human diet.<sup>2-6</sup> Stevia Extract granules has been shown to promote healthy blood sugar levels in those already within normal range.<sup>7-11</sup>

A box containing 100 1 gram packets retails for **\$9.95**. During **Super Sale**, members pay **\$6.72** per box.

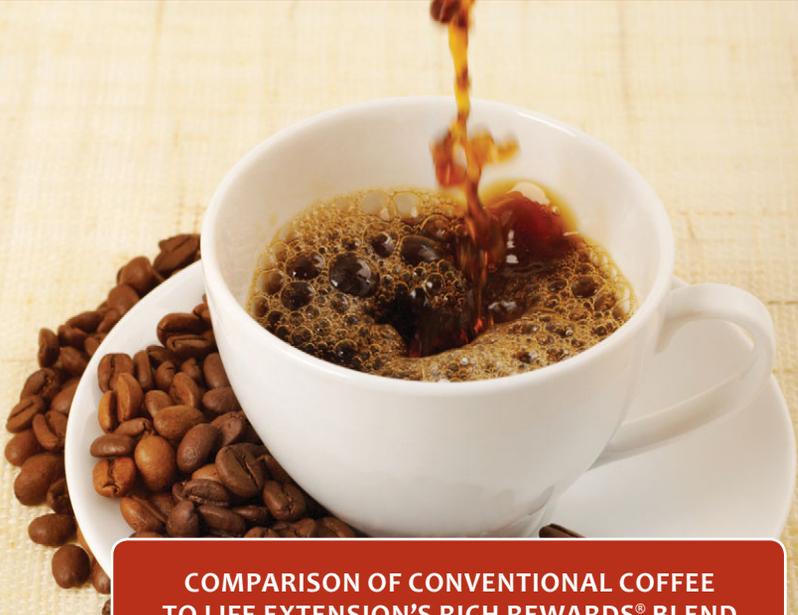


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11. Pharmacognosy Res. 2010 Jul;2(4):258-63.

To order any of these naturally sweet foods and chlorogenic acid-fortified coffees call 1-800-544-4440 or log on to [www.LifeExtension.com](http://www.LifeExtension.com)

# and Synthetic Sweeteners



## COMPARISON OF CONVENTIONAL COFFEE TO LIFE EXTENSION'S RICH REWARDS® BLEND

### Chlorogenic Acid

Conventional Coffee 92 mg  
(Caffeinated)

Conventional Coffee 52 mg  
(Decaffeinated)

### Chlorogenic Acid

Rich Rewards® Coffee Blend 172 mg  
(Caffeinated)

Rich Rewards® Coffee Blend 132 mg  
(Decaffeinated)

## Rich Rewards® Premium Coffees

**Rich Rewards® Premium Coffees** are made from organic Arabica beans using a patented, **100% natural process** called **HealthyRoast™** which delivers a more complete nutritional profile of the coffee bean, yielding **chlorogenic acid** levels far greater than other premium brands. And all without sacrificing a drop of rich gourmet flavor!

Rich Rewards® coffee beans are roasted gently and precisely in small batches with no additives or preservatives. And the HealthyRoast™ process preserves the special, naturally occurring compounds found in coffee beans that make it **easy on your stomach**.

The **100% USDA Organic Certified Arabica beans** used in Rich Rewards® are grown deep in the rainforests of Central America using traditional and ecologically sustainable coffee-growing practices. Then they're hand-picked and **Rainforest Alliance certified**.

**NATURAL MOCHA FLAVOR**



**Rich Rewards® Decaf Roast**  
12 oz. • Item# 01610  
Retail: \$14  
Super Sale Member Price: **\$9.45**



**Rich Rewards® Breakfast Blend**  
12 oz. (340 grams) • Item# 01609  
Retail: \$13  
Super Sale Member Price: **\$8.78**



**Rich Rewards® Natural Mocha Flavor**  
12 oz. (340 grams) • Item# 01730  
Retail: \$15  
Super Sale Member Price: **\$10.13**



**B**lood testing provides the ultimate information regarding correctable risk factors that may predispose you to disorders such as cancer, diabetes, cardiovascular disease, and more. Information about general health and nutritional status can also be gained through standard blood analysis. Standing behind the belief that blood testing is an essential component of any program designed to attain optimal health and longevity, *Life Extension*<sup>®</sup> offers this innovative and convenient service at a very affordable price. Not only is comprehensive blood testing an important step in safeguarding your health, it is a simple process from virtually anywhere in the United States.

#### Five Easy Steps:

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

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

#### For Our Local Members:

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

# Blood Testing The Ultimate Information

## MOST POPULAR PANELS

### Life Extension Member Pricing

- COMPREHENSIVE PANELS**

**○ MALE LIFE EXTENSION PANEL (LC322582) \$269**  
**Chemistry Profile** includes glucose, cholesterol, LDL, HDL, triglycerides, liver and-kidney function tests PLUS 20 additional tests. **CBC** includes immune (white) cell count, red blood cell count and platelet count. Also includes: **C-Reactive Protein**  
**DHEA-S** **Homocysteine**  
**TSH for thyroid function** **Free Testosterone**  
**Estradiol** **Total Testosterone**  
**Vitamin D 25- hydroxy** **PSA (prostate-specific antigen)**  
**Hemoglobin A1c**
- FEMALE LIFE EXTENSION PANEL (LC322535) \$269**  
**Chemistry Profile** includes glucose, cholesterol, LDL, HDL, triglycerides, liver and-kidney function tests PLUS 20 additional tests. **CBC** includes immune (white) cell count, red blood cell count and platelet count. Also includes: **C-Reactive Protein**  
**DHEA-S** **Homocysteine**  
**TSH for thyroid function** **Free Testosterone**  
**Estradiol** **Total Testosterone**  
**Progesterone** **Vitamin D 25- hydroxy**  
**Hemoglobin A1c**
- MALE WEIGHT LOSS PANEL (LCWLM) \$299**  
**Chemistry Profile** includes glucose, cholesterol, LDL, HDL, triglycerides, liver and-kidney function tests PLUS 20 additional tests. **CBC** includes immune (white) cell count, red blood cell count and platelet count. Also includes: **C-Reactive Protein**  
**DHEA-S** **Insulin**  
**SHBG** **Free Testosterone**  
**Estradiol** **Total Testosterone**  
**Free T3** **Free T4**  
**TSH for thyroid function** **PSA (prostate-specific antigen)**
- FEMALE WEIGHT LOSS PANEL (LCWLF) \$299**  
**Chemistry Profile** includes glucose, cholesterol, LDL, HDL, triglycerides, liver and-kidney function tests PLUS 20 additional tests. **CBC** includes immune (white) cell count, red blood cell count and platelet count. Also includes: **C-Reactive Protein**  
**DHEA-S** **Insulin**  
**Progesterone** **Free Testosterone**  
**Estradiol** **Total Testosterone**  
**Free T3** **Free T4**  
**TSH for thyroid function** **SHBG**
- MALE HORMONE ADD-ON PANEL (LCADDM)\* \$155**  
**Pregnenolone and Dihydrotestosterone (DHT)**  
 To provide an even more in-depth analysis of a man's hormone status, Life Extension has created this panel as an addition to the Male Life Extension Panel. This panel provides valuable information about a testosterone metabolite that can affect the prostate, and the mother hormone that acts as a precursor to all other hormones.
- FEMALE HORMONE ADD-ON PANEL (LCADDF)\* \$125**  
**Pregnenolone and Total Estrogens**  
 To provide an even more in-depth analysis of a woman's hormone status, Life Extension has created this panel as an addition to the Female Life Extension Panel. This panel provides valuable information about total estrogen status, and the mother hormone that acts as a precursor to all other hormones.
- LIFE EXTENSION THYROID PANEL (LC304131) \$75**  
**TSH, T4, Free T3, Free T4.**
- FEMALE COMPREHENSIVE HORMONE PANEL\* (LC100011) \$299**  
**CBC/Chemistry Profile** (see description above), **DHEA-S**, **Estradiol**, **Total Estrogens**, **Progesterone**, **Pregnenolone**, **Total and Free Testosterone**, **SHBG**, **TSH**, **Free T3**.
- MALE COMPREHENSIVE HORMONE PANEL\* (LC100010) \$299**  
**CBC/Chemistry Profile** (see description above), **DHEA-S**, **Estradiol**, **DHT**, **PSA**, **Pregnenolone**, **Total and Free Testosterone**, **SHBG**, **TSH**, **Free T3**.
- THE CBC/CHEMISTRY PROFILE (LC381822) \$35**  
**Note:** This CBC/Chemistry Profile is included in many Life Extension panels. Please check panel descriptions.  
**CARDIOVASCULAR RISK PROFILE**  
**Total Cholesterol** **Cholesterol/HDL Ratio**  
**HDL Cholesterol** **Estimated CHD Risk**  
**LDL Cholesterol** **Glucose**  
**Triglycerides** **Iron**  
**LIVER FUNCTION PANEL**  
**AST (SGOT)** **Total Bilirubin**  
**ALT (SGPT)** **Alkaline Phosphatase**  
**LDH**  
**KIDNEY FUNCTION PANEL**  
**BUN** **BUN/Creatinine Ratio**  
**Creatinine** **Uric Acid**  
**BLOOD PROTEIN LEVELS**  
**Total Protein** **Globulin**  
**Albumin** **Albumin/Globulin Ratio**  
**BLOOD COUNT/RED AND WHITE BLOOD CELL PROFILE**  
**Red Blood Cell Count** **Monocytes**  
**White Blood Cell Count** **Lymphocytes**  
**Eosinophils** **Platelet Count**  
**Basophils** **Hemoglobin**  
**Polys (Absolute)** **Hematocrit**  
**Lymphs (Absolute)** **MCV**  
**Monocytes (Absolute)** **MCH**  
**Eos (Absolute)** **MCHC**  
**Baso (Absolute)** **Polynucleated Cells**  
**RDW**  
**BLOOD MINERAL PANEL**  
**Calcium** **Sodium**  
**Potassium** **Chloride**  
**Phosphorus** **Iron**
- COMPREHENSIVE THYROID PANEL (LC100018) \$199**  
**TSH, T4, Free T4, Free T3, Reverse T3, TPO, ATA**
- FOOD SAFE ALLERGY TEST\*\* (LCM73001) \$198**  
 This test measures delayed (IgG) food allergies for 95 common foods.
- ADRENAL FUNCTION PANEL (LC100021) \$136**  
**DHEA-S, AM/PM Cortisol, Glucose, Insulin, Lipid Panel, RBC magnesium**
- OMEGA SCORE™\*\*\* (LCOMEGA) \$131.25**  
 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.
- MITOCHONDRIAL FUNCTION PANEL\* (LC100020) \$159**  
**Carnitine (Free with Total), CoQ10, Glucose**
- VAP™ TEST\* (LC804500) \$90**  
 The VAP™ cholesterol test provides a more comprehensive coronary heart disease (CHD) risk assessment than the conventional lipid profile. Direct measurements, not estimations, are provided for total cholesterol, LDL, HDL, VLDL, and cholesterol subclasses.

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

\*\* This test is packaged as a kit, requiring a finger stick performed at home.



## Other Popular Tests and Panels Life Extension Member Pricing

- |   |  |
|---|--|
| <input type="radio"/> <b>ENERGY PROFILE (LC100005)</b> <b>\$375</b><br>CBC/Chemistry Profile (see description), Epstein –Barr Virus antibodies (IgG and IgM), Cytomegalovirus Antibodies (IgG and IgM), Ferritin, Total and Free Testosterone, DHEA-S, Free T3, Free T4, Cortisol, C-Reactive Protein (high sensitivity), Vitamin B12, Folate, Insulin. | <input type="radio"/> <b>HORMONES</b><br><b>DHEA-SULFATE (LC004020)</b> <b>\$61</b><br>This test shows if you are taking the proper amount of DHEA. This test normally costs \$100 or more at commercial laboratories.   |
| <input type="radio"/> <b>ANEMIA PANEL* (LC100006)</b> <b>\$86</b><br>CBC/Chemistry Profile (see description), Ferritin, Total Iron Binding Capacity (TIBC), Vitamin B12, Folate, Reticulocyte Count.  | <input type="radio"/> <b>DIABESITY PANEL* (LC100019)</b> <b>\$159</b><br>Glucose, Insulin, HbA1c, VAP™, Cortisol, C-Reactive Protein   |
| <input type="radio"/> <b>INFLAMMATION PANEL (LC100007)</b> <b>\$135</b><br>CBC/Chemistry Profile (see description above), C-Reactive Protein (high sensitivity), Sedimentation Rate, Rheumatoid (RA) Factor, Antinuclear Antibodies (ANA) Screen.   | <input type="radio"/> <b>MALE BASIC HORMONE PANEL (LC100012)</b> <b>\$75</b><br>DHEA-S, Estradiol, Free and Total Testosterone, PSA  |
| <input type="radio"/> <b>THYROID ANTIBODY PROFILE (LC100004)</b> <b>\$99</b><br>Thyroid Antithyroglobulin Antibody (ATA) and Thyroid Peroxidase Antibody (TPO).   | <input type="radio"/> <b>FEMALE BASIC HORMONE PANEL (LC100013)</b> <b>\$75</b><br>DHEA-S, Estradiol, Free and Total Testosterone, Progesterone   |
| <input type="radio"/> <b>CARDIAC PLUS* (LC100008)</b> <b>\$145</b><br>CBC/Chemistry profile (see description), Vitamin D 25-hydroxy, C-Reactive Protein (high sensitivity), Fibrinogen, Homocysteine.   | <input type="radio"/> <b>DIHYDROTESTOSTERONE (DHT)* (LC500142)</b> <b>\$99</b><br>Measures serum concentrations of DHT.  |
| <input type="radio"/> <b>VAP™ PLUS* (LC100009)</b> <b>\$330</b><br>VAP, C-Reactive Protein (high sensitivity), Homocysteine, Fibrinogen, PLAC® Test (Lp-PLA2), Vitamin D 25-hydroxy.  | <input type="radio"/> <b>ESTRADIOL (LC004515)</b> <b>\$33</b><br>For men and women. Determines the proper amount in the body.  |
| <b>CARDIAC RISK</b>   | <input type="radio"/> <b>INSULIN FASTING (LC004333)</b> <b>\$25</b><br>Can predict those at risk of diabetes, obesity, and heart and other diseases.   |
| <input type="radio"/> <b>COQ10* (COENZYME Q10) (LC120251)</b> <b>\$99</b><br>This test is used to check the blood level of CoQ10 and will enable more precise dosing for anyone seeking to achieve and maintain high levels of this critical antioxidant.   | <input type="radio"/> <b>PREGNENOLONE* (LC140707)</b> <b>\$116</b><br>Used to determine ovarian failure, hirsutism, adrenal carcinoma, and Cushing's syndrome.   |
| <input type="radio"/> <b>Lp-PLA2 (PLAC® TEST) (LC123240)</b> <b>\$125</b><br>This test is used to aid in predicting risk for coronary heart disease, and ischemic stroke associated with atherosclerosis. Lp-PLA2 is a cardiovascular risk factor that provides unique information about the stability of the plaque inside your arteries.              | <input type="radio"/> <b>PROGESTERONE (LC004317)</b> <b>\$55</b><br>Primarily for women. Determines the proper amount in the body.   |
| <input type="radio"/> <b>C-REACTIVE PROTEIN (HIGH-SENSITIVITY) (LC120766)</b> <b>\$42</b><br>Measures inflammation factors in arteries. Recent studies indicate that C-reactive protein may be the most accurate risk factor for predicting heart attack and stroke.  | <input type="radio"/> <b>SEX HORMONE BINDING GLOBULIN (SHBG) (LC082016)</b> <b>\$33</b><br>This test is used to monitor SHBG levels which are under the positive control of estrogens and thyroid hormones, and suppressed by androgens.   |
| <input type="radio"/> <b>FIBRINOGEN* (LC001610)</b> <b>\$31</b><br>High levels of this blood-clotting factor increase the risk of heart attack and stroke.  | <b>BONE HEALTH</b>   |
| <input type="radio"/> <b>HOMOCYSTEINE (LC706994)</b> <b>\$64</b><br>Can indicate if you are likely to have a heart attack or stroke. Even if you take folic acid, you still may have dangerously high levels of this artery-clogging metabolic debris that can be lowered with high doses of TMG, vitamin B6, and vitamin B12.                          | <input type="radio"/> <b>VITAMIN D (25OH) (LC081950)</b> <b>\$47</b><br>This test is used to rule out vitamin D deficiency as a cause of bone disease. It can also be used to identify hypercalcemia.  |
| <b>MALE HEALTH</b>  | <input type="radio"/> <b>OSTEOCALCIN* (LC010249)</b> <b>\$91</b><br>Osteocalcin is often used as a biochemical marker, or biomarker, for the bone formation process. It has been routinely observed that higher serum osteocalcin levels are relatively well correlated with bone diseases characterized by increased bone turnover, especially osteoporosis.  |
| <input type="radio"/> <b>PSA (PROSTATE-SPECIFIC ANTIGEN) (LC010322)</b> <b>\$31</b><br>Can provide an early warning sign for prostate disorders and possible cancer.  | <input type="radio"/> <b>DPD CROSS LINK URINE TEST (LC511105)</b> <b>\$79</b><br>The deoxypyridinoline (DPD) urine test can be used to measure bone re-absorption rates in healthy individuals and in those with enhanced risk of developing metabolic bone diseases. Deoxypyridinoline can be used to monitor therapies (which may include bisphosphonate drugs) in people diagnosed with osteoporosis. |
| <input type="radio"/> <b>FREE-PSA (INCLUDES TOTAL PSA)* (LC480780)</b> <b>\$61</b><br>Recommended to determine if an elevated PSA is indicative of prostate cancer.   |  |

