

RELIEF FROM IRRITABLE BOWEL SYNDROME

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July 2015

Can Vitamin K Reverse Arterial Calcification?

**Exclusive Report
From Metabolic
Syndrome Conference**

**Anticoagulant Drugs
That Don't Cause
Vascular Calcification**

**What "Quality Control"
Means In the Real World**

**Warfarin Increases
Arterial Calcification
By 50% In 30 Days**

**Interview with
Michael Ozner, M.D.
Preventive Cardiologist**



Protect Skin Against Everyday Sun Damage From Within Your Body

Solar radiation damage from **everyday** sun exposure is a major accelerant of **skin aging**.

Just one capsule a day of **FernBlock®** provides considerable protection to all exposed skin areas.

Total Body Surface Protection

Scientists have discovered that the ingredients in **FernBlock®** help inhibit cellular changes in the skin that can lead to premature aging due to sun exposure.¹

Taken *orally*, **Enhanced FernBlock® with Red Orange Complex** provides an **additional** layer of support for the body's ultraviolet light defenses when spending long periods outdoors and using a topical sunscreen.

Best of all, the most active ingredient in **FernBlock®** (*Polypodium leucotomos*) offers this protection from the **inside** out. The result is an oral photoprotective agent that provides uniform, systemic, total-body surface protection (including the eyes, lips, and the scalp), without the problems associated with sunscreen.^{2,3}

Oral Sun Defense

FernBlock® has shown remarkable effectiveness in promoting skin defenses against harmful solar radiation.^{1,4-7}

FernBlock® in this **oral** formulation works by promoting the body's ability to inhibit absorption of ultraviolet rays and to quench the free radicals that this type of radiation can generate.^{4,5} In one clinical study, *Polypodium leucotomos* offered significant protection against the sun's rays, even for those taking medication that causes increased sun sensitivity.⁸ The study subjects experienced an almost **three-fold** increase in the amount of time they spent in the sun.

Enhanced FernBlock® Formula

This product has been upgraded to contain **Red Orange Complex**, a standardized extract that is obtained from three **red orange** varieties—*Citrus sinensis* var. Moro, Tarocco, and Sanguinello.

The main active **phenolic** compounds include **anthocyanins**, **flavanones**, and **hydroxycinnamic acids**. It also includes vitamin C,⁹ which works together to support the body's natural photoprotection against ultraviolet radiation,^{10,11} by helping to balance the body's normal inflammation response,¹² free-radical defense mechanism, and healthy apoptotic (cell death) activity.¹³

In a controlled human trial, 15 days of **oral** supplementation with **Red Orange Complex** was demonstrated to **measurably** support natural skin defenses against ultraviolet radiation.¹¹

References

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More Comprehensive Sun Protection

Enhanced FernBlock® with Red Orange Complex is designed to complement topical sunscreens for sun exposure. Taken orally, **FernBlock®** supplements the effectiveness of topical sunscreens by protecting the **entire skin surface** and has an obvious advantage in that it **cannot be removed by perspiring or bathing**.

If taken daily, just one capsule should provide everyday protection. Each vegetarian capsule of **Enhanced FernBlock® with Red Orange Complex** provides:

FernBlock® <i>Polypodium leucotomos</i> extract (leaf)	240 mg
Red Orange Complex (Sicilian red oranges – <i>Citrus sinensis</i> var. Moro, Sanguinello, Tarocco) extract (fruit and peel)	100 mg
Vitamin C (as ascorbic acid from Red Orange Complex)	5.5 mg



Item # 01728

A bottle of 30 vegetarian capsules of **Enhanced FernBlock® with Red Orange Complex** retails for \$42. If a member buys four bottles, the price is reduced to **\$28.50** per bottle.

FernBlock® is a registered trademark of Industrial Farmaceutica Cantabria, S.A.
Note: This product is not a sunscreen.

To order **Enhanced FernBlock® with Red Orange Complex**, call 1-800-544-4440 or visit www.LifeExtension.com

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

REPORTS



28 ENSURING DIETARY SUPPLEMENT QUALITY STANDARDS

Concern about dietary supplement **quality** is increasing as unscrupulous companies sell products that are not up to standard or are spiked with prescription drugs. **Life Extension**[®] maintains a rigid inspection program of meticulous assays from raw material sourcing to the final packaged product that exceeds FDA minimum requirements. Independent testing organizations, ConsumerLab, and the International Fish Oil Standards Program regularly verify the potency and purity of Life Extension[®]'s products, while NSF International certifies that Life Extension[®]'s manufacturing and handling procedures exceed industry standards.



38 RELIEF FROM IRRITABLE BOWEL SYNDROME

Because the digestive tract communicates directly with the brain, people with **irritable bowel syndrome** can experience discomfort and pain from intestinal distress. While no medical treatment addresses all symptoms of **irritable bowel syndrome**, recently published clinical trials demonstrate that *Perilla frutescens* leaf extract and the patented probiotic organism *S. cerevisiae* can provide relief from IBS (irritable bowel syndrome).



50 WHEN TO TAKE YOUR FAT-SOLUBLE VITAMINS

Research shows that **fat-soluble** vitamins are absorbed differently than water-soluble vitamins. For optimal absorption, critical fat-soluble nutrients should be taken with the day's heaviest meal, which usually contains the most dietary fat.



64 EXCLUSIVE CONFERENCE REPORT ON SYNDROME X

The **2014 World Congress on Insulin Resistance, Diabetes, and Cardiovascular Disease** featured scientific reports about the effects of bariatric surgery, how artificial sweeteners impact weight **gain**, and how **metabolic syndrome** increases risk of diabetes, cardiovascular disease, cancer, neuropathy, and Alzheimer's.



78 ANTICOAGULANT DRUGS: COMPARATIVE SAFETY AND EFFICACY DATA

Three new oral anticoagulants provide alternatives to warfarin (Coumadin[®]), which antagonizes **vitamin K** and creates systemic calcification. For those requiring anticoagulant therapy, understanding these newer drugs (in conjunction with your physician) is a critical medication decision.



7 ON THE COVER

CAN VITAMIN K REVERSE ARTERIAL CALCIFICATION?

As we age, our normally pliable tissues can become **hardened**, which contributes to degenerative disorders like **vascular calcification**. Vitamin K blocks the **calcification** of heart valves, arterial linings, and other soft tissues, while keeping calcium within **bone** to protect against osteoporosis. New data reveals how **quickly** our vascular system **calcifies** when **vitamin K** is neutralized. Even more intriguing is a study showing how **vitamin K** supplementation may help **reverse** arterial **calcification**.

DEPARTMENTS



21 IN THE NEWS

High cholesterol blocks vitamin absorption; oral calcium not linked to atherosclerosis; omega-3 protects against intracerebral hemorrhage; testosterone therapy not a cardiovascular risk; metformin contains anticancer mechanisms; testosterone treats prostate cancer; lycopene inhibits kidney cancer; and more.



89 ASK THE DOCTOR

Cardiologist and author Dr. Michael Ozner is the director of the world's largest cardiovascular disease prevention symposium. In an exclusive interview, he explains some of the latest scientific findings for the prevention of heart disease.

97 SUPER FOODS

Quinoa, often mistaken for a grain, is a vegetable seed recognized to be an excellent source of low-fat protein. Compounds in **quinoa** like saponins and hydroxybenzoic acids inhibit inflammation and free radicals, while promoting cellular energy production and weight loss.





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Magnesium and Brain Health

Profound shrinkage of **synaptic connections** between nerve cells is one of the major hallmarks associated with brain aging. **Magnesium** is a critical factor in controlling **synaptic density** in the brain.¹

An innovative form of magnesium called **Neuro-Mag™** has been shown to specifically target multiple areas of the aging brain. In fact, preclinical models show that the **magnesium-L-threonate** contained in **Neuro-Mag™** boosted levels of magnesium in spinal fluid by **15%** versus no increase from conventional magnesium.² This means that this **form** of **magnesium** is passing through the blood-brain barrier for assimilation into the **brain**.

Comprehensive Cognitive Benefits

Scientists continue to uncover **magnesium's** comprehensive benefits for cognitive function.^{1,3} Studies using **magnesium-L-threonate** show this unique form of magnesium maintains the quantity of **synaptic** connections between brain cells and inhibits the dysregulation of signaling pathways.¹

Neuro-Mag...Capsules or Powder

The suggested daily dose of three **Neuro-Mag™** 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 powder called **Neuro-Mag™ Magnesium-L-Threonate with Calcium and Vitamin D3**. In addition to its fresh lemon flavor, the one-scoop-per-day serving supplies the same amount of magnesium as the capsules, plus **500 mg** of highly soluble calcium and **1,000 IU** of vitamin D3.

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

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Magazine

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



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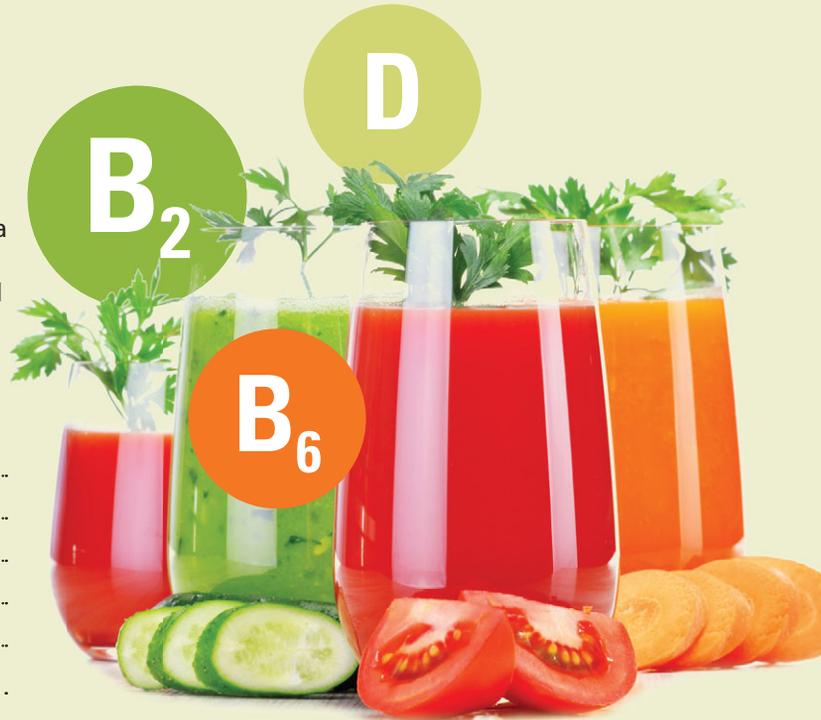
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Turning To Stone



BY WILLIAM FALOON

As we age, our soft tissues **harden** as a result of **calcium** infiltration. This **calcification** process is a major contributor to degenerative disease. **Vitamin K** functions to keep calcium out of soft tissues. New findings reveal that a vitamin K deficit creates more **vascular calcification** than initially thought.

A recent study showed when women were given a drug that blocks **vitamin K**, there was a **50%** greater prevalence of **arterial calcification** compared to women not taking this drug (warfarin). This pathological effect occurred in as little as one month.¹ This study showed that longer term use of warfarin was associated with even greater **arterial calcification** prevalence.

Kidney dialysis patients suffer severe **arterial calcification** with cardiovascular disease accounting for almost half of all their deaths.² A clinical study examined **vitamin K** levels in dialysis patients. The results showed that **93%** of the patients were at risk for **arterial calcification**. This risk was shown to be reduced with **vitamin K2** supplementation.³

The quotation on the right side of this page comes from a report published by the **American Heart Association**.⁴ Despite this indisputable data, doctors today typically do nothing to protect their aging patients from the devastating impact of **vascular calcification**.

This article briefly describes how **proper** use of **vitamin K** can markedly protect our soft tissues against **calcification**.



“Most individuals aged over 60 years have progressively enlarging deposits of calcium mineral in their major arteries.⁵ This vascular calcification reduces aortic and arterial elastance, which impairs cardiovascular hemodynamics, resulting in substantial morbidity and mortality⁶⁻⁸ in the form of hypertension, aortic stenosis, cardiac hypertrophy, myocardial and lower-limb ischemia, congestive heart failure, and compromised structural integrity.⁹⁻¹¹ The severity and extent of mineralization reflect atherosclerotic plaque burden¹² and strongly and independently predict cardiovascular morbidity and mortality.”¹³

Source: American Heart Association

A search of the **National Library of Medicine** data base using the term “**vascular calcification**” at the time of this writing turns up the following numbers of published scientific articles:

Year	New Articles
1982	16
1994	53
2004	214
2008	373
2014	700+

The total number of articles that discuss **arterial calcification** in the **National Library of Medicine** as of April, 2015, is over **6,400**.

The surge from a mere **16** articles in **1982** to over **6,400** today is a reflection of the exponential increase in knowledge about this widespread pathological process.

The problem is that this lifesaving data is not being translated into clinical medical practice where it is urgently needed to protect aging humans against a host of cardiovascular disorders.

Calcification And Hypertension

When arteries are soft and elastic, they readily expand and contract with each heartbeat. As arteries **harden** (calcify) and lose youthful elasticity, there is a progressive elevation in **blood pressure**.¹⁴

This happens because the heart is forced to beat stronger to force blood into the increasingly rigid arterial system. **Calcification** of the large artery exiting the heart (the aorta) helps explain why blood pressure elevates as people age.

A hallmark sign of long-term hypertension is enlargement of the heart’s left ventricle,¹⁵ which is the chamber of the heart that pushes blood into the aorta from where it is then distributed throughout the body.

The increase in cardiac workload caused by aortic rigidity (**calcification**) contributes to **heart failure** that afflicts over 5 million Americans.^{16,17}

Aortic Valve Stenosis

A dilemma faced by elderly persons is progressive dysfunction of the valve between their heart and aorta that opens and closes with each heartbeat.

When the **aortic valve** fails to completely close, blood regurgitates back into the left ventricle of the heart.^{18,19} Without surgical replacement/repair of the aortic valve, death from congestive heart failure often occurs.²⁰

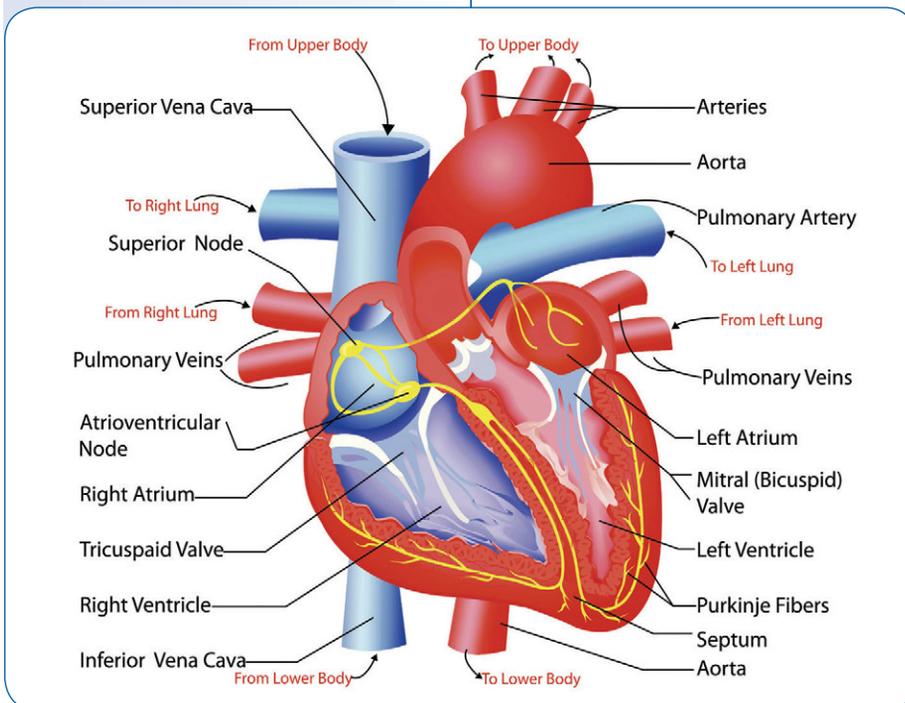
Elderly persons are challenged to fully recover from aortic valve replacement, though newer **intra-arterial** techniques are becoming available whereby an artificial valve is threaded through the aorta and sewn into place.²¹ Those with successful mechanical valve replacements usually require anti-coagulant drug therapy for life, which poses its own complicated set of side effects.²²

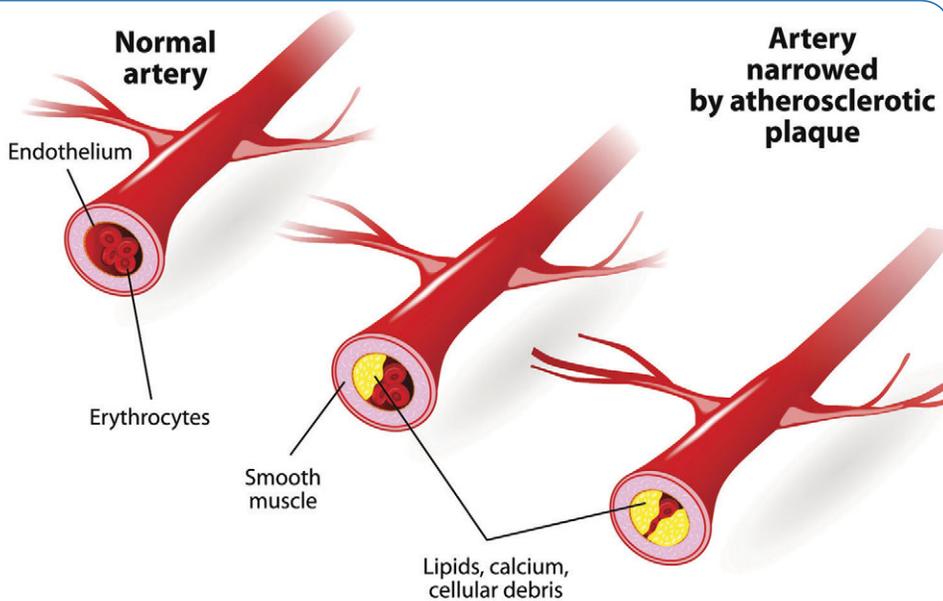
It used to be thought that **aortic stenosis** was caused by a lifetime of “wear and tear.”²³ It is now clear that **calcification** of the aortic valve leaflets is a cause of aortic valve failure, along with chronic inflammation, elevated glucose, high homocysteine, and low magnesium.²⁴⁻³¹

Coronary Artery Calcification

Blockage of the coronary arteries that feed the heart muscle necessitates enormous amounts of hospital expenditures each year in the form of open heart coronary bypass surgeries and intra-arterial “stenting” procedures.

Interestingly, when open heart surgery is performed to replace a calcified **aortic valve**, the surgeon will often also bypass blocked





coronary arteries in the same patient.³² This is not surprising since **coronary atherosclerosis** and **aortic valve stenosis** have similar underlying causes such as elevated homocysteine, chronic inflammation, and **calcification**.³³⁻³⁶

Calcification plays a significant role in accelerating the formation of the atherosclerotic plaque that narrows the coronary arteries of aging humans. In patients with **coronary artery disease**, calcification is present in **90%** of cases.^{37,38}

Clinically, **vascular calcification** is now accepted as a valuable predictor of coronary heart disease.³⁹ Yet most cardiologists use it only as a diagnostic marker (the **coronary calcium score** test) as opposed to directly treating the underlying calcification pathology.⁴⁰

What Causes Arteries To Calcify?

Many of the known risk factors that underlie atherosclerosis have been shown to promote **arterial calcification**. These include elevated LDL cholesterol, elevated homocysteine, diabetes, kidney failure, chronic inflammation, and oxidative stress.^{33,41-55}

Additional calcification contributors include low magnesium (a natural calcium channel blocker), hormone imbalance, and excess blood calcium (caused by hyperparathyroidism).⁵⁶⁻⁶⁶

An underappreciated, major reason our vascular system **turns to stone** (calcifies) as we age, however, is inadequate intake of **vitamin K**.

As you'll read next, a **low** blood level of vitamin K2 causes a **protein** in the vascular wall to **bind** calcium to arteries, heart valves, and other soft tissues.

A Calcium Inhibitor In Need Of Vitamin K

Matrix Gla-protein is a vitamin K-dependent protein, and it must be **carboxylated** to function properly. Poor vitamin K status leads to inactive **uncarboxylated matrix Gla**, which enables calcium to accumulate in soft tissues.⁶⁷⁻⁶⁹

Failure to optimally **carboxylate** matrix Gla-protein is a risk factor for atherosclerosis, coronary heart attack, and kidney disease.⁷⁰⁻⁷⁴ The title of a **2008** study that examined the impact of cardiovascular calcification is: "**Matrix Gla-Protein: The Calcification Inhibitor In Need Of Vitamin K**."^{75,76}

Matrix Gla-protein lines our vascular system and its function is governed by the **quantity** of **vitamin K** in our bloodstream.

When **vitamin K** levels are **less** than optimal, **matrix Gla-protein** allows **calcium** to infiltrate into our soft tissues similar to the way calcium absorbs into bone. When you hear the term "**hardening of the arteries**," this can literally mean one's previously flexible blood vessels are turning into rigid (calcified) bony structures.

With **optimal** levels of vitamin K, **matrix Gla-protein** becomes **activated** to shield **calcium** from entering arteries, heart valves, and other soft tissues.

Said differently, vitamin K functions as a control switch. When **matrix Gla-protein** is turned "on" by **vitamin K**, it **blocks calcium** from entering soft tissues. In the **absence** of adequate **vitamin K**, the **matrix Gla-protein** switch is turned "off" and calcium quickly infiltrates into soft tissues.

So the title of the 2008 study is quite revealing in that **matrix Gla-protein** is clearly a "**calcification inhibitor in need of vitamin K**."

What Happens When Vitamin K Is Acutely Withdrawn?

A recent study provided real-world evidence of what happens to aging humans who are deprived of vitamin K.

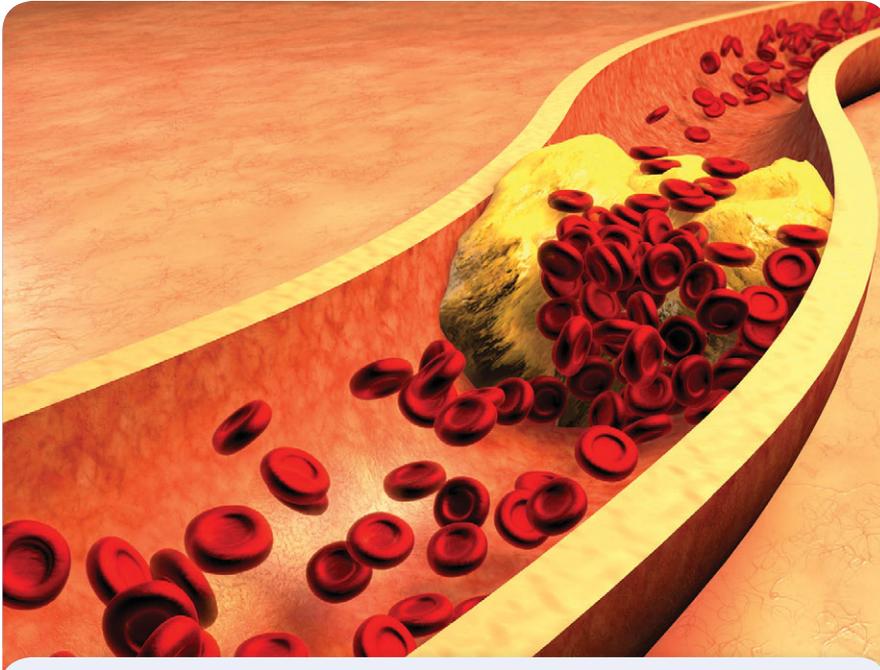
Warfarin is an anticoagulant drug that functions by antagonizing the effects of vitamin K in the body.⁷⁹ This drug has been sold under the trade name Coumadin® for many decades.

Scientists were long ago aware that warfarin users suffered accelerated **arterial calcification**, but until

recently, there was no alternative to protect high-risk patients from a **thrombotic** (arterial clotting) event, such as an ischemic **stroke**.

A study published in **2015** evaluated 451 women using mammograms to measure arterial calcification. After just one month

or more of warfarin drug therapy, the prevalence of arterial calcification increased by an astounding **50%** compared to that in untreated women. When these women were evaluated again after five years, the prevalence of **arterial calcification** increased almost **3-fold**.¹



What Is Matrix Gla-Protein?

Early forms of life emanated from calcium-rich oceans, which required primitive organisms to develop mechanisms to prevent widespread calcium crystallization of living soft tissues.⁷⁷

A prominent calcium-blocking mechanism is through activation of a protein called **matrix gamma-carboxyglutamic acid**, more commonly referred to as **matrix Gla-protein** or **matrix Gla**.⁷⁸

The key to how **matrix Gla-protein** functions lies with its “**carboxyl**” group. **Matrix Gla** must be **carboxylated** to function properly.⁷⁴

In the presence of **vitamin K2**, matrix Gla-protein becomes “**carboxylated**,” which means it’s being turned “**on**” to repel calcium infiltration.⁷⁴

Insufficient **vitamin K2** results in **matrix Gla** being *inadequately carboxylated* or turned “**off**,” which means it’s unable to inhibit calcium infiltration into soft tissues.

To keep our natural calcium inhibitor **matrix Gla** continuously **carboxylated**, we need to provide it with a steady supply of **vitamin K2**. This is easy to do with one-per-day dosing of the proper forms of **vitamin K**.

This new human trial provides stark evidence of rapid **calcification** occurring in response to vitamin K withdrawal caused by **warfarin** (a vitamin K antagonist drug.)

We discuss the pros and cons of **anticoagulant drugs** that may be used in place of **warfarin** in this month’s issue of *Life Extension*[®] magazine.

What Happens When Vitamin K Is Introduced To Deficient Patients?

Kidney failure patients are kept alive by thrice weekly **dialysis** treatments. While the advent of hemodialysis has added countless human life years, it produces devastating side effects over the longer term. Over **50%** of hemodialysis patients have **vascular calcification**, a major cause of cardiovascular disease. Cardiovascular disease accounts for about **50%** of all deaths in these patients.⁸⁰⁻⁸²

A study was done to evaluate the effects of varying doses of the MK-7 form of **vitamin K2** on markers of arterial calcification including **carboxylation** (activation) of **matrix Gla-proteins**.⁸³

MK-7 (menaquinone-7) is a unique form of **vitamin K2** because it remains active in the body for 24 hours and longer.⁸⁴

At baseline, hemodialysis patients had a **4.5-fold** higher level of uncarboxylated **matrix Gla** compared to controls.⁸³ Daily doses of **MK-7** of **45 mcg**, **135 mcg**, and **360 mcg** were then administered over a six-week period.

Results were measured by the reduction of uncarboxylated **matrix Gla** and other measures of systemic **calcification**. Recall that when **matrix Gla** is under-carboxylated, it enables **calcification** of its surrounding tissue.

Supplementation with the MK-7 form of **vitamin K2** reduced uncarboxylated matrix Gla by **36.7%** in the **135 mcg** dose group and **61.1%** in the **360 mcg** dose group. In the group given **360 mcg** per day of **MK-7**, the favorable response rate was a remarkable **93%**.⁸³

When **vitamin K2** supplementation was ceased in these dialysis patients, plasma levels of uncarboxylated matrix Gla-protein increased significantly, which indicated these high-risk individuals were once again vulnerable to severe **vascular calcification**.

Importance Of Adequate Calcium Intake

Calcium serves numerous life-sustaining processes, the most important of which is to maintain the **electrolyte balance** needed for proper rhythmic heart beats.¹⁰⁷ If one were to deplete their bloodstream of calcium, they could die from a **heart attack** caused by an acute arrhythmic disorder.