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

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

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

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

### TERMS AND CONDITIONS

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

Signature of Life Extension Member

X \_\_\_\_\_

Life Extension Foundation Members only

#### MEMBER NO.

Male  Female

Name \_\_\_\_\_

Date of Birth (required) / / \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_

Zip \_\_\_\_\_

Phone \_\_\_\_\_

Credit Card No. \_\_\_\_\_

Expiration Date / \_\_\_\_\_

Mail your order form to:

**LifeExtension**  
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

# PRODUCTS

## AMINO ACIDS

Acetyl-L-Carnitine  
Acetyl-L-Carnitine-Arginate  
Branched Chain Amino Acids  
D, L-Phenylalanine Capsules  
Glycine Capsules  
L-Arginine Capsules  
Arginine/L-Ornithine Capsules  
L-Carnitine Capsules  
L-Carnitine Powder Natural Lemon Flavor  
L-Glutathione, L-Cysteine & C  
L-Glutamine Capsules  
L-Glutamine Powder  
L-Lysine Capsules  
L-Tyrosine Tablets  
Mega L-Glutathione Capsules  
N-Acetyl-L-Cysteine Capsules  
Optimized Carnitine with GlycoCarn®  
PharmaGABA  
Super Carnosine Capsules  
Taurine Capsules

## BONE & JOINT HEALTH

ArthroMax® with Theaflavins and AprèsFlex®  
ArthroMax® Advanced with UC-II® and  
AprèsFlex®  
Bone-Up™  
Bone Restore  
Bone Restore w/Vitamin K2  
Bone Strength Formula w/KoAct™  
Dr. Strum's Intensive Bone Formula  
Fast Acting Joint Formula  
Glucosamine Chondroitin Capsules

## BRAIN HEALTH

Acetyl-L-Carnitine  
Acetyl-L-Carnitine-Arginate  
Brain Shield™  
CDP Choline Capsules  
Cognitex® with Brain Shield™  
Cognitex® with Pregnenolone &  
Brain Shield™  
Cognitex® Basics  
DMAE Bitartrate  
Ginkgo Biloba Certified Extract™  
Huperzine A  
Lecithin Granules  
Methylcobalamin Lozenges  
Migra-Mag with Brain Shield™  
Neuro-Mag™ Magnesium L-Threonate  
Optimized Ashwagandha Extract  
Phosphatidylserine Capsules  
Rhodiola Extract  
Super Ginkgo Extract  
Vinpocetine

## DIGESTIVE

Bifido GI Balance  
Carnosoothe w/PicroProtect  
Digest RC™  
Esophageal Guardian  
Enhanced Super Digestive Enzymes  
Extraordinary Enzymes  
FlorAssist™  
LACTOSOLV™ Long Lasting Digestion  
Pancreatin  
Regimint  
Theralac Probiotics

## DURK AND SANDY PRODUCTS

Blast™  
Inner Power™

## EYE CARE

Bilberry Extract  
Brite Eyes III  
Eye Pressure Support with Mirtogenol®  
MacuGuard™ Ocular Support  
MacuGuard™ Ocular Support with Astaxanthin  
Solarshield Sunglasses

## FIBER

AppleWise Polyphenol  
Fiber Food  
TruFiber®  
WellBetX PGX® plus Mulberry

## FOOD

Rich Rewards™ Black Bean Vegetable Soup  
Rich Rewards™ Spicy Cruciferous Vegetable Soup  
Rich Rewards™ Cruciferous Vegetable Soup  
Rich Rewards™ Lentil Soup  
Rich Rewards™ Mung Bean Soup with Turmeric  
Rich Rewards® Coffee  
(Available in mocha, vanilla and decaffeinated)  
Rich Rewards™ Dark Chocolate

## HAIR CARE

Dr. Proctor's Advanced Hair Formula  
Dr. Proctor's Shampoo  
Super-Absorbable Tocotrienols

## HEART HEALTH

AppleWise Polyphenol  
Advanced Lipid Control  
Aspirin (Enteric Coated)  
Cardio Peak™ w/Standardized Hawthorn and Arjuna  
Cho-Less™  
D-Ribose Tablets  
D-Ribose Powder  
Endothelial Defense™ with  
Full-Spectrum Pomegranate™  
Fibrinogen Resist  
Forskolin  
Homocysteine Resist  
Natural BP Management  
Olive Leaf Vascular Support  
Peak ATP® with GlycoCarn®  
PhosphOmega®  
Policosanol  
PROVINAL® Purified Omega-7  
Pycnogenol® French Maritime Pine Bark Extract  
Red Yeast Rice  
Super Absorbable CoQ10™ with d-Limonene  
Super Omega-3 EPA/DHA with Sesame  
Lignans & Olive Fruit Extract  
Super Ubiquinol CoQ10  
Super Ubiquinol CoQ10 with BioPQQ®  
Super Ubiquinol CoQ10 with Enhanced  
Mitochondrial™ Support  
Theaflavin Standardized Extract  
TMG Powder  
TMG Tablets

## HERBAL/PHYTO PRODUCTS

Artichoke Leaf Extract  
Asian Energy Boost  
Astaxanthin w/Phospholipids  
Berry Complete  
Blueberry Extract  
Blueberry Extract w/Pomegranate  
Butterbur Extract w/Standardized  
Rosmarinic Acid  
Calcium D-Glucarate  
Enhanced Berry Complete with Acai  
Full-Spectrum Pomegranate™  
Grapeseed Extract with Resveratrol &  
Pterostilbene  
Huperzine A  
Kyolic® Garlic Formula 102 + 105  
Kyolic® Reserve  
Mega Green Tea Extract  
Mega Green Tea Extract (Decaffeinated)  
(also w/CoffeeGenic® Green Coffee Extract)  
Mega Lycopene Extract  
Optimized Ashwagandha Extract  
Optimized Garlic  
Pomegranate Extract  
Pomegranate Juice Concentrate  
Pycnogenol  
Optimized Quercetin

Resveratrol with Synergistic Grape-Berry Actives  
Rhodiola Extract  
Silymarin  
SODzyme™ with GliSODin®  
Stevia Extract  
Advanced Bio-Curcumin®  
with Ginger & Turmerones  
Super Bio-Curcumin®  
Super Ginkgo Extract  
Triple Action Cruciferous Vegetable Extract  
Venotone  
Whole Grape Extract

## HORMONES

Advanced Natural Sex for Women® 50+  
7-KETO® DHEA  
DHEA  
DHEA Complete  
GH Pituitary Support Day Formula  
GH Pituitary Support Night Formula  
Liquid Melatonin  
Melatonin  
Melatonin Timed Release  
Natural Estrogen with Pomegranate Extract  
Pregnenolone  
ProgestaCare for Women  
Super Miraforte with Standardized Lignans

## IMMUNE ENHANCEMENT

AHCC® (Active Hexose Correlated Compound)  
Black Cumin Seed Oil  
Black Cumin Seed Oil w/Bio-Curcumin®  
Buffered Vitamin C Powder  
Echinacea Extract  
FlorAssist™ Probiotic  
i26 Hyperimmune Egg  
Immune Modulator w/Tinofend®  
Immune Protect with PARACTIN®  
Lactoferrin  
Norwegian Shark Liver Oil  
Optimized Fucoidan w/Maritech® 926  
ProBoost™ Thymic Protein A  
Reishi Extract Mushroom Complex  
Vitamin C with Dihydroquercetin  
Winter Wellness™  
Zinc Lozenges

## INFLAMMATORY REACTIONS

Arthro-Immune Joint Support  
ArthroMax® with Theaflavins  
Boswella  
Bromelain (Specially-coated)  
Cytokine Suppress™ with EGCG  
DHA (Vegetarian Sourced)  
Fast Acting Joint Formula  
Ginger Force  
Krill Healthy Joint Formula  
5-LOX Inhibitor w/AprèsFlex®  
Mega EPA/DHA  
Mega GLA with Sesame Lignans  
MSM  
Omega-3 Whirl  
Serrafazyme  
SODzyme™ with GliSODin® and Wolfberry  
Super Omega-3 EPA/DHA with Sesame  
Lignans & Olive Fruit Extract  
Tart Cherry w/Standardized CherryPURE®  
Zyflamend® Whole Body

## LIVER HEALTH

Branch Chain Amino Acids  
N-Acetyl Cysteine  
Liver Efficiency Formula  
European Milk Thistle  
Advanced Phospholipid Delivery  
Hepatopro  
SAME  
Silymarin

## MINERALS

Biosil  
 Bone Restore  
 Bone Strength Formula w/KoAct®  
 Bone-Up™  
 Boron Capsules  
 Calcium Citrate with D3  
 Chromium Ultra  
 Copper  
 Iodoral  
 Iron Protein Plus  
 Magnesium  
 Magnesium Citrate  
 Only Trace Minerals  
 Optimized Chromium w/Crominex® 3+  
 OptiZinc  
 Sea-Iodine™  
 Selenium  
 Se-Methyl L-Selenocysteine  
 Strontium  
 Vanadyl Sulfate  
 Zinc Lozenges

## MISCELLANEOUS

Blood Pressure Monitor Arm Cuff  
 CR Way Edition Advanced Dietary Software

## MITOCHONDRIAL SUPPORT

Acetyl-L-Carnitine  
 Acetyl-L-Carnitine-Arginate  
 Mitochondrial Basics w/BioPQQ®  
 Mitochondrial Energy Optimizer w/BioPQQ®  
 Optimized Carnitine with GlycoCarn®  
 Super Absorbable CoQ10™ with d-Limonene  
 Super Alpha Lipoic Acid with Biotin  
 Super R-Lipoic Acid  
 Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™

## MOOD RELIEF

Adrenal Energy Formula  
 Bioactive Milk Peptides  
 L-Theanine  
 5 HTP  
 Enhanced Natural Sleep® w/ Melatonin  
 Enhanced Natural Sleep® w/o Melatonin  
 Natural Stress Relief  
 SAME  
 St. John's Wort Extract  
 L-Tryptophan  
 Optimized Tryptophan Plus

## MOUTH CARE

Advanced Oral Hygiene  
 Mouthwash w/Pomegranate  
 Toothpaste  
 Xyliwhite™ Mouthwash

## MULTIVITAMIN

Booster  
 Children's Formula Life Extension Mix™  
 Comprehensive Nutrient Packs Basic  
 Comprehensive Nutrient Packs Advanced  
 Life Extension Mix™ Capsules  
 Life Extension Mix™ Powder  
 Life Extension Mix™ Tablets  
 Life Extension Mix™ w/o Copper Capsules  
 Life Extension Mix™ w/o Copper Tablets  
 Life Extension Mix™ w/Extra Niacin  
 Life Extension Mix™ w/Extra Niacin w/o Copper  
 Life Extension Mix™ w/Stevia Powder  
 Life Extension Mix™ w/Stevia w/o Copper Powder  
 Life Extension One-Per-Day  
 Life Extension Two-Per-Day  
 Super Booster Softgels w/Advanced K2 Complex

## PET CARE

Cat Mix  
 Dog Mix

## PROSTATE & URINARY HEALTH

Optimized Cran-Max® with UTIRose™  
 5-LOXIN®  
 Pomi-T™

(Water-Soluble) Pumpkin Seed Extract  
 Super Saw Palmetto with Beta-Sitosterol  
 Super Saw Palmetto/Nettle Root Formula w/Beta-Sitosterol  
 Ultra Natural Prostate Formula

## SKIN CARE

Advanced Under Eye Serum with Stem Cells  
 Amber Self MicroDermAbrasion  
 Anti-Aging Mask  
 Anti-Glycation Serum  
 Anti-Aging Rejuvenating Face Cream with Coffee Extracts  
 Antioxidant Rejuvenating Foot Cream  
 Antioxidant Rejuvenating Foot Scrub  
 Antioxidant Rejuvenating Hand Cream  
 Antioxidant Rejuvenating Hand Scrub  
 Anti-Redness & Blemish Lotion  
 Bio-Collagen w/Patented UC-II®  
 Bioflavonoid Cream  
 Broccoli Sprout  
 Corrective Clearing Mask  
 DNA Repair Cream  
 Dual-Action MicroDermAbrasion  
 Essential Plant Lipids Reparative Serum  
 Face Master® Platinum  
 Face Rejuvenating Antioxidant Cream  
 Enhanced FernBlock® with Red Orange Complex  
 Fine Line-Less  
 Hair Suppress Formula  
 Healing Formula All-in-One Cream  
 Healing Mask  
 Hyaluronic Facial Moisturizer  
 Hydrating Anti-oxidant Face Mist  
 Hydroderm®  
 Lifting & Tightening Complex  
 Lycopene Cream  
 Melatonin Cream  
 Mild Facial Cleanser  
 Neck Rejuvenating Antioxidant Cream  
 Pigment Correcting Cream (Ultra) Rejuvenex®  
 Rejuvenex® Body Lotion  
 Rejuvenex® Factor Firming Serum  
 Rejuvenating Serum  
 Renewing Eye Cream  
 Resveratrol Anti-Oxidant Serum  
 Skin Lightening Serum  
 Skin Restoring Phytoceramides w/Lipowheat®  
 Skin Stem Cell Serum  
 Stem Cell Cream w/Alpine Rose  
 Ultra Rejuvenex®  
 Ultra RejuveNight® w/o Progesterone  
 Ultra Lip Plumper  
 Ultra Wrinkle Relaxer  
 Under Eye Refining Serum  
 Under Eye Rescue Cream  
 Vitamin C Serum  
 Vitamin D Lotion  
 Vitamin E-ssential Cream  
 Vitamin K Healing Cream  
 Youth Serum