In a healthy body, **99%** of all calcium is stored in **bone** where it provides structural support.¹⁰⁸ The amount of calcium that is allowed in the bloodstream is tightly controlled by the parathyroid glands.¹⁰⁹

In bone, **vitamin K2** *activates* proteins that bind **calcium**.¹¹⁰ Populations with high dietary intake of vitamin K2 have lower rates of **osteoporosis**.¹¹¹⁻¹¹⁴

People need around **1,200 mg** per day of calcium from diet and supplements to maintain bone density. We suggest around **700 mg** per day of supplemental calcium for women and around **500 mg** per day for men. Most people can rely on their diet for the balance of their calcium needs.¹¹⁵

Supplementing with moderate daily doses of calcium will not

Three Forms Of Vitamin K

Based on the totality of evidence and low cost, it is prudent to take a supplement that contains multiple forms of **vitamin K**. The three forms of vitamin K most applicable to human health are:

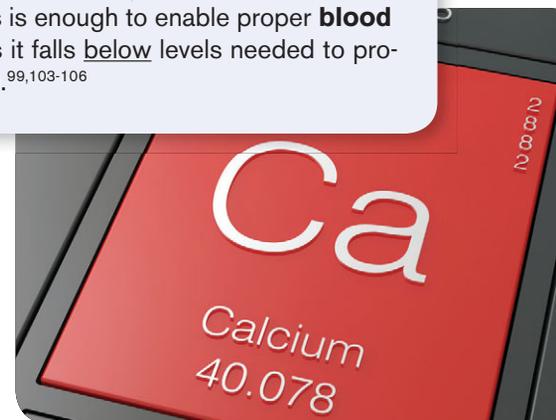
- **Vitamin K1.** Vitamin K1, also known as phylloquinone, is found in plants and some of it converts to vitamin K2 in the body.⁸⁵ This form is considered the least effective because it depends on conversion into activated K2 to confer significant protection against calcification. There are nonetheless published studies showing disease risk reduction in response to ingestion of vitamin K1.⁸⁶⁻⁹⁰
- **Vitamin K2 (MK-4).** MK-4 is found in meat, eggs, and dairy products.⁹¹ It is the most studied form of vitamin K to preserve bone health. It is rapidly absorbed and rapidly metabolized by the body.⁹²⁻⁹⁶
- **Vitamin K2 (MK-7).** MK-7 is found in fermented soybeans and fermented cheeses.^{97,98} What makes this form so special is that it remains active in the body for more than 24 hours.⁸⁴ This is critical when protecting against calcification since matrix Gla-proteins quickly inactivate in the absence of vitamin K2.⁹⁹

The federal government says that adults only need **90 to 120 mcg** per day of vitamin K.¹⁰⁰⁻¹⁰² While this is enough to enable proper **blood clotting**, current research suggests it falls below levels needed to protect against **vascular calcification**.^{99,103-106}

accelerate arterial calcification.^{116,117} One reason is that calcium blood levels are tightly regulated in the body and most ingested calcium will be stored in one's bones. Your bloodstream has top priority when it comes to getting the calcium it needs, which means that if you intentionally deprive yourself of calcium from food and supplements, your parathyroid glands will rob calcium from your bones to maintain a constant calcium blood level to ensure **electrolyte** balance.¹¹⁸

Vitamin K is a **calcium-regulating** nutrient. When properly supplemented, vitamin K2 activates **matrix Gla-proteins** in **soft tissues** to keep calcium out. On the flip side, vitamin K2 activates calcium binding proteins in **bone** to maintain skeletal density.

In the absence of vitamin K, bony structures form in soft tissues. Early pathologists were perplexed to find arteries that were supposed



to be soft and pliable instead had literally **turned to stone**. In 1863, Rudolf Virchow, known as the “father of pathology,” described vascular changes he observed as “**ossification, not mere calcification, occurring by the same mechanism by which an osteophyte forms on the surface of bone.**”¹¹⁹

These observations confirmed by modern findings clearly demonstrate the power of **vitamin K**, or lack thereof, to control whether we maintain strong bone density and soft pliable tissues, or develop osteoporosis together with vascular calcification.

Can Calcification Be Reversed?

Most adults probably suffer some degree of calcification, as intake of vitamin K in Western societies remains at epidemic low levels.

Some of us are severely calcified because of medical disorders requiring dialysis or the drug warfarin, or we allowed blood levels of homocysteine, LDL, or glucose to remain too high for too long.

So the question begs is there anything we can do now to reverse the accumulation of calcium in our arteries, heart valves, glands, and other soft tissues? We found one animal study published in **2007** suggesting that high-dose vitamin K might work. The authors of the study wrote:⁹⁹

“Given that arterial calcifications are predictive of cardiovascular events, regression of arterial calcification may help to reduce the risk of death in people with chronic kidney disease and coronary artery disease.”

The study involved four groups of rats who were all initially fed a six-week diet that contained **warfarin** to induce calcium buildup in the blood vessels. This diet also included a low-dose (normal) vitamin K1 to ensure the animals were not vitamin K deficient. The rats were divided into several groups, of which the following four groups comprised the main part of the experiment:

Group 1: Continue the warfarin plus normal K1 diet;

Group 2: Stop warfarin, but continue with normal dose of vitamin K1;

Group 3: Stop warfarin, but use a high-dose of vitamin K1;

Group 4: Stop warfarin, but add high-dose of MK-4 form of vitamin K2.

During the initial six weeks of warfarin plus normal K1, all animals showed a significant increase in **arterial calcification**.

In the groups receiving high-dose vitamin **K1** or **K2** (MK-4), not only was there no further arterial calcium accumulation, but there was a greater than **37% reduction** of previously accumulated arterial calcification after six weeks. After 12 weeks, there was a **53% reduction** in accumulated arterial calcium deposits.

The groups receiving the high-dose vitamin K1 and K2 also showed a reversal in carotid artery stiffness.⁹⁹

This study provides intriguing evidence that warfarin-induced **calcification** may be reversible by high vitamin K intake.

An estimate of the **human equivalent dose** given to the rats whose arterial calcification was reversed is difficult to precisely calculate because of many variables involved. Our calculations based on estimates of food consumption and animal body weight suggest that the **human equivalent dose** of the **vitamin K2 (MK-4)** used in this study is in the range of approximately **52,000 mcg** to **97,000 mcg** per day (i.e. **52 mg** to **97 mg** per day).

Since the RDA for vitamin K is only **90** to **120 mcg**, the dose of vitamin K used in this rat study may seem extremely high. Yet in Japan, the **MK-4** form of vitamin K2 is approved as a **drug** to treat osteoporosis in humans, and the daily dose is **45,000 mcg (45 mg)**, which has not been reported to have any toxic effects.¹²⁰⁻¹²³

Most **Life Extension**® members take a combination supplement that provides **1,000 mcg** of vitamin K1, **1,000 mcg** of vitamin K2 (MK-4), and **200 mcg** of vitamin K2 (MK-7).

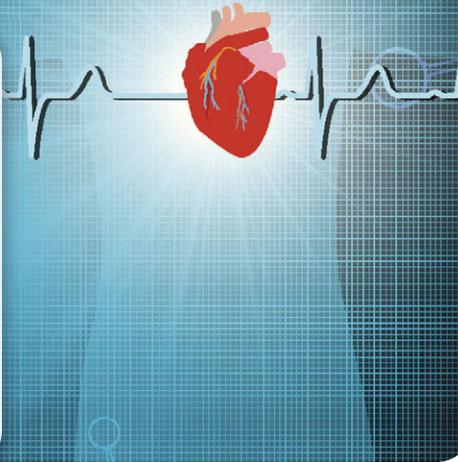
These are high doses compared to dietary supplement industry standards, and one could postulate that taking these daily doses over



Systemic Calcification

Cardiovascular tissues are particularly prone to **calcium infiltration**.

The calcification process, however, is also commonly observed in the skin, kidney, tendons, glands, and other soft tissues as a result of disease, and/or aging.¹²⁴⁻¹³²



an extended time period might induce a **regression of arterial calcification**, but more human research is needed to establish this. Some members are taking higher doses of vitamin K now with the objective of **reversing** accumulated soft tissue calcification.

How To Properly Supplement With Vitamin K

A review of the published scientific literature provides a rationale for aging people to supplement with all **three** vitamin K forms, i.e. **vitamin K1, vitamin K2 (MK-4), and vitamin K2 (MK-7)**.

Since vitamin K is **fat-soluble**, taking it with the fattiest meal of the day will greatly augment **absorption** into one's bloodstream.

A lot of members ask why they cannot take just the **MK-7** form of vitamin K2 since this has long-acting effects in the body and has demonstrated powerful calcium blocking properties. Our response is that vitamin K1 and MK-4 have demonstrated impressive results in other studies, so it is best to take a formula that contains all **three** forms of vitamin K. As mentioned

already, the MK-4 form of vitamin K2 has been used in high doses as a prescription drug in Japan to treat **osteoporosis**.

Since vitamin K1 and MK-4 are inexpensive, it makes sense to include them with the long-acting MK-7 form of vitamin K2 to inhibit and possibly reverse as much vascular calcification as possible, while providing support for strong bones.

Why Doctors Are Apprehensive About Vitamin K

In **1999**, one of our scientific advisors recommended to me that aging people supplement with **vitamin K**.

Vitamin K is known as the "**coagulation vitamin**" because of the critical role it plays in essential blood clotting.

I was initially apprehensive because **abnormal** clotting inside blood vessels (thrombosis) is a leading cause of death in the elderly.^{133,134} Thrombosis is a frequent underlying cause of coronary occlusion heart attacks and ischemic strokes.^{135,136}

One might think that taking higher amounts of vitamin K would increase thrombotic risk. This concern, however, has **no** basis in reality. The reason is that only small amounts of vitamin K are required to fully saturate **coagulation proteins**.¹³⁷

Once **coagulation proteins** are fully saturated by **vitamin K**, then there is **no** increased thrombotic risk in response to **additional** vitamin K intake.

The misconception about the role vitamin K plays in **coagulation** is contributing to the epidemic of diseases caused by **vascular calcification**. A plethora of published studies indicate that the most common degenerative diseases afflicting aging humans could be prevented by taking the proper doses of vitamin K.

What mainstream doctors still don't understand is vitamin K's critical role of **blocking the calcification** of heart valves, arterial linings, and other soft tissues, while helping to keep calcium in bone where it is needed.

Eye-opening recent studies shed light on the importance for people to optimize their intake of **vitamin K** to protect against soft tissue **calcification**.

An urgent need exists to convey this information to the medical community. This may not happen any time soon because vitamin K is sold as a low-cost **dietary supplement** and not an expensive prescription drug.

For longer life,

William Faloon

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1 bottle	\$32	\$24
4 bottles	\$28 each	\$21 each

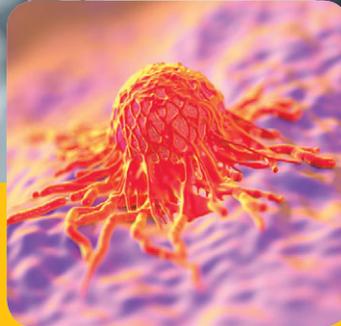


Non-GMO

HMRIignan™ is a trademark used under sublicense from Linnea S.A.
Lifeno™ is a trademark of Naturex, Inc.



To order **Life Extension® Natural Estrogen Without Soy Isoflavones**, call **1-800-544-4440** or visit **www.LifeExtension.com**



IN THE NEWS

Fish-Eating Vegetarians Have Lowest Risk Of Colorectal Cancer

A study published in *JAMA Internal Medicine* found eating a plant-based diet that includes fish significantly reduces the risk of colorectal cancer, the second leading cause of cancer-related deaths in America.*

Researchers from Loma Linda University tracked 77,659 men and women from Seventh-day Adventist churches for seven years. (Adventists were chosen because they abstain from smoking and drinking, and typically follow a vegetarian diet.) Participants filled out a questionnaire regarding over 200 food item choices.

During follow-up, scientists found 490 cases of colorectal cancer (380 cases of colon cancer and 110 cases of rectal cancer). After adjusting for many health and behavioral variables, scientists say vegetarians who included fish in their diet had a **27%** reduced risk of contracting colorectal cancer. Compared to non-vegetarians, those who consumed fish once or more a month—and other meats less than once a month—reduced their risk by **43%**.

Editor's Note: The authors of the study suggest that omega-3 fatty acids may be the key to such a low risk of cancer in the fish-eating group.

* *JAMA Intern Med.* 2015 Mar 9.



Breast Arterial Calcification A Strong Indicator Of Coronary Arterial Calcification

A study presented at the annual meeting of the American Roentgen Ray Society found that mammograms can be an aid for heart risk assessment.* Having calcium deposits in the coronary artery correlates with cardiovascular disease and death. Researchers wanted to determine if **breast arterial calcification** might correlate with **coronary artery calcification**.

Study author Dr. Laurie Margolies of Icahn School of Medicine at Mount Sinai, looked at imaging results from 371 women who had a digital mammogram and a chest CT scan performed within one year of each other. From the mammograms, researchers derived a score based on the number of blood vessels affected and the extent of calcification. Coronary artery calcification scores were obtained from CT scans.

The researchers found that in **76%** of the women, those with a breast arterial calcification score of 0 also had a coronary artery calcification score of 0. As the breast arterial calcification score went up, there was a corresponding rise in the coronary artery calcification score. The findings indicated the presence of breast arterial calcification may play a role in identifying women with coronary artery disease without additional time, cost, and exposure to radiation.

Editor's Note: "The opportunity to diagnose cardiovascular risk on mammography heralds a paradigm shift in imaging," said Dr. Margolies.

* American Roentgen Ray Society Annual Meeting, Toronto, Canada. April 19-24, 2015.

No Link Between Calcium Supplements And Coronary Artery Calcification In Rheumatoid Arthritis Patients

An article published in *Arthritis and Rheumatology* found that supplementing with higher levels of oral calcium was not associated with an increased risk of coronary atherosclerosis in rheumatoid arthritis patients.*

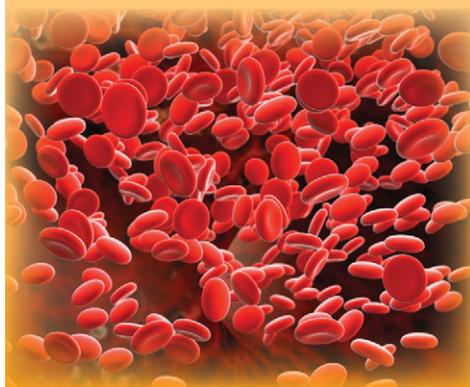
According to a large cohort study of 145 patients with rheumatoid arthritis between the ages of 45 and 84, baseline coronary artery calcification scores less than 100 units—which is a strong indicator of future cardiovascular events—were **70%** less frequent among study participants who took **1,000 mg** or more per day supplemental calcium than in those who consumed less than **1,000 mg** a day.

Approximately **29%** of patients were taking at least **1,000 mg** of supplemental calcium a day while the remainder were taking less than **1,000 mg** a day.

A coronary artery calcification score of less than 100 units was documented in **30%** of patients at baseline and **34%** of patients at the third visit.

Editor's Note: "To our knowledge, this is the first study to explore the association of oral calcium supplementation with coronary artery atherosclerosis in rheumatoid arthritis patients," said study author Laura Geraldino-Pardilla, MD, of Columbia University in New York City.

* *Arthritis Rheumatol.* 2015 Mar 25.



Omega-3 Helps Heart Attack Survivors

The American College of Cardiology's 64th Annual Scientific Session was the site of the presentation of the finding of a benefit for omega-3 fatty acids in patients recovering from heart attack.*

Raymond W. Kwong, MD, MPH, and associates randomized 374 heart attack survivors who were given standard therapy to receive **4,000 mg** of omega-3 fatty acids or a placebo daily for six months. Blood samples were analyzed for omega-3 fatty acid levels and other factors, and cardiac magnetic resonance imaging was conducted at two to four weeks and at the trial's conclusion.

By the end of the trial, blood levels of omega-3 fatty acids had increased among **92%** of the omega-3 group and ST2, a marker of the severity of adverse cardiac remodeling and tissue fibrosis, was reduced. Cardiac imaging results indicated that the omega-3 group experienced less deterioration in heart function in comparison with those who received a placebo.

Editor's Note: "Omega-3 fatty acids may have anti-inflammatory effects and also promote better cardiac healing," commented Dr. Kwong, who is the director of cardiac magnetic resonance imaging at Brigham and Women's Hospital. "This is important because other anti-inflammatory agents, including steroids and NSAIDs, have failed to make a difference after myocardial infarction."

* 2015 American College of Cardiology's 64th Annual Scientific Session.



Low Levels Of Omega-3 Linked With Increased Risk Of Intracerebral Hemorrhage

Researchers at Japan's Tokai University School of Medicine report a protective effect for the omega-3 fatty acid eicosapentaenoic acid (EPA) against the risk of intracerebral hemorrhage, which is characterized by bleeding in the brain. The findings were published in the March 2015 issue of the journal *Nutrition Research*.*

The study included 70 participants who had an intracerebral hemorrhage within 30 to 60 days, compared to 66 controls. Fasting blood samples were analyzed for plasma EPA, docosahexaenoic acid (DHA), arachidonic acid (AA), and other factors. A dietary questionnaire provided information regarding participants' consumption of fish (the most common source of omega-3 fatty acids), as well as other information.

Subjects who had been diagnosed with intracerebral hemorrhage had significantly higher diastolic blood pressure and other factors, lower EPA levels, and a lower average ratio of EPA to AA. Further analysis of the data revealed that low EPA was a risk factor for those 65 and older.

Editor's Note: While omega-3 fatty acids have been linked with protection against ischemic stroke, their ability to help reduce blood clotting has led to speculation that the fatty acids could increase the risk of hemorrhagic stroke, which the current finding contradicts.

* *Nutr Res.* 2015 Mar;35(3):214-20.



Pharmacist Survey Shows Increased Use Of Compounded Hormones

According to an analysis of a recent survey of nearly 500 pharmacists, nearly half of all prescriptions for menopausal hormone therapy are custom-compounded, non-regulated “bioidentical” hormones, which are mixed for each individual according to her doctor’s prescription.*

Since a 2002 Women’s Health Initiative study linked traditional hormone therapy to increased health risks postmenopausal women have been seeking safer alternatives. Customized bioidentical hormones are often marketed as safer alternatives to FDA-approved hormone therapy, with fewer side effects. The Endocrine Society, however, says there is no scientific evidence supporting the safety or effectiveness of compounded bioidentical hormones.

Lead researcher JoAnn Pinkerton, MD, a professor of obstetrics and gynecology at the University of Virginia Health System, Charlottesville, sent surveys to 12,250 pharmacists who provide compounding services. Of those pharmacists who responded, 69% said they expected their hormone therapy compounding services to grow over the next two years.

Editor’s Note: Dr. Pinkerton cited statistics from Symphony Health Solutions stating that in 2012, there were 36 million FDA-approved prescriptions for HT; that number is down 61% from 2002.

* 2015 Mar 6. Endocrine Society’s 97th Annual Meeting.

How Vitamin E Deficiency Damages The Brain

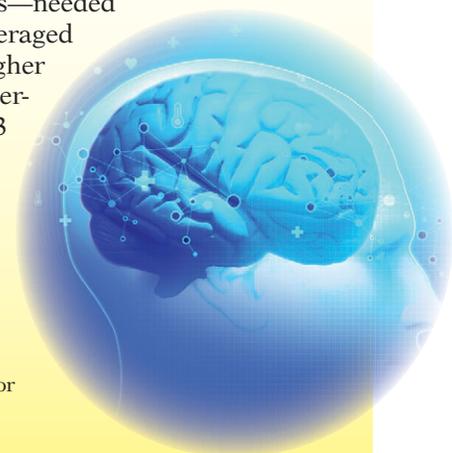
On April 8, 2015, the *Journal of Lipid Research* published an article which explains how a sufficient intake of vitamin E could help protect the brain from lipid peroxidation and its damaging effects.*

Maret G. Traber and associates at Oregon State University evaluated the effects of lifelong vitamin E deficiency in zebrafish. After nine months of consuming a diet with or without vitamin E, the brains of the fish were examined.

The team observed a reduction of approximately one-third in the brain cell membrane component DHA-PC in fish fed the vitamin E-deficient diet in comparison with those whose diets were sufficient. Deficient fish also had a level of lyso PLs—needed for getting DHA into the brain—that averaged 60% less. Hydroxy-DHA-PC 38:6 was higher in deficient fish, indicating increased peroxidation of DHA, which is an omega-3 fatty acid.

Editor’s Note: “This research showed that vitamin E is needed to prevent a dramatic loss of a critically important molecule in the brain, and helps explain why vitamin E is needed for brain health,” Dr. Traber stated. “Human brains are very enriched in DHA but they can’t make it, they get it from the liver. The particular molecules that help carry it there are these lyso PLs, and the amount of those compounds is being greatly reduced when vitamin E intake is insufficient. This sets the stage for cellular membrane damage and neuronal death.”

* *J Lipid Res.* 2015 Apr 8.



Research On Metformin’s Anticancer Effect

The *Proceedings of the National Academy of Sciences* published the outcome of research that helps explain the anticancer effects of metformin observed in men and women with diabetes. Meta-analyses of epidemiologic studies have uncovered a 30 to 40% reduction in cancer incidence among diabetics who use metformin in comparison with other drugs; however, its anticancer mechanisms have not been well studied.*

Researchers examined the effect of metformin on immune system cells known as CD8+ tumor-infiltrating lymphocytes. Due to repeated stimulation during chronic infectious disease and cancer, these cells are known to undergo immune exhaustion, which is characterized by a reduction in cytokine production and the cells’ eventual elimination by apoptosis, accompanied by the expression of specific markers.

The researchers describe a series of experiments in which metformin enabled animals to reject solid tumors while CD8+ tumor-infiltrating lymphocytes were increased and protected from exhaustion and apoptosis.

* *Proc Natl Acad Sci U S A.* 2015 Jan 26.



Testosterone May Help Patients With Prostate Cancer

The January 7, 2015, issue of *Science Translational Medicine* describes a study conducted at Johns Hopkins University School of Medicine that found a benefit for treatment with testosterone in patients with metastatic prostate cancer.*

The study included 16 men with castration-resistant prostate cancer who were injected with **400 mg** testosterone cypionate on the first day of three 28-day cycles. The subjects were also given the chemotherapy drug etoposide daily during the first two weeks of each cycle. Androgen deprivation therapy to suppress the body's production of testosterone was then resumed. This allowed for cycling from elevated to near-castrate testosterone levels during the course of the study.

Half of the 14 men who completed the study experienced reductions in prostate-specific antigen (PSA, a blood marker used to evaluate prostate cancer progression) and of 10 men whose cancer could be imaged, five experienced regression.

Editor's Note: Although the participants eventually experienced PSA progression, subsequent treatment with androgen-ablative therapies was successful in all who received it, which suggests that testosterone therapy as administered in the study may restore sensitivity to the drugs among those who have become resistant.

* *Sci Transl Med.* 2015 Jan 7;7(269):269ra2.



Increased Lycopene Associated With Lower Kidney Cancer Risk

The February 2015 issue of the journal *Cancer* reported a finding among participants in the Women's Health Initiative (WHI) of a lower risk of renal cell carcinoma in association with greater intake of lycopene, which is found in red fruit such as watermelon and tomatoes.*

Cathryn Bock, PhD, MPH, and associates analyzed data from 96,196 postmenopausal women who enrolled in the WHI from 1993 to 1998 and were followed through July 2013. Dietary questionnaires completed upon enrollment were analyzed for the intake of lycopene and other nutrients, and supplement use was ascertained in subject interviews.

Two hundred-forty women were diagnosed with renal cell carcinoma over follow-up. Among women whose intake of lycopene was among the top **25%** of subjects, there was a **39%** lesser risk of the disease in comparison with those whose intake was among the lowest **25%**.

Editor's Note: Lycopene from food sources has also been associated with decreased risk of breast and prostate cancers, said Dr. Bock.

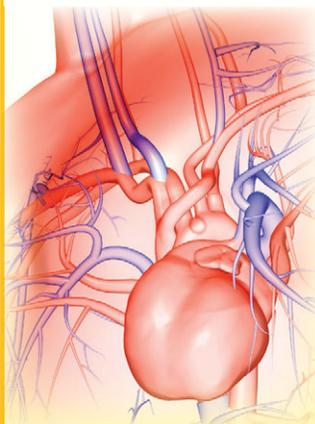
* *Cancer.* 2015 Feb 15;121(4):580-8.



L-Carnitine Lowers Inflammation In Heart Disease Patients

The journal *Nutrition* reported the outcome of a trial of coronary artery disease patients, which found that supplementation with L-carnitine was associated with a reduction in markers of inflammation.*

Thirty-nine men were given **1,000 mg** L-carnitine or a placebo for 12 weeks. Serum inflammation markers C-reactive protein (CRP), interleukin-6 (IL-6), and tumor necrosis factor-alpha (TNF- α) were measured before and after the treatment period.



Among those who received L-carnitine, all markers of inflammation were lower on average in comparison with the placebo group by the end of the study. Higher CRP and IL-6 levels were correlated with increased levels of oxidative stress.

"We suggest that L-carnitine supplementation ... may have potential utility to reduce inflammation in coronary artery disease," Bor-Jen Lee, MD, PhD, and colleagues conclude.

Editor's Note: Dr. Lee and associates note that studies have shown that L-carnitine helps prevent oxidative injury in models of cardiovascular disease by reducing lipid peroxidation, scavenging hydrogen peroxide and superoxide radicals, chelating metal ions and upregulating the body's defense system.

* *Nutr.* 2015 Mar;31(3):475-9.

When it Comes to the *Health Benefits of a Mediterranean Diet*

Can Your Omega-3 Compare?

From supporting **heart health** and **brain function** to balancing the **inflammatory** response, there is no debating the broad-spectrum benefits of **omega-3** fatty acids.¹⁻³

There are hundreds of fish oil supplements on the market, but only one incorporates lifesaving findings to provide optimal omega-3 and olive fruit extracts, along with sesame lignans, in one formula—**Super Omega-3** from **Life Extension**®!

Fish Oil + Olive Fruit Extract

Research confirms that a combination of **fish oil** and **olive oil** may support a healthy inflammatory response better than fish oil alone.⁴ And only one omega-3 product incorporates the benefits of both fish oil and olive fruit extract into a single novel formula called **Super Omega-3**. Each four softgel serving supplies the equivalent amount of **4 to 6 ounces** of polyphenol content found in **extra virgin olive oil**.

+ Sesame Lignans

Studies show that when added to fish oil, **sesame lignans** safeguard against oxidation and direct fatty acids toward pathways that help with inflammatory reactions.⁵

= Health Benefits of a Mediterranean Diet

No other commercially available fish oil supplement contains this level of essential fatty acids, sesame lignans, and olive fruit polyphenols.

Super Omega-3 uses a proprietary process to produce a pure, stable, and easy-to-tolerate fish oil that exceeds the standards set by international rating agencies, ensuring any pollutants are reduced to a virtually undetectable level.



Super Omega-3

Item #01482 • 120 softgels • Non-GMO

	Retail Price	Member Price
1 bottle	\$32	\$24
4 bottles	\$28 each	\$21 each
10 bottles	\$22.73 each	\$17.05 each



References

1. *Public Health Nutr.* 2006 Dec;9(8A):1136-40.
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4. *Nutrition.* 2005 Feb;21(2):131-6.
5. *Biochem Biophys Acta.* 2004 Jun 1;1682(1-3):80-91.

Note: While the health benefits of omega-3s from fish oil are universally recognized, the critical importance of olive oil in maintaining healthy vascular function remains largely overlooked.

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

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



Blueberry Extract Boosts DNA Function

Studies show that blueberries delay the aging process through a variety of mechanisms, including **maintaining healthy DNA structure** and favorably modulating **genes** associated with aging.^{1,2}

Chockfull of **anthocyanins**, the **blueberry** provides health-boosting benefits shown to:

- Enhance heart health³
- Maintain brain function^{4,5}
- Sustain healthy blood sugar levels already within normal range⁶
- Support smooth firm skin⁷
- Maintain a healthy weight⁸ and stable cholesterol levels already within normal range⁹

Blueberry extract is even more potent than the whole berry or juice, providing greater metabolic support throughout the entire body and without the excess sugar of raw fruit.¹⁰ Life Extension®'s **Blueberry Extract Capsules** consists of only concentrated **extracts** from **wild blueberries**, which possess up to **10 times** the nutritional capacity of cultivated berries.

Blueberry Extract Capsules

Item #01214 • 60 vegetarian capsules

	Retail Price	Member Price
1 bottle	\$22.50	\$16.88
4 bottles	\$20 each	\$15 each



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Non-GMO

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To order **Blueberry Extract Capsules**, call **1-800-544-4440** or visit **www.LifeExtension.com**

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NUTRIENTS

FIT

FIBER

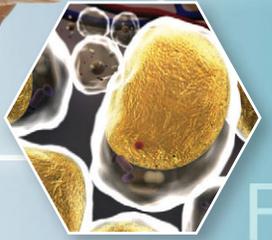
FAT

CALORIES



CalReduce
Selective Fat Binder

LIMIT EXCESS DIETARY FAT



Combating excess dietary fat is one of the most difficult challenges for those trying to lose weight and avoid the effects of unhealthy lipids.

CalReduce Selective Fat Binder safely binds to **excess fats** in your body and can help you maintain a healthy weight.

The primary ingredient in this formula is **alpha-cyclodextrin**, a patented super-fiber that **absorbs** fat molecules from your food before they enter your bloodstream.

This soluble fiber absorbs **9 times** its weight in dietary fat—without undesirable gastrointestinal side effects.¹ And research shows that **alpha-cyclodextrin** selectively binds to unhealthy **saturated** and **trans fats** without affecting healthy fats such as polyunsaturated fatty acids.^{2,3} In one experimental study, it was shown that **alpha-cyclodextrin** caused an approximately **13%** increase in beneficial **omega-3 DHA** blood levels.³

Chewing the recommended **two tablets** after each fat-containing meal binds up to **36 grams** of pure dietary fat, assuming you eat two fat-containing meals daily. This is sufficient to decrease up to **320 calories** from the fat in your food.¹ If all your daily meals are high in fat, chew **two tablets** of **CalReduce Selective Fat Binder** with each of your **three meals** to reduce your caloric intake up to **500 calories** a day.

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

A bottle of 120 **CalReduce Selective Fat Binder** chewable mint tablets retails for \$45. If a member buys four bottles, the price is reduced to **\$28.50** per bottle... a huge savings!



Item # 01823

To order **CalReduce Selective Fat Binder**, call **1-800-544-4440** or visit **www.LifeExtension.com**

References

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

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





Relentless Commitment To **QUALITY**

If you're reading this article, you are likely part of an **elite** group of longevity enthusiasts who take extraordinary steps to stave off aging and premature death.

Life Extension[®] supporters highly value the **quality** standards of the **nutrient formulations** they rely on to support their health. One reason for this consumer confidence is the **obsession** of Life Extension's founders and board members to significantly extend healthy human life spans.

Life Extension's success in producing superior quality nutritional supplements that provide clinically meaningful effects is the result of a rigorous, formalized system of checks and balances. This process begins before raw materials for product formulation are acquired.

Life Extension utilizes **independent testing** labs to routinely analyze raw materials for quality and consistently submits finished products to third-party testing organizations to confirm and document product potency and purity.

The **Life Extension Quality Control** program consists of scientific analysis, testing, and monitoring all the way from the original raw material sourcing to the finished, packaged product that exceeds the **FDA's** standards.

This article details how this relentless commitment to quality is carried out.

Unwavering Quality Assurance

Life Extension's dietary supplements are manufactured under rigorous standards for quality control. These formulations meet, and often exceed, predefined industry standards for product quality.

"Our suppliers and contract manufacturers are constantly evaluated on a variety of parameters, including quality performance," says Life Extension's Vice President of Quality Assurance/Quality Control, George Stevens.

And just as Life Extension closely monitors and tests the potency of standardized botanical extracts slated for manufacturing products, the organization's fulfillment facility, as well as quality assurance and quality control (QA/QC) procedures, are evaluated regularly by **NSF International**, an organization that provides independent, third-party certification programs on a variety of aspects of dietary supplement production, including certification in **good manufacturing practices**. NSF International has certified that Life Extension's QA/QC procedures consistently meet the highest standards of good practices for quality assurance and control.

"Life Extension earned Good Manufacturing Practices registration," says Stevens, referring to the NSF International-certified designation for **current Good Manufacturing Practices** for dietary supplement manufacturers that meet the level of best practices for quality. "And we're subject to rigorous current Good Manufacturing Practices audits every six months to maintain our registration."

Life Extension's fulfillment facility was recently certified for current Good Manufacturing Practices

based on a demanding, two-day audit conducted by NSF International that included an evaluation of Life Extension's warehouse and distribution center, including facility cleanliness and sanitation, as well as various quality systems such as complaint handling and investigations, product returns, training, deviation management, and product recall handling. The NSF International registration is widely recognized as an objective and exemplary seal of approval that signifies that the company has met or exceeded current Good Manufacturing Practices requirements and industry standards and best practices for quality.

ConsumerLab is a leading provider of information to help consumers and health care professionals identify the best quality health and nutrition products. Products are tested for identity (i.e. does the product meet recognized standards of identity and does the product meet the level of quality claimed on the label?), strength (i.e. does the product contain the amount of ingredient claimed on the label?), purity (i.e. is the product free of specified contaminants?), and disintegration (i.e. does the product break apart properly so that it may be used by the body?).

"Life Extension has voluntarily participated in the **ConsumerLab** program for years," says George Stevens. "This is an independent organization that tests various classes of nutrition products for potency and other issues related to quality. Life Extension consistently meets ConsumerLab standards and has been recognized for its outstanding purity and quality."

The **International Fish Oil Standards Program** is another voluntary program in which Life Extension



has participated for some time. “The International Fish Oil Standards Program is the only third-party testing and certification for omega-3 fish oil products in the world,” says Stevens. “Under the program, finished products are analyzed to the highest industry standards for contaminants, stability, and potency. These results are then made available to consumers through their website (www.nutrasource.ca/ifos) on a per-lot basis.” The International Fish Oil Standards Program is the only program that tests fish oil products by specific batch and lot number to make sure that they do not contain harmful levels of contaminants. Recently, the organization has gone a step further and instituted additional tests for radiation. Life Extension consistently receives the highest world-wide five-star rating by the International Fish Oil Standards Program.

Life Extension’s Advanced Processes And Procedures

Life Extension consistently reviews advanced processes and procedures to ensure the most up-to-date strategies and methods are utilized.

This has been accomplished, says Stevens, by “proactively defining and managing” quality systems internally with an emphasis on qualification of materials and suppliers, mandating meticulous facility cleanliness, and insisting on rigorous finished goods specification and testing programs.

The difference is Life Extension’s well-documented, procedure-driven, quality control program that is given the highest possible priority throughout the company—from raw material sourcing and ongoing monitoring to finished product quarantine and lot testing. “We follow the science of nutritional excellence, typically basing product concept and dosing on published research studies,” explains Stevens.

Quality Assurance Begins With Product Conception

Life Extension’s success in producing superior quality nutraceuticals that consistently exceed both industry and government standards and provide clinically effective results is the result of a formalized system of checks and balances that begins even before raw materials are acquired and runs through to the testing of every lot of packaged, finished products. Even after the product is sold, the company evaluates and tracks any returns received and invites customer feedback. “We consistently evaluate and investigate consumer feedback on our products. If we see an opportunity to improve, we implement it,” says Stevens.



What You Need To Know

Life Extension’s Quality Control

- From raw materials to the final packaging, Life Extension utilizes the highest quality control procedures to ensure products meet exacting standards for potency and purity.
- Life Extension products have been consistently recognized by ConsumerLab, the leading provider of information to help consumers and health care professionals identify the best quality health and nutrition products, for their outstanding purity and quality.
- The International Fish Oil Standards Program is a volunteer program that tests and certifies fish oil products. Life Extension consistently receives the highest worldwide five-star rating.
- Life Extension consistently reviews advanced processes and procedures to ensure the most up-to-date strategies and methods are utilized.
- Life Extension also strongly emphasizes the management and evaluation of its outside providers and frequently conducts detailed on-site audits of new and existing suppliers.
- Quality control continues even after the final finished and packaged products are received by Life Extension.



Life Extension also utilizes the **Supplier Management and External Audit Program**, which places strong emphasis on the management and evaluation of outside providers—including contract manufacturers and packagers, contract laboratories, and raw material suppliers.

This evaluation process consists of an assessment of completed regulatory questionnaires as well as an aggressive on-site audit program based on our stringent criteria for manufacturing, packaging, labeling, and holding dietary supplement products in the United States. Items of special interest include cleaning and sanitation procedures, pest control, manufacturing and packaging controls, testing, training, and documentation practices.

“In the early phases of product conception, before consideration for use, any new raw material will be rolled into the qualification testing program,” says Stevens. “This program uses a variety of advanced technological methods to test material identity and potency, as well as the absence of contaminants.

“These methods may include, but are not limited to, **high performance thin-layer chromatography**, assay by **high-performance liquid chromatography**, pesticide and residual solvent testing by **gas chromatography**, and **microbial testing** using United States Pharmacopeia methodology.”

Identification of botanical ingredients is given the highest level of scrutiny, using high performance thin-layer chromatography and other evaluative techniques to ensure there has been no substitution or adulteration of these compounds. Botanical ingredients are also rigorously screened for pesticides. “Because botanicals are natural products, quality, potency, and ingredients can vary widely. We perform in-depth testing to ensure that the highest quality botanicals are used in our products for our customers’ health.

“In addition, the suppliers themselves will be asked to complete detailed regulatory questionnaires and may be subject to on-site audits by Life Extension staff,” Stevens adds. “Failure at the raw material qualification stage indicates that a suspect ingredient or supplier simply cannot be used in Life Extension products.”

Each year, Life Extension conducts frequent detailed on-site audits of new suppliers and existing suppliers—including on-site evaluations of the company’s top contract manufacturers, packagers, and laboratories.

“These ongoing supplier management activities are critical to ensure that manufacturers continue to follow current Good Manufacturing Practices and provide the highest quality products to our customers,” Stevens says.

“Audit findings are documented and reported back to the suppliers, and, if necessary, corrective and preventive actions are requested from each supplier. In some instances, follow-up audits are performed to make sure that the corrective actions we require have been to our requirements. And in some cases, companies are eliminated from consideration as partners, disqualified for not meeting Life Extension’s most exacting quality standards.”

This aggressive audit schedule is necessary to ensure the highest level of current Good Manufacturing Practices compliance. The combination of NSF International registration along with Life Extension’s on-site inspections helps ensure that the products manufactured on Life Extension’s behalf have been produced in accordance with high standards.

Quality Control Continues After Product Packaging

Explaining what happens after a raw material source has been approved, Stevens says: “Once raw materials have been qualified, small-scale pilot batch manufacturing work is conducted.

“Once this process has been completed successfully, formal **Finished Product Specification Packets** are issued to the contract manufacturer. These packets are filled with required specifications and pertinent information about the final formulation, packaging configuration, and testing requirements for the finished

goods. This information is essential to ensure consistency from batch to batch.”

Then, when raw materials are received at the manufacturer’s premises, “the materials are held in quarantine and cannot be used until testing is complete and they’ve been fully approved by Life Extension’s QA/QC team. At that point only approved materials will be issued and used for our production.”

Samples are collected throughout the manufacturing process to be tested at the manufacturer and at a qualified third-party laboratory to ensure that the product is meeting everything stated in the Finished Product Specification Packet.

“Final packaging only begins when these tests are completed and approved by our Quality Assurance team,” says Stevens. “An additional series of quality checks are performed during packaging to ensure there are no issues with labels, capsule counts, product seals, or other parameters.

“Once all testing is complete and related batch documentation is closed, the contract manufacturer will issue a Certificate of Analysis and the product will be shipped to Life Extension’s Distribution Center.”

And the quality inspections and documentation do not stop when the finished products are received at Life Extension.

“Each lot of finished product received by Life Extension is held in quarantine, pending a physical inspection of the goods along with a review of the product’s Certificate of Analysis, which must accompany each shipment,” explains Stevens. “The result of this incoming inspection is documented by our Quality

Screening (And Rejecting) New Ingredients

Throughout the year, Life Extension introduces new ingredients to address specific health needs.

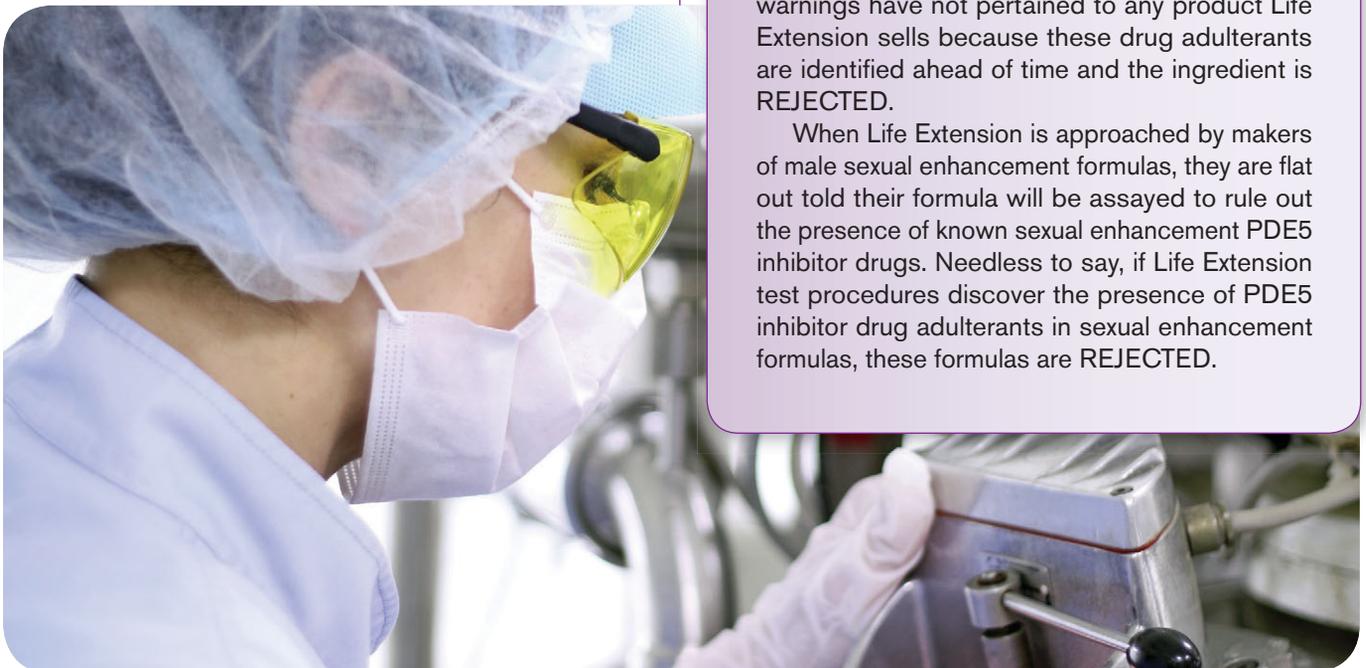
What consumers don’t see are the many ingredients that are **REJECTED** because the raw material fails analytical testing performed by Life Extension (e.g. a tested material fails to achieve potency standards as claimed by the supplier). In addition, ingredients or products may be rejected because health claims made by the material supplier cannot be substantiated (e.g. a supplier claims an ingredient provides substantial support for HDL cholesterol, but clinical data is lacking and/or preclinical data is suspect).

Here is an example of adulteration associated with a particularly problematic category of consumer products and the steps Life Extension takes to ensure purity of products:

An epidemic practice occurring in the area of male sexual enhancement products is to spike herbal products with prescription erection-inducing PDE5 inhibitor drugs like Viagra®, Levitra® or Cialis®. These adulterated, male sexual health products are increasingly ingested by aging male consumers, who are unknowingly exposed to unknown potencies of drugs that can inflict unwanted side effects.

Over the past decade, the FDA has issued alerts warning consumers of potentially dangerous drug adulterants in male sexual health products. These warnings have not pertained to any product Life Extension sells because these drug adulterants are identified ahead of time and the ingredient is **REJECTED**.

When Life Extension is approached by makers of male sexual enhancement formulas, they are flat out told their formula will be assayed to rule out the presence of known sexual enhancement PDE5 inhibitor drugs. Needless to say, if Life Extension test procedures discover the presence of PDE5 inhibitor drug adulterants in sexual enhancement formulas, these formulas are **REJECTED**.





Control group—and any finished products not meeting our exacting standards are rejected and are not released for distribution.”

Those product Certificates of Analysis are made available to Life Extension customers on request.

“These certificates are representations of the analytical reports received from the contract manufacturers and labs,” says Stevens. “They contain all of the required tests as defined in the Finished Product Specification Packets, including potency and other pertinent data. This transparency provides additional confidence that Life Extension’s products meet the highest quality standards.”

The same inspection rigor is applied to Life Extension’s internal operations as well.

The **Life Extension Quality Unit** maintains a documented system for self-inspections that includes internal audits conducted at the corporate location as well as at the distribution center in Edison, NJ. These internal audits are required annually—but at Life Extension, they are conducted more frequently by choice.

Summary

Commercial supplement companies sell bottles of pills with varying degrees of quality. A number of once-respected supplement brands have sold out to pharmaceutical behemoths whose financial interests lie in Americans falling ill from degenerative illnesses and requiring loads of outlandishly priced prescription drugs to remain alive.

The most popular multivitamin supplements (like Centrum®) are owned by pharmaceutical companies. Other purveyors of supplements have sold out to capital venture firms whose only goal is to find ways to squeeze out more profits, with zero concern for the health of their customers.

Life Extension views its supplement formulas as stepping stones towards life spans long enough for humans alive today to access breakthrough medical technologies that will eradicate pathological aging processes.

Advanced quality control and quality assurance procedures are utilized by Life Extension to ensure products meet exacting standards for potency and purity.

Life Extension takes it a step further and utilizes third-party testing labs to routinely analyze raw materials for quality. Finished products are consistently submitted to third-party testing organizations to confirm and document product potency and purity.

From raw materials to finished product and retained samples, Life Extension products are tested, analyzed, and inspected at every step of the manufacturing process to ensure that each bottle meets the **Life Extension** expectations of superior quality. ●

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



Highly Absorbable ASTAXANTHIN

For Total Body Cellular Support

Astaxanthin has long been shown to promote eye health. More recent findings indicate that this member of the **carotenoid** family has benefits for the entire body, including the brain, heart, skin, and immune system.

Since astaxanthin is a **fat-soluble** compound, it has limited assimilation into the bloodstream, with as little as **50%** getting absorbed by the body.^{1,2}

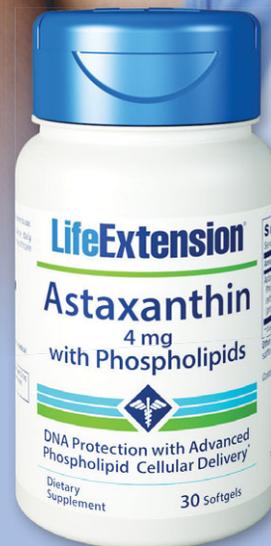
To facilitate maximum absorption of this key nutrient, Life Extension has combined **4 mg** of natural astaxanthin with a proprietary blend of **80 mg** of four different **phospholipids**. This innovative formulation has been shown to enhance carotenoid absorption by **several-fold**.³

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

Contains soybeans.

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Item # 01720

To order Astaxanthin 4 mg with
Phospholipids, call 1-800-544-4440 or visit
www.LifeExtension.com

Restore Structural Support To Aging Skin

Aging skin loses structural **collagen** and water-binding **hyaluronic acid**,^{1,2} while **environmental** factors weaken the skin's protective outer barrier.³

The results of these changes are wrinkles, age spots, fine lines, and a dull, dry appearance.⁴⁻⁶

The **new Collagen Boosting Peptide Serum** helps inhibit these unsightly processes—supporting the skin's collagen structural support and maintaining its youthful hydration, which in turn firms, lifts, and contours dermal appearance.

REGENERATIVE EFFECTS OF SNOW ALGAE

The key to **Collagen Boosting Peptide Serum's** restorative power is its high concentration of **snow algae**, which comprises of resilient organisms that have been lab-cultivated and formulated into a serum format (instead of a cream) for maximum absorption. Snow algae help activate cellular **AMPK** and a key **longevity gene**.

In skin cells, the result is **increased collagen** production. Researchers recently observed that **snow algae** boosted skin **hydration** in **100%** of studied individuals—after just **14 days** of application.⁷

SUPPORTING PEPTIDES AND HYALURONIC ACID

Supporting these regenerative effects are **peptides** that stimulate the synthesis of **collagen** at the point where the dermis meets the epidermis above it. A clinical trial found that these **peptides** increased skin smoothness by **12.2%**, and firmness by **10.8%**, after **two months** of application.⁸

One peptide, **palmitoyl tripeptide-5**, further supports collagen production by activating "latent tissue growth factor beta." A study showed that it reduced the appearance of deep wrinkles by **28%**—**within minutes** of application!⁹

Collagen Boosting Peptide Serum also contains **hyaluronic acid** to directly replenish falling hyaluronic acid levels—shown to restore the skin's ability to hold moisture and retain its softness and youthfulness.¹⁰

Due to its high-absorption serum format, applying just 2-3 drops of **Collagen Boosting Peptide Serum**, morning and night, to targeted areas of the face produces noticeable rejuvenation effects within weeks of first use.

A 1-ounce bottle of **Cosmesis Collagen Boosting Peptide Serum** retails for \$59. If a member buys two bottles, the price is reduced to **\$39** per bottle.



Item # 80156

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To order **Cosmesis Collagen Boosting Peptide Serum**, call 1-800-544-4440 or visit www.LifeExtension.com

BEST SELLER OF 2014!

Your Skin's Internal Moisturizer

Ceramides are essential for preserving healthy-looking skin.^{1,2} They play an important role in maintaining the skin's moisture balance and protecting the skin's surface.³

Unfortunately, your body's production of ceramides declines with age.⁴ Many anti-aging face creams include ceramides. The problem is that **topical application** cannot penetrate deeply enough into the skin to have a long-term impact on your skin's appearance.

Researchers have discovered that the ceramides naturally produced by young skin are identical to those present in **wheat**—and that these wheat-derived oils can be taken *orally*.

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

Skin Restoring Phytoceramides with Lipowheat® can reach the deepest layers of skin all over the body—*not just where creams are applied*—where it can offset the visible impact of the body's gradual decline in ceramides. The hydrating action of **Lipowheat® ceramides** has proved effective in clinical trials.

One bottle containing 30 **350 mg** vegetarian liquid capsules of **Skin Restoring Phytoceramides with Lipowheat®** retails for **\$25**. If a member buys four bottles, the price is reduced to **\$17.25**.

Gluten-free.
Non-GMO.

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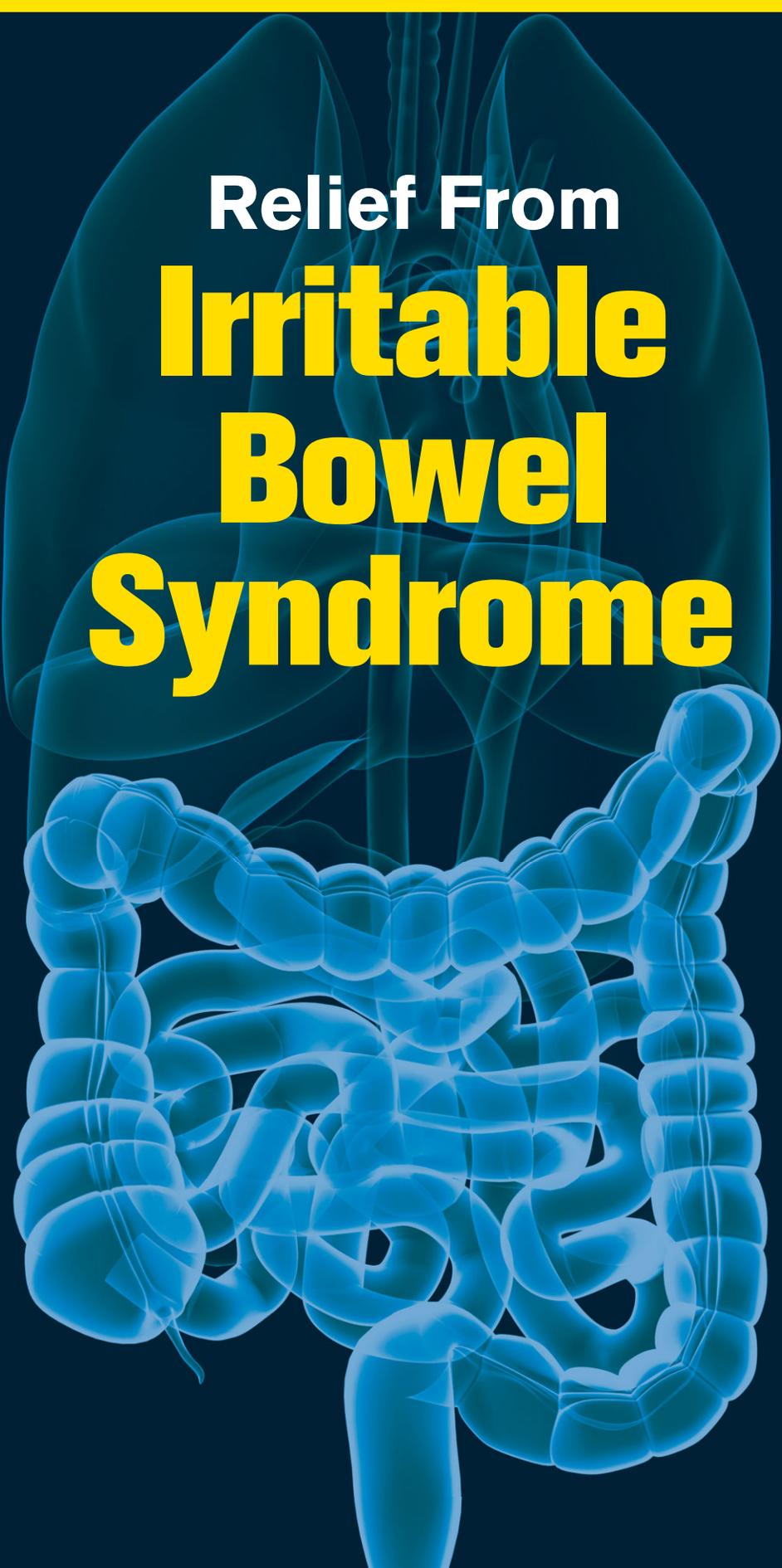


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To order Skin Restoring
Phytoceramides with Lipowheat®
call 1-800-544-4440 or visit
www.LifeExtension.com

For most of 2014, demand for
Skin Restoring Phytoceramides
has far outstripped supply.
We are now fully stocked and
will ship orders usually within one
business day of receipt.

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.



Relief From **Irritable Bowel Syndrome**





Few people realize that the intestinal tract has its own nervous system that communicates directly with the brain. Because of this unique nervous system,¹⁻³ people with **irritable bowel syndrome** often have intensified responses to abdominal distension or movement that can result in the brain receiving distressingly strong pain signals.⁴⁻⁶

Nearly **20%** of Americans suffer from irritable bowel syndrome, a chronic disorder that causes painful symptoms such as cramping, abdominal pain, bloating, gas, diarrhea, and constipation.⁷⁻¹⁰

Despite its prevalence, there is no universally accepted medical treatment that directly addresses irritable bowel syndrome symptoms in all people.^{11,12}

However, cutting-edge research has determined that there are **five major biological changes** that contribute to the symptoms associated with irritable bowel syndrome. With this knowledge, scientists from around the world have combined **two specific compounds** that work together to address **all** of these changes.

This unique formulation is composed of an extract from the ***Perilla leaf*** that is rich in beneficial flavonoids.^{13,14} The second constituent, a patented probiotic organism, ***S. cerevisiae***, helps normalize the intestinal microbial community by reducing the presence of deleterious or disease-causing bacteria.^{15,16} Together, these compounds are showing relief of painful symptoms for the five major causes of irritable bowel syndrome.

What Causes Irritable Bowel Syndrome?

Irritable bowel syndrome has multiple potential mechanisms in different individuals—all of which produce approximately the same set of symptoms.¹⁷⁻¹⁹ Potential causes can include everything from hidden food allergies or sensitivities²⁰ to insufficient function of the pancreas²¹ to infection with a number of common intestinal parasites.²²⁻²⁵

Regardless of the specific underlying cause of irritable bowel syndrome symptoms, there are five major biological changes that contribute to the symptoms:

- **Disordered gut motility** (abnormal movements of the muscles in the intestine),^{26,27}
- **Visceral hypersensitivity** (exceptionally brisk pain responses in the intestine),²⁷⁻³⁰
- **Inflammation** (very low grade, present in intestinal walls of some irritable bowel syndrome patients),³¹⁻³³
- **“Food sensitivities and leaky gut”** (increased intestinal permeability),^{20,34,35} and
- **Dysbiosis** (disruption of the normal balance of intestinal microorganisms).³⁶⁻³⁹

We now recognize that **all five** of these processes interact with each other in order to produce the symptoms associated with irritable bowel syndrome. For example, dysbiosis can produce inflammatory changes, which can lead to loss of intestinal barrier function, resulting in “leaky gut.”^{34,37,39} Inflammation and dysbiosis are involved in altered pain perception and disordered bowel motility.^{29,40,41} These are only a few of the dizzying number of interactions that ultimately produce the suite of symptoms that we define as irritable bowel syndrome.

Because these five processes are so interconnected, it’s necessary to address all of them simultaneously in order to have an impact on symptoms.

Modern mainstream medicine offers irritable bowel syndrome treatments such as the Fermentable Oligo-Di-Monosaccharides and Polyols diet that eliminates foods like carbohydrates, fructose, lactose, and more in an effort to remove irritants from the stomach as well as anti-inflammatory⁴² or antispasmodic drugs,⁴³ but no single treatment works in a majority of cases.^{8,27,44-46} No doubt this is due to the fact that none of these approaches addresses the five major disturbances that are intrinsic to the full irritable bowel syndrome picture.

If we could control or reverse these five changes, we’d likely be able to control irritable bowel syndrome symptoms themselves. The good news is that a pair of simple, natural compounds does what no modern drugs can do: directly address each of those five components in the irritable bowel syndrome puzzle. The result is helpful relief from irritable bowel syndrome symptoms.

Two Natural Compounds Fight Irritable Bowel Syndrome On Five Major Fronts

One of the benefits of natural compounds is that they often work via a variety of mechanisms that add to the overall desired effect.^{47,48} That is precisely the case with a novel combination of two compounds *specifically developed* for people with irritable bowel syndrome and related abdominal complaints.

An extract from the **Perilla leaf** and a probiotic strain of a natural organism called **S. cerevisiae** have been used for both culinary and health-promoting ingredients.^{49,50} Together, these two compounds work in harmony to reverse or mitigate all five of the major factors that can produce irritable bowel syndrome symptoms. As a result, human studies show that these two compounds significantly improve the symptoms of irritable bowel syndrome, including bloating and distension, passage of gas, gastrointestinal rumbling, feelings of fullness, and abdominal discomfort.