## SOY

Natural Estrogen w/Pomegranate  
 Super Absorbable Soy Isoflavones  
 Ultra Soy Extract

## SPECIAL PURPOSE FORMULA

Anti-Alcohol Antioxidants w/HepatoProtection Complex  
 Benfotiamine w/Thiamine  
 Breast Health Formula  
 Butterbur Extract w/Standardized Rosmarinic Acid  
 Chlorella  
 Chlorophyllin  
 Green Coffee Extract CoffeeGenic® (also w/Glucose control)  
 Coriolus Super Strength  
 CR Mimetic Longevity Formula

Cinsulin® w/InSea2® and Crominex® 3+  
 European Leg Solution Diosmin 95  
 Fem Dophilus  
 Femmenessence MacaPause®  
 GlycemicPro™ Transglucosidase  
 Migra-eeze™  
 Natural Female Support  
 Pecta-So!®  
 Potassium Iodide  
 PQQ Caps with BioPQQ®  
 PteroPure™  
 Prelox® Natural Sex for Men®  
 Pyridoxal 5' - Phosphate  
 Tri Sugar Shield™

## SPORTS PERFORMANCE

Creatine Capsules  
 DMG (N, N-dimethylglycine)  
 L-Glutamine Capsules  
 L-Glutamine Powder  
 Whey Protein Isolate  
 Whey Protein Concentrate

## VITAMINS

Ascorbyl Palmitate Capsules  
 B12  
 Beta-Carotene  
 Biotin Capsules  
 Buffered Vitamin C Powder  
 Complete B Complex  
 Effervescent Vitamin C  
 Fast-C®  
 Folic Acid + B12  
 Gamma E Tocopherol w/Sesame Lignans  
 Gamma E Tocopherol/Tocotrienols  
 Inositol Capsules  
 Mega Lycopene Extract  
 Methylcobalamin  
 MK-7  
 No-Flush Niacin  
 Optimized Folate  
 Super Ascorbate C Capsules  
 Super Ascorbate C Powder  
 Super K w/Advanced K2 Complex  
 Tocotrienols w/Sesame Lignans  
 Vitamin B3 (Niacin) Capsules  
 Vitamin B6  
 Vitamin B12 Lozenges  
 Vitamin C  
 Vitamin D3  
 Vitamin D3 w/Sea-Iodine™  
 Vitamins D and K w/Sea-Iodine™  
 Vitamin E  
 Vitamin K2

## WEIGHT MANAGEMENT

Advanced Anti-Adipocyte Formula w/AdipoStat & Integra Lean®  
 Advanced Natural Appetite Suppress  
 Alli® Refill Pack  
 Calorie Control Weight Management™ Formula w/CoffeeGenic® Green Coffee Extract  
 CoffeeGenic® Weight Management™ with Green Coffee Extract  
 7-KETO DHEA  
 DHEA® Complete  
 Fucoxanthin Slim™  
 Garcinia HCA  
 Integra-Lean® African Mango Irvingia  
 LuraLean® Caps Special Propolmannan Particle Size  
 Optimized Irvingia w/Phase 3™ Calorie Control Complex  
 Optimized Saffron with Satiereal®  
 Natural Appetite Control  
 Natural Glucose Absorption Control  
 Super CLA Blend w/Guarana and Sesame Lignans  
 Super CLA Blend w/Sesame Lignans  
 WellBetX PGX® plus Mulberry

# Buyers Club Order Form

**SUPER SALE SAVINGS ON ALL PRODUCTS**  
To order call 1-800-544-4440

No.		Retail Each	Member Each	Qty	Total
<b>A</b>					
01524	<b>ACETYL-L-CARNITINE</b> - 500 mg, 100 veg. caps	\$34.00	\$25.50		
	Buy 4 bottles, price each	30.00	22.50		
01525	<b>ACETYL-L-CARNITINE ARGINATE</b> - 100 veg. caps	59.00	44.25		
	Buy 4 bottles, price each	50.99	38.24		
01628	<b>ADRENAL ENERGY FORMULA</b> - 60 veg. caps	24.00	18.00		
	Buy 4 bottles, price each	22.00	16.50		
01630	<b>ADRENAL ENERGY FORMULA</b> - 120 veg. caps	46.00	34.50		
	Buy 4 bottles, price each	42.00	31.50		
01308	<b>ADVANCED LIPID CONTROL</b> - 60 veg. caps	30.00	22.50		
	Buy 4 bottles, price each	27.00	20.25		
01521	<b>ADVANCED ORAL HYGIENE</b> - 60 veg. mint lozenges	20.00	15.00		
	Buy 4 bottles, price each	18.00	13.50		
00681	<b>AHCC</b> - 500 mg, 30 caps	59.98	44.99		
*46925	<b>ALLI® REFILL PACK</b> - 120 caps	69.95	58.00		
00457	<b>ALPHA-LIPOIC ACID w/BIOTIN (SUPER)</b> - 250 mg, 60 caps	37.00	27.75		
	Buy 4 bottles, price each	32.00	24.00		
01440	<b>ANTI-ALCOHOL ANTIOXIDANTS w/HEPATOPRO</b> - 100 caps	26.00	19.50		
	Buy 4 bottles, price each	23.00	17.25		
01509	<b>ANTI-ADIPOCYTE FORMULA w/ADIPOSTAT &amp; INTEGRA LEAN® (ADVANCED)</b> - 60 veg. caps	39.00	29.25		
	Buy 4 bottles, price each	36.00	27.00		
01625	<b>APPLEWISE POLYPHENOL EXTRACT</b> - 600 mg, 30 veg. caps	21.00	15.75		
	Buy 4 bottles, price each	19.00	14.25		
01039	<b>ARGININE/ORNITHINE</b> - 500/250, 100 caps	17.99	13.49		
00038	<b>ARGININE/ORNITHINE POWDER</b> - 150 grams	22.95	17.21		
	Buy 4 bottles, price each	19.00	14.25		
01624	<b>(L)-ARGININE CAPS</b> - 700 mg, 200 veg. caps	26.50	19.88		
	Buy 4 bottles, price each	23.25	17.44		
01617	<b>ARTHROMAX® w/THEAFLAVINS &amp; APRESFLEX®</b> - 120 veg. caps	44.00	33.00		
	Buy 4 bottles, price each	40.00	30.00		
01618	<b>ARTHROMAX® ADVANCED w/UC-II® &amp; APRESFLEX®</b> - 60 caps	36.00	27.00		
	Buy 4 bottles, price each	32.00	24.00		
01404	<b>ARTHRO-IMMUNE JOINT SUPPORT</b> - 60 veg. caps	32.00	24.00		
	Buy 4 bottles, price each	28.00	21.00		
00919	<b>ARTICHOKE LEAF EXTRACT</b> - 500 mg, 180 veg. caps	28.00	21.00		
	Buy 4 bottles, price each	25.38	19.04		
01533	<b>ASCORBYL PALMITATE</b> - 500 mg, 100 veg. caps	22.50	16.88		
	Buy 4 bottles, price each	20.00	15.00		
00888	<b>ASHWAGANDHA EXTRACT (OPTIMIZED)</b> - 60 veg. caps	10.00	7.50		
	Buy 4 bottles, price each	9.00	6.75		
01805	<b>ASIAN ENERGY BOOST</b> - 90 veg. caps	24.00	18.00		
	Buy 4 bottles, price each	22.00	16.50		
01066	<b>ASPIRIN</b> - 81 mg, 300 enteric coated tablets	6.00	4.50		
	Buy 4 bottles, price each	5.33	4.00		
01720	<b>ASTAXANTHIN WITH PHOSPHOLIPIDS</b> - 4 mg, 30 softgels	16.00	12.00		
	Buy 4 bottles, price each	14.00	10.50		
<b>B</b>					
00920	<b>BENFOTIAMINE w/ THIAMINE</b> - 100 mg, 120 veg. caps	\$19.95	\$14.96		
	Buy 4 bottles, price each	18.60	13.95		
00925	<b>BENFOTIAMINE (MEGA)</b> - 250 mg, 120 veg. caps	30.00	22.50		
	Buy 4 bottles, price each	27.00	20.25		
01206	<b>BERRY COMPLETE</b> - 30 veg. caps	21.00	15.75		
	Buy 4 bottles, price each	18.67	14.00		

**SUB-TOTAL OF COLUMN 1**

No.		Retail Each	Member Each	Qty	Total
01496	<b>BERRY COMPLETE w/ACAI (ENHANCED)</b> - 60 veg. caps	\$29.00	\$21.75		
	Buy 4 bottles, price each	26.00	19.50		
00664	<b>BETA-CAROTENE</b> - 25,000 IU, 100 softgels	11.25	8.44		
01622	<b>BIFIDO GI BALANCE</b> - 60 veg. caps	20.00	15.00		
	Buy 4 bottles, price each	18.00	13.50		
01073	<b>BILBERRY EXTRACT</b> - 100 mg, 100 veg. caps	42.00	31.50		
	Buy 4 bottles, price each	38.00	28.50		
01512	<b>BIOACTIVE MILK PEPTIDES</b> - 30 caps	18.00	13.50		
	Buy 4 bottles, price each	16.00	12.00		
01631	<b>BIO-COLLAGEN w/PATENTED UC-II®</b> - 60 caps	36.00	27.00		
	Buy 4 bottles, price each	32.00	24.00		
*01006	<b>BIOSIL™</b> - 5 mg, 30 veg. caps	18.95	15.16		
*01007	<b>BIOSIL™</b> - 1 fl oz	31.99	25.59		
00102	<b>BIOTIN</b> - 600 mcg, 100 caps	7.50	5.63		
	Buy 4 bottles, price each	6.50	4.88		
01709	<b>BLACK CUMIN SEED OIL</b> - 60 softgels	16.00	12.00		
	Buy 4 bottles, price each	14.00	10.50		
01710	<b>BLACK CUMIN SEED OIL w/BIO-CURCUMIN®</b> - 60 softgels	32.00	24.00		
	Buy 4 bottles, price each	30.00	22.50		
01008	<b>BLAST™</b> - 600 grams of powder	26.95	20.21		
70000	<b>BLOOD PRESSURE MONITOR</b> - ARM CUFF (medium)	99.95	64.97		
70004	<b>BLOOD PRESSURE MONITOR</b> - WRIST (travel size)	69.95	52.46		
01214	<b>BLUEBERRY EXTRACT</b> - 60 veg. caps	22.50	16.88		
	Buy 4 bottles, price each	20.00	15.00		
01438	<b>BLUEBERRY EXTRACT w/POMEGRANATE</b> - 60 veg. caps	30.00	22.50		
	Buy 4 bottles, price each	27.00	20.25		
01506	<b>BONE FORMULA (DR. STRUM'S INTENSIVE)</b> - 300 caps	56.00	42.00		
	Buy 4 bottles, price each	50.00	37.50		
01726	<b>BONE RESTORE</b> - 120 caps	22.00	16.50		
	Buy 4 bottles, price each	19.00	14.25		
01727	<b>BONE RESTORE w/VITAMIN K2</b> - 120 caps	24.00	18.00		
	Buy 4 bottles, price each	22.00	16.50		
01725	<b>BONE STRENGTH FORMULA w/KOACT®</b> - 120 veg. caps	45.00	33.75		
	Buy 4 bottles, price each	40.00	30.00		
00313	<b>BONE-UP®</b> - 240 caps	28.95	21.71		
	Buy 4 bottles, price each	27.21	20.41		
01379	<b>BOOSTER</b> - 60 softgels	48.00	36.00		
	Buy 4 bottles, price each	44.00	33.00		
01680	<b>BOOSTER w/ADVANCED K2 COMPLEX (SUPER)</b> - 60 softgels	42.00	31.50		
	Buy 4 bottles, price each	38.00	28.50		
01661	<b>BORON</b> - 3 mg, 100 veg. caps	5.95	4.46		
	Buy 4 bottles, price each	5.25	3.94		
00202	<b>BOSWELLA</b> - 100 caps	38.00	28.50		
	Buy 4 bottles, price each	30.00	22.50		
01802	<b>BRAIN SHIELD™</b> - 60 veg. caps	33.00	24.75		
	Buy 4 bottles, price each	30.00	22.50		
01253	<b>BRANCHED CHAIN AMINO ACIDS</b> - 90 veg. caps	19.50	14.63		
	Buy 4 bottles, price each	17.00	12.75		
01699	<b>BREAST HEALTH FORMULA</b> - 60 veg. caps	34.00	25.50		
	Buy 4 bottles, price each	30.00	22.50		
00893	<b>BRITE EYES III</b> - 2 vials, 5 ml each	34.00	25.50		
	Buy 4 boxes, price each	32.00	24.00		

**SUB-TOTAL OF COLUMN 2**

FEBRUARY 2014

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

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

**OFFER ENDS FEBRUARY 3, 2014**  
**To order online visit [www.LifeExtension.com/SuperSale](http://www.LifeExtension.com/SuperSale)**