Perilla frutescens is an herb in the mint family that is found in much of Asia and North America. The green or dark red leaves of *Perilla* are used in Japanese and Korean cuisine (where they are known as Shiso, Japanese basil, or Japanese Melissa), and have a long history in traditional medical systems, especially for their properties at relieving digestive symptoms.^{13,51}

Perilla leaves are laden with beneficial biomolecules, most notably a unique flavonoid compound called **vicenin-2**.^{13,52} A newly developed, proprietary extract of green *Perilla* leaves contains a specific ratio of vicenin-2 in combination with *rosmarinic acid*, another flavonoid that is especially noted for its relaxing properties (it promotes activity of the neurotransmitter GABA, the target of anti-anxiety drugs such as Valium®).^{14,53}

The second compound, a specific strain of ***S. cerevisiae***, has been used for millennia in baking (especially sourdough bread).⁵⁴ It is a probiotic organism that helps to normalize the intestinal microbial community by reducing the presence of deleterious or disease-causing bacteria.^{15,16}

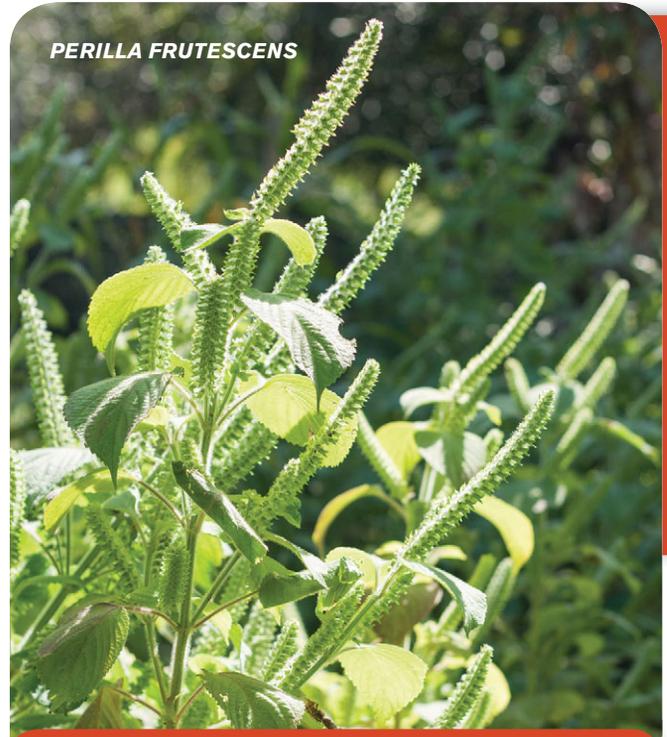
Unlike drugs, which only mask the symptoms, this natural combination *modifies* each of the following five major biological changes that contribute to the symptoms.

1. Disordered Gut Motility

Perilla leaf extract has been shown to address four of the five major irritable bowel syndrome symptom-producing processes. The first of these is **disordered gut motility**. This refers to alterations in the normal coordinated waves of muscle contractions and relaxations in the intestinal wall that propel food/fecal contents through the gastrointestinal tract.^{26,27} Both increased and decreased motility may occur in the various forms of irritable bowel syndrome,^{27,55} and may be related to disturbances in distribution of certain important hormone-producing (endocrine) cells in the stomach and intestinal walls.⁵⁶⁻⁵⁸ Disordered motility can result in symptoms such as cramping, bloating, and urgency to defecate soon after food intake—all of which are reported by irritable bowel syndrome patients.^{26,27,59}

Studies show that vicenin-2 and *Perilla* leaf extract help improve disordered gut motility by producing *relaxation* in the muscles of the intestinal wall. This effect is achieved by inhibiting excessive excitatory nerve and muscle activity in the intestine.^{14,52} The *Perilla* extract also has a “prokinetic” effect, meaning that it promotes normal motility to allow intestinal contents to move along smoothly without cramping or bloating.

It’s important to note that unlike antispasmodic drugs, *Perilla* extract acts only when neurotransmitters in the intestine are imbalanced, so they do not have a negative effect on gut motility in any way.⁵²



What You Need To Know

Relief From Irritable Bowel Syndrome

- Irritable bowel syndrome affects up to 20% of adult Americans.
- The cramping, bloating, abdominal pain, diarrhea, constipation, or a mix of both can destroy quality of life and impair work performance.
- Mainstream medicine cannot even agree on a unifying cause of irritable bowel syndrome symptoms, let alone produce a cure.
- Leading scientists now recognize five major pathological processes that contribute to the symptoms seen in irritable bowel syndrome.
- A combination of natural ingredients, *Perilla* leaf extract and a beneficial probiotic strain of *S. cerevisiae*, directly oppose all five processes, resulting in proven symptomatic relief.
- This natural combination does not mask symptoms like drugs, but in fact modifies each of the fundamental disease-causing processes in irritable bowel syndrome.



2. Visceral Hypersensitivity

Through its antispasmodic effects,⁵² *Perilla* leaf extract may also help alleviate **visceral hypersensitivity**, another alteration in physiology known to produce irritable bowel syndrome symptoms.^{27,60} Visceral hypersensitivity is an overreaction to stimuli in the bowel.

The intestinal tract has its own nervous system. Networks of sensory and motor nerves throughout the walls of the intestine communicate with the brain, sending signals about fullness, stretching, and motion of the intestine. People with irritable bowel syndrome often have very brisk responses to abdominal distension or movement that can result in the brain receiving a pain signal.⁴⁻⁶

Research shows that *Perilla* extract affects areas in the brain where pain processing occurs,⁶¹ suggesting that it may play a further role in reducing the abnormal pain perception that results from visceral hypersensitivity.⁶²

3. Chronic, Low-Grade Inflammation

The third major trigger of irritable bowel syndrome symptoms is *chronic, low-grade inflammation*.

This is separate from the major, high-grade inflammation in the intestine that produces “inflammatory bowel disease.” These conditions, primarily Crohn’s disease and ulcerative colitis, involve major inflammation of the gut, with severe pain, blood and pus in the stools, and immunological changes throughout the body.⁶³⁻⁶⁸

For many years, scientists have worked to distinguish inflammatory bowel disease from irritable bowel syndrome, suggesting that irritable bowel syndrome is free of inflammation. But more recently, studies have demonstrated that many irritable bowel syndrome patients indeed suffer from subtle inflammatory changes in the large intestine that can create symptoms.^{31,32}

Perilla leaf extract fights the chronic, low-grade **inflammation** that produces irritable bowel syndrome symptoms through reduction in expression and activity of inflammatory signaling molecules.^{69,70} In fact, the **rosmarinic acid** component of *Perilla* leaf extract inhibits one of the major inflammation-regulating molecular complexes, known as high-mobility group box 1.^{71,72}

4. Increased Intestinal Permeability

In addition to reducing inflammation, *Perilla* leaf extract’s ability to inhibit **high-mobility group box 1**, a protein involved in inflammation, also reduces **intestinal permeability** (“leaky gut”)—the fourth important pathological process associated with irritable bowel syndrome.^{34,72}

Under normal circumstances, our intestines do a fine job of keeping what is in the intestine contained within the intestine. That way, food molecules, microorganisms, toxins, and other biologically active substances cannot enter the bloodstream without specific transport mechanisms. To maintain the integrity of that barrier, our intestines are equipped with specialized proteins linking intestinal cells together at so-called “tight junctions.”^{31,60,73}

Studies show that people with irritable bowel syndrome have an unexplained increase in intestinal permeability. Their “tight junctions” are no longer as tight as they should be, allowing intact, undigested food molecules and other materials to enter the circulation, contributing to food allergy/sensitivity-like reactions that can induce irritable bowel syndrome symptoms.^{73,74}

Evidence that *Perilla* leaf extract can support the intestinal barrier layer comes from a study showing that the extract could reduce manifestations of the allergic responses in mice; food allergy/sensitivity is a known potential cause of symptoms in irritable bowel syndrome patients.⁷⁵

5. Dysbiosis

We’ve seen that *Perilla* extracts address four of the five underlying processes behind irritable bowel syndrome symptoms. For comprehensive treatment, the fifth must be addressed as well. That’s where

S. cerevisiae comes in; it reverses **dysbiosis**, the fifth leading contributor to irritable bowel syndrome symptoms.

Dysbiosis is the disruption of the normal balance of the trillions of microorganisms that populate the human intestinal tract. Those organisms occur in large communities, each of which should be as diverse as possible. Recent studies show that the greater the overall diversity among bacterial groups, the healthier the individual.³⁶⁻³⁹

S. cerevisiae is a probiotic organism that is capable of reversing dysbiosis. *S. cerevisiae* helps normalize the intestinal microbial community by reducing the presence of deleterious or disease-causing bacteria.^{15,16} Mice deliberately infected with an invasive form of *E. coli*, a common “bad guy” in the intestinal tract, gained back healthy body weight after supplementation with this probiotic and demonstrated an astonishing **43-fold** reduction in colonization by the bacteria just five days after treatment began.¹⁶

Symptoms Of Irritable Bowel Syndrome

Irritable bowel syndrome is composed of a group of gastrointestinal symptoms.⁷⁹ Victims experience abdominal discomfort and often pain, along with bloating, flatulence, and abnormal stool patterns.⁸⁰ Some have diarrhea presentation, others a mostly constipation picture, but the majority of irritable bowel syndrome patients suffer the so-called “mixed” pattern, with both problems arising unpredictably.⁸¹

Studies also show that, following intestinal tract colonization with live *S. cerevisiae* organisms, inflammation produced by unhealthful bacteria in the intestinal tract is reduced, demonstrating powerful overlap with the anti-inflammatory properties of *Perilla* leaf extract.^{15,69,70}

Human Studies Validate Effectiveness

With its ability to address four of the five major irritable bowel syndrome symptom-producing processes, *Perilla* extract is an ideal treatment for stubborn irritable bowel syndrome symptoms.

In a study of 50 otherwise healthy adults who all suffered from frequent gastrointestinal discomfort (bloating, rumbling, gas, etc.), subjects received either placebo or a **150 mg** capsule of *Perilla frutescens* leaf extract.¹³ Subjects took one capsule twice daily (before breakfast and dinner) for four weeks, rating each of their symptoms on a scale of 0 (none) to 4 (extreme).

The study showed that patients taking the *Perilla* extract had significant improvements in all symptoms—including bloating/distension, passage of gas, gastrointestinal rumbling, feeling of fullness, and abdominal discomfort—over the four-week study period, while the placebo recipients only reported improvement in



general abdominal discomfort. Interestingly, women, who make up the majority of irritable bowel syndrome sufferers, reported even stronger improvements than the group as a whole.

This study's results are especially important in light of the known strong placebo effect in studies of gastrointestinal effects; showing a significant difference from placebo is a challenging bar to clear for many treatments.

A 2015 human study has validated the benefits of a specific strain of *S. cerevisiae* in irritable bowel syndrome patients. Of 179 adults with irritable bowel syndrome, 86 received *S. cerevisiae* capsules, **500 mg** once daily (that's a dose of 4 billion viable organisms), and 93 adults received a placebo capsule.⁷⁶

After the eight-week study period, **63%** of the supplemented group experienced improvement in abdominal pain or discomfort, while only **47%** of placebo patients experienced this kind of improvement. Best of all, the supplement was well tolerated by all subjects.

Summary

Irritable bowel syndrome may affect up to one-fifth of the US adult population. It is not fatal, but has a huge impact on quality of life, depressive symptoms,⁷⁷ and job performance. Sufferers report not only the pain and discomfort of the disorder, but also embarrassment and humiliation when their bowel patterns and symptoms become evident to others.

Mainstream medicine offers treatments that are helpful for alleviating symptoms; however, some medications work for some people, but none are effective in all.⁷⁸

Experts have identified five major biological processes that are underlying the symptom complex of irritable bowel syndrome.

Two natural compounds, **Perilla leaf extract** and the probiotic organism *S. cerevisiae*, work together to address all five of these major pathological processes now recognized.

Together, these ingredients directly alleviate **disordered intestinal motility**, reduce **visceral hypersensitivity**, suppress **low-level inflammation**, decrease **increased gut permeability**, and rectify **dysbiosis**, the abnormal composition of the vital intestinal microbial community. Human studies show that these compounds help improve the major symptoms of irritable bowel syndrome.

There is no reason to continue to suffer with irritable bowel syndrome. Using this new and natural combination of ingredients will help your body restore its natural balance, and give you long-lasting sense of intestinal tranquility. ●



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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Mediterranean Diet For Long-Term Health And Weight Control

People today pursue diets to **lose weight**, often with unsatisfactory results. A Mediterranean diet and a lifestyle can not only make you look and feel great but help you live longer and healthier.

Jump-Start Your Weight-Loss Program

In overweight individuals, **fat cells** have less- than-optimal function of an **enzyme** called **hormone-sensitive lipase**. This enzyme is required to help break down stored fat and burn it for energy.^{1,2} As these individuals become more **overweight**, their cells are less effective at removing stored fat.

Studies reveal that biologically active **flavonoids** from Mediterranean **citrus fruits** and South American **seed extracts** initiate a chain of events that helps support the function of this **fat-removing** cellular **enzyme**.^{1,2}

Clinical research demonstrates that taking **450 mg** twice daily at breakfast and lunch for 12 weeks resulted in a **5.8-pound** weight loss on average and a **6.6%** reduction in body fat, while placebo subjects experienced no significant weight or body fat loss. The extract group also lost on average **two inches** off their waist and hip circumference.²

In a human study, subjects supplemented with **citrus fruit/seed extract** shed **9.73%** of their white **abdominal fat** stores. This nearly **10%** loss of **abdominal fat** promoted a healthy inflammatory response.

Proper use of this **citrus fruit/seed blend** can help jump-start a weight-loss program.

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Non-GMO

Sinetrol™ is a trademark of Fytexia®.

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

Mediterranean Trim: Low-Cost Support For Healthy Weight Management

Mediterranean Trim contains a synergistic blend of polyphenolic compounds specially selected from potent Mediterranean citrus fruits that have been shown to aid in the breakdown of stored body fat.^{1,2}

Mediterranean Trim also contains an extract from the Brazilian **guarana seed** that has been shown to reduce localized fat deposits via similar mechanisms.

The suggested dose is **450 mg**, twice daily at breakfast and at lunch.

You can enjoy the benefits of activating your **hormone-sensitive lipase** enzyme for as low as **40 cents** a day— one of the great bargains for a nutrient blend with this level of supporting clinical research.

Mediterranean Trim with Sinetrol™-XPur should be used in conjunction with a healthy diet and regular exercise program. Although real-world results often vary from what is observed in placebo-controlled studies, you could experience similar benefits found in the clinical trial participants using these active ingredients.

Mediterranean Trim with Sinetrol™-XPur

Item #01908 • 60 vegetarian capsules

	Retail Price	Member Price
1 bottle	\$18	\$13.50
4 bottles	\$16 each	\$12 each

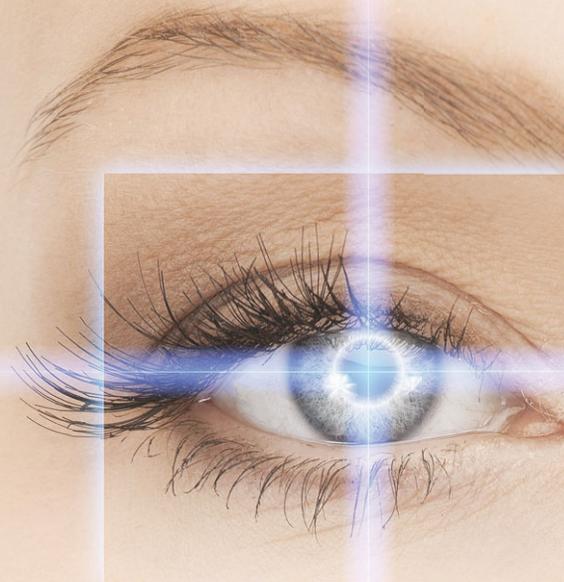


To order **Mediterranean Trim with Sinetrol™-XPur**, call 1-800-544-4440 or visit www.LifeExtension.com

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

MacuGuard®

Provides
Powerful
Eye Protection



It's not easy to get all the vital nutrients you need to take care of your eyes from food alone. Fortunately, **MacuGuard® Ocular Support with Astaxanthin** contains the nutritional building blocks necessary to maintain the structural integrity of your eyes.

MacuGuard® Ocular Support with Astaxanthin maintains eye health in many ways:¹⁻⁷

- Supports lutein concentration in the eye
- Supports efficient absorption of lutein in the bloodstream
- Provides phospholipids to enhance lutein in the cell membrane
- Maintains zeaxanthin concentrations in the eye
- Provides *meso*-zeaxanthin, which is difficult to obtain from dietary sources
- Contains cyanidin-3-glucoside, shown to help with night vision.
- Provides astaxanthin to protect against free radical-induced DNA damage, which may play a protective role against eye fatigue.

Contains soybeans.

LuteinPlus® and **Mz®** are registered trademarks of Nutriproducts Ltd., UK, licensed under U.S. Patent 8,623,428.

MacuGuard® Ocular Support with Astaxanthin

Item #01886 • 60 softgels

	Retail Price	Member Price
1 bottle	\$42	\$31.50
4 bottles	\$38 each	\$28.50 each

Suggested dose is one softgel daily with a meal. Each bottle of **MacuGuard** provides a **two-month** supply.



References:

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To order **MacuGuard® Ocular Support with Astaxanthin**, call **1-800-544-4440** or visit **www.LifeExtension.com**

Innovative Support For **INTESTINAL REGULARITY** And **GI COMFORT**

Many individuals experience feelings of bloating, gas, and abdominal discomfort that interfere with their daily lives. These complaints can arise due to factors such as abnormal movements of the intestines' muscles, low-grade inflammation, and disruption of the normal balance of intestinal microorganisms.¹

Tranquil Tract™ contains an extract from the *Perilla frutescens* leaf and a patented strain of a probiotic organism called *Saccharomyces cerevisiae* (CNCM I-3856)—each used as culinary and health-promoting ingredients.^{2,3} These novel compounds synergistically relieve occasional bloating, pressure, and soothe and balance your intestinal tract.

Perilla Leaf Extract

As an herb in the mint family,⁴ *Perilla frutescens* is richly packed with beneficial biomolecules, notably the unique flavonoid vicenin-2.^{5,6} In a clinical study of 50 adults, twice-daily capsules of **150 mg of Perilla leaf extract** significantly improved feelings of boating, gas, fullness, and abdominal discomfort in just four weeks compared to placebo.⁵

Saccharomyces Cerevisiae

Saccharomyces cerevisiae is a probiotic that normalizes the intestinal microbial community.⁷ Clinical study volunteers who took **500 mg of S. cerevisiae** daily experienced significant improvement in abdominal discomfort after eight weeks.⁸

The new Tranquil Tract™

Tranquil Tract™ is designed to address specific biological mechanisms related to intestinal discomforts. Two daily vegetarian capsules of **Tranquil Tract™** contain clinically validated novel ingredients shown to deliver unparalleled support for intestinal regularity and GI comfort.

Non-GMO

Benegut® is a registered trademark of Vital Solutions.

Lynside® Pro GI+ is a registered trademark of Lesaffre et Compagnie.

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7. *Appl Environ Microbiol*. 2011 Feb;77(3):1127-31.
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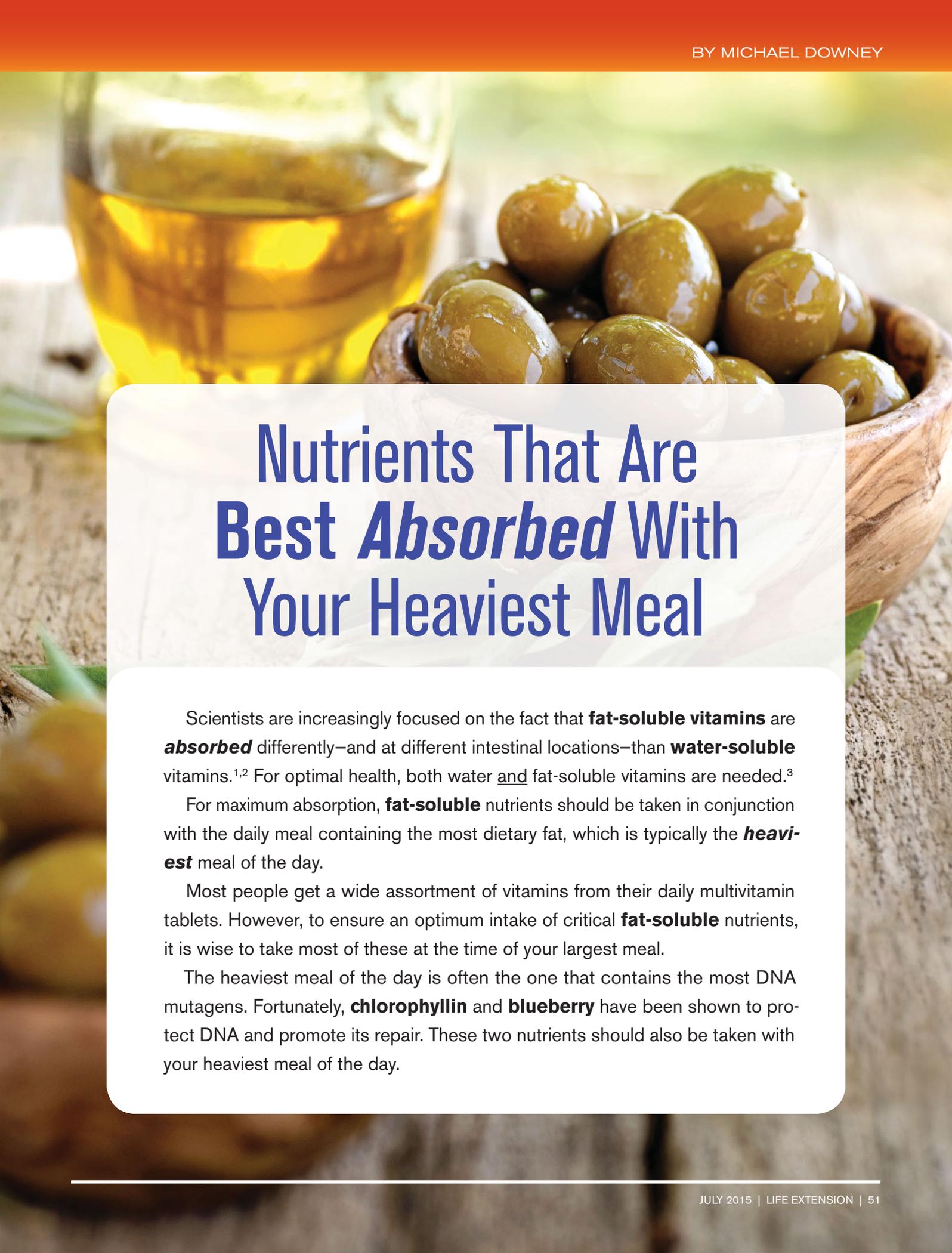
Tranquil Tract™

Item #01917 • 60 vegetarian capsules

	Retail Price	Member Price
1 bottle	\$52	\$39
4 bottles	\$46 each	\$34.50 each

To order **Life Extension® Tranquil Tract™**, call 1-800-544-4440 or visit www.LifeExtension.com



A glass of golden olive oil and a wooden bowl of olives. The background is a soft-focus outdoor scene with greenery.

Nutrients That Are Best *Absorbed* With Your Heaviest Meal

Scientists are increasingly focused on the fact that **fat-soluble vitamins** are **absorbed** differently—and at different intestinal locations—than **water-soluble** vitamins.^{1,2} For optimal health, both water and fat-soluble vitamins are needed.³

For maximum absorption, **fat-soluble** nutrients should be taken in conjunction with the daily meal containing the most dietary fat, which is typically the **heaviest** meal of the day.

Most people get a wide assortment of vitamins from their daily multivitamin tablets. However, to ensure an optimum intake of critical **fat-soluble** nutrients, it is wise to take most of these at the time of your largest meal.

The heaviest meal of the day is often the one that contains the most DNA mutagens. Fortunately, **chlorophyllin** and **blueberry** have been shown to protect DNA and promote its repair. These two nutrients should also be taken with your heaviest meal of the day.

Critical Differences Between Fat-Soluble And Water-Soluble Vitamins

Most **water-soluble** vitamins travel from the small intestine to the bloodstream with relative ease.¹

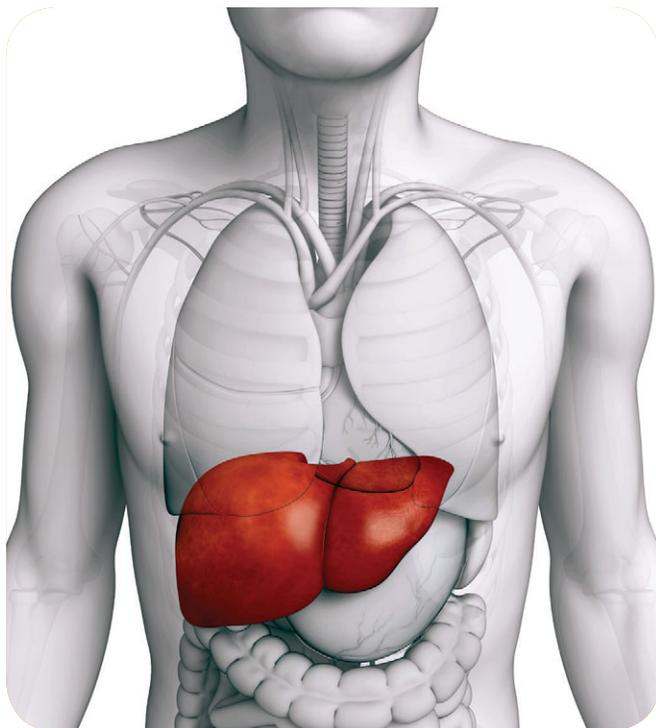
Fat-soluble vitamins, however, rely on bile for absorption. Bile is produced in the liver and then travels into the small intestine, where it helps break down fats. Fat-soluble nutrients are then absorbed through the intestinal wall and enter the lymph vessels. From there, these fat-soluble nutrients make their way into the bloodstream.²

With the exception of vitamin B12, which can be stored in your liver, most water-soluble vitamins are utilized around the time of absorption and later excreted in the urine.⁴

Unused **fat-soluble nutrients** are stored in the liver and in fat tissue. As additional amounts are needed at a later time, they are then released from these storage areas into the bloodstream.⁵

Many people don't get enough oil-based vitamins from their diet. Those on low-fat or vegan diets might be at even greater risk of receiving inadequate amounts, which is understandable when you consider that dietary fat must be consumed for the **absorption** of fat-soluble vitamins.⁶

Because dietary fat is generally consumed with the heaviest meal of the day—and because fat-soluble nutrients interact synergistically with each other⁶—this fattiest, largest meal provides an ideal window of opportunity for taking **fat-soluble** nutrients.



Let's now examine the critical body functions served by individual **fat-soluble** nutrients.

Vitamin E

Alpha tocopherol is the best known form of vitamin E and is widely distributed in the body.^{7,8} It is critical, however, for anyone supplementing with vitamin E to make sure they are also getting adequate **gamma** tocopherol each day—and both are best absorbed with dietary fat.

Both **alpha** and **gamma** tocopherols powerfully fight free radicals, however, studies demonstrate **gamma** tocopherol's superior ability to neutralize **reactive nitrogen oxides**.^{9,10}

Current research supports the importance of **gamma** tocopherol in preventing numerous components of the degenerative diseases associated with aging.^{11,12}

Gamma tocopherol has far more powerful anti-inflammatory actions than the alpha form.^{13,14} Furthermore, it is more potent at inhibiting certain **inflammatory cytokines** in cell culture and in living animals.¹⁵⁻¹⁷ And it inhibits production of stress-related "heat shock proteins" that result from inflammatory stimuli.¹⁸

Research shows that **gamma** tocopherol helps prevent migration of inflammatory cells into the airways at the beginning of an attack of **asthma** or **allergic** rhinitis and also reduces overgrowth of inflammatory cells in the nose and upper airways.¹⁹

Gamma tocopherol also provides anti-inflammatory effects that are important for fighting **atherosclerosis**.²⁰⁻²³ It is converted in your body to gamma-CEHC, a metabolite that helps shed excess sodium—an important property if mealtime sodium intake has been high.²⁴⁻²⁷

Another benefit of **gamma** tocopherol is its ability to improve **endothelial function** by increasing **nitric oxide synthase**, the enzyme responsible for producing vessel-relaxing **nitric oxide**.²⁸ One major way it produces this effect is by sponging up destructive reactive nitrogen species, such as peroxynitrite.²⁹ In fact, gamma tocopherol is able to "trap" a variety of reactive nitrogen species and halt their negative effects on a host of cellular processes.³⁰

Strenuous exercise, while beneficial for people in good physical shape, does tend to increase blood coagulation and platelet aggregation in sedentary individuals—a bad thing in people with pre-existing atherosclerosis. Gamma tocopherol supplementation can mitigate these effects, potentially lowering stroke and heart attack risk.³¹

Gamma tocopherol inhibits cancer cell growth in culture through a number of different mechanisms.³² By decreasing the levels of proteins responsible for

controlling **cancer cell** reproduction, gamma tocopherol effectively halts the spread of malignancy.³³ This anticancer effect appears to be based on a mechanism separate from the vitamin's well-known ability to fight free radicals.

A nuclear hormone receptor called **PPAR-gamma** is a promising target for anticancer therapies because it affects genes that control cancer cell growth and death.^{34,36} Gamma tocopherol is more powerful than alpha tocopherol at stimulating PPAR-gamma activity especially in colon cancer cells.^{37,38}

In a mouse model of **Parkinson's disease**, gamma tocopherol has been shown to be more effective than alpha tocopherol at preventing loss of the essential neurotransmitter **dopamine**, the chemical defect that produces Parkinson's symptoms.³⁹

Those wishing to further boost tissue vitamin E levels should take a supplement that also contains **sesame lignans**—the **1%** solid portion of sesame oil. In animal studies, **sesame lignans** have been shown to increase tissue and blood levels of both **alpha and gamma** tocopherol.^{40,41}

Vitamin K

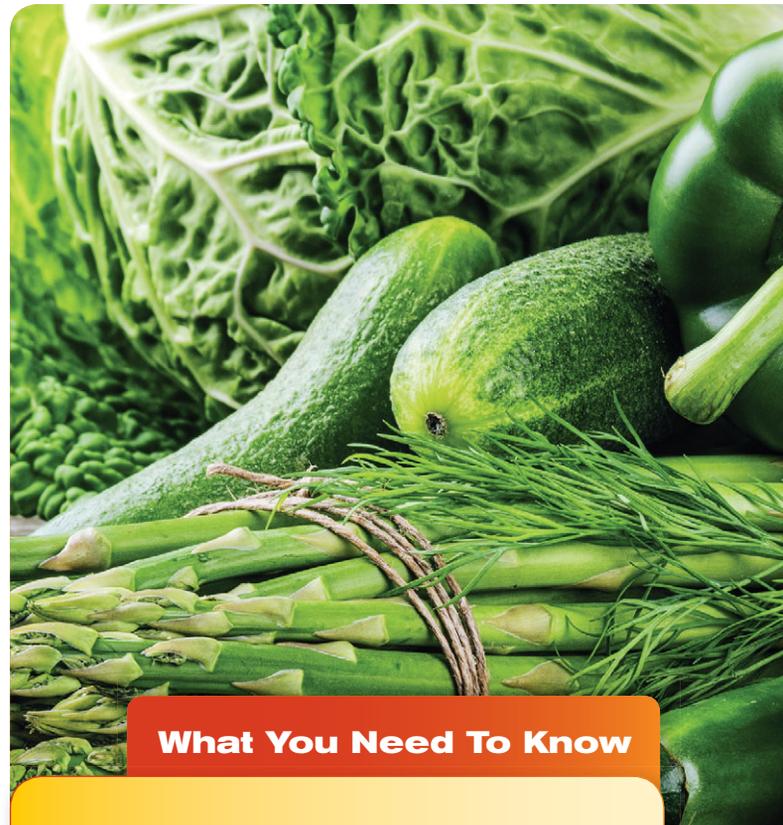
A 2014 study confirms that ample intake of fat-soluble **vitamin K** supports longevity. In a group of more than 7,000 people at high risk for cardiovascular disease, those with the **highest** vitamin K intake were **36%** less likely to die from any cause, compared with those with the lowest intake.⁴²

Vitamin K may reduce the risk of many of the leading causes of American deaths—including atherosclerosis,^{43,44} osteoporosis,^{45,46} diabetes,^{47,48} cardiovascular-related deaths,⁴² and cancer.^{42,49} Vitamin K is such a versatile protective nutrient because it has the unique ability to **activate proteins** involved in these conditions. In fact, a large European study showed that cancer death was **28%** less likely overall in those with the highest versus lowest consumption of **vitamin K2**.⁵⁰

Vitamin K plays a critical role in maintaining healthy **bone** density by facilitating the transport of calcium from the bloodstream into the bone.⁵¹⁻⁵⁴ Without adequate vitamin K, calcium in the blood does not adequately bind to bone and instead infiltrates into the arterial wall, resulting in **calcification**.^{55,56} Poor vitamin K status is associated with increased bone loss in postmenopausal women.^{57,58}

Humans get most of their vitamin K from green vegetables in the form of vitamin K1.⁵⁹ The problem is that K1 is tightly bound to plant fiber and only a small fraction absorbs into the bloodstream.⁵⁹⁻⁶¹

Vitamin K2 (**menaquinones**) is found in meat, eggs, and dairy products and is also made by bacteria in the human gut, which provide a certain amount of



What You Need To Know

Vitamins To Take With Your Heaviest Meal

- **Fat-soluble vitamins**—which are absorbed differently than water-soluble vitamins—are best taken with the meal providing the most dietary fat, usually the day's heaviest meal.
- Most people take multivitamin tablets daily. But to ensure optimum levels of the fat-soluble vitamins (and other fat-soluble nutrients), it's wise to take additional doses of these along with your largest meal.
- It's at the time of your largest meal that you generally ingest the most dietary mutagens, often from deep-fried or high-temperature-cooked foods—so it's also wise to supplement your heaviest meal with DNA-protective chlorophyllin, which binds to mutagens and excretes them from the body, and blueberry extract, which protects DNA and promotes its accurate repair.

the human vitamin K requirement.^{62,63} Human studies show that vitamin K2 is up to **10 times** more bioavailable than K1. Vitamin K2 remains biologically active in the body far longer than K1. For instance, K1 is rapidly cleared by the liver within eight hours, whereas measurable levels of K2 (**MK-7**) have been detected 72 hours after ingestion.⁵⁴

The **MK-4** form of vitamin K2 is the most rapidly absorbed and is now routinely used in Japan to maintain healthy bone density.⁶⁴ MK-4, however, only remains active in the blood for a few hours.^{65,66}

The **MK-7** form of K2, on the other hand, remains bioavailable to the human body over a sustained period⁶⁵ and at higher levels—**7- to 8-fold**—during prolonged intake.⁵⁴ Both MK-4 and MK-7 have demonstrated remarkable health benefits when studied in human populations.

Vision-Supporting Carotenoids

Fat-soluble nutrients include **carotenoids** that are essential for **vision** support.

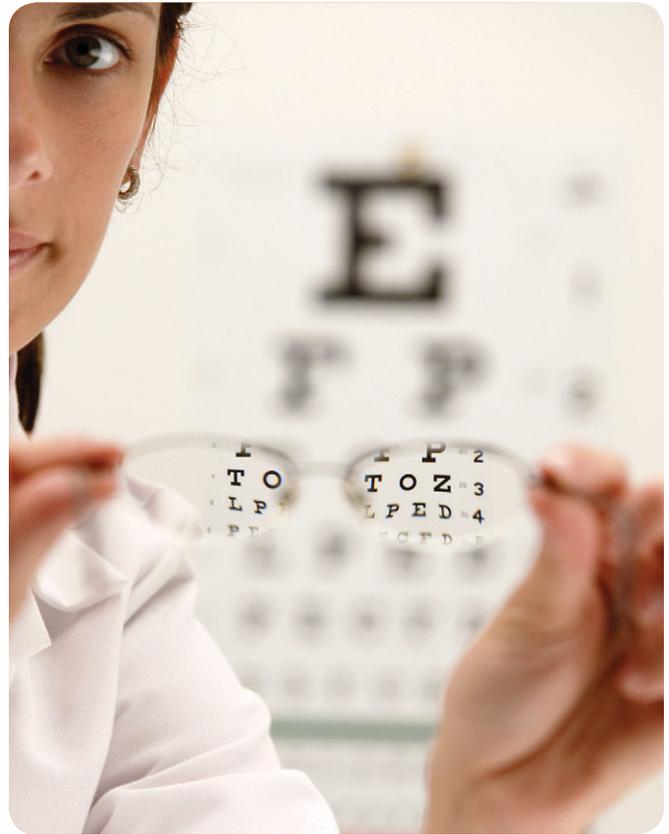
For example, carotenoid nutrients such as **lutein** and specific forms of **zeaxanthin** make up your **macular pigment**—the part of your retina that protects underlying photoreceptor cells from the harmful effects of excess blue and ultraviolet light.⁶⁷⁻⁷⁰ And the density of your macular pigment is essential to healthy vision.⁷¹⁻⁷³

Unfortunately, this density naturally declines with age⁷⁴ and some of us lose the ability to synthesize **meso-zeaxanthin** from lutein over time.⁷⁵ For this reason, it is critical to supplement with **lutein**, as well as **trans-zeaxanthin** and **meso-zeaxanthin**, which are difficult to get from diet alone.

Additionally, phospholipids help drive these eye-healthy nutrients to where they're needed most. Phospholipids mix well with lutein and are an integral part of the cell membrane. Studies show that they support lutein absorption⁷⁵⁻⁸⁰ and improve the circulation and accumulation of lutein within the retina.⁸⁰

Delayed regeneration of **rhodopsin**, a retinal compound that absorbs light, is associated with the **loss of night vision** humans experience as they age.⁸¹ To help maintain night vision in your later years, it is advisable to take **cyanidin-3-glucoside**—a purple pigment in the **anthocyanin** family of flavonoid molecules.

Derived from **blackberries** or **black currants**, cyanidin-3-glucoside encourages the **regeneration of rhodopsin**⁸² and beneficially changes its molecular structure.⁸³ In one study, volunteers who took a **berry extract** concentrate containing cyanidin-3-glucoside experienced improved ability to see in darkness after just 30 minutes.⁸⁴ Beyond eye health, this flavonoid also helps to induce apoptosis in a number of human cancer lines, important to cancer prevention^{85,86}—and



was discovered to be neuroprotective, helping to prevent the disastrous effects of the Alzheimer's-related protein amyloid beta on brain cells.⁸⁷

Lycopene

Lycopene is a fat-soluble carotenoid with a unique structure that drives its intense free-radical-trapping activity. Controlled studies show that increased lycopene levels result in broad cellular benefits—and reduced incidences of cancer, diabetes, Alzheimer's, and cardiovascular disease.⁸⁸

Prostate cancer is the disease that is best known as a target for prevention by lycopene.^{89,90} But lycopene is also associated with preventive effects against breast,^{91,92} cervical,⁹³ lung,^{94,95} and colon cancer.^{96,97}

Research indicates that people with the highest blood lycopene levels also have greater glucose tolerance than do those with lower lycopene levels.⁹⁸ Diabetics with healthy eyes were found to have higher levels of lycopene than those with the blindness-inducing condition called **diabetic retinopathy**.⁹⁹ Similarly, **diabetic neuropathy**, a painful and debilitating nerve condition that is among the hardest of pain syndromes to treat, is substantially ameliorated in animal studies of **lycopene supplementation**.^{100,101} And the cognitive decline associated with diabetes can be decreased with long-term lycopene supplementation.¹⁰²

Lycopene may help prevent Alzheimer's by inhibiting formation of oxidant-producing *amyloid beta* proteins,¹⁰³ and lycopene studies demonstrate decreased death rates of neurons, especially in the memory-processing hippocampus area of the brain.¹⁰⁴

A **lycopene-rich** tomato powder supplement completely prevented destruction of essential dopamine-producing brain cells in a mouse model of **Parkinson's disease**,¹⁰⁵ and other studies showed that lycopene successfully prevented the neurobehavioral deficits associated with the disease.¹⁰⁶ In animal models of Huntington's disease, lycopene reduced memory impairment while blocking the behavioral and biochemical abnormalities,¹⁰⁷ apparently by inhibiting inflammatory *peroxynitrite* production and inducing protective effects on brain mitochondria.¹⁰⁸

Individuals with the highest lycopene blood levels have a **45%** lower risk of **atherosclerosis**.¹⁰⁹ In a human study, supplementation with tomato products decreased total cholesterol by **5.9%** and LDL cholesterol by **12.9%**.¹¹⁰ And in animals, lycopene supplementation reduced both LDL cholesterol and total cholesterol by **50%**.¹¹¹ Lab and human studies demonstrate that lycopene decreases production of multiple proinflammatory mediators and markers of inflammation.¹¹²⁻¹¹⁴

Chlorophyllin

Your heaviest meal of the day often contains the most dietary mutagens. So this is the ideal time to supplement with **chlorophyllin**—a mutagen-neutralizing substance derived from the plant pigment chlorophyll.

Your body encounters environmental toxins such as cigarette smoke and diesel-emission particles on a regular basis.¹¹⁵⁻¹¹⁷ But it's your **largest meal** that

can inflict the most cellular damage as a result of the formation of gene-mutating *heterocyclic amines* caused by heavily cooked foods.^{118,119} Even healthy foods can hold small amounts of DNA mutating substances.¹²⁰

Chlorophyllin is able to bind to mutagenic substances and excrete them from the body before they can do any damage.¹²¹

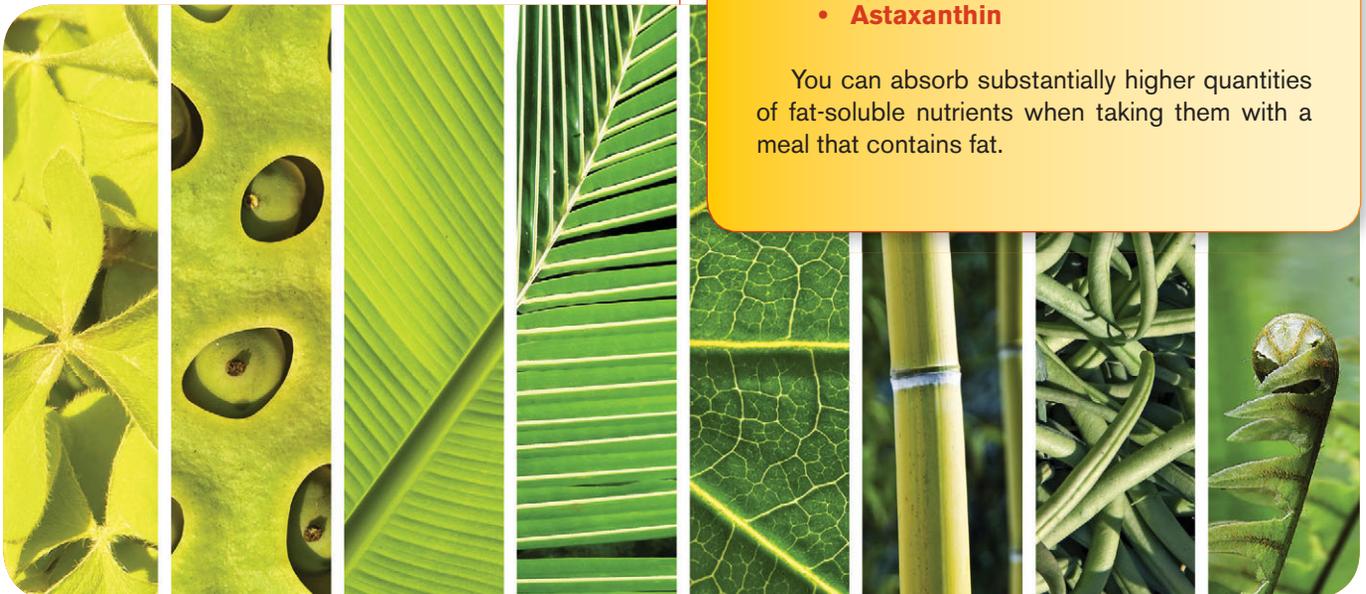
In addition, **chlorophyllin** has been demonstrated to possess **DNA-protective** and radical-quenching properties that inhibit the creation of **DNA adducts**—pieces of DNA bonded to a cancer-causing chemical.^{118,122-124} Animal and human studies show that these **adducts** contribute to cancer by causing extensive and irreversible DNA damage.¹²⁵⁻¹²⁸ By inhibiting harmful substances¹²³ and helping to prevent induced DNA mutations,¹²⁴ **chlorophyllin** acts as an "interceptor

Popular Fat-Soluble Nutrients

What follows is a list of popular **fat-soluble** supplements best taken with meals that contain at least some **dietary fat**:

- **Vitamin D**
- **Fish oil**
- **Coenzyme Q10**
- **Vitamin E (alpha and gamma forms)**
- **Vitamin K**
- **Lycopene**
- **Zeaxanthin**
- **Meso-zeaxanthin**
- **Astaxanthin**

You can absorb substantially higher quantities of fat-soluble nutrients when taking them with a meal that contains fat.





molecule”—isolating **carcinogens** so that they cannot form dangerous adducts.^{129,130}

Chlorophyllin also quenches a wide variety of reactive oxygen radicals¹³¹ and can powerfully induce enzymes that protect cells from other unstable molecules.¹³² It also has a role in protecting against a naturally occurring mold called **afatoxin**, which is a potent carcinogen found in plant foods.^{121,133,134}

Blueberry Extract

Another DNA-guarding nutrient best taken with a heavy meal is **blueberry extract**.

Recent studies now demonstrate that **blueberry extract** prevents DNA damage and promotes rapid and accurate **DNA repair**.¹³⁵⁻¹⁴³ These dual effects of **blueberries** block environmental (and age-related) impacts that lead to cancer,^{144,145} cardiovascular disease,^{146,147} and the loss of metabolic control^{148,149} that underlies obesity and diabetes.

An animal study found that blueberry compounds increased mean life span by **28%**, representing over **22 years** in human terms.¹⁵⁰ Further research on humans showed that, within just one hour of ingesting ground blueberries, participants experienced an **18%** reduction in the amount of oxidation-induced DNA damage compared to control subjects.¹⁵¹

In addition to **DNA protection**, blueberry has been found in several studies to benefit the cognitive health

of older adults. The compounds in blueberries protect against age-related changes in neuronal aging and have been associated with slower rates of **cognitive decline**.¹⁵²

In **2014**, a double-blind, placebo-controlled clinical trial gave some of the 105 cognitively intact adults, aged 65 to 85, a formulation of blueberry (and other nutrients). After two months of daily supplementation, a battery of cognitive tests showed that the intervention group had improved significantly on two measures of cognitive processing speed, while the control group did not show improvement.¹⁵³

Vitamin B12

Aging individuals¹⁵⁴⁻¹⁵⁷ and vegetarians are at significant risk of vitamin B12 (or cobalamin) deficiency.^{158,159}

Intrinsic factor, a compound secreted by the cells lining the stomach, is crucially important for the absorption of vitamin B12 from the small intestine.¹⁶⁰ However, intrinsic factor production diminishes as your body ages. Worse, it is estimated that up to **30%** of individuals over age 50 secrete low amounts of stomach acid,^{161,162} further decreasing bioavailability of vitamin B12 from food.

Deficiency of vitamin B12 principally affects the peripheral nerves, and in later stages may target the spinal cord.^{163,164} Impaired mental function is the usual result, often manifesting as slower thinking, confusion, and memory lapses.¹⁶⁴

Also, cobalamin deficiency leads to inhibition of methionine synthase, the key enzyme responsible for the conversion of homocysteine to methionine.^{165,166} The result is a high level of serum homocysteine,¹⁶⁷ which may be toxic to the cells that line blood vessels¹⁶⁸ and may increase clotting.¹⁶⁹

Summary

Critical to life, **fat-soluble vitamins** are *absorbed* and stored differently than **water-soluble** vitamins. Fat-soluble nutrients are best absorbed when taken with the meal providing the most dietary fat—usually the **heaviest meal** of the day.

Even if, like most people, you take daily multivitamin tablets, it is wise to ensure optimum levels of the fat-soluble vitamins (and other fat-soluble nutrients) by taking additional doses of these along **with your largest meal**.

Also important to take with your largest meal—the meal that usually contains the most dietary mutagens—is DNA-protective **chlorophyllin**, which binds to mutagens and carries them from your body, and **blueberry extract**, which protects DNA and promotes its repair. ●

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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B-vitamins are water soluble and easily washed from the body. Stress, certain medications, and alcoholic beverages can quickly deplete the body's B-vitamin reserves.¹⁻⁴ Therefore, daily replenishment of the B-vitamins is essential.

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What distinguishes **Complete B-Complex** is that it provides **enzymatically** active forms of critical nutrients like the **pyridoxal-5-phosphate** form of **vitamin B6**, a **natural** form of **folate** from **lemon peel**, and nutritionally **balanced** potencies of each B-vitamin.^{5,6}

A bottle containing 60 vegetarian capsules of **Complete B-Complex** retails for \$10. If a member buys four bottles, the price is reduced to **\$6.75** per bottle.

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A daily dose of two vegetarian capsules of **Complete B-Complex** provides:

Thiamine (vitamin B1) (as thiamine HCl)	100 mg
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Niacin (as niacinamide and niacin)	100 mg
Vitamin B6 (as pyridoxine HCl and pyridoxal 5'-phosphate)	100 mg
Folate [from lemon extract (peel)]	400 mcg
Vitamin B12 (as methylcobalamin)	300 mcg
Biotin	1000 mcg
Pantothenic acid (as D-calcium pantothenate)	500 mg
Inositol	100 mg
PABA (para-aminobenzoic acid)	50 mg
Calcium (as D-calcium pantothenate)	40 mg



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Superior-Absorbing CURCUMIN



Curcumin has turned into a nutrition **superstar** because of the enormous health-promoting effects it provides for almost every organ system.^{1,2}

However, most curcumin extracts are neither well **absorbed** nor well retained in the body.

Life Extension®'s curcumin supplements utilize a patented preparation of curcumin that can reach up to **7 times higher** concentration in the blood than standard curcumin³

As the graphs on this page illustrate, the **400 mg** of curcumin in either of our formulas supply the body with the equivalent of **2,500 mg** of most commercial curcumin products.

In recent studies comparing the effects of standard curcumin against Life Extension's turmeric extracts, researchers observed:^{4,5}

- Nearly **twice** the support for immune health and approximately **2 times** the support for inflammatory issues.
- Almost **double** the free radical-fighting support. A separate study indicated that curcumin extract provided powerful support for heart health.

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TWO CURCUMIN FORMULAS TO CHOOSE FROM

Those who want a curcumin stand-alone can order a bottle of 60 vegetarian capsules of **Super Bio-Curcumin**® (Item # 00407) for \$38. If a member buys four bottles, the price is reduced to **\$26.25** per bottle. Each bottle lasts a typical user two months.

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While both of these formulas provide the superior **absorbing** curcumin, **Advanced Bio-Curcumin**® also contains:

- **Turmerones** to increase the amount of curcumin inside cells.⁶
- **Ginger**, which provides complementary health benefits.
- **Phospholipids** that further enhance absorption.⁷

A bottle of 30 softgels of **Advanced Bio-Curcumin**® With Ginger & Turmerones (Item # 01808) retails for \$30. If a member buys four bottles, the price is reduced to **\$20.25** per bottle. The suggested dose for either of these highly **absorbable** curcumin supplements is one softgel or capsule daily.

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

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

Compared with Plant-Bound Curcumin with Piperine³

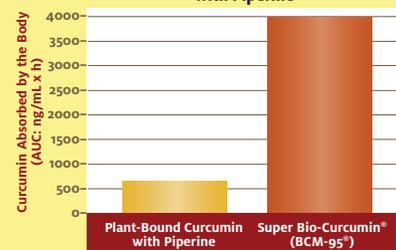


Chart 1. Super Bio-Curcumin® showed 6.3 times greater bioavailability (absorption and sustainability over eight hours) in humans compared with plantbound curcumin with piperine (as measured by the area under the curve [AUC] in a plot of blood levels against time, that is, the total amount of curcumin absorbed by the body over eight hours).

Absorption of Super Bio-Curcumin® in Humans Compared with Conventional Curcumin³

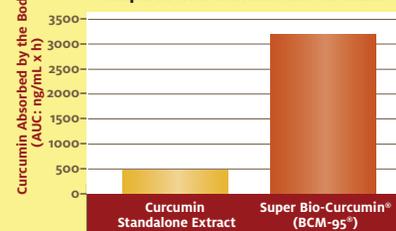


Chart 2. Super Bio-Curcumin® showed 6.9 times greater bioavailability (absorption and sustainability over eight hours) in humans compared with conventional curcumin (as measured by the area under the curve [AUC] in a plot of blood levels against time, that is, the total amount of curcumin absorbed by the body over eight hours).

Absorption of Super Bio-Curcumin® in Rats Compared with Conventional Curcumin⁸

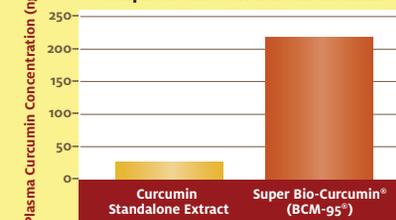


Chart 3. Bioavailability in rats fed with 7.8 times higher than conventional curcumin.

To order either of these products, call 1-800-544-4440 or visit www.LifeExtension.com

Super Cost Effective!

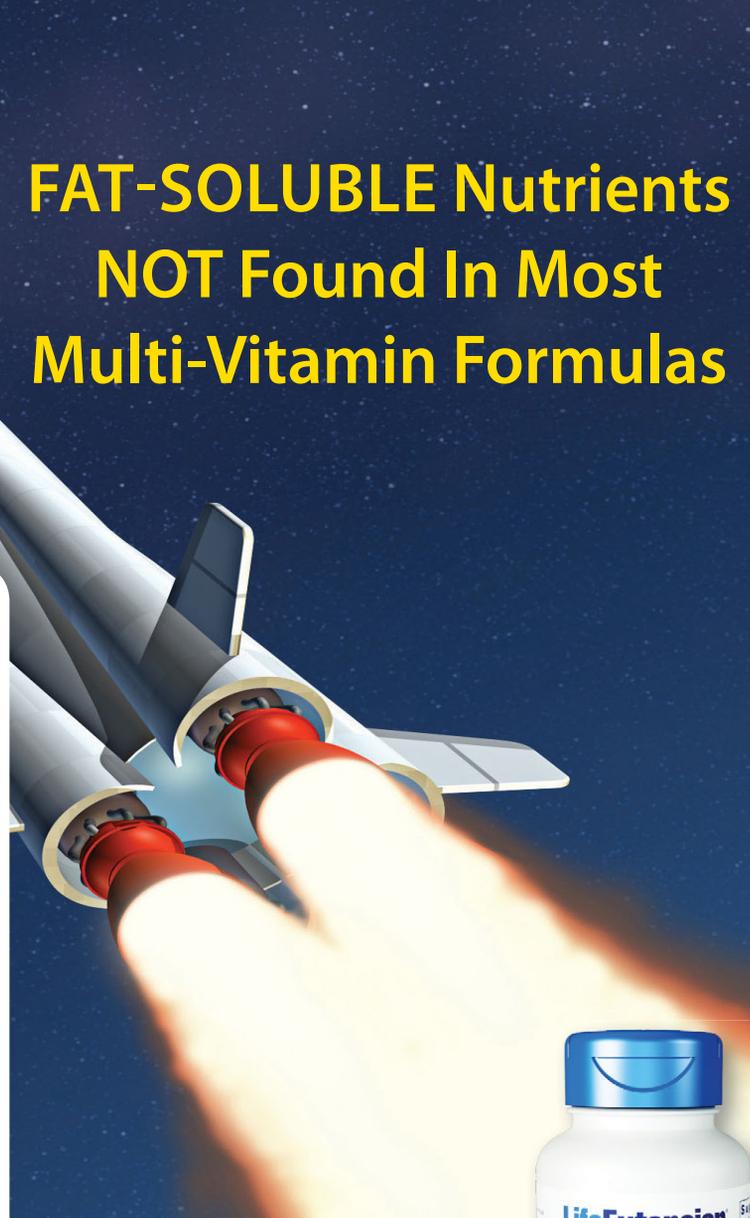
FAT-SOLUBLE Nutrients NOT Found In Most Multi-Vitamin Formulas

Life Extension®'s **Once-Daily Health Booster** is a **cost-effective** nutrient formula that combines a **variety** of valuable nutrients in just one softgel.

Once-Daily Health Booster provides the following nutrients:

- **Vitamins K1 and K2**, including the rapidly absorbed **MK-4**¹² and the 24-hour bioavailable **MK-7**¹ to keep calcium in the bones and out of the arteries.
- **MacuGuard™ Carotenoid Phospholipid Blend**, which contains **trans-zeaxanthin**, **meso-zeaxanthin**, and **lutein** to support eye health and healthy vision.
- **Gamma tocopherol**, a highly effective form of vitamin E, which quenches a dangerous free radical (peroxynitrite) that plays a major role in age-related decline.^{3,4}
- **Vitamin E as D-alpha tocopherol** to suppress lipid peroxidation.^{5,6}
- **Blueberry extract** to boost DNA repair and sustain healthy blood sugar levels already within normal range.^{7,8}
- **Sesame lignans** to boost tissue levels of **gamma tocopherol**.⁹
- **Lycopene** to support prostate health and guard against LDL oxidation.^{10,11}
- **Chlorophyllin**, which offers protection against environmentally induced DNA damage.¹²
- **Black currant extract** anthocyanins to promote eye health.¹³
- **Vitamin B12** to help maintain a healthy nervous system and metabolism.¹⁴

Just one softgel of the new **Health Booster** taken with a heavy meal provides optimized potencies of **fat-soluble** vitamins, carotenoids, and other nutrients needed by maturing individuals. Taken separately, the individual ingredients in **Once-Daily Health Booster** would cost **two to three times** more!