# Buyers Club Order Form

No.		Retail Each	Member Each	Qty	Total
01203	<b>BROMELAIN (SPECIALLY-COATED)</b> - 500 mg, 60 enteric coated tablets Buy 4 bottles, price each	\$21.00 19.00	\$15.75 14.25		
00884	<b>BUTTERBUR EXT. w/STANDARDIZED ROSMARINIC ACID</b> - 60 softgels Buy 4 bottles, price each	44.00 39.60	33.00 29.70		
<b>C</b>					
01653	<b>CALCIUM CITRATE w/VITAMIN D</b> - 300 caps Buy 4 bottles, price each	\$24.00 21.25	\$18.00 15.94		
01651	<b>CALCIUM D-GLUCARATE</b> - 200 mg, 60 veg. caps Buy 4 bottles, price each	18.00 15.00	13.50 11.25		
01693	<b>CALORIE CONTROL WEIGHT MANAGEMENT FORMULA w/COFFEEGENIC® GREEN COFFEE EXTRACT BLUEBERRY FLAVOR</b> - 414 grams powder Buy 4 jars, price each Buy 8 jars, price each	60.00 54.00 50.00	45.00 40.50 37.50		
01700	<b>CARDIO PEAK™ w/STANDARDIZED HAWTHORN &amp; ARJUNA</b> - 120 veg. caps Buy 4 bottles, price each	36.00 32.00	27.00 24.00		
00916	<b>CARNITINE w/GLYCOCARN® (OPTIMIZED)</b> - 60 veg. caps Buy 4 bottles, price each	36.00 32.00	27.00 24.00		
01532	<b>L-CARNITINE</b> - 500 mg, 30 veg. caps Buy 4 bottles, price each	15.00 13.20	11.25 9.90		
01719	<b>L-CARNITINE POWDER NATURAL LEMON FLAVOR</b> - 114 grams Buy 4 jars, price each	28.00 24.00	21.00 18.00		
01258	<b>CARNOSSOOTHIE w/PICROPROTECT™</b> - 60 veg. caps Buy 4 bottles, price each	29.95 27.00	22.46 20.25		
01687	<b>CARNOSINE (SUPER)</b> - 500 mg, 90 veg. caps Buy 4 bottles, price each	66.00 60.00	49.50 45.00		
01003	<b>CAT MIX</b> - 100 grams powder Buy 4 jars, price each	15.00 12.00	11.25 9.00		
01659	<b>CDP CHOLINE CAPS</b> - 250 mg, 60 veg. caps Buy 4 bottles, price each	36.00 34.00	27.00 25.50		
01391	<b>CHILDREN'S FORMULA LIFE EXTENSION MIX™</b> - 100 chewable tablets Buy 4 bottles, price each	20.00 18.00	15.00 13.50		
00550	<b>CHLORELLA</b> - 500 mg, 200 tablets	23.50	17.63		
01571	<b>CHLOROPHYLLIN</b> - 100 mg, 100 veg. caps Buy 4 bottles, price each	24.00 20.00	18.00 15.00		
01359	<b>CHO-LESS™</b> - 90 capsules	33.50	25.13		
01477	<b>CHROMIUM ULTRA</b> - 100 veg. caps Buy 4 bottles, price each	24.00 21.00	18.00 15.75		
01504	<b>CHROMIUM W/CROMINEX® 3+ (OPTIMIZED)</b> - 500 mcg, 60 veg. caps Buy 4 bottles, price each	9.00 8.00	6.75 6.00		
01503	<b>CINSULIN® W/INSEA® AND CROMINEX® 3+</b> - 90 veg. caps Buy 4 bottles, price each	38.00 34.00	28.50 25.50		
00818	<b>CLA BLEND W/SESAME LIGNANS (SUPER)</b> - 1,000 mg, 120 softgels Buy 4 bottles, price each Buy 10 bottles, price each	36.00 33.00 26.33	27.00 24.75 19.75		
00819	<b>CLA BLEND w/GUARANA &amp; SESAME (SUPER)</b> - 1,000 mg, 120 softgels Buy 4 bottles, price each	42.00 38.33	31.50 28.75		
01707	<b>COFFEEGENIC® WEIGHT MANAGEMENT™ w/GREEN COFFEE EXTRACT</b> - 90 veg. caps Buy 4 bottles, price each	48.00 42.00	36.00 31.50		
01896	<b>COGNITEX® w/BRAIN SHIELD™</b> - 90 softgels Buy 4 bottles, price each Buy 8 bottles, price each	60.00 52.00 48.00	45.00 39.00 36.00		

**SUB-TOTAL OF COLUMN 3**

No.		Retail Each	Member Each	Qty	Total
01897	<b>COGNITEX® w/PREGNENOLONE &amp; BRAIN SHIELD™</b> - 90 softgels Buy 4 bottles, price each Buy 8 bottles, price each	\$62.00 53.00 50.00	\$46.50 39.75 37.50		
01421	<b>COGNITEX® BASICS</b> - 60 softgels Buy 4 bottles, price each Buy 12 bottles, price each	38.00 35.00 32.00	28.50 26.25 24.00		
01735	<b>COMPLETE B-COMPLEX</b> - 60 veg. caps Buy 4 bottles, price each	10.00 9.00	7.50 6.75		
01795	<b>COMPREHENSIVE NUTRIENT PACKS BASIC</b> - 30 packs Buy 4 boxes, price each	48.00 44.00	36.00 33.00		
01798	<b>COMPREHENSIVE NUTRIENT PACKS ADVANCED</b> - 30 packs Buy 4 boxes, price each	90.00 82.00	67.50 61.50		
00119	<b>COPPER CAPSULES</b> - 2 mg, 100 caps	9.91	7.43		
00949	<b>COQ10™ w/ d-LIMONENE (SUPER ABSORBABLE)</b> - 50 mg, 60 softgels Buy 4 bottles, price each Buy 10 bottles, price each	25.00 22.00 20.00	18.75 16.50 15.00		
00950	<b>COQ10™ w/ d-LIMONENE (SUPER ABSORBABLE)</b> - 100 mg, 100 softgels Buy 4 bottles, price each Buy 10 bottles, price each	66.00 60.00 56.00	49.50 45.00 42.00		
01226	<b>COQ10 (SUPER UBIQUINOL)</b> - 100 mg, 60 softgels Buy 4 bottles, price each Buy 10 bottles, price each	56.00 52.00 48.00	42.00 39.00 36.00		
01733	<b>COQ10 w/BIOPQQ® (SUPER UBIQUINOL)</b> - 100 mg, 30 softgels Buy 4 bottles, price each Buy 10 bottles, price each	54.00 50.00 46.00	40.50 37.50 34.50		
01426	<b>COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (SUPER UBIQUINOL)</b> - 100 mg, 60 softgels Buy 4 bottles, price each Buy 10 bottles, price each	62.00 56.00 52.00	46.50 42.00 39.00		
01425	<b>COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (SUPER UBIQUINOL)</b> - 50 mg, 100 softgels Buy 4 bottles, price each Buy 10 bottles, price each	58.00 53.00 50.00	43.50 39.75 37.50		
01427	<b>COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (SUPER UBIQUINOL)</b> - 50 mg, 30 softgels Buy 4 bottles, price each	20.00 18.00	15.00 13.50		
01431	<b>COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (SUPER UBIQUINOL)</b> - 200 mg, 30 softgels Buy 4 bottles, price each Buy 10 bottles, price each	62.00 56.00 52.00	46.50 42.00 39.00		
01053	<b>CORIOLUS SUPER STRENGTH</b> - 600 mg, 150 veg. caps	99.95	74.96		
80140	<b>COSMESIS ADVANCED UNDER EYE SERUM w/STEM CELLS</b> - .33 oz Buy 2 bottles, price each	49.00 42.00	36.75 31.50		
80139	<b>COSMESIS AMBER SELF MICRODERMABRASION</b> - 2 oz Buy 2 jars, price each	49.00 42.00	36.75 31.50		
80151	<b>COSMESIS ANTI-AGING REJUVENATING FACE CREAM</b> - 2 oz jar w/COFFEE EXTRACT Buy 2 jars, price each	65.00 57.00	48.75 42.75		
80118	<b>COSMESIS ANTI-AGING MASK</b> - 2 oz Buy 2 bottles, price each	72.00 63.36	54.00 47.52		
80134	<b>COSMESIS ANTI-GLYCATION SERUM</b> - 1 oz w/BLUEBERRY & POMEGRANATE EXTRACTS Buy 2 bottles, price each	33.00 31.35	24.75 23.51		
80133	<b>COSMESIS ANTIOXIDANT FACIAL MIST</b> - 2 oz Buy 2 bottles, price each	32.00 30.40	24.00 22.80		
80127	<b>COSMESIS ANTIOXIDANT REJUVENATING FOOT CREAM</b> - 2 oz Buy 2 jars, price each	45.00 42.80	33.75 32.10		

**SUB-TOTAL OF COLUMN 4**

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

FEBRUARY 2014

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

# Buyers Club Order Form

**SUPER SALE SAVINGS ON ALL PRODUCTS**  
To order call 1-800-544-4440

No.		Retail Each	Member Each	Qty	Total
<b>C CONTINUED</b>					
80128	<b>COSMESIS ANTIOXIDANT REJUVENATING FOOT SCRUB - 2 oz</b> Buy 2 jars, price each	\$59.00 51.92	\$44.25 38.94		
80117	<b>COSMESIS ANTIOXIDANT REJUVENATING HAND CREAM - 2 oz</b> Buy 2 jars, price each	64.00 57.49	48.00 43.12		
80121	<b>COSMESIS ANTIOXIDANT REJUVENATING HAND SCRUB - 2 oz</b> Buy 2 jars, price each	58.00 51.04	43.50 38.28		
80105	<b>COSMESIS ANTI-REDNESS &amp; ADULT BLEMISH LOTION - 1 oz</b> Buy 2 bottles, price each	74.50 65.56	55.88 49.17		
80147	<b>COSMESIS BIOFLAVONOID CREAM - 1 oz jar</b> Buy 2 jars, price each	46.00 39.00	34.50 29.25		
80144	<b>COSMESIS BROCCOLI SPROUT CREAM - 1 oz</b> Buy 2 jars, price each	46.00 39.00	34.50 29.25		
80120	<b>COSMESIS CORRECTIVE CLEARING MASK - 2 oz</b> Buy 2 jars, price each	64.50 56.76	48.38 42.57		
80141	<b>COSMESIS DNA REPAIR CREAM - 1 oz jar</b> Buy 2 jars, price each	49.00 42.00	36.75 31.50		
80108	<b>COSMESIS ESSENTIAL PLANT LIPIDS REPARATIVE SERUM - 1 oz</b> Buy 2 bottles, price each	74.95 65.95	56.21 49.46		
80123	<b>COSMESIS FACE REJUVENATING ANTIOXIDANT CREAM - 2 oz</b> Buy 2 jars, price each	69.50 61.16	52.13 45.87		
80107	<b>COSMESIS FINE LINE-LESS - 1 oz</b> Buy 2 bottles, price each	74.50 65.56	55.88 49.17		
80131	<b>COSMESIS HAIR SUPPRESS FORMULA - 4 oz</b> Buy 2 bottles, price each	59.00 51.92	44.25 38.94		
80137	<b>COSMESIS HEALING FORMULA ALL-IN-ONE CREAM - 1 oz</b> Buy 2 jars, price each	53.00 45.43	39.75 34.07		
80115	<b>COSMESIS HEALING MASK - 2 oz</b> Buy 2 bottles, price each	64.50 56.76	48.38 42.57		
80102	<b>COSMESIS HEALING VITAMIN K CREAM - 1 oz</b> Buy 2 bottles, price each	79.50 69.96	59.63 52.47		
80109	<b>COSMESIS HYALURONIC FACIAL MOISTURIZER - 1 oz</b> Buy 2 bottles, price each	58.00 51.04	43.50 38.28		
80110	<b>COSMESIS HYALURONIC OIL-FREE FACIAL MOISTURIZER - 1 oz</b> Buy 2 bottles, price each	58.00 51.04	43.50 38.28		
80138	<b>COSMESIS HYDRATING ANTIOXIDANT FACE MIST - 4 oz</b> Buy 2 bottles, price each	39.95 38.00	29.96 28.50		
80103	<b>COSMESIS LIFTING &amp; TIGHTENING COMPLEX - 1 oz</b> Buy 2 tubes, price each	74.50 65.56	55.88 49.17		
80146	<b>COSMESIS LYCOPENE CREAM - 1 oz jar</b> Buy 2 jars, price each	28.00 25.40	21.00 19.05		
80135	<b>COSMESIS MELATONIN CREAM - 1 oz</b> Buy 2 jars, price each	33.00 27.10	24.75 20.33		
80114	<b>COSMESIS MILD FACIAL CLEANSER - 8 oz</b> Buy 2 bottles, price each	59.00 51.92	44.25 38.94		
80122	<b>COSMESIS NECK REJUVENATING ANTIOXIDANT CREAM - 2 oz</b> Buy 2 jars, price each	64.00 56.32	48.00 42.24		
80111	<b>COSMESIS PIGMENT CORRECTING CREAM - 1/2 oz</b> Buy 2 bottles, price each	74.00 65.12	55.50 48.84		
80106	<b>COSMESIS REJUVENATING SERUM - 1 oz</b> Buy 2 bottles, price each	74.50 65.56	55.88 49.17		
80150	<b>COSMESIS RENEWING EYE CREAM - 1/2 oz</b> Buy 2 jars, price each	65.00 57.00	48.75 42.75		

**SUB-TOTAL OF COLUMN 5**

No.		Retail Each	Member Each	Qty	Total
80142	<b>COSMESIS RESVERATROL ANTI-OXIDANT SERUM - 1 oz</b> Buy 2 bottles, price each	\$46.00 39.00	\$34.50 29.25		
80112	<b>COSMESIS SKIN LIGHTENING SERUM - 1/2 oz</b> Buy 2 bottles, price each	85.00 74.80	63.75 56.10		
80130	<b>COSMESIS SKIN STEM CELL SERUM - 1 oz</b> Buy 2 bottles, price each	74.00 69.00	55.50 51.75		
80143	<b>COSMESIS STEM CELL CREAM W/ALPINE ROSE - 1 oz jar</b> Buy 2 jars, price each	66.00 58.00	49.50 43.50		
80148	<b>COSMESIS TIGHTENING &amp; FIRMING NECK CREAM - 2 oz jar</b> Buy 2 jars, price each	39.00 35.00	29.25 26.25		
80116	<b>COSMESIS ULTRA LIP PLUMPER - 1/3 oz</b> Buy 2 bottles, price each	64.00 56.32	48.00 42.24		
80101	<b>COSMESIS ULTRA WRINKLE RELAXER - 1 oz</b> Buy 2 bottles, price each	89.95 79.76	67.46 59.82		
80113	<b>COSMESIS UNDER EYE REFINING SERUM - 1/2 oz</b> Buy 2 bottles, price each	74.50 65.56	55.88 49.17		
80104	<b>COSMESIS UNDER EYE RESCUE CREAM - 1/2 oz</b> Buy 2 bottles, price each	74.50 65.56	55.88 49.17		
80129	<b>COSMESIS VITAMIN C SERUM - 1 oz</b> Buy 2 bottles, price each	85.00 74.80	63.75 56.10		
80136	<b>COSMESIS VITAMIN D LOTION - 4 oz</b> Buy 2 bottles, price each	36.00 33.66	27.00 25.25		
80145	<b>COSMESIS VITAMIN E-ESSENTIAL CREAM - 1 oz</b> Buy 2 jars, price each	28.00 26.00	21.00 19.50		
80149	<b>COSMESIS YOUTH SERUM - 1 oz</b> Buy 2 bottles, price each	65.00 57.00	48.75 42.75		
00862	<b>CRAN-MAX® - 500 mg, 60 veg. caps</b> Buy 4 bottles, price each	17.50 15.00	13.13 11.25		
01424	<b>CRAN-MAX® with UTIROSE™ (OPTIMIZED) - 60 veg. caps</b> Buy 4 bottles, price each	18.00 16.00	13.50 12.00		
01529	<b>CREATINE CAPSULES - 120 veg. caps</b> Buy 4 bottles, price each	10.95 9.25	8.21 6.94		
01746	<b>CREATINE WHEY GLUTAMINE POWDER - 454 grams (vanilla)</b> Buy 4 jars, price each	30.00 27.00	22.50 20.25		
01429	<b>CR MIMETIC LONGEVITY FORMULA - 60 veg. caps</b> Buy 4 bottles, price each	39.00 36.00	29.25 27.00		
*33840	<b>CRWAY GREAT GLUCOSE CONTROL CD</b>	98.00	82.00		
**CRWAY	<b>CR WAY OPTIMAL HEALTH PROGRAM SOFTWARE</b>	195.00	195.00		
00407	<b>CURCUMIN® (SUPER BIO) - 400 mg, 60 veg. caps</b> Buy 4 bottles, price each	38.00 35.00	28.50 26.25		
01808	<b>CURCUMIN® w/GINGER &amp; TURMERONES (ADVANCED BIO)-30 softgels</b> Buy 4 bottles, price each	30.00 27.00	22.50 20.25		
01804	<b>CYTOKINE SUPPRESS™ w/EGCG - 30 veg. caps</b> Buy 4 bottles, price each	30.00 27.00	22.50 20.25		
<b>D</b>					
00658	<b>7-KETO® DHEA METABOLITE - 25 mg, 100 caps</b> Buy 4 bottles, price each	\$28.00 24.00	\$21.00 18.00		
01479	<b>7-KETO® DHEA METABOLITE - 100 mg, 60 veg. caps</b> Buy 4 bottles, price each	40.00 36.00	30.00 27.00		
01640	<b>DHA (VEGETARIAN SOURCED) - 200 mg, 30 veg. softgels</b> Buy 4 bottles, price each	20.00 18.00	15.00 13.50		
00607	<b>DHEA - 25 mg, 100 tablets (dissolve in mouth)</b> Buy 4 bottles, price each	14.00 11.75	10.50 8.81		

**SUB-TOTAL OF COLUMN 6**

FEBRUARY 2014

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

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

**OFFER ENDS FEBRUARY 3, 2014**  
 To order online visit [www.LifeExtension.com/SuperSale](http://www.LifeExtension.com/SuperSale)

# Buyers Club Order Form

No.		Retail Each	Member Each	Qty	Total
01478	<b>DHEA COMPLETE</b> - 60 veg. caps Buy 4 bottles, price each	\$48.00 43.20	\$36.00 32.40		
00335	<b>DHEA</b> - 25 mg, 100 caps Buy 4 bottles, price each	18.00 15.00	13.50 11.25		
00454	<b>DHEA</b> - 15 mg, 100 caps Buy 4 bottles, price each	14.00 12.00	10.50 9.00		
00882	<b>DHEA</b> - 50 mg, 60 caps Buy 4 bottles, price each	19.00 17.00	14.25 12.75		
01689	<b>DHEA</b> - 100 mg, 60 veg. caps Buy 4 bottles, price each	24.00 22.00	18.00 16.50		
01358	<b>DIGEST RC</b> - 30 tablets Buy 4 boxes, price each	19.95 17.00	14.96 12.75		
01272	<b>DIGESTIVE ENZYMES (ENHANCED SUPER)</b> - 100 veg. caps Buy 4 bottles, price each	18.95 16.00	14.21 12.00		
01671	<b>D,L-PHENYLALANINE CAPSULES</b> - 500 mg, 100 veg. caps Buy 4 bottles, price each	18.75 16.00	14.06 12.00		
01540	<b>DMAE BITARTRATE</b> - 150 mg, 200 veg. caps Buy 4 bottles, price each	18.00 15.00	13.50 11.25		
00059	<b>DMG</b> - 125 mg, 60 tablets Buy 4 boxes, price each	22.80 21.00	17.10 15.75		
01570	<b>DNA PROTECTION FORMULA</b> - 60 veg. caps Buy 4 bottles, price each	34.00 32.00	25.50 24.00		
00544	<b>DOG MIX</b> - 100 grams powder Buy 4 jars, price each	19.50 16.00	14.63 12.00		
00321	<b>DR. PROCTOR'S ADVANCED HAIR FORMULA</b> - 2 oz Buy 4 bottles, price each	39.95 32.00	29.96 24.00		
00320	<b>DR. PROCTOR'S HAIR FORMULA SHAMPOO</b> - 8 oz Buy 4 bottles, price each	24.95 22.00	18.71 16.50		
00899	<b>DUAL-ACTION MICRODERMABRASION ADV. EXFOLIATE</b> - 2.4 oz Buy 4 jars, price each	39.95 38.95	29.96 29.21		
<b>E</b>					
01528	<b>ECHINACEA EXTRACT</b> - 250 mg, 60 veg. caps Buy 4 bottles, price each	\$14.35 12.50	\$10.76 9.38		
01498	<b>ENDOTHELIAL DEFENSE™ w/FULL-SPECTRUM POMEGRANATE™</b> - 60 softgels Buy 4 bottles, price each	56.00 52.00	42.00 39.00		
00997	<b>ENDOTHELIAL DEFENSE™ w/GLISODIN®</b> - 60 veg. caps Buy 4 bottles, price each	54.00 48.00	40.50 36.00		
00625	<b>EPA/DHA (MEGA)</b> - 120 softgels Buy 4 bottles, price each	19.95 18.00	14.96 13.50		
01737	<b>ESOPHAGEAL GUARDIAN</b> (Berry flavor) - 60 chewable tablets Buy 4 bottles, price each	36.00 32.00	27.00 24.00		
01042	<b>EUROPEAN LEG SOLUTION DIOSMIN 95</b> - 600 mg, 30 veg. tabs Buy 4 bottles, price each	20.00 18.00	15.00 13.50		
01706	<b>EXTRAORDINARY ENZYMES</b> - 60 caps Buy 4 bottles, price each	26.00 24.00	19.50 18.00		
01514	<b>EYE PRESSURE SUPPORT w/MIRTOGENOL®</b> - 30 veg. caps Buy 4 bottles, price each	38.00 34.00	28.50 25.50		
<b>F</b>					
01054	<b>FACE MASTER® PLATINUM</b>	\$199.00	\$199.00		
00965	<b>FAST-ACTING JOINT FORMULA</b> - 30 caps Buy 4 bottles, price each	39.00 36.00	29.25 27.00		
01717	<b>FAST-C® w/DIHYDROQUERCETIN</b> - 120 veg. tabs Buy 4 bottles, price each	26.00 24.00	19.50 18.00		

**SUB-TOTAL OF COLUMN 7**

No.		Retail Each	Member Each	Qty	Total
20053	<b>FEM DOPHILUS®</b> - 30 caps	\$25.95	\$19.46		
20055	<b>FEM DOPHILUS®</b> - 60 caps	39.95	29.96		
01064	<b>FEMMENESSENCE MACAPAUSE®</b> - 120 veg. caps	34.99	26.24		
01728	<b>FERNBLOCK® w/RED ORANGE COMPLEX (ENHANCED)</b> - 30 veg. caps Buy 4 bottles, price each	42.00 38.00	31.50 28.50		
01670	<b>FIBER FOOD CAPS</b> - 200 veg. caps Buy 4 bottles, price each Buy 10 bottles, price each	16.00 14.00 13.00	12.00 10.50 9.75		
00718	<b>FIBRINOGEN RESIST™</b> - 30 veg. caps Buy 4 bottles, price each	49.00 44.00	36.75 33.00		
01806	<b>FLORASSIST™ PROBIOTIC</b> - 30 liquid veg. caps Buy 4 boxes, price each	33.00 30.00	24.75 22.50		
01439	<b>FOLATE (OPTIMIZED) (L-METHYLFOLATE)</b> 1,000 mcg - 100 veg. caps Buy 4 bottles, price each	28.00 25.00	21.00 18.75		
01641	<b>FOLIC ACID + B12 CAPSULES</b> - 200 veg. caps Buy 4 bottles, price each	10.50 9.50	7.88 7.13		
01544	<b>FORSKOLIN</b> - 10 mg, 60 veg.caps Buy 4 bottles, price each	16.00 14.00	12.00 10.50		
01513	<b>FUCOIDAN w/MARITECH® 926 (OPTIMIZED)</b> - 60 veg. caps Buy 4 bottles, price each	36.00 33.00	27.00 24.75		
00993	<b>FUCOXANTHIN-SLIM™</b> - 90 softgels Buy 4 bottles, price each	44.00 39.00	33.00 29.25		
<b>G</b>					
00559	<b>GAMMA E TOCOPHEROL/TOCOTRIENOLS</b> - 60 softgels Buy 4 bottles, price each	\$42.00 37.00	\$31.50 27.75		
00759	<b>GAMMA E TOCOPHEROL w/SESAME LIGNANS</b> - 60 softgels Buy 4 bottles, price each	32.00 29.00	24.00 21.75		
01394	<b>(OPTIMIZED) GARLIC</b> - 200 veg. caps Buy 4 bottles, price each	24.95 21.00	18.71 15.75		
01301	<b>GH PITUITARY SUPPORT DAY FORMULA</b> - 120 tabs Buy 4 bottles, price each	48.00 44.00	36.00 33.00		
01302	<b>GH PITUITARY SUPPORT NIGHT FORMULA</b> - 120 veg. caps Buy 4 bottles, price each	25.00 22.50	18.75 16.88		
**01228	<b>GINGER FORCE</b> - 60 softgels	31.95	23.96		
01658	<b>GINKGO BILOBA CERTIFIED EXTRACT™</b> - 120 mg, 365 veg. caps Buy 2 bottles, price each	46.00 43.50	34.50 32.63		
01648	<b>GINKGO EXTRACT 28/7 (SUPER)</b> - 120 mg, 100 veg. caps Buy 4 bottles, price each	29.00 26.50	21.75 19.88		
00756	<b>GLA WITH SESAME LIGNANS (MEGA)</b> - 60 softgels Buy 4 bottles, price each	19.50 18.00	14.63 13.50		
00345	<b>(L) GLUTAMINE CAPSULES</b> - 500 mg, 100 caps Buy 4 bottles, price each	14.95 13.50	11.21 10.13		
00141	<b>(L)-GLUTAMINE POWDER</b> - 100 grams Buy 4 bottles, price each	22.00 20.00	16.50 15.00		
00522	<b>GLUCOSAMINE/CHONDROITIN CAPSULES</b> - 100 caps Buy 4 bottles, price each	38.00 32.00	28.50 24.00		
01541	<b>GLUTATHIONE, CYSTEINE &amp; C</b> - 100 veg. caps Buy 4 bottles, price each	20.00 18.00	15.00 13.50		
00314	<b>L-GLUTATHIONE (MEGA)</b> - 250 mg, 60 caps	39.64	29.73		
01731	<b>GLYCEMICPRO™ TRANSGLUCOSIDASE</b> - 60 veg. caps Buy 4 bottles, price each	48.00 42.00	36.00 31.50		
01669	<b>GLYCINE</b> - 1,000 mg, 100 veg. caps Buy 4 bottles, price each	12.00 10.80	9.00 8.10		

**SUB-TOTAL OF COLUMN 8**

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

FEBRUARY 2014

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

# Buyers Club Order Form

**SUPER SALE SAVINGS ON ALL PRODUCTS**  
To order call 1-800-544-4440

No.		Retail Each	Member Each	Qty	Total
<b>G CONTINUED</b>					
01091	<b>GRAPE EXTRACT w/RESVERATROL (WHOLE)</b> - 60 veg. caps Buy 4 bottles, price each	\$36.00 34.00	\$27.00 25.50		
01411	<b>GRAPE SEED EXTRACT w/RESVERATROL &amp; PTEROSTILBENE</b> - 100 mg, 60 veg. caps Buy 4 bottles, price each	36.00 34.00	27.00 25.50		
01604	<b>GREEN COFFEE EXTRACT COFFEEGENIC®</b> - 200 mg, 90 veg. caps Buy 4 bottles, price each	25.00 22.00	18.75 16.50		
01620	<b>GREEN COFFEE EXTRACT COFFEEGENIC®</b> - 400 mg, 90 veg. caps Buy 4 bottles, price each	38.00 34.00	28.50 25.50		
00953	<b>GREEN TEA EXTRACT (MEGA)</b> - lightly caffeinated - 100 veg. caps Buy 4 bottles, price each	30.00 28.00	22.50 21.00		
00954	<b>GREEN TEA EXTRACT (MEGA)</b> - decaffeinated - 100 veg. caps Buy 4 bottles, price each	30.00 28.00	22.50 21.00		
<b>H</b>					
01074	<b>5 HTP</b> - 100 mg, 60 caps	\$27.95	\$20.96		
01738	<b>HCA (GARCINIA)</b> - 90 veg. caps Buy 4 bottles, price each	16.00 14.00	12.00 10.50		
01393	<b>HEPATOPRO</b> - 900 mg, 60 softgels Buy 4 bottles, price each	50.00 46.00	37.50 34.50		
01435	<b>HOMOCYSTEINE RESIST</b> - 100 caps Buy 4 bottles, price each	24.00 21.60	18.00 16.20		
01527	<b>HUPERZINE A</b> - 200 mcg, 60 veg caps Buy 4 bottles, price each	40.00 36.00	30.00 27.00		
00661	<b>HYDRODERM®</b> - 1 oz Buy 2 bottles, price each	79.95 65.33	59.96 49.00		
<b>I</b>					
*01060	<b>i26® HYPERIMMUNE EGG</b> - 140 grams powder	\$54.99	\$46.75		
01704	<b>IMMUNE MODULATOR W/TINOFEND®</b> - 60 veg. caps Buy 4 bottles, price each	17.00 15.00	12.75 11.25		
00955	<b>IMMUNE PROTECT W/PARACTIN®</b> - 30 veg. caps Buy 4 bottles, price each	29.50 26.55	22.13 19.91		
01049	<b>INNERPOWER™</b> - 555 grams powder	42.00	31.50		
01674	<b>INOSITOL CAPSULES</b> - 1,000 mg, 360 veg. caps Buy 4 bottles, price each	62.00 58.00	46.50 43.50		
01292	<b>INTEGRA-LEAN® AFRICAN MANGO IRVINGIA</b> - 150 mg, 60 veg. caps Buy 4 bottles, price each	28.00 24.00	21.00 18.00		
01002	<b>IODORAL®</b> - 180 tabs	50.00	37.50		
01677	<b>IRON PROTEIN PLUS</b> - 300 mg, 100 veg. caps Buy 4 bottles, price each	28.00 26.00	21.00 19.50		
01492	<b>IRVINGIA W/PHASE 3™</b> - 120 veg. caps <b>CALORIE CONTROL COMPLEX (OPTIMIZED AFRICAN MANGO)</b> Buy 4 bottles, price each	56.00 48.00	42.00 36.00		
<b>J, K</b>					
00056	<b>JARRO-DOPHILUS EPS™</b> - 60 veg. caps	\$22.95	\$17.21		
01724	<b>K w/ADVANCED K2 COMPLEX (SUPER)</b> - 90 softgels Buy 4 bottles, price each	30.00 27.00	22.50 20.25		
01600	<b>KRILL HEALTHY JOINT FORMULA</b> - 30 softgels Buy 4 bottles, price each	32.00 29.00	24.00 21.75		
01050	<b>KRILL OIL PHOSPHOMEGA™</b> - 60 softgels	33.95	25.46		
00316	<b>KYOLIC® GARLIC FORMULA 102</b> - 200 caps	26.45	19.84		
00214	<b>KYOLIC® GARLIC FORMULA 105</b> - 200 caps	27.45	20.59		
00789	<b>KYOLIC® RESERVE</b> - 600 mg, 120 caps	27.95	20.96		