Once-Daily Health Booster

Item #01981 • 60 softgels (two-month supply)

	Retail Price	Member Price
1 bottle	\$52	\$39
4 bottles	\$48 each	\$36 each

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

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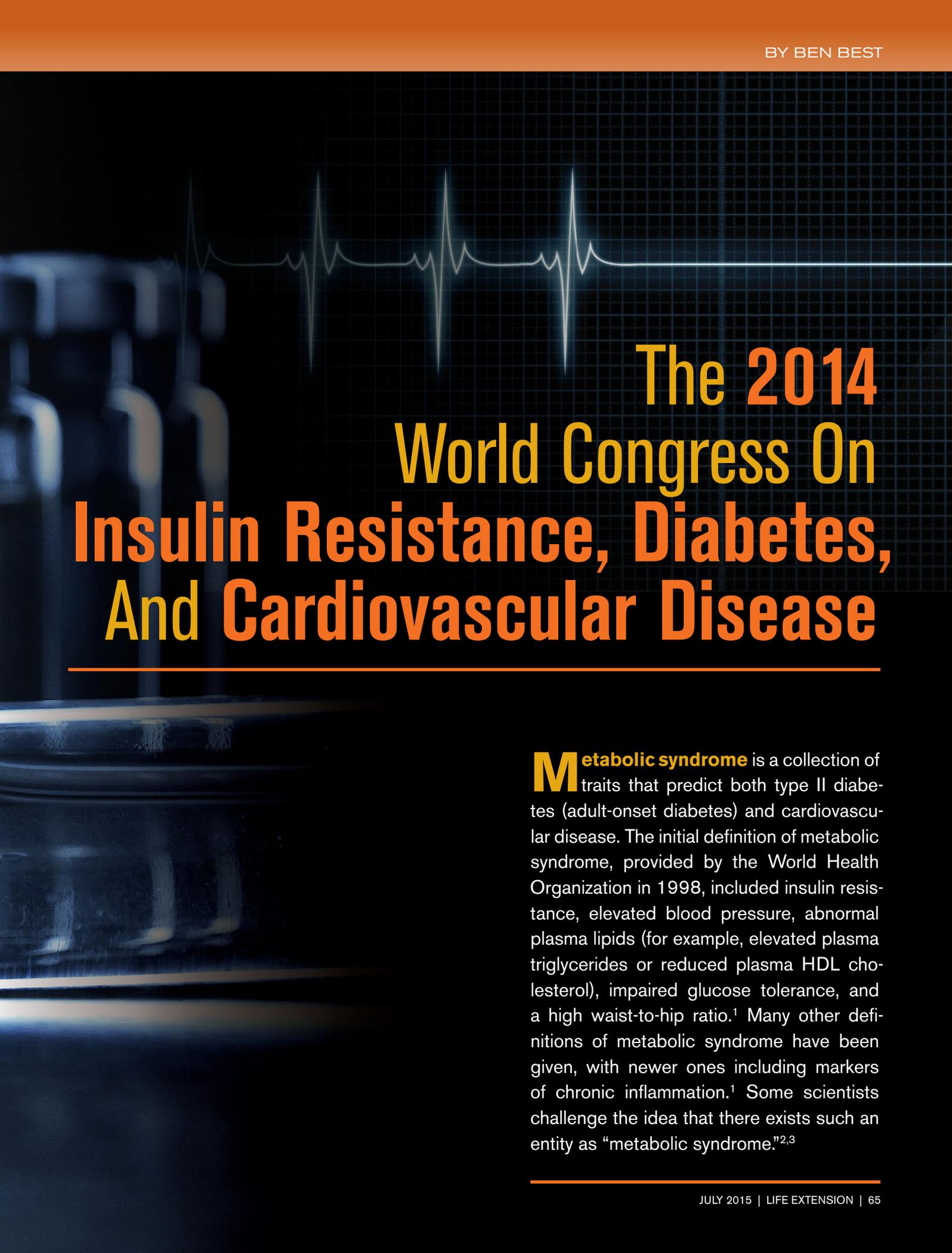
Contains soybeans.

Caution: if taking anticoagulant or antiplatelet medication, consult your health care provider before taking this product. Those with inborn errors of copper metabolism (e.g. Wilson's disease) should avoid daily, chronic use of this product.

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The 2014 World Congress On Insulin Resistance, Diabetes, And Cardiovascular Disease

Metabolic syndrome is a collection of traits that predict both type II diabetes (adult-onset diabetes) and cardiovascular disease. The initial definition of metabolic syndrome, provided by the World Health Organization in 1998, included insulin resistance, elevated blood pressure, abnormal plasma lipids (for example, elevated plasma triglycerides or reduced plasma HDL cholesterol), impaired glucose tolerance, and a high waist-to-hip ratio.¹ Many other definitions of metabolic syndrome have been given, with newer ones including markers of chronic inflammation.¹ Some scientists challenge the idea that there exists such an entity as “metabolic syndrome.”^{2,3}

The concept of metabolic syndrome was inspired by a 1988 paper by the physician/scientist Gerald Reaven, who described a collection of traits he believed are caused by insulin resistance, and which he said predict cardiovascular disease.⁴ Dr. Reaven called the collection of traits “Syndrome X.” He did not include obesity or inflammation as traits of Syndrome X.

Insulin resistance was the centerpiece of Syndrome X. **Insulin resistance** most often refers to the reduced ability of insulin to cause glucose to enter muscle and fat cells, but insulin resistance can also affect the liver, brain, immune system cells, endothelial cells, the beta cells of the pancreas that produce insulin, and other tissues. In 2003, Dr. Reaven co-organized a World Congress on Insulin Resistance. Subsequent conferences have been called the “World Congress on Insulin Resistance, Diabetes and Cardiovascular Disease.” From November 20-22, 2014, I attended the 12th Congress in Los Angeles, California.

Central Obesity May Not Always Predict Heart Disease

Gerald Reaven, MD, (Professor of Medicine, Stanford University) cited studies (particularly from Asian countries) demonstrating that central (abdominal) obesity is not an essential feature for metabolic syndrome, nor for predicting ischemic heart disease^{5,6} or insulin resistance.⁷



Reaven

BMI (Body Mass Index) measures obesity based on the ratio of weight to height (kg/m^2). Although BMI has been criticized because it does not distinguish between fat and muscle, possibly because so few people are muscular, BMI has proven to be a convenient measure of obesity in population studies. Dr. Reaven cited studies showing that BMI is equal to or better than waist circumference or wrist-to-hip ratio as a measure of obesity,⁸ insulin resistance,⁹ and diabetes.¹⁰



When other risk factors are available, such as plasma lipids, blood pressure, and history of diabetes, none of the measures of obesity improve prediction of cardiovascular disease.¹¹ Nonetheless, abdominal obesity is a frequent cause of metabolic syndrome¹² and type II diabetes.¹³

Obesity Treatments

Samuel Klein, MD, (Professor of Medicine, Washington University, St. Louis, Missouri) has



Klein

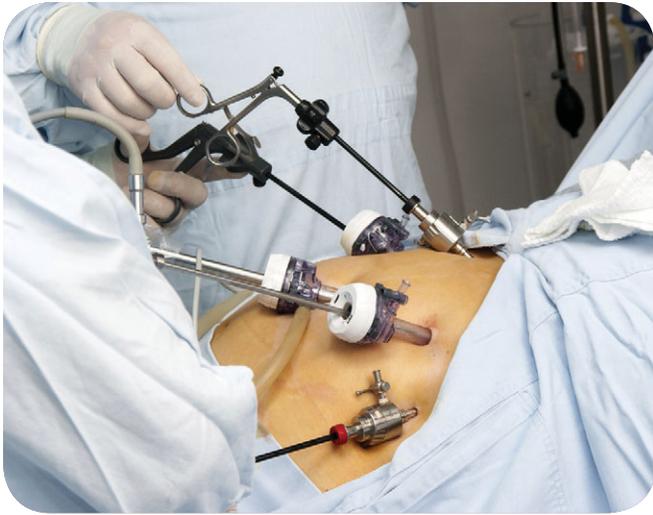
attempted a variety of interventions to address the problems of obesity, type II diabetes, and metabolic syndrome. Overweight subjects who lost weight through diet and exercise showed a reduction in blood pressure, blood glucose, and blood triglycerides in proportion to the amount of their weight loss.¹⁴ Type II diabetics placed on a very calorie-restricted diet (600 calories per day) for eight weeks showed normalization of plasma glucose, liver insulin sensitivity, and insulin production by the pancreas.¹⁵

Dr. Klein studied the effect of a low-carbohydrate diet. Although LDL cholesterol leads to atherosclerosis, small LDL particles do so much more than large LDL particles.¹⁶ A low-carbohydrate diet reduces blood triglycerides while increasing the size of LDL particles.¹⁷ The amount of small LDL particles increase in direct proportion to the percent of carbohydrate in the diet.¹⁷ When Dr. Klein put obese patients on a calorie-restricted diet that was either low in fat or low in carbohydrate, both groups lost weight, but the low-carbohydrate group had a greater reduction in triglycerides and blood pressure.¹⁸

Abdominal (visceral) fat is associated with chronic inflammation and insulin resistance. Surgical removal of abdominal fat (**liposuction**) from obese patients had no effect on blood pressure, insulin resistance, plasma glucose, or chronic inflammation.^{19,20}

By contrast, **bariatric surgery** (surgical procedures to reduce the size of the stomach and/or small intestine) was shown to produce substantial weight loss for at least 10 years. This weight loss was accompanied by improved insulin sensitivity, reduced chronic inflammation, and reversal of factors leading to nonalcoholic fatty liver disease, in addition to reducing death rate.²¹⁻²⁴

Gastric bypass is superior to binding methods of bariatric surgery, leading to **25%** weight loss after 10 years compared to **16%** or less for binding.²⁵ Gastric bypass for type II diabetes more often greatly reduces hemoglobin glycation than sleeve gastronomy.²⁶ Death in the first 30 days after bariatric surgery is rare



(0.3%), mostly due to pre-surgical health conditions.²⁷ Complications due to bariatric surgery are largely dependent upon the skillfulness of the surgeon.²⁸ The website of the American Society of Metabolic and Bariatric Surgery (<https://asmbs.org>) has a search tool for finding a quality local provider of bariatric surgery.

Appetite Suppression With Leptin Hormone

Christos Mantzoros, MD, DSc, (Professor of Medicine, Harvard Medical School) is an expert on **leptin**, the “satiety hormone” that curbs appetite. Leptin is produced by fat cells. Leptin exerts its appetite-satiating effects by acting on the brain, mainly in the hypothalamus. Although blood levels of leptin increase with obesity due to an increase in fat, obese individuals experience less of leptin’s appetite-suppressing effects, a condition known as **leptin resistance**.²⁹ Leptin administration to obese individuals has not resulted in weight loss.³⁰ A study conducted by Dr. Mantzoros showed that sleep deprivation decreases plasma leptin levels, lending credence to the idea that eating at night can make a substantial contribution to obesity.³¹

Leptin is opposed by **ghrelin**, a “hunger hormone” that stimulates appetite. Ghrelin is mostly produced by the gut and, like leptin, exerts its effects on appetite by its action on the hypothalamus of the brain. When individuals lose weight, ghrelin blood levels rise. But weight loss due to bariatric surgery greatly reduces ghrelin levels.³²

Leptin is only one of several substances released by fat cells, leading to the concept that fat is an endocrine

organ.³³ **Adiponectin**, an anti-inflammatory hormone that increases insulin sensitivity, is another major hormone produced by fat cells.³³ Pro-inflammatory factors produced by fat cells include TNF-alpha and even leptin, which contribute to the chronic inflammation associated with obesity.³⁴ Nonetheless, leptin is important for brain development, memory formation, protection against age-related brain atrophy, and for removal of the amyloid-beta protein that accumulates in Alzheimer’s disease.³⁵

Artificial Sweeteners Promote Weight Gain

Yanina Pepino, PhD, (Research Assistant Professor, Washington University School of Medicine, St. Louis, Missouri)



studies the effects of artificial sweeteners. The worldwide share of artificial sweeteners is aspartame (27.9%), sucralose (27.9%), cyclamate (15.7%), saccharin (13.1%), acesulfame-K (5.2%), and neotame (1.4%).³⁶

In some short-term studies, the use of artificial sweeteners rather than sugar has been shown to slightly reduce weight gain³⁷ or slightly increase weight loss.³⁸ But a 14-year study showed that the consumption of either sugar-sweetened beverages or artificially sweetened beverages was associated with a higher risk of type II diabetes than consumption of fruit juice.³⁹

Similarly, a study lasting seven to eight years found that consumption of artificially sweetened beverages was associated with a nearly 50% greater change in BMI than was seen in non-consumers.⁴⁰ The authors suggested that subjects prone to weight gain might be more inclined to drink diet beverages. The authors also suggested that artificial sweeteners might increase food intake or increase the appeal of sweetness. Obese subjects given the artificial sweetener sucralose showed increased insulin levels and insulin resistance.⁴¹ Insulin levels were also raised in type II diabetics given sucralose and acesulfame-K.⁴² Mice given the artificial sweeteners aspartame and erythritol showed increased insulin levels and insulin resistance, which was believed to be due to increased plasma triglycerides.⁴³ By contrast, the natural sweetener **stevia** lowered insulin levels in obese subjects who showed increased insulin following aspartame and sucrose consumption.⁴⁴

A study of both humans and mice showed that the artificial sweeteners sucralose, aspartame, and saccharin had a substantial effect on gut bacteria that increased glucose intolerance.⁴⁵ The effect was greater with saccharin than with sucralose or aspartame.

Dana Small, PhD, (Associate Professor of Psychiatry, Yale School of Medicine) has done research on the effects of artificial sweeteners on behavior and the brain. Experiments on rats have shown that appetite results not only from the area of the brain that communicates with hormones (the hypothalamus), but with the area of the brain associated with learning (the hippocampus).⁴⁶ Dr. Small has shown that this also applies to humans.⁴⁷ She has shown that



learned association occurs between food flavors and the ability of those foods to change blood glucose.⁴⁸

Rats given foods with artificial sweeteners learn that those foods are not providing calories associated with sweeteners and compensate by eating more food and becoming obese.⁴⁹ Mice prefer sucrose over sucralose (which is 600 times sweeter than sucrose) because of an area of the brain that responds to sucrose.⁵⁰ There is considerable evidence that artificial sweeteners contribute to weight gain in people.⁵¹

Calories cause the small intestine to release the hormone **glucagon-like peptide 1**, which reduces appetite by its effects on the brain. Glucagon-like peptide 1 also increases insulin sensitivity. Rats fed artificial sweetener show reduced glucagon-like peptide 1 secretion and increased food consumption.⁵² Mice fed the artificial sweetener acesulfame-K showed impaired memory due to disruption of functioning neurons in the hippocampus.⁵³

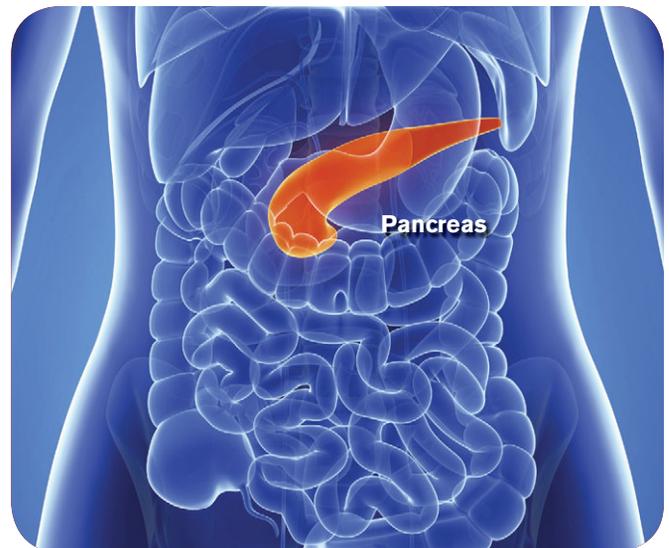
Vitamin D3 Deficiency Promotes Insulin Resistance

Carlos Bernal-Mizrachi, MD, (Associate Professor of Cell Biology and Physiology, Washington University, St. Louis, Missouri) has shown that there is a vicious cycle between insulin resistance in the immune system cells (**macrophages**) that contribute to atherosclerosis and endoplasmic reticulum stress in those cells.⁵⁴



The endoplasmic reticulum is the organelle in cells that synthesizes proteins, fats, and other macromolecules. By preventing synthesis of vital cell components, endoplasmic reticulum stress disrupts cell function, increases macrophage insulin resistance, and increases atherosclerotic foam cell formation.⁵⁴

Vitamin D3 deficiency activates endoplasmic reticulum stress in macrophages^{55,56} and increases blood pressure.⁵⁷ Persons with low vitamin D levels have higher



risk for insulin resistance and metabolic syndrome.⁵⁸ A review of studies of vitamin D supplementation failed to show prevention of cardiovascular disease, but noted that the dose used in the largest trial was low (**400 IU**) and had compliance problems.⁵⁹ A vitamin D3 dose of **2,000 IU** daily has been shown to reduce symptoms in patients at risk for diabetes.⁶⁰ A review of studies showed a direct relationship between vitamin D blood levels and risk of type II diabetes.⁶¹

Endothelial Cell Function And Dysfunction

Mark Kearney, MD, (Professor of Cardiology, University of Leeds, Leeds, UK) has done much research on **endothelial dysfunction**. The **endothelium** is the layer of cells covering the walls of blood vessels. Among the most important functions of endothelial cells is to dilate blood vessels by releasing **nitric oxide**.



Aging and other conditions cause the production of nitric oxide by endothelial cells to decline, a condition described as **endothelial dysfunction**. Failure of blood vessels to dilate leads to high blood pressure.⁶² Failure of the coronary arteries of the heart to dilate can lead to a heart attack. For that reason, nitroglycerin tablets (which cause nitric oxide production) are taken to relieve angina and prevent immediate heart attack.⁶³ Increases in free radicals and chronic inflammation associated with aging leads to endothelial dysfunction,^{64,65} which contributes to atherosclerosis.⁶⁶ Smoking leads to endothelial dysfunction, which can be somewhat reversed by smoking cessation.⁶⁷

Dr. Kearney's team has established that insulin resistance in endothelial cells leads to endothelial dysfunction,⁶⁸ a result that has been confirmed by others.⁶⁹ His team has shown that reducing free radicals reduces endothelial dysfunction.

Insulin resistance in the endothelial cells precedes insulin resistance in the liver and muscles.⁷⁰ Dr. Kearney noted that endothelial dysfunction is highly associated with metabolic syndrome.⁷¹ Type II diabetes has the effect of 15 years of additional aging on blood vessels.⁷² An estimated **25%** of chronic heart failure patients have type II diabetes.⁷³

Lipoprotein(a) As A Cardiovascular Disease Risk Factor

Sotirios Tsimikas, MD, (Director of Vascular Medicine, San Diego Health Center) is concerned with the effect of lipoprotein(a) on cardiovascular disease risk. **Lipoprotein(a)** is a special kind of LDL particle that can cause atherosclerosis independently of other LDL particles.^{74,75}

Lipoprotein(a) consists of an LDL particle that is bound to the glycoprotein (sugared-protein) apoprotein(a).⁷⁶ Some genetic variants of lipoprotein(a) are associated with greater cardiovascular risk than others.⁷⁷ Lipoprotein(a) binds strongly both to the proteoglycans in blood vessel walls and to oxidized phospholipids.⁷⁸⁻⁸⁰

Niacin has been reported to slightly reduce plasma lipoprotein(a),^{81,82} but niacin has not been shown to reduce cardiovascular events in patients receiving statin therapy.⁸³ The most effective therapy is **apheresis** (removal of lipoprotein(a) by filtering the blood). Apheresis that reduced LDL-cholesterol by **65%** and lipoprotein(a) by **73%** reduced major cardiac events by **86%**, a result that cannot be explained by the LDL reduction alone.⁷⁸

Metabolic Syndrome Factors

Ele Ferrannini, MD, (Professor of Internal Medicine, University of Pisa, Pisa, Italy) studies correlation of factors associated with metabolic syndrome. In one study, Dr. Ferrannini showed that there is a direct association between insulin resistance and endothelial function in patients with type II diabetes.⁸⁴ The same study found insulin resistance in type II diabetes to be associated with chronic inflammation and with an impaired

ability to prevent blood clots (impaired fibrinolysis), even in persons who were not obese.⁸⁴

As obesity increases, fat cells become larger, and larger fat cells become more insulin resistant. As abdominal obesity increases, glucose uptake is reduced in both skeletal muscle and fat.⁸⁵ Other studies by Dr. Ferrannini showed that insulin resistance increases in direct proportion to waist circumference⁸⁶ and blood pressure.⁸⁷ **Glucose tolerance** measures how rapidly glucose is reduced in the bloodstream after being administered. A person has poor glucose tolerance if glucose is not rapidly reduced. Dr. Ferrannini showed that impaired glucose tolerance is directly related to insulin resistance of the insulin-producing beta cells of the pancreas.⁸⁸

Atherosclerosis In Childhood

Olli Raitakari, MD, PhD, (Professor of Cardiovascular Medicine, University of Turku, Turku, Finland) began his talk by referring to the fact that more than three-quarters of American soldiers killed and autopsied in the Korean War (with an average age of 22) had gross signs of atherosclerosis.⁸⁹

Dr. Raitakari has found that children with risk factors for cardiovascular disease (based on lipids and blood pressure) typically will develop atherosclerosis as adults.⁹⁰

Based on his research, screening children for atherosclerosis (thickness in the intima-media of blood vessels) beginning at the age of 9 could identify children who would most benefit from therapies to prevent cardiovascular disease.⁹¹ Dr. Raitakari has found that obese children who become nonobese as adults have a similar cardiovascular risk as those who were never obese.⁹² He also found that having both parents smoke had the effect of increasing blood vessel age by an average of **3.3 years**.⁹³



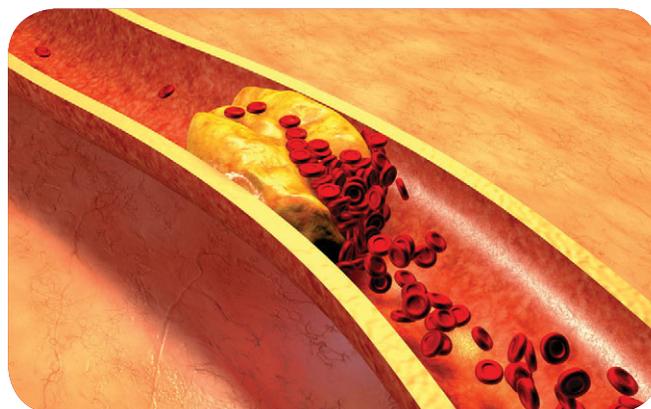
Tsimikas



Raitakari



Ferrannini



Cancer Due To Obesity And Diabetes

Derek LeRoith, MD, PhD, (Director of Diabetes Research, Rambam Health Care Campus, Haifa, Israel) studies the effect of obesity and diabetes on cancer. In the US, cancer deaths due to overweight and obesity are estimated to be **14%** for men and **20%** for women.⁹⁴



Cancer cells avidly consume glucose, and insulin is a growth factor that enhances cancer growth (many cancer cells have insulin receptors).⁹⁵ People with insulin resistance, such as

type II diabetics, and people with metabolic syndrome have high blood plasma levels of both glucose and insulin, which accelerates cancer growth.⁹⁵ Women without diabetes who have had surgery for early-stage breast cancer have a greatly increased risk of cancer recurrence if their plasma insulin levels are high.⁹⁶

Type II diabetics show a steady decline in insulin production by their pancreas such that after 10 years, half of these diabetics require insulin injections.⁹⁷ Diabetics receiving insulin or insulin analogs have an increased risk of cancer in proportion to the size of the dose of insulin or insulin analog.⁹⁸

But type II diabetics receiving **metformin** have reduced plasma glucose and insulin, which reduces their incidence of cancer.⁹⁹ By one estimate, the overall reduction in cancer risk with metformin is **31%**.¹⁰⁰ Gastric bypass surgery of severely obese subjects has reduced cancer risk by **60%**.¹⁰¹

Diabetic Neuropathy

Allen Jacobs, Doctor of Podiatric Medicine, (private practice, St. Louis, Missouri) is concerned with medical conditions resulting from high blood glucose of persons with type II diabetes, especially with the condition of neuropathy.



Neuropathy is damage to nerves, which impairs sensation, movement, and other functions.

Diabetic neuropathy is present in **8%** of newly diagnosed type II diabetics, and in over **40%** of diabetics who have had the disease for more than 10 years.¹⁰² Diabetic neuropathy is the major cause of kidney disease, and is the most common cause of blindness in middle-aged adults.¹⁰³ More than half of all foot amputations are due to diabetes.¹⁰⁴

The antidiabetic drug metformin lowers blood levels of vitamin B12, which may worsen neuropathy.¹⁰⁵

Oral administration of vitamin B12 in the form of Methyl-B12 (methylcobalamin) has been shown to relieve symptoms of diabetic neuropathy.¹⁰⁶

Obesity And Alzheimer's Disease

Suzanne Craft, PhD, (Professor of Medicine, Wake Forest School of Medicine, Winston-Salem, North Carolina) is concerned about metabolic syndrome and the risk of dementia, especially Alzheimer's disease.



Above the age of 40, obesity is associated with a reduction of gray matter (neurons) in the brain.¹⁰⁷ A study of non-demented elderly found that high insulin levels were associated with subsequent higher incidence of Alzheimer's disease.¹⁰⁸ High insulin

levels in the elderly are associated with less gray matter in the areas of the brain most associated with Alzheimer's disease,¹⁰⁹ and is associated with reduced metabolic rate in those areas.¹¹⁰

Mouse experiments indicate that insulin deficiency or insulin resistance can increase aggregation of the amyloid-beta,¹¹¹ or tau¹¹² proteins associated with Alzheimer's disease. Conversely, insulin has been shown to reduce amyloid-beta binding and protect synapses.^{113,114} Dr. Craft has shown that moderate doses of insulin improved cognitive function in adults with mild cognitive impairment or mild-to-moderate Alzheimer's disease.¹¹⁵ Higher or lower doses of insulin did not improve cognitive function.

Conclusions

The annual Southern California World Congress on Insulin Resistance, Diabetes, and Cardiovascular Disease has much in common with the annual South Florida Cardiovascular Disease Prevention Symposium, described in the July 2014 issue of *Life Extension*[®] magazine. Both are conferences that attract several hundred people, where most of the presenters are MDs. These physicians do not discuss disease without discussing both prevention and treatment. The Congress has a greater emphasis on insulin resistance, diabetes, and obesity, but cardiovascular disease is the major cause of death for these conditions.

Some key points in this Congress include the substantial beneficial effects that bariatric surgery can have for reducing obesity and the health consequences of obesity; artificial sweeteners lead to weight gain, rather than weight loss; and that obesity and metabolic syndrome can lead to not only diabetes and cardiovascular disease but cancer, neuropathy, and Alzheimer's disease. ●

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Tri Sugar Shield™

Supports
Healthy
Blood Glucose
Levels

Despite a healthy diet and exercise, aging individuals often find themselves under assault from rising **blood sugar** levels due to a multitude of factors such as:

- Excess **gluconeogenesis**, (glucose produced in the liver from protein)¹
- Rapid conversion of any **starch**—including whole grains—into **glucose**²

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

Tri Sugar Shield™ is designed to support healthy glucose metabolism in aging individuals within the normal range.

TRI SUGAR SHIELD™ THREE ACTIVE NUTRIENTS

Sorghum Extract

Sorghum helps maintain healthy blood sugar levels among those in normal range by:

- Balancing the rate of sugar manufacture in the liver³
- Promoting insulin sensitivity⁴
- Regulating *PPAR-gamma*, a metabolic thermostat that controls glucose metabolism^{4,5}
- Regulating *alpha-amylase*, which controls the release of sugar from starch⁶

Mulberry Leaf Extract

Mulberry leaf extract targets **two** different mechanisms by:

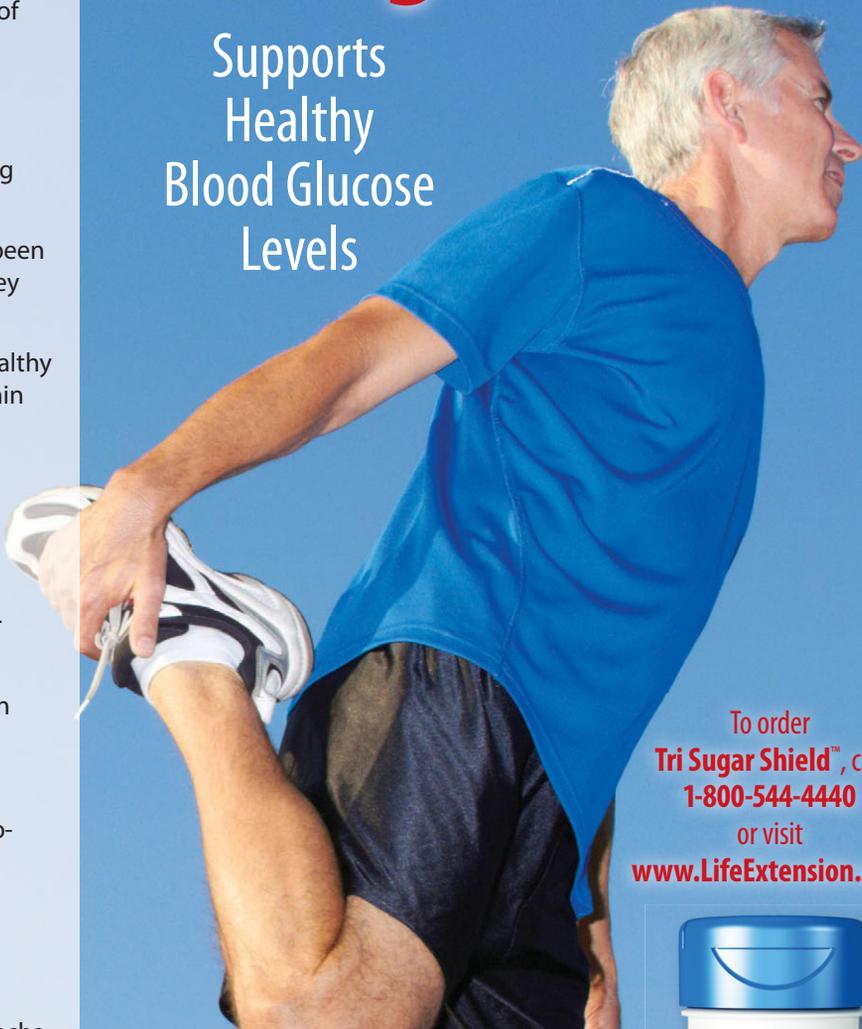
- Supporting glucose transporter *GLUT4* that moves glucose out of the bloodstream and into muscle and liver cells⁸
- Promoting insulin sensitivity⁹

Phloridzin

Phloridzin helps maintain healthy blood sugar levels among those in the normal range by:

- Regulating carrier protein *SGLT1*, helping to block absorption of glucose into the bloodstream¹⁰
- Regulating carrier protein *SGLT2*, in turn supporting glucose elimination via urine¹¹

By targeting **all** of these diverse glucose pathways, **Tri Sugar Shield™** delivers **broad-spectrum support** to help naturally stabilize already healthy glucose levels!