**SUB-TOTAL OF COLUMN 9**

No.		Retail Each	Member Each	Qty	Total
<b>L</b>					
01681	<b>LACTOFERRIN (APOLACTOFERRIN) CAPS</b> - 60 caps Buy 4 bottles, price each	\$48.00 44.00	\$36.00 33.00		
01702	<b>LACTOSOLV™ LONG LASTING LACTASE</b> - 30 caps Buy 4 boxes, price each	30.00 27.00	22.50 20.25		
00020	<b>LECITHIN</b> - 16 oz. granules Buy 4 jars, price each	15.00 12.50	11.25 9.38		
01855	<b>LIFE EXTENSION MIX™</b> - 315 tablets Buy 4 bottles, price each Buy 10 bottles, price each	98.00 86.00 69.50	73.50 64.50 52.13		
01857	<b>LIFE EXTENSION MIX™ W/EXTRA NIACIN</b> - 315 tablets Buy 4 bottles, price each Buy 10 bottles, price each	98.00 86.00 69.50	73.50 64.50 52.13		
01854	<b>LIFE EXTENSION MIX™</b> - 490 caps Buy 4 bottles, price each Buy 10 bottles, price each	110.00 98.00 85.00	82.50 73.50 63.75		
01856	<b>LIFE EXTENSION MIX™ POWDER</b> - 14.81 oz Buy 4 bottles, price each Buy 10 bottles, price each	98.00 86.00 72.00	73.50 64.50 54.00		
01865	<b>LIFE EXTENSION MIX™</b> - 315 tablets w/o copper Buy 4 bottles, price each Buy 10 bottles, price each	98.00 86.00 69.50	73.50 64.50 52.13		
01867	<b>LIFE EXTENSION MIX™ W/EXTRA NIACIN</b> 315 tablets w/o copper Buy 4 bottles, price each Buy 10 bottles, price each	98.00 86.00 69.50	73.50 64.50 52.13		
01864	<b>LIFE EXTENSION MIX™</b> - 490 caps w/o copper Buy 4 bottles, price each Buy 10 bottles, price each	110.00 98.00 85.00	82.50 73.50 63.75		
01866	<b>LIFE EXTENSION MIX™ POWDER</b> - 14.81 oz w/o copper Buy 4 bottles, price each Buy 10 bottles, price each	98.00 86.00 72.00	73.50 64.50 54.00		
01608	<b>LIVER EFFICIENCY FORMULA</b> - 30 veg. caps Buy 4 bottles, price each	18.00 16.00	13.50 12.00		
01639	<b>5-LOX INHIBITOR W/APRESFLEX®</b> - 100 mg, 60 veg. caps Buy 4 bottles, price each	22.00 20.00	16.50 15.00		
01678	<b>L-LYSINE</b> - 620 mg, 100 veg. caps Buy 4 bottles, price each	9.00 8.00	6.75 6.00		
01470	<b>LURALEAN® CAPS SPECIAL PROPOLMANNAN PARTICLE SIZE</b> - 120 veg. caps Buy 4 bottles, price each	28.00 25.00	21.00 18.75		
00455	<b>LYCOPENE EXTRACT (MEGA)</b> - 15 mg, 90 softgels Buy 4 bottles, price each	35.00 30.00	26.25 22.50		
<b>M</b>					
01885	<b>MACUGUARD™ OCULAR SUPPORT</b> - 60 softgels Buy 4 bottles, price each	\$22.00 19.80	\$16.50 14.85		
01886	<b>MACUGUARD™ OCULAR SUPPORT w/ASTAXANTHIN</b> - 60 softgels Buy 4 bottles, price each	42.00 38.00	31.50 28.50		
01459	<b>MAGNESIUM CAPS</b> - 500 mg, 100 veg. caps Buy 4 bottles, price each	12.00 10.00	9.00 7.50		
01682	<b>MAGNESIUM CITRATE</b> - 160 mg, 100 veg. caps Buy 4 bottles, price each	9.00 7.50	6.75 5.63		

**SUB-TOTAL OF COLUMN 10**

FEBRUARY 2014

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

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

**OFFER ENDS FEBRUARY 3, 2014**  
 To order online visit [www.LifeExtension.com/SuperSale](http://www.LifeExtension.com/SuperSale)

# Buyers Club Order Form

No.		Retail Each	Member Each	Qty	Total
01668	<b>MELATONIN</b> - 300 mcg, 100 veg. caps Buy 4 bottles, price each	\$5.75 5.00	\$4.31 3.75		
01083	<b>MELATONIN</b> - 500 mcg, 200 veg. caps Buy 4 bottles, price each	18.00 16.00	13.50 12.00		
00329	<b>MELATONIN</b> - 1 mg, 60 caps Buy 4 bottles, price each	5.00 4.63	3.75 3.47		
00330	<b>MELATONIN</b> - 3 mg, 60 caps Buy 4 bottles, price each	8.00 6.88	6.00 5.16		
01786	<b>MELATONIN TIME RELEASE</b> - 3 mg, 60 veg. tabs Buy 4 bottles, price each	12.00 11.00	9.00 8.25		
00331	<b>MELATONIN</b> - 10 mg, 60 caps Buy 4 bottles, price each	28.00 24.00	21.00 18.00		
00332	<b>MELATONIN</b> - 3 mg, 60 veg. lozenges Buy 4 bottles, price each	8.00 6.88	6.00 5.16		
01734	<b>MELATONIN</b> (Fast Acting Liquid) - 3 mg (Natural Citrus-Van) Buy 4 bottles, price each	12.00 11.00	9.00 8.25		
01787	<b>MELATONIN TIME RELEASE</b> - 300 mcg, 100 veg. tabs Buy 4 bottles, price each	12.00 11.00	9.00 8.25		
01788	<b>MELATONIN TIME RELEASE</b> - 750 mcg, 60 veg. tablets Buy 4 bottles, price each	8.00 7.00	6.00 5.25		
01536	<b>METHYLCOBALAMIN</b> - 1 mg, 60 lozenges (vanilla) Buy 4 bottles, price each	9.95 8.00	7.46 6.00		
01537	<b>METHYLCOBALAMIN</b> - 5 mg, 60 lozenges (vanilla) Buy 4 bottles, price each Buy 10 bottles, price each	32.00 25.00 23.00	24.00 18.75 17.25		
00709	<b>MIGRA-EEZE™ (BUTTERBUR)</b> - 60 softgels Buy 4 bottles, price each	29.50 26.33	22.13 19.75		
01800	<b>MIGRA-MAG w/BRAIN SHIELD™</b> - 90 veg. caps Buy 4 bottles, price each	22.00 20.00	16.50 15.00		
01822	<b>MILK THISTLE (EUROPEAN)</b> - 60 softgels Buy 4 bottles, price each	28.00 25.00	21.00 18.75		
01817	<b>MILK THISTLE (EUROPEAN)</b> - 120 softgels Buy 4 bottles, price each	44.00 40.00	33.00 30.00		
01698	<b>MIRAFORTE w/STANDARDIZED LIGNANS (SUPER)</b> - 120 caps Buy 4 bottles, price each	62.00 56.00	46.50 42.00		
01769	<b>MITOCHONDRIAL BASICS w/BIOPQQ®</b> - 30 caps Buy 4 bottles, price each	52.00 46.00	39.00 34.50		
01768	<b>MITOCHONDRIAL ENERGY OPTIMIZER w/BIOPQQ®</b> - 120 caps Buy 4 bottles, price each	94.00 84.00	70.50 63.00		
00065	<b>MK-7</b> - 90 mcg, 60 softgels Buy 4 bottles, price each	28.00 25.00	21.00 18.75		
01279	<b>MOUTHWASH W/POMEGRANATE</b> - 16 oz Buy 4 bottles, price each	18.50 17.00	13.88 12.75		
00451	<b>MSM (METHYLSULFONYLMETHANE)</b> - 1,000 mg, 100 caps Buy 4 bottles, price each	14.00 11.95	10.50 8.96		
<b>N</b>					
01534	<b>#-ACETYL-L-CYSTEINE</b> - 600 mg, 60 veg. caps Buy 4 bottles, price each	\$14.00 13.50	\$10.50 10.13		
00066	<b>NATTOKINASE</b> - 60 softgels	25.50	19.13		
00891	<b>NATURAL APPETITE CONTROL</b> - 90 softgels Buy 4 bottles, price each	28.00 25.20	21.00 18.90		
01807	<b>NATURAL APPETITE SUPPRESS (ADVANCED)</b> - 60 veg. caps Buy 4 bottles, price each	38.00 34.00	28.50 25.50		

**SUB-TOTAL OF COLUMN 11**

No.		Retail Each	Member Each	Qty	Total
00984	<b>NATURAL BP MANAGEMENT</b> - 60 tablets Buy 4 bottles, price each	\$42.00 37.80	\$31.50 28.35		
01692	<b>NATURAL ESTROGEN w/POMEGRANATE EXTRACT</b> - 60 caplets Buy 4 bottles, price each	38.00 33.00	28.50 24.75		
01221	<b>NATURAL FEMALE SUPPORT</b> - 30 veg. caps Buy 4 bottles, price each	28.00 24.00	21.00 18.00		
01471	<b>NATURAL GLUCOSE ABSORPTION CONTROL</b> - 60 veg. caps Buy 4 bottles, price each	39.00 36.00	29.25 27.00		
01626	<b>NATURAL SEX FOR WOMEN® 50+ (ADVANCED)</b> - 90 veg. caps Buy 4 bottles, price each	59.00 45.33	44.25 34.00		
01444	<b>NATURAL SLEEP®</b> - 60 veg. caps Buy 4 bottles, price each	13.00 10.00	9.75 7.50		
01551	<b>NATURAL SLEEP® w/ MELATONIN (ENHANCED)</b> - 30 caps Buy 4 bottles, price each	22.00 20.00	16.50 15.00		
01511	<b>NATURAL SLEEP® w/o MELATONIN (ENHANCED)</b> - 30 caps Buy 4 bottles, price each	20.00 18.00	15.00 13.50		
01445	<b>NATURAL SLEEP® MELATONIN</b> - 5 mg, 60 veg. caps Buy 4 bottles, price each	18.00 16.00	13.50 12.00		
00987	<b>NATURAL STRESS RELIEF</b> - 30 veg. caps Buy 4 bottles, price each	28.00 24.00	21.00 18.00		
01603	<b>NEURO-MAG™ MAGNESIUM L-THREONATE</b> - 90 veg. caps Buy 4 bottles, price each	40.00 36.00	30.00 27.00		
01602	<b>NEURO-MAG™ L-THREONATE W/CALCIUM &amp; VITAMIN D</b> 225 grams - Lemon flavor Buy 4 bottles, price each	40.00 36.00	30.00 27.00		
00373	<b>NO-FLUSH NIACIN</b> - 800 mg, 100 caps Buy 4 bottles, price each	19.00 17.00	14.25 12.75		
<b>O</b>					
01623	<b>OLIVE LEAF VASCULAR SUPPORT</b> - 500 mg, 60 veg. caps Buy 4 bottles, price each	\$22.00 20.00	\$16.50 15.00		
01483	<b>OMEGA 3 EPA/DHA w/SESAME LIGNANS &amp; OLIVE FRUIT EXTRACT (SUPER)</b> - 60 softgels Buy 4 bottles, price each Buy 10 bottles, price each	18.00 16.00 14.00	13.50 12.00 10.50		
01482	<b>OMEGA 3 EPA/DHA w/SESAME LIGNANS &amp; OLIVE FRUIT EXTRACT (SUPER)</b> - 120 softgels Buy 4 bottles, price each Buy 10 bottles, price each	32.00 28.00 24.90	24.00 21.00 18.68		
01484	<b>OMEGA 3 EPA/DHA w/SESAME LIGNANS &amp; OLIVE FRUIT EXTRACT (SUPER)</b> Buy 4 bottles, price each Buy 10 bottles, price each	34.00 31.00 28.00	25.50 23.25 21.00		
01485	<b>OMEGA 3 EPA/DHA w/SESAME LIGNANS &amp; OLIVE FRUIT EXTRACT (SUPER)</b> - 60 enteric coated softgels Buy 4 bottles, price each Buy 10 bottles, price each	20.00 18.00 16.00	15.00 13.50 12.00		
01619	<b>OMEGA 3 EPA/DHA w/SESAME LIGNANS &amp; OLIVE FRUIT EXTRACT (SUPER) (SMALL SOFTGEL)</b> Buy 4 bottles, price each Buy 10 bottles, price each	32.00 28.00 24.90	24.00 21.00 18.68		
01632	<b>OMEGA-3 LEMON WHIRL</b> - 16 oz bottle Buy 4 bottles, price each	24.00 22.00	18.00 16.50		
01633	<b>OMEGA-3 TROPICAL WHIRL</b> - 16 oz bottle Buy 4 bottles, price each	24.00 22.00	18.00 16.50		

**SUB-TOTAL OF COLUMN 12**

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

FEBRUARY 2014

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

# Buyers Club Order Form

**SUPER SALE SAVINGS ON ALL PRODUCTS**  
To order call 1-800-544-4440

No.		Retail Each	Member Each	Qty	Total
<b>CONTINUED</b>					
01801	<b>ONE-PER-DAY</b> - 60 tablets Buy 4 bottles, price each	\$22.00 20.00	\$16.50 15.00		
01328	<b>ONLY TRACE MINERALS</b> - 90 caps Buy 4 bottles, price each	15.00 12.50	11.25 9.38		
00915	<b>OPTIZINC</b> ® - 30 mg, 90 veg. caps Buy 4 bottles, price each	5.95 5.00	4.46 3.75		
<b>P</b>					
00073	<b>PANCREATIN</b> - 500 mg, 50 caps	\$13.22	\$9.92		
01323	<b>PEAK ATP® WITH GLYCOCARN®</b> - 60 veg. caps Buy 4 bottles, price each	54.00 50.00	40.50 37.50		
00342	<b>PECTA SOL-C® MODIFIED CITRUS PECTIN</b> - 454 grams powder	109.95	82.46		
01080	<b>PECTA SOL-C® MODIFIED CITRUS PECTIN</b> - 270 veg. caps	79.95	59.96		
00673	<b>PGX™ PLUS MULBERRY (WELLBETX®)</b> -180 caps	34.95	26.21		
00865	<b>PHARMAGABA®</b> - 60 chewable tablets Buy 4 bottles, price each	29.95 27.00	22.46 20.25		
01676	<b>PHOSPHATIDYL SERINE CAPS</b> - 100 mg, 100 veg. caps Buy 4 bottles, price each	54.00 48.00	40.50 36.00		
01390	<b>PHOSPHOMEGA®</b> - 60 softgels	39.95	26.96		
01436	<b>POLICOSANOL</b> - 10 mg, 60 veg. caps Buy 6 bottles, price each	20.00 15.00	15.00 11.25		
01423	<b>POMEGRANATE™ (FULL-SPECTRUM)</b> - 30 softgels Buy 4 bottles, price each	24.00 21.00	18.00 15.75		
00956	<b>POMEGRANATE EXTRACT</b> - 30 veg. caps Buy 4 bottles, price each	19.50 17.55	14.63 13.16		
00957	<b>POMEGRANATE JUICE CONCENTRATE</b> - 16 oz. liquid Buy 4 bottles, price each	30.00 28.00	22.50 21.00		
01797	<b>POMI-T™</b> - 60 veg. caps Buy 4 bottles, price each	33.33 30.00	25.00 22.50		
00577	<b>POTASSIUM IODIDE</b> - 1 box, 14 tablets Buy 4 boxes, price each	6.95 5.25	5.21 3.94		
01500	<b>PQQ CAPS W/BIO PQQ®</b> - 10 mg, 30 veg. caps Buy 4 bottles, price each	24.00 22.00	18.00 16.50		
01647	<b>PQQ CAPS W/BIO PQQ®</b> - 20 mg, 30 veg. caps Buy 4 bottles, price each	40.00 36.00	30.00 27.00		
00302	<b>PREGNENOLONE</b> - 50 mg, 100 caps Buy 4 bottles, price each	26.00 22.00	19.50 16.50		
00700	<b>PREGNENOLONE</b> - 100 mg, 100 caps Buy 4 bottles, price each	30.00 27.00	22.50 20.25		
***01373	<b>PRELOX® NATURAL SEX FOR MEN®</b> - 60 tablets Buy 4 bottles, price each	52.00 48.00	39.00 36.00		
00525	<b>PROBOOST THYMIC PROTEIN A™</b> - 4 mcg, 30 packets	59.95	44.96		
01441	<b>PROGESTACARE FOR WOMEN</b> - 4 oz cream Buy 4 bottles, price each	35.00 32.00	26.25 24.00		
01895	<b>PROSTATE FORMULA (ULTRA NAT)</b> 60 softgels Buy 4 bottles, price each Buy 12 bottles, price each	38.00 35.00 32.00	28.50 26.25 24.00		
01742	<b>PROTEIN-ISOLATE (WHEY) VANILLA</b> - 1 lb. powder Buy 4 jars, price each	30.00 27.00	22.50 20.25		
01743	<b>PROTEIN-ISOLATE (WHEY) CHOCOLATE</b> - 1 lb. powder Buy 4 jars, price each	30.00 27.00	22.50 20.25		
01770	<b>PROTEIN CONCENTRATE</b> (New Zealand Whey) <b>Vanilla</b> - 520 gr Buy 4 bottles, price each	30.00 26.60	22.50 19.95		

**SUB-TOTAL OF COLUMN 13**

No.		Retail Each	Member Each	Qty	Total
01771	<b>PROTEIN CONCENTRATE</b> (New Zealand Whey) <b>Chocolate</b> - 660 gr Buy 4 bottles, price each	\$30.00 26.60	\$22.50 19.95		
01812	<b>PROVINAL® PURIFIED OMEGA-7</b> - 30 softgels Buy 4 bottles, price each	27.00 24.00	20.25 18.00		
01508	<b>PTEROPURE™</b> - 50 mg Pterostilbene 60 veg. caps Buy 4 bottles, price each	32.00 30.00	24.00 22.50		
01587	<b>PURE PLANT PROTEIN</b> - Veg. Vanilla 540 grams powder Buy 4 jars, price each	38.00 35.00	28.50 26.25		
01209	<b>PUMPKIN SEED EXTRACT (WATER-SOLUBLE)</b> - 60 veg. caps Buy 4 bottles, price each	20.00 18.00	15.00 13.50		
01210	<b>PUMPKIN SEED EXT w/SOY ISOFLAVONES (WATER-SOLUBLE)</b> - 60 veg. caps Buy 4 bottles, price each	22.00 20.00	16.50 15.00		
01637	<b>PYCNOGENOL® FRENCH MARITIME PINE BARK EXTRACT</b> -100 mg, 60 veg. caps Buy 4 bottles, price each	64.00 60.00	48.00 45.00		
01217	<b>PYRIDOXAL 5'-PHOSPHATE</b> - 100 mg, 60 veg. caps Buy 4 bottles, price each	22.00 19.80	16.50 14.85		
<b>Q, R</b>					
01309	<b>QUERCETIN (OPTIMIZED)</b> - 250 mg, 60 veg. caps Buy 4 bottles, price each	\$22.00 20.00	\$16.50 15.00		
01030	<b>RED YEAST RICE</b> (Bluebonnet)- 600 mg, 60 veg. caps	16.95	13.56		
00605	<b>REGIMINT</b> - 60 enteric-coated caps Buy 4 bottles, price each	19.95 18.67	14.96 14.00		
01708	<b>REISHI EXTRACT MUSHROOM COMPLEX</b> - 60 veg. caps Buy 4 bottles, price each	30.00 27.00	22.50 20.25		
01448	<b>REJUVENEX® BODY LOTION</b> - 6 oz Buy 4 tubes, price each Buy 8 tubes, price each	24.00 19.80 17.00	18.00 14.85 12.75		
01621	<b>REJUVENEX® FACTOR FIRING SERUM</b> - 1.7 oz Buy 2 bottles, price each Buy 6 bottles, price each	65.00 50.66 38.52	48.75 38.00 28.89		
01220	<b>REJUVENEX® (ULTRA)</b> - 2 oz Buy 2 jars, price each Buy 4 jars, price each Buy 8 jars, price each	52.00 48.00 44.00 39.93	39.00 36.00 33.00 29.95		
00676	<b>REJUVENIGHT® (ULTRA)</b> - 2 oz Buy 4 jars, price each	39.95 36.00	29.96 27.00		
01413	<b>RESVERATROL W/PTEROSTILBENE</b> - 20 mg, 60 veg. caps Buy 4 bottles, price each	24.00 22.00	18.00 16.50		
01410	<b>RESVERATROL W/PTEROSTILBENE</b> - 100 mg, 60 veg. caps Buy 4 bottles, price each	36.00 32.00	27.00 24.00		
01430	<b>RESVERATROL w/SYNERGISTIC GRAPE-BERRY ACTIVES (OPTIMIZED)</b> - 250 mg, 60 veg. caps Buy 4 bottles, price each	46.00 41.33	34.50 31.00		
00889	<b>RHODIOLA EXTRACT</b> - 250 mg, 60 veg. caps Buy 4 bottles, price each	11.75 10.58	8.81 7.94		
00972	<b>(D) RIBOSE POWDER</b> - 150 grams Buy 4 jars, price each	27.50 24.75	20.63 18.56		
01473	<b>(D) RIBOSE TABLETS</b> - 100 veg. tabs Buy 4 bottles, price each	32.00 28.00	24.00 21.00		
01609	<b>RICH REWARDS® BREAKFAST GROUND COFFEE</b> - 12 oz. bag	13.00	9.75		
01729	<b>RICH REWARDS® BREAKFAST BLEND GROUND COFFEE</b> - 12 oz. bag Natural Vanilla	15.00	11.25		
01730	<b>RICH REWARDS® BREAKFAST BLEND GROUND COFFEE</b> - 12 oz. bag Natural Mocha	15.00	11.25		

**SUB-TOTAL OF COLUMN 14**

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

**OFFER ENDS FEBRUARY 3, 2014**  
**To order online visit [www.LifeExtension.com/SuperSale](http://www.LifeExtension.com/SuperSale)**

# Buyers Club Order Form

No.		Retail Each	Member Each	Qty	Total
01610	<b>RICH REWARDS™ DECAFFEINATED ROAST GROUND COFFEE</b> - 12 oz. bag	\$14.00	\$10.50		
01809	<b>RICH REWARDS™ DARK CHOCOLATE</b> - 15 piece bag	15.00	11.25		
	Buy 4 bags, price each	12.96	9.72		
01712	<b>RICH REWARDS™ BLACK BEAN VEGETABLE SOUP</b> - 32 oz. bottle	13.00	9.75		
	Buy 6 bottles, price each	12.25	9.19		
01530	<b>RICH REWARDS™ CRUCIFEROUS VEGETABLE SOUP</b> - 32 oz. bottle	11.95	8.96		
	Buy 6 bottles, price each	11.25	8.44		
01531	<b>RICH REWARDS™ (SPICY) CRUCIFEROUS VEGETABLE SOUP</b> - 32 oz. bottle	11.95	8.96		
	Buy 6 bottles, price each	11.25	8.44		
01705	<b>RICH REWARDS™ LENTIL VEGETABLE SOUP</b> - 32 oz. bottle	13.00	9.75		
	Buy 6 bottles, price each	12.25	9.19		
01810	<b>RICH REWARDS™ MUNG BEAN SOUP W/TURMERIC</b> - 32 oz. bottle	13.00	9.75		
	Buy 6 bottles, price each	12.25	9.19		
01208	<b>R-LIPOIC ACID (SUPER)</b> - 300 mg, 60 veg. caps	49.00	36.75		
	Buy 4 bottles, price each	45.00	33.75		
00070	<b>RNA CAPSULES</b> - 500 mg, 100 caps	17.95	13.46		
	Buy 4 bottles, price each	16.16	12.12		
<b>S</b>					
01432	<b>SAFFRON w/SATIAREAL (OPTIMIZED)</b> - 60 veg. caps	\$36.00	\$27.00		
	Buy 4 bottles, price each	32.00	24.00		
00358	<b>SAME (S-ADENOSYL-METHIONINE)</b> - 200 mg, 20 enteric coated tablets	16.00	12.00		
	Buy 8 boxes, price each	14.00	10.50		
00453	<b>SAME (S-ADENOSYL-METHIONINE)</b> - 200 mg, 50 enteric coated tablets	36.00	27.00		
	Buy 4 bottles, price each	32.00	24.00		
00557	<b>SAME (S-ADENOSYL-METHIONINE)</b> - 400 mg, 20 enteric coated tablets	28.00	21.00		
	Buy 6 boxes, price each	24.00	18.00		
01055	<b>SAME (S-ADENOSYL-METHIONINE)</b> - 400 mg, 50 enteric coated tablets	66.00	49.50		
	Buy 4 bottles, price each	60.00	45.00		
01543	<b>SEA-IODINE™</b> - 1,000 mcg, 60 caps	8.00	6.00		
	Buy 4 bottles, price each	7.20	5.40		
00046	<b>SELENIUM</b> - 2 oz dropper bottle	11.95	8.96		
01679	<b>SE-METHYL L-SELENOCYSTEINE</b> - 200 mcg, 100 veg. caps	12.00	9.00		
	Buy 4 bottles, price each	11.00	8.25		
00318	<b>SERRAFLAZYME</b> - 100 tablets	18.00	13.50		
	Buy 4 bottles, price each	16.00	12.00		
00284	<b>SHARK LIVER OIL (NORWEGIAN)</b> - 1,000 mg, 30 softgels	18.00	13.50		
	Buy 4 bottles, price each	16.00	12.00		
01684	<b>SILYMARIN</b> - 100 mg, 50 veg. caps	9.25	6.94		
	Buy 4 bottles, price each	8.25	6.19		
01596	<b>SKIN RESTORING PHYTCERAMIDES w/LIPOHEAT®</b> - 30 veg. liquid caps	25.00	18.75		
	Buy 4 bottles, price each	23.00	17.25		
00961	<b>SODZYME® w/GLISODIN® AND WOLFBERRY</b> - 90 veg. caps	28.00	21.00		
	Buy 4 bottles, price each	24.00	18.00		
00657	<b>SOLARSHIELD SUNGLASSES</b> - 1 pair smoke color	12.99	9.74		
	Buy 2 pairs, price each	11.50	8.63		
01097	<b>SOY EXTRACT (ULTRA)</b> - 150 veg. caps	87.00	65.25		
	Buy 4 bottles, price each	78.00	58.50		
00432	<b>STEVIA™ EXTRACT (BETTER)</b> - 100 packets, 1 gram each	9.95	7.46		
00438	<b>STEVIA™ ORGANIC LIQUID EXTRACT (BETTER)</b> - 2 oz liquid	11.00	8.25		
01396	<b>ST. JOHN'S WORT EXTRACT</b> - 300 mg, 60 veg. caps	10.98	8.24		
	Buy 4 bottles, price each	10.00	7.50		
01476	<b>STRONTIUM</b> - 750 mg, 90 veg. caps	20.00	15.00		
	Buy 4 bottles, price each	18.00	13.50		

**SUB-TOTAL OF COLUMN 15**

No.		Retail Each	Member Each	Qty	Total
01649	<b>SUPER ABSORBABLE SOY ISOFLAVONES</b> - 60 veg. caps	\$28.00	\$21.00		
	Buy 4 bottles, price each	25.00	18.75		
01790	<b>SUPER SAW PALMETTO/NETTLE ROOT W/BETA-SITOSTEROL</b> - 60 softgels	28.00	21.00		
	Buy 4 bottles, price each	26.00	19.50		
	Buy 12 bottles, price each	24.00	18.00		
01407	<b>SUPER SAW PALMETTO W/BETA-SITOSTEROL</b> - 30 softgels	15.00	11.25		
	Buy 12 bottles, price each	12.00	9.00		
01778	<b>SUPER SELENIUM COMPLEX</b> - 200 mcg, 100 veg. caps	14.00	10.50		
	Buy 4 bottles, price each	12.00	9.00		
	Buy 12 bottles, price each	11.00	8.25		
<b>T</b>					
01723	<b>TART CHERRY EXTRACT w/STANDARDIZED CHERRYPURE®</b> - 60 veg. caps	\$22.00	\$16.50		
	Buy 4 bottles, price each	20.00	15.00		
00199	<b>TAURINE</b> - 1,000 mg, 50 caps	8.95	6.71		
	Buy 4 bottles, price each	8.00	6.00		
00133	<b>TAURINE POWDER</b> - 300 grams	20.00	15.00		
	Buy 4 bottles, price each	16.88	12.66		
01304	<b>THEAFLAVIN STANDARDIZED EXTRACT</b> - 30 veg. caps	18.00	13.50		
	Buy 4 bottles, price each	16.00	12.00		
01683	<b>(L) THEANINE</b> - 100 mg, 60 veg. caps	24.00	18.00		
	Buy 4 bottles, price each	20.50	15.38		
*†01038	<b>THERALAC PROBIOTICS</b> - 30 caps	47.95	35.96		
00668	<b>THYROID FORMULA™ (METABOLIC ADVANTAGE)</b> - 100 caps	21.95	16.46		
00349	<b>TMG POWDER</b> - 50 grams	14.00	10.50		
	Buy 4 bottles, price each	11.00	8.25		
01559	<b>TMG</b> - 500 mg, 60 veg. tablets	11.00	8.25		
	Buy 4 boxes, price each	10.00	7.50		
00781	<b>TOCOTRIENOLS WITH SESAME LIGNANS</b> - 60 softgels	38.00	28.50		
	Buy 4 bottles, price each	36.00	27.00		
01400	<b>TOCOTRIENOLS (SUPER-ABSORBABLE)</b> - 60 softgels	30.00	22.50		
	Buy 4 bottles, price each	28.00	21.00		
01278	<b>TOOTHPASTE</b> - 4 oz (Mint)	9.50	7.13		
	Buy 4 tubes, price each	8.67	6.50		
01468	<b>TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT</b> - 60 veg. caps	24.00	18.00		
	Buy 4 bottles, price each	22.00	16.50		
01469	<b>TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT W/RESVERATROL</b> - 60 veg. caps	32.00	24.00		
	Buy 4 bottles, price each	29.60	22.20		
01803	<b>TRI SUGAR SHIELD™</b> - 60 veg. caps	36.00	27.00		
	Buy 4 bottles, price each	32.00	24.00		
01386	<b>TRUFIBER®</b> - 180 grams	32.95	24.71		
01389	<b>TRUFLORA PROBIOTICS</b> - 32 veg. caps	42.95	32.21		
01722	<b>L-TRYPTOPHAN</b> - 500 mg, 90 veg. caps	33.00	24.75		
	Buy 4 bottles, price each	30.00	22.50		
01721	<b>TRYPTOPHAN PLUS (OPTIMIZED)</b> - 90 veg. caps	32.00	24.00		
	Buy 4 bottles, price each	29.00	21.75		
01816	<b>TWO-PER-DAY</b> - 60 tablets	10.50	7.88		
	Buy 4 bottles, price each	9.50	7.13		
01815	<b>TWO-PER-DAY</b> - 120 tablets	20.00	15.00		
	Buy 4 bottles, price each	18.00	13.50		
01814	<b>TWO-PER-DAY</b> - 120 caps	22.00	16.50		
	Buy 4 bottles, price each	20.00	15.00		
00326	<b>L-TYROSINE</b> - 500 mg, 100 tablets	12.98	9.74		