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or visit
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Tri Sugar Shield™

Item #01803 • 60 vegetarian capsules

	Retail Price	Member Price
1 bottle	\$36	\$27
4 bottles	\$32 each	\$24 each

Take **one** capsule twice daily immediately before the heaviest carbohydrate or sugar containing meals/drinks.

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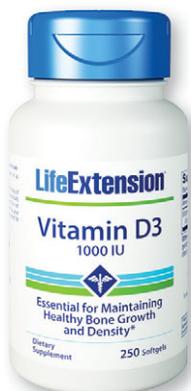
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D₃

VITAMIN D3 SOFTGELS

For Superior Absorption

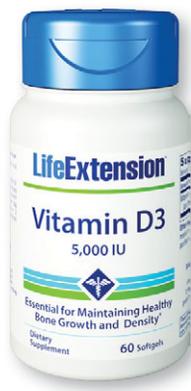
New research on the vital benefits of **vitamin D** emerges on a daily basis. Studies confirm that **optimal** levels of vitamin D are in the range of **50-80 ng/mL** of **25-hydroxyvitamin D**. **Life Extension®** has created a large selection of highly *absorbable* **vitamin D** supplements in softgels to help you to achieve your individual **vitamin D goals**. Keep in mind that you may already be getting **1,000-3,000 IU** of **vitamin D** in your current multi-nutrient formulas.



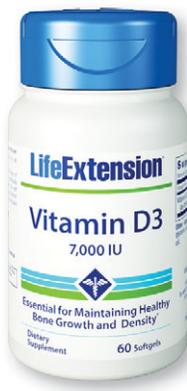
Vitamin D3 • 1,000 IU
250 softgels • Retail: \$12.50
Four-bottle Member Price: **\$8.44 ea.**
For most people, a **1,000 IU** potency is insufficient to attain optimal **vitamin D** blood levels. However, this potency may be suitable for smaller individuals who obtain **2,000-3,000 IU** in their multi-nutrient formulas (and children). **Item # 01751**
Non-GMO.



Vitamin D3 • 5,000 IU With Sea-Iodine™*
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Most people, especially those seeking to reduce their salt intake, do not ingest enough iodine. Combining **5,000 IU** of **vitamin D3** with **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 # 01758**



Vitamin D3 • 5,000 IU
60 softgels • Retail: \$11
Four-bottle Member Price: **\$7.43 ea.**
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Non-GMO.



Vitamin D3 • 7,000 IU
60 softgels • Retail: \$14
Four-bottle Member Price: **\$9.45 ea.**
Some people (such as those weighing more than 180 pounds) may require even more **vitamin D**. When combined with **1,000-3,000 IU** taken in a multi-nutrient formula, this **7,000 IU** softgel should enable these individuals to attain blood levels above **50 ng/mL**. **Item # 01718**



Vitamin D3 Liquid • 2,000 IU (Natural Mint Flavor)
1 ounce • Retail: \$28 • Non-GMO
Four-bottle Member Price: **\$18.75 ea.**
Great for travel and for those individuals who have difficulty absorbing enough vitamin D3 from softgels, this liquid vitamin D is ideal. **Item # 01732**
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To order any of these high-potency vitamin D3 supplements, call 1-800-544-4440 or visit www.LifeExtension.com

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

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

Hundreds of published studies validate the neurological properties of the individual ingredients contained in **Cognitex**[®].

Scientists wondered what would happen if these cognitive-enhancing nutrients were combined into one formula. An open label study was performed to assess the effects of **Cognitex**[®] on the brain health of elderly human subjects.

Here is a summary of the findings from a study that was published in the *Journal of Dietary Supplements* in June 2011:

Study design: 26 elderly participants with memory complaints completed the study. Participants were given three capsules daily of **Cognitex**[®] for 12 weeks with assessments at two weeks and 12 weeks.

Memory at two weeks:

- Recall: +11.15 points vs. baseline—a **15%** improvement
- Recognition: +8.68 points vs. baseline—a **11%** improvement
- Spatial short-term memory: +19.85 points vs. baseline—a **42%** improvement

Attention (sustained and focused) at two weeks:

- Sustained attention: +9.46 points vs. baseline—a **12%** improvement
- Focused attention: +3.77 points vs. baseline—a **4%** improvement

Visuospatial learning at two weeks:

- +17.31 points vs. baseline—a **33%** improvement

Activities of daily living (executive functions and mental flexibility) scores at two weeks:

- Executive functions: +9.45 points vs. baseline—a **14%** improvement
- Mental flexibility: +9.92 points vs. baseline—a **15%** improvement

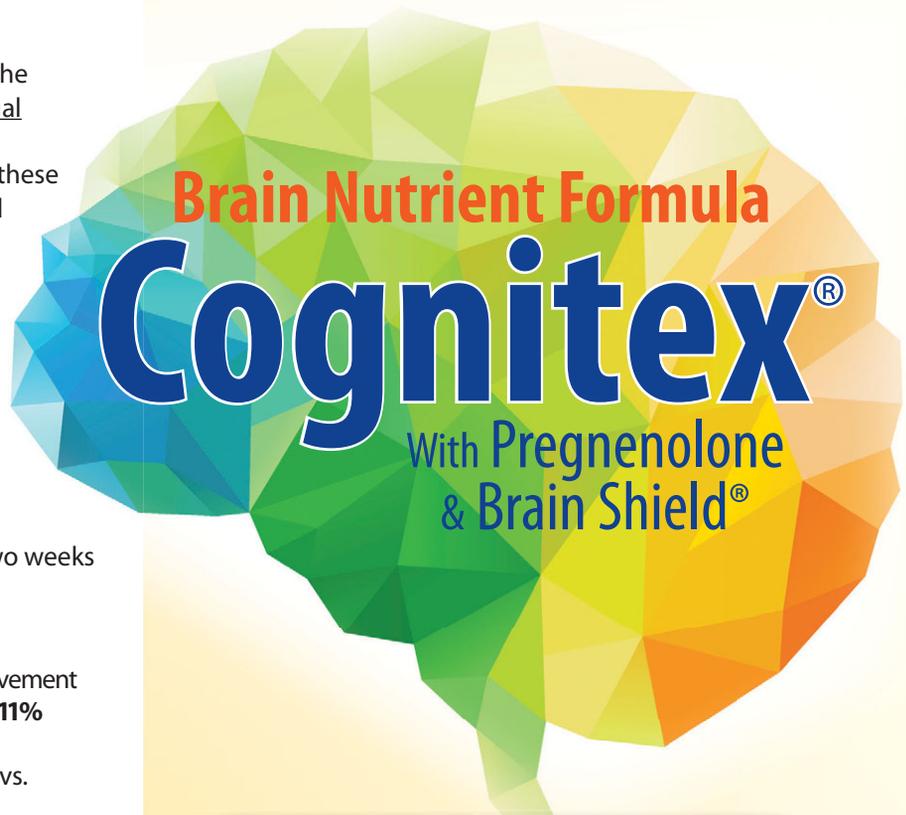
After **10 additional weeks** of **Cognitex**[®] supplementation, further statistically significant improvements in **activities of daily living** (executive functions and mental flexibility) were observed:

- Executive function: +9.15 points vs. two-week scores—a **12%** improvement
- Mental flexibility: +9.73 points vs. two-week scores—a **13%** improvement

Cognitex[®] is designed to improve cerebral performance and protect against neurological problems over the long term. This study evaluated the effects of **Cognitex**[®] on boosting brain function over a short-term period.

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The suggested daily dose of three **Cognitex**[®] with **Pregnenolone & Brain Shield**[®] softgel caps provides:

Alpha-Glycerol Phosphoryl Choline (A-GPC)	600 mg
Phosphatidylserine (from Sharp-PS [®])	100 mg
Brain Shield [®] (Gastrodin)	50 mg
Vinpocetine	20 mg
Leucoselect [®] Grape Extract (seed)	150 mg
Sensoril [®] Ashwagandha Extract	125 mg
BlueActiv [™] Wild Blueberry Extract	150 mg
Uridine-5'-Monophosphate (disodium)	50 mg
Proprietary NeuroProtection Complex Blend Perluxan [®] Hops Extract, Rosemary Extract	125 mg
Pregnenolone	50 mg

Cognitex[®]

Item #01897 • 90 softgels

	Retail Price	Member Price
1 bottle	\$62	\$46.50
4 bottles	\$53 each	\$39.75 each
8 bottles	\$50 each	\$37.50 each

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IMPORTANT DATA

On **3** New Oral Anticoagulants



There are a host of medical issues that can necessitate **anticoagulant** drug therapy. These include atrial fibrillation, mechanical heart valve replacement, deep vein thrombosis, severe atherosclerosis, prior stroke, and coagulation disorders.

Today's medical journals are filled with advertisements for new anticoagulant drugs such as **Pradaxa**[®], **Eliquis**[®], and **Xarelto**[®]. The implication is that these newer drugs have advantages over **warfarin** (Coumadin[®]), which has been the standard anticoagulant drug in clinical use for over 60 years.¹

A careful review of the research on these newer drugs compared to warfarin finds they have important problems of their own (including potential lack of reversibility of their anticoagulation effects).² A huge advantage of these newer drugs over warfarin, however, is that they do not function by antagonizing **vitamin K**.³

Warfarin users are vulnerable to suffer severe system-wide **calcification**.^{4,5}

This article contains technical descriptions of the three new anticoagulant drugs that may be used in place of warfarin. The data is not sufficient, however, to definitely recommend one of these newer drugs over the other. The experience your physician has with any one of these three alternatives to warfarin is likely to be the most important factor when considering their safe and effective use.

The unique advantage of this data is that it is unbiased, which is a major issue nowadays as pharmaceutical companies make tremendous efforts to influence physician prescribing practices.

In this article, **Life Extension**[®] describes the pros and cons of three newer anticoagulant drugs and then compares their effects to warfarin (Coumadin[®]). We know this is highly technical reading, but it is meant primarily for our many physician readers. This information is also relevant to those in need of **anticoagulant drug** therapy.

Dabigatran (Pradaxa®)

A direct thrombin inhibitor, **dabigatran** (Pradaxa®) is approved in the US for use in the prevention of stroke and systemic embolism in adult patients with nonvalvular atrial fibrillation, for the treatment of deep venous thrombosis and pulmonary embolism in patients, and to reduce the risk of recurrence of deep vein thrombosis and pulmonary embolism.⁶⁻⁸

The RE-COVER study in patients with acute venous thromboembolism showed:⁹

- The six-month incidence of recurrent symptomatic acute venous thromboembolism or related deaths was **similar** (test for non-inferiority), **2.4%** in patients treated with dabigatran vs **2.1%** in those treated with warfarin.
- The rates of major bleeding episodes were **similar** in the dabigatran and warfarin groups (**1.6** vs **1.9%**). However, the incidence of all bleeding events was **lower** with dabigatran use (**16.1** vs **21.9%**).

The RE-LY (Randomized Evaluation of Long-term Anticoagulant Therapy, Warfarin, compared with Dabigatran) study in patients with nonvalvular atrial fibrillation and at risk of thromboembolism showed:¹⁰

- The rate of stroke and systemic embolism per year was **lower** with **150 mg** dabigatran twice daily (**1.11%**) and statistically **equivalent** (non-inferiority test) with **110 mg** dabigatran twice daily (**1.54%**) compared with warfarin (**1.71%**).
- The rate per year of major bleeding with a **150 mg** dabigatran dose was not significantly different (**3.32%**; **P=0.31**) compared with warfarin (**3.57%**). However, the rate of major bleeding

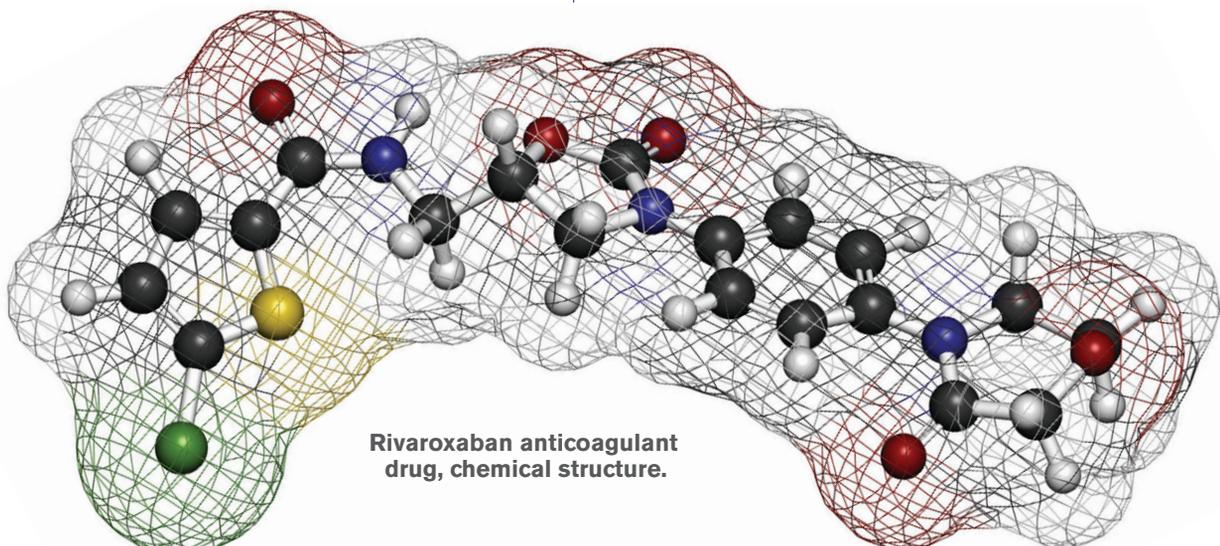
was significantly **lower** with a **110 mg** dose of dabigatran (**2.87%**; **P=0.003**) than either the **150 mg** dabigatran dose or warfarin. The rates per year of hemorrhagic stroke with the **110** and **150 mg** dabigatran doses were both significantly **lower** than with warfarin (**0.12%** and **0.10%** vs **0.38%** respectively; **P<0.001**), as were the rates of intracranial hemorrhage (**0.23%** and **0.32%** vs **0.74%**; **P<0.001**).

An analysis of seven trials involving over 30,000 patients, including two studies of stroke prophylaxis in atrial fibrillation, one in acute venous thromboembolism, one in acute coronary syndrome, and three of short-term prophylaxis of deep vein thrombosis showed:¹¹

- Dabigatran was associated with a significantly higher risk of myocardial infarction or acute coronary syndrome (dabigatran, **1.19%** vs control, **0.79%**; **P=0.03**).
- The risk of myocardial infarction or acute coronary syndrome was **similar** when using revised criteria to exclude short-term trials and was **consistent** when using different methods and measures of association.

Rivaroxaban (Xarelto®)

A direct factor Xa inhibitor, **rivaroxaban** (Xarelto®) is approved in the US for reducing stroke risk and systemic embolism in nonvalvular atrial fibrillation, treatment of deep vein thrombosis and pulmonary embolism as well as reduction in the risk of recurrence of deep vein thrombosis and of pulmonary embolism, and prophylaxis of deep vein thrombosis after knee replacement surgery and hip replacement surgery.¹²⁻¹⁵



What You Need To Know

Three New Oral Anticoagulants

- There are now new oral anticoagulants on the market in addition to warfarin (Coumadin®)—dabigatran (Pradaxa®), rivaroxaban (Xarelto®), and apixaban (Eliquis®).
- Dabigatran is approved to prevent strokes and systemic embolism in patients with nonvalvular atrial fibrillation, for treating deep venous thrombosis and pulmonary embolism, and to reduce the risk of these conditions recurring.
- Rivaroxaban reduces stroke risk and systemic embolism, treats deep vein thrombosis and PE, and reduces their recurrence after knee replacement surgery and hip replacement surgery, respectively.
- Apixaban inhibits free and clot-bound factor Xa as well as prothrombinase activity and is also approved to treat deep vein thrombosis and pulmonary embolism, reduce stroke and embolism risk, and reduce risk of recurrent stroke and embolism.
- The new drugs all have advantages and disadvantages when compared with Coumadin® (warfarin).
- A major benefit of the new oral anticoagulants over warfarin is they don't antagonize vitamin K and patients don't have to avoid foods that contain this nutrient.



The Rivaroxaban Once Daily Oral Direct Factor Xa Inhibition Compared with Vitamin K Antagonism for Prevention of Stroke and Embolism Trial in Atrial Fibrillation (ROCKET AF) study evaluated rivaroxaban for prevention of stroke or embolization in patients with nonvalvular atrial fibrillation at risk of stroke, and showed:^{16,17}

- Rivaroxaban was **similar** to warfarin (**2.1%** vs **2.4%** per year; non-inferiority test) for risk of stroke and embolism.
- **Similar** rates were observed between patients taking rivaroxaban and those taking warfarin in terms of all clinically relevant nonmajor bleeding events (**14.9%** vs **14.5%** per 100 patient years) and major bleeding events (**3.6%** vs **3.4%** per 100 patient years).
- In addition, the rates of intracranial hemorrhage were **less** with rivaroxaban therapy (**0.5%** vs **0.7%**, **P=0.02** and **0.4%** vs **0.8%**, **P=0.003**, respectively).
- The EINSTEIN study included a comparison of oral rivaroxaban to traditional therapy with low molecular weight heparin (enoxaparin) and a vitamin K antagonist in patients with acute, symptomatic deep vein thrombosis.¹⁸
- Rivaroxaban therapy was **similar** (non-inferiority test) to enoxaparin/vitamin K antagonists therapy with respect to recurrent acute venous thromboembolism (**2.1%** vs **3.0%**; **P<.001**).

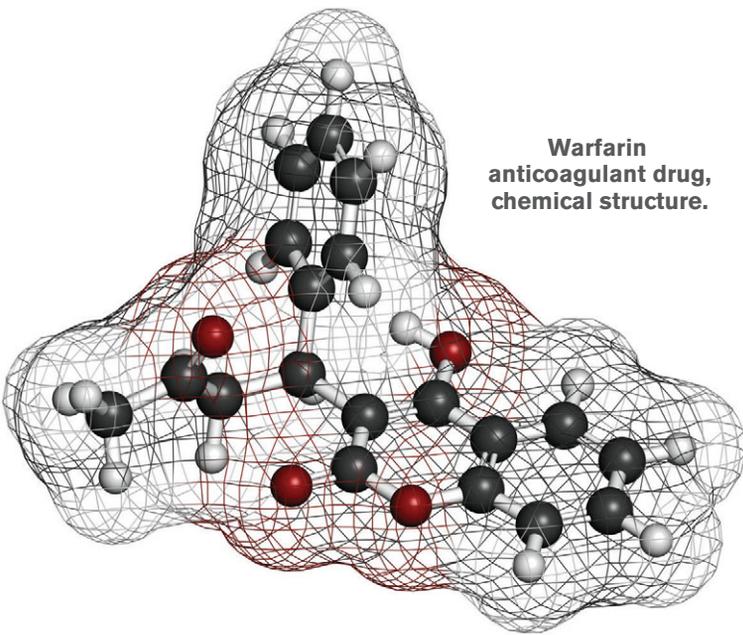
- The principal safety outcome of major or clinically relevant non-major bleeding occurred at **similar** rates in both treatment arms (rivaroxaban vs enoxaparin/vitamin K antagonists).

Apixaban (Eliquis®)

An inhibitor of free and clot-bound factor Xa as well as prothrombinase activity, **apixaban** (Eliquis®) is approved in the US for the treatment of deep vein thrombosis and pulmonary embolism, for the reduction in the risk of recurrent deep vein thrombosis and pulmonary embolism following initial therapy, to reduce the risk of stroke and systemic embolism in patients with nonvalvular atrial fibrillation, and prophylaxis of deep vein thrombosis, which may lead to pulmonary embolism, in patients who have undergone hip or knee replacement surgery.¹⁹⁻²²

The Apixaban after the initial Management of PuLmonary embolism and deep vein thrombosis with First-line therapy-EXTended treatment (AMPLIFY-EXT) trial evaluated the efficacy and safety of different doses of apixaban compared with placebo in patients who had a venous thromboembolism and completed prior anticoagulation therapy. The results showed:²³

- The incidence of recurrent acute venous thromboembolism and acute venous thromboembolism-related mortality was **1.7%** in both the apixaban dose groups (**2.5 mg** or **5 mg** twice daily) compared with **8.8%** in the placebo group (**P<0.001**).



- The rates of major bleeding were **similar** across the treatment groups (placebo: **0.5%**; **2.5 mg** of apixaban: **0.2%**; and **5 mg** of apixaban: **0.1%**).
- The Apixaban for Reduction in Stroke and Other Thromboembolic Events in Atrial Fibrillation (ARISTOTLE) trial compared apixaban at a dose of **5 mg** twice daily with the vitamin K antagonists warfarin in patients with nonvalvular atrial fibrillation and at least one additional risk factor for stroke and showed:²⁴
- Compared with warfarin, apixaban therapy was **better** in preventing stroke or embolism (**1.27%** vs **1.60%** per year; **P<0.001** for non-inferiority and **P=0.01** for superiority).
- The rate of major bleeding per year with apixaban use was **better**, **2.1%** compared to nearly **3.1%** with warfarin (**P<0.001**).

Using These New Anticoagulant Drugs As Alternatives To Warfarin (Coumadin®)

For approximately 60 years, vitamin K antagonists like warfarin (Coumadin®) were the only *orally bioavailable* anticoagulant drugs. (Aspirin is not an anticoagulant drug but rather reduces the effectiveness of platelets to stick together in *primary hemostasis*, a separate function from the body's very complex system of clotting homeostasis involved in *secondary hemostasis*{for a thorough review of the complex nature of this topic, please review: <http://www.lef.org/Protocols/Heart-Circulatory/Blood-Clot.>})

However, use of vitamin K antagonists like warfarin in patients has been **plagued** by problems.

Warfarin treatment risks multiple medication (and food) interactions,²⁵ the problem of variable pharmacologic effect,²⁶ a narrow, brittle therapeutic index,² and a relatively slow onset of action,²⁷ all of which serve to place patients at risk.

For example, an underappreciated analysis showed just how clinically problematic warfarin's narrow therapeutic window can be. A hefty **44%** of bleeding complications with oral anticoagulants (largely warfarin) were found in patients anticoagulated **excessively**, and a whopping **48%** of clotting events (thromboembolic) occurred in patients anticoagulated **inadequately**.²⁸

However, over the past several years, several novel, orally bioavailable anticoagulant drugs have become available in the US.

These new medications target critical anticoagulant factors like factor Xa and thrombin (factor IIa). They include **dabigatran** (Pradaxa®; Boehringer Ingelheim), **rivaroxaban** (Xarelto®; Bayer HealthCare AG and Janssen Research & Development LLC, a Johnson & Johnson Company), and **apixaban** (Eliquis®; Pfizer, and Bristol-Myers Squibb).

A *fourth* oral anticoagulant, Daiichi Sankyo's edoxaban (Savaysa®), was recently approved by the FDA (January, 2015). It is used to reduce the risk of stroke and systemic embolism in patients with atrial fibrillation that is not caused by a heart valve problem.²⁹

Be aware that although there appear to be a variety of advantages associated with the new oral anticoagulants in comparison with warfarin, there is also controversy.

For example, many of the studies submitted for FDA approval with the new, oral anticoagulants utilized so-called **non-inferiority** designs and statistical tests in order to show that the newer drugs are at least as good as the vitamin K antagonists warfarin in reducing the risk of thromboembolic events as well as supporting safety, in particular in the context of major bleeding like intracranial hemorrhage (ICH). However, one criticism of the use of the **non-inferiority** test suggests that the relative benefits of these newer drugs versus warfarin have been overstated (given the limitations of the trial designs).

Also, although some outcomes may "appear" better (or safer) with specific new anticoagulants, the patient populations are similar, but not the same (nor are the trial designs), and the idea that one agent is necessarily better than another *at the current time* is not supportable. However, one of the new oral agents (dabigatran) has a potential danger signal. Though very controversial at the current time, some data suggest an increase in heart attack and acute coronary syndrome in some patients with the use of this new drug.¹¹

General advantages of the new oral anticoagulants include:³⁰⁻³²

- More rapid onset of action compared with warfarin,
- No need for frequent blood test monitoring compared with warfarin,
- Far more predictable, consistent pharmacologic effects compared with warfarin,
- Dramatically reduced drug-drug, and drug-food, interactions compared with warfarin,
- Similar (or better) short-term efficacy for reduction of clotting events (thromboembolism) compared with warfarin,
- Similar (or improved) short-term safety (e.g. major bleeding risk) compared with warfarin.

General disadvantages of the new oral anticoagulants include:^{11,32-37}

- High(er) cost relative to warfarin;
- No specific antidote to counteract bleeding (in contrast to high-dose vitamin K to reverse warfarin's effects), though protein C concentrate has been used;
- Lack of long-term safety data and adequate data to support use in pregnancy, patients with mechanical heart valves, and patients with severe kidney disease.
- Potential safety signal observed with at least one of the new drugs (dabigatran), suggesting an increase in heart attack and acute coronary syndrome risk in at least some vulnerable patients.

When it comes to **anticoagulant** drugs, there are no definitive best choices that can be made. They all have dangerous side effects. The dilemma is that failure to use an anticoagulant drug when one is indicated predisposes the patient to an unacceptably high risk of thrombosis, and ensuing ischemic stroke, heart attack, pulmonary embolism, deep vein thrombosis, etc.

The main advantage of the new anticoagulant drugs over warfarin is that they don't antagonize vitamin K and they don't require the patient to avoid vitamin K-containing foods. Warfarin users are predisposed to systemic calcification.

Switching from warfarin to one of these new anticoagulant drugs requires expert physician intervention.

Summary

In addition to the traditional warfarin (Coumadin®) here are three new oral anticoagulants on the market—Dabigatran (Pradaxa®), rivaroxaban (Xarelto®), and apixaban (Eliquis®). All have their advantages and disadvantages. Some of the advantages of the new drugs include more rapid onset of action compared to Coumadin®, no more need for frequent blood testing, fewer interactions, similar or better efficacy, and similar or improved risk. The main advantage of the new oral anticoagulants over warfarin is they don't antagonize **vitamin K** and a patient no longer has to avoid foods containing this nutrient. Disadvantages include a higher cost to consumers, no specific antidote for bleeding, and lack of long-term data supporting use. ●

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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Advanced Vascular Support Formula

Olive Leaf

WITH CELERY SEED EXTRACT



Advanced Olive Leaf Vascular Support with Celery Seed Extract is a unique, *dual-action* formulation containing two *bioactive compounds* that support optimal cardiovascular health.

1. **Olive Leaf extract** contains *oleuropein*, a natural compound that supports healthy blood pressure already within the normal range.

Researchers using **1,000 mg** per day of **olive leaf extract** in a controlled clinical trial documented an average **11 mm Hg** decline in systolic readings and a **4.8 mm Hg** drop in diastolic readings within eight weeks!¹

2. **Celery seed extract** contains *3-n-butylphthalide (3nB)*, which supports a healthy inflammatory response that is critical to maintaining a healthy circulatory system.² **Celery seed** also helps minimize the flow of calcium into the muscle cells lining blood vessels, promoting healthy blood pressure already within the normal range.^{3,4}

In a controlled clinical trial, researchers using an equivalent amount of active compounds as found in this **celery seed extract** documented an average **8.2 mm Hg** decline in systolic readings and **8.5 mm Hg** drop in diastolic readings—in just six weeks!⁵

While **olive leaf** and **celery seed extracts** show impressive support individually, **Advanced Olive Leaf Vascular Support with Celery Seed Extract** combines two bioactive compounds to provide **dual-action** vascular support.

The suggested daily dose of two vegetarian capsules of **Advanced Olive Leaf Vascular Support with Celery Seed Extract** provides:

Benolea® Olive extract (leaf)	1,000 mg
[standardized to 16% oleuropein (160 mg)]	
Celery3nB™ Celery seed extract	300 mg
[standardized to 42.5% phthalides (butylphthalide and sedanenolide (127.5 mg)]	

A bottle of 60 vegetarian capsules of **Advanced Olive Leaf Vascular Support with Celery Seed Extract** retails for \$36. If a member buys four bottles, the price is reduced to **\$24** per bottle.