**SUB-TOTAL OF COLUMN 16**

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

FEBRUARY 2014

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

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<b>V</b>					
00213	<b>VANADYL SULFATE</b> - 7.5 mg, 100 tablets	\$15.00	\$11.25		
	Buy 4 bottles, price each	12.50	9.38		
00408	<b>VENOTONE</b> - 60 caps	18.95	14.21		
	Buy 4 bottles, price each	16.00	12.00		
01327	<b>VINPOCETINE</b> - 10 mg, 100 tablets	18.00	13.50		
	Buy 4 bottles, price each	14.00	10.50		
01526	<b>VITAMIN B3 Niacin</b> - 1,000 mg, 100 veg. caps	12.75	9.56		
	Buy 4 bottles, price each	12.00	9.00		
00372	<b>VITAMIN B3 Niacin</b> - 500 mg, 100 caps	7.65	5.74		
	Buy 4 bottles, price each	6.65	4.99		
00098	<b>VITAMIN B5</b> - 500 mg, 100 caps (Pantothenic Acid)	10.50	7.88		
	Buy 4 bottles, price each	9.38	7.04		
01535	<b>VITAMIN B6</b> - 250 mg, 100 veg. caps	12.50	9.38		
	Buy 4 bottles, price each	11.00	8.25		
00361	<b>VITAMIN B12</b> - 500 mcg, 100 lozenges	8.75	6.56		
	Buy 4 bottles, price each	7.25	5.44		
01634	<b>VITAMIN C w/ DIHYDROQUERCETIN</b> - 1,000 mg, 60 tablets	10.00	7.50		
	Buy 4 bottles, price each	9.00	6.75		
00927	<b>VITAMIN C w/ DIHYDROQUERCETIN</b> - 1,000 mg, 250 tablets	25.50	19.13		
	Buy 4 bottles, price each	23.25	17.44		
00084	<b>VITAMIN C (BUFFERED) POWDER</b> - 454.6 grams	23.95	17.96		
	Buy 4 bottles, price each	22.00	16.50		
01736	<b>(EFFERVESCENT) VITAMIN C-MAGNESIUM CRYSTALS</b> - 180 grams	20.00	15.00		
	Buy 4 bottles, price each	18.00	13.50		
01732	<b>VITAMIN D3</b> - 2,000 IU, 1 fl oz, Mint flavor	28.00	21.00		
	Buy 4 bottles, price each	25.00	18.75		
01753	<b>VITAMIN D3</b> - 1,000 IU, 90 softgels	7.00	5.25		
	Buy 4 bottles, price each	6.00	4.50		
01751	<b>VITAMIN D3</b> - 1,000 IU, 250 softgels	12.50	9.38		
	Buy 4 bottles, price each	11.25	8.44		
01713	<b>VITAMIN D3</b> - 5,000 IU, 60 softgels	11.00	8.25		
	Buy 4 bottles, price each	9.90	7.43		
01718	<b>VITAMIN D3</b> - 7,000 IU, 60 softgels	14.00	10.50		
	Buy 4 bottles, price each	12.60	9.45		
01573	<b>VITAMIN D3 w/SEA-IODINE™</b> - 5,000 IU, 60 caps	14.00	10.50		
	Buy 4 bottles, price each	12.50	9.38		
00864	<b>VITAMIN D3</b> Liquid Emulsion - 2,000 IU, 1 oz.	28.00	21.00		
	Buy 4 bottles, price each	25.00	18.75		
01572	<b>VITAMINS D AND K w/SEA-IODINE™</b> - 60 caps	24.00	18.00		
	Buy 4 bottles, price each	22.00	16.50		
01763	<b>VITAMIN E (NATURAL)</b> - 400 IU, 100 softgels	30.00	22.50		
	Buy 4 bottles, price each	28.00	21.00		
	Buy 10 bottles, price each	26.00	19.50		
01225	<b>VITAMIN K2 (LOW-DOSE)</b> - 45 mcg, 90 softgels	18.00	13.50		
	Buy 4 bottles, price each	16.00	12.00		
<b>X</b>					
00409	<b>XYLIWHITE™ MOUTHWASH</b> - 16 oz	\$10.00	\$7.50		
<b>W</b>					
01739	<b>WINTER WELLNESS™</b> - 60 caps	\$15.00	\$11.25		
	Buy 4 bottles, price each	13.00	9.75		
<b>Z</b>					
01561	<b>ZINC LOZENGES</b> - 75 lozenges	\$9.00	\$6.75		
	Buy 4 bottles, price each	8.00	6.00		
**01051	<b>ZYFLAMEND® WHOLE BODY</b> - 120 softgels	64.95	48.71		

**SUB-TOTAL OF COLUMN 17**

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SUB-TOTAL COLUMN 3	
SUB-TOTAL COLUMN 4	
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SUB-TOTAL COLUMN 7	
SUB-TOTAL COLUMN 8	
SUB-TOTAL COLUMN 9	
SUB-TOTAL COLUMN 10	
SUB-TOTAL COLUMN 11	
SUB-TOTAL COLUMN 12	
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SUB-TOTAL COLUMN 15	
SUB-TOTAL COLUMN 16	
SUB-TOTAL COLUMN 17	

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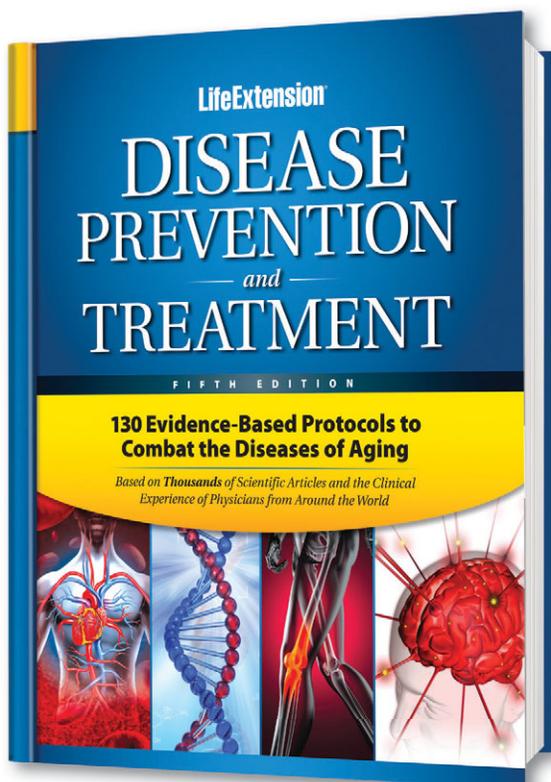
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This 2014 edition of ***Disease Prevention and Treatment*** provides 1,400 pages of information about therapies that are documented in the scientific literature, but are not routinely used in clinical medical practice. Gaining access to this knowledge 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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### HOW TO JOIN THE LIFE EXTENSION FOUNDATION®

As a member of the Life Extension Foundation®, you have the opportunity to participate in a great scientific endeavor. We are the world's premier organization dedicated to stopping and reversing aging.

Our 33-year track record shows that we have been five to ten years ahead of conventional and alternative medicine in making new life-saving therapies available to our members.

When you join the Life Extension Foundation®, we update you on the latest published medical research by sending you FREE books. Our most impressive publication is the 1,400-page *Disease Prevention and Treatment* protocol book that contains novel therapies to treat 130 common diseases of aging. *Disease Prevention and Treatment* is the only book that combines conventional and alternative therapies in order to implement a treatment regimen for fighting the multiple processes involved in degenerative disease.

Each month, Life Extension Foundation® members receive a magazine packed with the latest medical findings from around the world. Members also can call a toll-free phone number to talk to our knowledgeable health advisors about their health issues.

**If your number one priority is good health and a long life,  
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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.

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Check enclosed (payable to Life Extension Foundation®)

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**NEW**  
**Four-Food  
 Formula**

# Target PSA!

## Breakthrough Research

A high percentage of men will endure some form of prostate-induced discomfort over the course of their lifetimes.<sup>1</sup>

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)*<sup>12</sup>

**Life Extension®** now 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.<sup>3-19</sup>



### • POMEGRANATE

- Specifically concentrates in prostate tissue<sup>3</sup>
- Supports healthy *apoptosis*, your body's system of removing senescent cells when needed<sup>4-6</sup>
- Promotes healthy levels of inflammatory response, inhibits androgen receptor expression, and inhibits abnormal cell migration.<sup>5,7,8</sup>



### • GREEN TEA

- *EGCG*, a green tea *catechin*, specifically concentrates in prostate tissue where it regulates *PSA (prostate specific antigen)* production to maintain healthy PSA levels<sup>9,10</sup>
- Helps modulate genetic expression and activity of *androgen receptors*<sup>11</sup>
- Supports body's natural defenses against oxidation.<sup>12</sup>



### • TURMERIC

- Promotes a healthy level of inflammatory response, chiefly due to its main component, *curcumin*<sup>13</sup>
- Helps modulate cell signaling mechanisms, inhibiting abnormal cell adhesion and migration.<sup>14</sup>
- Promotes healthy cell proliferation and apoptosis.<sup>15</sup>



### • BROCCOLI

- Helps regulate enzymes (*phase II detoxifying enzymes*) in gut and liver tissue that helps render harmful dietary molecules harmless<sup>16</sup>
- Helps promote healthy PSA levels<sup>17</sup>
- Supports regulation of cell growth and transcription factors and normal production of apoptosis-inducing proteins<sup>18,19</sup>



Item #01797

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 **\$22.50** per bottle during **Super Sale**.

#### References

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 call 1-800-544-4440  
 or visit  
[www.LifeExtension.com](http://www.LifeExtension.com)

# 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.<sup>1</sup> While **alpha tocopherol** inhibits free-radical production, **gamma tocopherol** is required to trap and neutralize existing free radicals.<sup>2</sup>

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**.<sup>2,3</sup>

## 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.\*

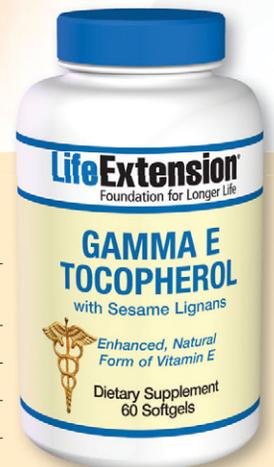
In a human study that combined **gamma tocopherol** with **sesame lignans**, gamma tocopherol/ sesame was **25% more effective** than gamma tocopherol/ tocotrienols in suppressing tissue measurements for free-radical and inflammatory damage.<sup>4,5</sup> Since tocotrienols are considered nature's most 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 during **Super Sale**, the price is reduced to only **\$19.58 per bottle**.



### Each softgel of Gamma E Tocopherol with Sesame Lignans provides:

<b>Gamma tocopherol</b>	<b>197.45-269.25 mg</b>
<b>Delta tocopherol</b>	<b>71.8-107.7 mg</b>
<b>Alpha tocopherol</b>	<b>30.52-43.08 mg</b>
<b>Beta tocopherol</b>	<b>&lt;17.95 mg</b>
<b>Sesame seed</b>	<b>20 mg</b>
<i>(Sesamum indicum)</i> lignan extract	

Item # 00759

### 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

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3. *Atherosclerosis.* 1999 May;144(1):117-22.
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**To order Gamma E Tocopherol  
with Sesame Lignans, call 1-800-544-4440  
or visit [www.LifeExtension.com](http://www.LifeExtension.com)**

# COMPREHENSIVE VITAMIN K FORMULA



Item # 01724

There are **three forms** of **vitamin K** that the human body can utilize to promote **arterial health and bone support**.<sup>1-8</sup>

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

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

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

**To order  
Super K with Advanced K2 Complex  
or Super Booster, call 1-800-544-4440 or  
visit [www.LifeExtension.com](http://www.LifeExtension.com)**

## Super K formula provides in just one daily softgel:

Vitamin K2 (MK-7)	200 mcg
Vitamin K2 (MK-4)	1000 mcg
Vitamin K1	1000 mcg

The retail price for a bottle containing **90 softgels** is \$30. If a member buys four bottles during **Super Sale**, the price is reduced to **\$18.23 per bottle**. Since each bottle lasts for three months, members pay as little as **\$6.08** a month for this high-potency blend of all three active forms of vitamin K during the Super Sale.

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

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

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

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# BRAIN SHIELD™



## SUPPORT for COGNITIVE FUNCTION with AGING

Your brain is under constant onslaught from environmental and stress-related challenges, as well as normal aging processes.<sup>1,2</sup>

Fortunately, our brain cells have built-in, **self-healing** systems that provide natural defenses against these ongoing threats.<sup>3</sup> Even more remarkable, molecular science is revealing that the human brain has the capacity to **preserve** the neurons involved in brain remodeling (*plasticity*).<sup>3</sup>

Scientists in China and Singapore have found that **gastrodin**, a compound typically derived from a traditional Chinese orchid (*Gastrodia elata*), provides powerful support for the brain's normal defenses and regenerative mechanisms.<sup>4,7</sup>

To make these benefits available to members, **Life Extension®** introduces **Brain Shield™**, providing **300 mg** of **gastrodin** in each capsule for *maximum* brain support.

### MULTI-FACTORIAL BENEFITS!

Recent studies confirm that the **gastrodin** in **Brain Shield™** is one of the most powerful compounds for supporting healthy brain function *at any age!* **Gastrodin** works by the following mechanisms:

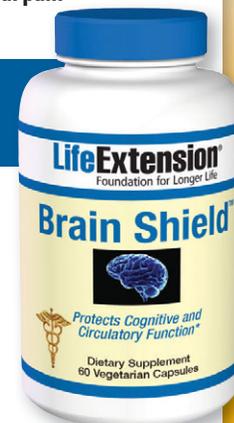
- To retain normal function, the aging brain relies on adequate **blood flow** to get sufficient oxygen and fuel.<sup>8</sup> It has been repeatedly shown that formulas containing **gastrodin** beneficially support normal, healthy levels of brain blood flow in both animals and in humans.<sup>6,7</sup>
- The body maintains a delicate balance of **neurotransmitters**, such as GABA, which is of tremendous importance to healthy brain function. Studies show that alone or in combination the active compounds in **gastrodin** help maintain healthy levels of vital neurotransmitters in those whose levels are already within the normal range.<sup>9-11</sup>

- With aging, short-term **memory** function is often impaired. Studies show that **gastrodin** and its active constituents help support the healthy body's normal defenses against the mild memory problems associated with aging.<sup>12</sup>
- Scientists have shown that the breakdown metabolites of **gastrodin** help provide support against the normal stress and tension of daily life.<sup>13,14</sup>
- And **Brain Shield™** helps alleviate the occasional **cranial pain** associated with daily life.<sup>15</sup>

**Brain Shield™ supports healthy cognitive and circulatory function in aging individuals.**

Those seeking maximum benefit should start with one **300 mg** capsule of **Brain Shield™** taken twice daily.<sup>16</sup> After thirty days, one **Brain Shield™** (gastrodin) capsule daily may be sufficient based upon the experience of gastrodin as an over-the-counter (OTC) pharmaceutical agent. Those taking Cognitex® are obtaining **50 mg** of gastrodin in the daily dose along with complementary nutrients. As additional research continues on gastrodin, better clarification on optimal dosing for a wide range of neurovascular and neuro-inflammatory conditions should be available.

A bottle of 60 **300 mg** vegetarian capsules of **Brain Shield™** retails for \$33. If a member buys four bottles during **Super Sale**, the price is reduced to **\$20.25** per bottle.



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To order **Life Extension® Brain Shield™**, call **1-800-544-4440** or visit [www.LifeExtension.com](http://www.LifeExtension.com)



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Visit us at [www.LifeExtension.com](http://www.LifeExtension.com)

# LifeExtension® Magazine



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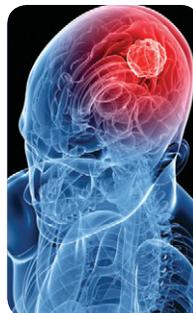
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