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To order **Advanced Olive Leaf Vascular Support with Celery Seed Extract**, call **1-800-544-4440** or visit www.LifeExtension.com

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

Advanced Defense Against Cellular Aging

NAD+ Cell Regenerator

If you are experiencing fatigue and lack of motivation, it may be due to the age-related decline in **NAD+** levels¹ and subsequent impairment of healthy cellular metabolism.²

NAD+ (*nicotinamide adenine dinucleotide*) promotes systemic youthful functions and is found in every cell in the body.³ In addition, **NAD+** plays an essential role in regulating **genes**^{4,5} that control aging.⁶

How To Boost NAD+ Levels Within Your Cells

Newly patented **nicotinamide riboside** increases cellular levels of **NAD+** in the body.^{7,8}

For the first time, aging humans have an effective and affordable method to boost the critical **NAD+** enzyme for refreshed vitality.

Nicotinamide riboside represents an innovative advance to combat aging that functions via unique mechanisms not found in typical dietary supplements. It has emerged as a front-line weapon in **Life Extension**®'s ongoing war against premature aging.

The name of this new **nicotinamide riboside** formulation is **NAD+ Cell Regenerator**™.

Multiple Benefits Of Increasing NAD+ Cellular Levels

Nicotinamide riboside has been documented to help replenish cellular **NAD+** and in the process:

- Promote sirtuin (SIRT1 and SIRT3) gene activation,⁶
- Enhance growth and efficiency of mitochondria—supporting energy levels and physical performance,⁶
- Favorably modulate metabolism,⁶
- Contribute to neuronal health—supporting cognitive function during aging,⁹⁻¹¹
- Promote insulin activity—supporting healthy blood sugar in those within the normal range.⁶

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The suggested daily dose of one **NAD+ Cell Regenerator**™ vegetarian capsule provides:

NIAGEN® Nicotinamide Riboside 100 mg

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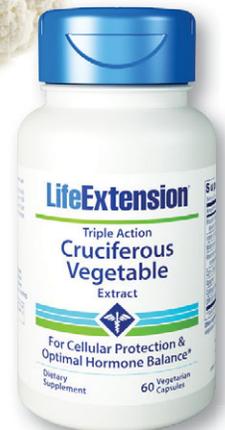
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Taurine is so vital that scientists have described it as **"one of the most essential substances in the body."**¹ Food sources provide relatively little taurine,^{2,3} and as we age, synthesis of taurine in our bodies (from cysteine) markedly declines.³⁻⁵

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Taurine is one of the most abundant amino acids.^{1,6} Extensive studies have demonstrated the ability of **taurine** to support:

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- Proper utilization of minerals such as calcium,¹
- Eye health,^{1,9,10}
- Regulation of the central nervous system,⁶
- Cell membrane stability⁶ and balanced water content (*osmoregulation*),^{11,12}
- Immune system modulation,^{11,13}
- Bile salt formation,¹¹
- Neuron integrity^{6,11} and cognitive function,¹⁴
- Liver function,¹⁵ and
- Cardiovascular health.^{12,16,17}

To promote **system-wide** health, the body requires adequate levels of this **essential** nutrient.^{1,11,18}

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Dr. Michael Ozner: Cardiac Prevention

Dr. Michael Ozner, who serves as medical director for the Cardiovascular Prevention Institute of South Florida and is a member of **Life Extension**®'s Scientific Advisory Board, organizes the largest and most prestigious **cardiovascular disease** prevention symposium in the world. For our readers who could not attend, Dr. Ozner met with Life Extension® to discuss some of the important highlights of this four-day meeting.



LE: Every year, you attract the most innovative doctors from around the globe to discuss the latest thinking in heart disease prevention. Yet for all the billions and billions of dollars spent on statins, bypass surgery, stents, and medical diagnostics, heart disease is still the major killer of humans worldwide. To an outsider, it would seem we are not making a great deal of progress. But you are involved in the latest research; what is your opinion? Are we making progress?

MO: That's an excellent question. There is progress on all fronts. The progress for fighting the epidemic of heart disease must come from prevention. From my particular view, the most effective way to avoid coronary heart disease and the need for expensive and high-risk surgical intervention is through lifestyle intervention. We need to get people to begin eating the right foods, exercising, reducing stress, and moving from the disease model to the wellness model. We know from years of experience, and the clinical data repeatedly supports this, that people can largely avoid heart disease, medication, and surgical interventions with the proper lifestyle. At the meeting, we had Dr. Vasanti Malik from Harvard Medical School discuss the role of nutrition in cardiovascular disease prevention. Based on research, which includes clinical trials, meta-analyses, epidemiological studies, cohort studies, the scientific evidence demonstrates that a traditional Mediterranean diet and related lifestyle is the optimal approach for preventing cardiovascular disease.

LE: That's impressive.

MO: We have become a very sedentary society and do a lot of sitting. At the symposium, we had a wonderful lecture about the relationship of sitting time as a direct correlation with **all-cause** mortality and cardiovascular disease risk and mortality. The longer people sit, the more dangerous it is. Most people sit while at work, come home, eat dinner, and then sit at night to watch TV. One of our speakers, Dr. Peter Katzmarzyk, has published extensively on this topic. For example, when people get on an airplane and fly a long distance, they can increase the risk of blood clots in the legs. So if one is in a sedentary occupation, you need to get up after an hour of sitting and go for a five- to 10-minute brisk walk and then go back to your activity.

LE: As part of the lifestyle modifications along with the Mediterranean diet comes stress reduction. Stress is mainly invisible and easy to miss. So, what role does stress play in heart disease?

MO: We know that stress plays a major role in cardiovascular disease based on extensive studies. What's interesting about stress is that we used to think that Type A personalities were the ones who were at increased risk for heart attacks and it turns out that it's not so much the person who's striving to get ahead; it's the person who is angry and hostile.

LE: The message is that physicians, especially cardiologists, need to understand their patient's life and what's going on with them and not just rely on a set of numbers from blood tests.

MO: No question about it.

LE: I noticed on the symposium agenda a presentation by Dr. Michael Blaha from Johns Hopkins titled "Erectile Dysfunction: An Early Sign of Cardiovascular Disease." Can you elaborate on this topic?

MO: Men who develop erectile dysfunction should be screened for cardiovascular disease, rather than just given a prescription for Viagra® or any of the other pharmaceutical approaches. Very frequently we've seen men present with erectile dysfunction and then drop dead a year later from a heart attack.

Erectile dysfunction is really a vascular disease and vascular disease rarely affects just one area of the body. So if we have vascular disease in men who develop erectile dysfunction, usually they also have vascular disease affecting the heart, and there could be some very easy, noninvasive tests that can screen men for this.

LE: The ads for erectile dysfunction products such as Cialis® and Viagra® do not indicate anywhere that if you have this condition, you should see your cardiologist. I don't think the public or even most physicians see the connection between erectile dysfunction and cardiovascular disease.



MO: That's a good point and this was brought up at the meeting. When it comes to erectile dysfunction, red flags should be raised in the mind of the physician writing a prescription for Cialis® or Viagra®. Many of these patients are being seen by their primary care physician who needs to start saying, "Hey, we'll address your erectile dysfunction, but just as importantly, we need to address the fact that you're at increased risk for a heart attack." There should certainly be a discussion and a workup.

If we're going to truly practice cardiovascular disease prevention and prevent heart attacks, what we need to do is be able to recognize these presentations that put people at increased risk. In men, erectile dysfunction is a huge red flag of lurking heart disease. You can add to that list low vitamin D, low omega-3 levels, and many other metabolic disorders. All of these factors can be discovered with simple blood tests. Targeted blood tests are an important tool to catch people with cardiovascular disease before they have a heart attack. You don't want to wait until somebody is in the throes of a heart attack because half of them won't even make it to the hospital.

LE: Your symposium seems to show that science is gaining a deeper understanding of cholesterol and all its complexities.

MO: Yes, the scientific understanding of lipids is rapidly expanding. When we talk about lipids, we're talking about cholesterol, as opposed to lipoproteins, which are the particles that carry cholesterol. In the past we've always used the term "good cholesterol" and "bad cholesterol," which are really incorrect terms. For example, HDL, which was always called

"good" cholesterol, can, in reality be good or bad. We could have what's called "dysfunctional HDL."

LE: Can you explain why HDL is not the perfect solution for protection from heart disease?

MO: It can get a little complicated because HDL wears many hats. HDL is involved in *reverse cholesterol transport*, which means it takes cholesterol from the arterial wall and brings it back to the liver for processing. This is a good thing because this decreases atherosclerosis. Cholesterol, as we know, is needed by every cell membrane in the body. It's needed to create steroid hormones for bile acid production, so it serves a very worthwhile purpose.

The problem is that HDL can become *dysfunctional* for a variety of reasons. There could be too many free radicals that affect HDL's function. There could be various types of genetic anomalies that could affect HDL function, and as a result, HDL no longer functions in a beneficial sense, but can actually function in a detrimental sense by promoting heart disease rather than preventing heart disease.

One of the problems we've had was not having a blood test that will identify functional HDL versus dysfunctional HDL. Currently, researchers are developing such a test, but they are very expensive and not ready for routine clinical use. But once those tests are available to physicians, we will have another important tool for preventing heart disease.

LE: And what about LDL?

MO: There is no controversy when it comes to LDL. If you have too many cholesterol-carrying LDL particles, these particles can then

enter the artery wall and initiate an atherosclerotic plaque, which essentially is like a pimple on the artery wall. When that plaque ruptures, you get a blood clot at that site and depending on how large that blood clot is, it could either cause chest pain, a heart attack, or sudden cardiac death.

However, what we can do today is *stabilize* plaques. If you have a highly inflamed, unstable plaque, it can rupture. But the plaques that become stable and never rupture will never cause a problem. Therefore, our goal through lifestyle modification and medication, when needed, is to decrease LDL particle numbers and reduce inflammation in the vascular wall to stabilize plaques so they don't rupture and lead to heart attacks and strokes.

LE: How do you identify people with potentially unstable plaques?

MO: Predominantly through blood tests. At the end of the day, cardiovascular disease is really a metabolic disorder and if we could identify on a blood test the metabolic derangements that lead to vascular disease, we could correct those metabolic abnormalities with lifestyle intervention and medical therapy and therefore convert an unstable plaque to a stable plaque.

The analogy I often make is if we had a member of a bomb squad who identified an active bomb that could go off, and they defused the bomb, that bomb would never explode and lead to injury or death.

And that's really what we do as preventive cardiologists. Through lifestyle intervention and medical therapy, we defuse these little bombs called atherosclerotic plaques in the coronary arteries in

the heart to prevent heart attacks, in the cerebral arteries in the brain to prevent strokes, and in the peripheral arteries that can lead to peripheral vascular catastrophes.

Contrast this with stents and bypass surgery, which just put a Band-Aid on a specific, small area of our vascular tree. That's why we know that vascular intervention with stents or bypass surgery in stable individuals has never been shown to reduce the risk of a future heart attack and reduce the risk of death from cardiovascular disease compared to medical therapy. Because you never know which plaque (and there could be literally thousands of them) is going to suddenly rupture.

However, in an unstable patient, acute treatment with stents can be lifesaving—and now it has been shown that *endovascular catheter intervention* in patients with an acute stroke can be highly beneficial. We'll discuss this in more detail later in the interview.

LE: It seems that triglycerides are now being included in the discussion about cardiovascular risk factors. Previously, it just seemed that physicians were mostly concerned about LDL, but now triglycerides are being considered as part of the cardiovascular risk equation.

MO: You are absolutely correct, triglycerides are a cardiovascular risk factor.

LE: *Life Extension*® magazine has consistently reported that fish oil is very effective toward lowering triglycerides.

MO: No question about it. Obviously people with high triglycerides need to reduce their intake of sugar and refined carbo-

hydrates, as well as saturated fat, in their diet. Fish oil is definitely effective in lowering triglycerides.

LE: Earlier we discussed erectile dysfunction as a red flag for heart disease. Another red flag is excess weight that creates havoc throughout the body.

MO: That **100%** correct. This is another situation where blood tests are invaluable. You can determine if there is *impaired fasting glucose* and measure inflammatory markers. In people with excess weight, their visceral fat cells will start releasing inflammatory markers like *interleukin 6* and *C-reactive protein*. If you have elevated blood pressure combined with mild blood sugar elevation and increased inflammation, that's a sign that you have *sick fat*. As your amount of *adiposopathy* or *sick fat* increases, your triglyceride levels also go up, small dense LDL particles rise, and HDL will decline.

So when you start looking at metabolic syndrome, it's a reflection of this whole process of smoldering insulin resistance and it's one of the precipitating causes of cardiovascular disease. Exercise is of great importance because it burns triglycerides and fat.

Dr. Katherine Esposito and others have shown that people who were placed on a Mediterranean diet for one year significantly lower their risk of metabolic syndrome.

LE: Most people see excess weight, that extra 10 pounds, as a cosmetic issue because they can't fit into their clothes. But as you point out, it's really a serious warning sign that the body is in a dysfunctional state.

MO: What people should understand is that this extra fat is an active endocrine organ just like the thyroid

or the pituitary gland and it pumps out all of these inflammatory cytokines and angiotensinogen.

For people who develop diabetes who cannot successfully tame the condition through lifestyle, doctors have used the drug *metformin* with good results. What happens with a lot of these pharmaceutical interventions is people think that they'll go on medications like metformin or a statin and they can eat whatever they want and not adhere to a healthy lifestyle.

One other thing about the Mediterranean diet I want to mention is that it provides an abundance of fiber that lowers fat and carbohydrate absorption and improves beneficial gut flora, which is an evolving area of interest for scientists. Researchers are looking at gut flora as being intimately connected to specific areas of brain, heart, and immune health. At our next symposium, we will have the world's foremost authorities discuss the role gut flora plays in cardiovascular health.

LE: What are some of the innovations on the horizon with regard to cardiovascular disease prevention?

MO: There were a number of landmark clinical trials recently presented at the International Stroke Conference that have to do with people who've had an acute stroke. Patients would usually receive a clot buster drug known as TPA, which breaks down a blood clot in the artery, assuming they have an occlusive stroke and not a hemorrhagic stroke. But now there's a new interventional technique called *endovascular catheter intervention* therapy that can lower the risk of death from a stroke **50%**, if it's initiated early on in the stroke process.

LE: How does this work?

MO: A catheter is inserted in the artery in the brain and the doctor removes the clot. This is going to be a paradigm shift. In the past, people who had a stroke were taken to just any hospital and given intravenous TPA. And now because this procedure has been shown to make such a significant difference, the stroke victim will be taken to a specialized stroke center, where specially trained physicians will perform this procedure that can make the difference between life and death. This really represents a major shift in stroke treatment. The key is that people need to recognize stroke symptoms—slurring of speech, numbness or weakness on one side of the body, garbled speech, and drooping on one side. If you get the person early and you take out that clot, they'll regain blood flow and may completely regain neurological function.

LE: From everything we have discussed, it appears that cardiovascular prevention is entering a new phase to beat the cardiovascular epidemic.

MO: Increasingly, more and more doctors realize that standard routine cholesterol testing is not enough. Physicians need to be measuring LDL cholesterol particles, vascular inflammation, omega-3 levels, vitamin D levels, and other important biomarkers that can predict an increased risk of heart attack or stroke. For instance, it has been shown that people walking around with low vitamin D levels are at increased risk for heart attacks. And if you replace the vitamin D, you can reduce that risk.

One of the most exciting new developments, which is now in Phase III clinical trials, are PCSK9 inhibitors. PCSK9 is a protein produced in the liver that lowers the number of receptors on the liver

that pull LDL cholesterol out of the bloodstream to keep LDL cholesterol down. By inhibiting PCSK9, LDL cholesterol is reduced and clinical studies have demonstrated a highly significant reduction in risk of heart attack in those receiving PCSK9 inhibitors.

LE: Very impressive.

MO: Inhibitors of PCSK9 have been shown to be safe and have been shown to significantly lower cholesterol and reduce the risk of cardiovascular disease.

We now have an opportunity to really make a major dent in reversing plaque because when you get levels that low, we're talking reversal. And more importantly, we're talking about getting significant stabilization of plaques and lowering the risk of heart attacks. The drug is going to be approved soon.

Additionally, there are many people who are intolerant to statins who would benefit from PCSK9 inhibitors. So the future with PCSK9 inhibition is very promising.

Now, despite all the promise of this new drug, I still stand by the fact that lifestyle is first and foremost your best avenue for preventing heart disease.

LE: There has been a lot of controversy over the new statin guidelines that seem to say that everyone over 50 needs to be on a statin. What are your thoughts on this new edict?

MO: This topic was discussed in detail at our symposium. Increasingly, we see evidence that statin drugs used to lower cholesterol can raise blood sugar, and can actually tip certain people with prediabetes into diabetes.

While statin medication has been shown to be beneficial in



ASK THE DOCTOR

men and women who have cardiovascular disease or significant risk factors, I don't think we should be mandating that everyone goes on a statin who is otherwise healthy. You know, all of these debates are settled with science. And we just don't have the science to say that we need to take every person walking down the street and start putting them on statin medications. Healthy lifestyle recommendations are always the first choice.

LE: You are proposing a sound strategy. Blood tests to determine your status, lifestyle adjustments including diet, exercise, and stress reduction, all of which make patients responsible for their own health. And finally, if this does not work, then we will consider medication. Medication is not always the first option.

MO: No question about it. And first and foremost is “do no harm.” And that’s where Life Extension® is really ahead of the curve with its emphasis on prevention. You know a lot of the interventions in cardiovascular medicine carry risk. The excessive reliance on CT scans with radiation exposure, surgery, and stent placement all come with potential side effects. We should reserve all those things for people who really need it. For the vast majority of healthy Americans, let’s focus on a healthy diet and lifestyle and supplements or medications, if necessary, to correct metabolic abnormalities—in most cases, that’s going to be adequate.

LE: Thank you for your time, Dr. Ozner, and the information. ●

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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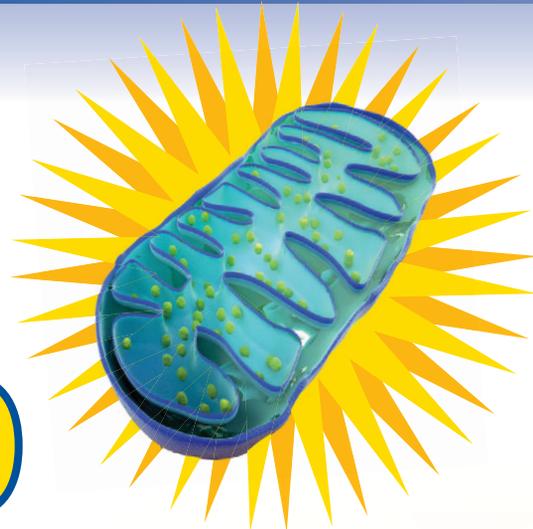
Cardiovascular Disease Prevention, an annual international meeting dedicated to the treatment and prevention of heart attack and stroke. He was the recipient of the 2008 American Heart Association Humanitarian Award and was elected to Top Cardiologists in America by the Consumer Council of America. *Dr. Ozner is also the author of The Great American Heart Hoax, Heart Attack Proof, and The Complete Mediterranean Diet.*

For more information on Dr. Michael Ozner, visit www.drozner.com.



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BY MICHAEL DOWNEY



SUPER FOODS

Quinoa

A Complete, Gluten-Free Protein

People everywhere are turning to **quinoa** for an excellent, meat-free, complete source of low-fat protein.¹⁻³

The high-protein content of this vegetable seed—often mistakenly called a grain—means quinoa has a much lower carbohydrate content than grains,² as well as a lower glycemic index.⁴ It is also low in sodium⁵ and unlike some grains, is completely gluten-free.^{2,6}

Quinoa contains a range of nutrients including riboflavin (vitamin B2),⁶ quercetin,⁷ tocopherols,⁸ polyphenols,^{3,8} saponins,⁸ phytosterols,³ minerals,³ vitamins,³ free-radical fighting molecules,^{7,9} fiber,¹⁰ and highly potent compounds like hydroxybenzoic acids and arabineans.⁹

Scientists continue to find evidence that this versatile grain substitute may inhibit inflammation,⁹ reduce cholesterol,^{8,9} quench free radicals,⁷ improve glucose levels,^{7,10} promote cellular energy production,¹⁰ support weight loss,¹⁰ act as a prebiotic,^{11,12} and potentially help prevent cancer and heart disease.¹³

In fact, NASA scientists have suggested quinoa as a possible crop for cultivation on long-duration manned space flights.¹⁴ And the United Nations officially declared 2013 to be the International Year of Quinoa, with UN Secretary-General Ban Ki-moon declaring, “Quinoa is now poised for global recognition.”¹⁵



A Protein Powerhouse

Quinoa was a dietary staple in South America as long as 4,000 years ago.¹⁶

However, it wasn't until 1955 that scientists concluded, "While no single food can supply all the essential life-sustaining nutrients, quinoa comes as close as any other in the plant or animal kingdom."¹⁷

Prominent among these nutrients is its high-quality protein.^{2,3,9,10,18} The seed of this vegetable, related to spinach and beets, is one of the most protein-rich foods we can eat.¹⁰

It is possible for plant foods to include all nine of the essential amino acids—those that must be derived from diet. But one or more of these protein-building blocks is generally in short supply, limiting the amount of usable protein.^{1,6,9} This means that vegans have very limited options for quality protein.

For instance, grains often lack sufficient amounts of lysine and isoleucine, rendering their protein contribution incomplete.⁶ But quinoa contains ideal levels of

these and all of the other essential amino acids⁶—making it the only grain-like food that is a complete protein.⁹

The gluten molecules in wheat, barley, and rye trigger an autoimmune response in celiac patients. However, quinoa—which can be eaten like a cooked grain—is gluten-free and safe for celiac patients, as well as those with gluten intolerance.¹⁹

Compared to grains, quinoa provides a substantially higher proportion of protein relative to carbohydrate.^{2,18} The concentration of protein is highest in the germ, and the quinoa germ comprises up to about **60%** of the quinoa seed—while the wheat germ makes up less than **3%** of the wheat kernel.² This makes quinoa ideal for low-carb and low-glycemic diets.

Many people consume grains because they can be a good source of fiber. But quinoa is fiber-abundant,¹⁰ with just one cup delivering **21%** of your recommended daily fiber intake.⁵ The fiber content of quinoa is significantly greater than that of either whole wheat or brown rice.¹⁸

Quinoa is recognized as a "functional food." That is, its balanced content of protein, minerals, vitamins, and fatty acids deliver such a strong contribution to nutrition that it may lower the risk of a broad range of diseases. Let's examine a few of these main health effects.

Protecting Against Cardiovascular Disease

Researchers continue to find that quinoa provides significant cardiovascular benefits.

In a University of Milan study, scientists compared various gluten-free foods. Quinoa stood out in the study for producing lower free fatty acid levels and triglyceride concentrations than other foods studied, including gluten-free pastas and breads.²⁰

Quinoa is high in magnesium,²¹ which can reduce blood pressure²² by relaxing blood vessels.

Quercetin, abundantly found in quinoa, has been shown to target blood pressure in hypertensive subjects.²³ Quinoa also delivers a significant fiber punch, which may help lower high blood pressure, as well as decrease cholesterol levels.¹⁰

Substantial levels of potent phytochemicals in quinoa—such as saponins and phytosterols—support significant cholesterol reduction. In a 2010 animal study at Jagiellonian University in Krakow, Poland, scientists concluded that quinoa decreased total cholesterol by **26%**, LDL cholesterol by **57%**, and triglycerides by **11%**, compared to controls. And while the control group suffered a significant decrease in beneficial HDL, quinoa inhibited this effect in the first group.⁸



Cooking Quinoa

If you mistakenly pronounce the name of this grain substitute as “kwin-OH-a,” someone will quickly inform you it’s “KEEN-wa.” A little-known fact is that it can also be pronounced “kee-NO-a.”³⁴ Now that you know how to say it, here is some guidance on how to cook it.

While the directions call for rinsing quinoa, you may be tempted to skip this step. Don’t. If you fail to wash away the thin coating on this tiny seed, it’s going to taste bitter. Use a strainer with a fine mesh because quinoa seeds are tiny enough to slip through some strainers.

To get the greatest nutritional punch from quinoa’s powerful compounds, don’t overcook it. (You wouldn’t want to eat mushy quinoa anyway.) Add two cups of water to one cup of quinoa and bring to a boil. Then, cover and reduce the heat to low. Let the quinoa simmer until tender, which should be in about 15 minutes.

You’ll know it’s cooked when the grain becomes translucent and the white germ forms a visible spiral on the exterior of the quinoa seed.

Remove the cooked quinoa from the pot and drain it, making sure to use a fine-mesh strainer again. Quinoa holds an incredible amount of water and forgetting to drain it thoroughly will make your dish watery.

Then, return the cooked and drained quinoa to the pot and—with the heat off—let it sit, with the pot covered, for another 15 minutes. Letting it rest in the still-warm pot dries it out a bit to ensure you don’t end up with wet, clumpy quinoa.

Uncover and fluff with a fork. The quinoa should look light and fluffy, and you should be able to see the germ separating from the seed. You’ll find quinoa’s consistency and texture is similar to a combination of rice and couscous.

To get maximum nutritional value and flavor, freshly cooked quinoa should be served immediately. Serve with a stir-fry, using quinoa as a substitute for rice. Add it to curries, salads, casseroles, or just about any dish.

Quinoa can also be cooked in a rice cooker or an oven.

The fat content in quinoa is higher than in cereal grasses such as wheat, and includes valuable amounts of heart-healthy fats such as oleic acid, a monounsaturated fat. Quinoa also provides small amounts of alpha-linolenic acid (ALA), an omega-3 fatty acid.²⁴⁻²⁶

Studies have demonstrated a remarkable fact: Quinoa does not get oxidized as rapidly as might be expected given its higher fat content. As a result, cooking quinoa doesn’t appear to significantly compromise the quality of its fatty acids. This oxidative protection

may be due to quinoa’s diverse array of polyphenols, various members of the vitamin E family such as alpha-, beta-, gamma- and delta-tocopherol, as well as flavonoids such as quercetin and kaempferol.^{24,27}

Controlling Blood Sugar

Quinoa is at the low end of the glycemic index,⁴ which makes it a great grain substitute for those with blood sugar issues. Its magne-

sium content may also reduce the risk of type II diabetes by promoting healthy blood sugar control.¹⁰

The high fiber content of quinoa can contribute to lower glucose levels and may promote weight loss¹⁰—which in turn, may further reduce the risk of diabetes. A University of Milan study found that quinoa has a higher Satiating Efficiency Index (SEI) than wheat or rice,²⁰ meaning it promotes a feeling of fullness that can block the weight gain associated with increased diabetes risk.

Investigators showed that “quinoa seeds can reduce most of the adverse effects exerted by fructose on lipid profile and glucose level.”⁸

In 2009, scientists at the University of São Paulo in Brazil studied 10 traditional Peruvian grains and legumes for their potential to inhibit type II diabetes-relevant hyperglycemia. This *in vitro* study concluded that quinoa could possibly be developed as dietary strategy for managing type II diabetes.⁷

Reducing Cancer Risk

High levels of bioactive compounds in quinoa have the potential to lower the risk of cancer.

The *Journal of Agricultural and Food Chemistry* published a study in 2011 that employed sophisticated laboratory techniques to determine levels of phenolic compounds in quinoa.²⁸

The researchers identified in quinoa the following compounds: genistein, quercetin, kaempferol, epigallocatechin (the anti-inflammatory polyphenol present in green tea) and other phenolic substances that have the capacity to suppress new blood vessel growth (*antiangiogenesis*) and inhibit the proliferation of cancer cells.²⁸ In

fact, the concentration of quercetin and kaempferol in quinoa sometimes exceeds their concentration in high-flavonoid berries such as cranberry and lingonberry.^{24,29}

Quinoa also contains a range of potent compounds known as saponins. These bitter-tasting chemicals provide strong antitumor, *apoptotic* (cell death), and tumor antiangiogenic effects.³⁰ They are sometimes used as an adjunct to chemotherapy.³⁰

The saponins in whole quinoa flour have been found to be so abundant that they constitute between **5.6** and **7.5%** of the flour's total composition.²⁸

Inhibiting Inflammation

Quinoa provides substantial anti-inflammatory effects.

A 2014 study in the *Journal of Food Science* tested some of the many saponins in quinoa on rodent macrophage cells for anti-inflammatory effect. The researchers found that these compounds decreased the production of nitric oxide, an inflammatory mediator. The quinoa saponins also inhibited the release of inflammatory cytokines, including tumor necrosis factor-alpha and interleukin-6. This study concluded that, "These results suggest that quinoa saponins may be used as functional food components for prevention and treatment of inflammation."³¹

Beyond saponins, research has been identifying a greatly expanded list of anti-inflammatory components in quinoa. The unique combination of these phytonutrients in quinoa may explain the results of animal studies indicating that daily ingestion of quinoa decreases the risk of inflammation-related health issues, including obesity.^{24,32}

Nutritional Content Of Quinoa

Incorporating quinoa into your diet is a sound nutritional strategy for getting high-quality protein while reducing your meat intake. It is the ideal choice for:

- Vegans,
- People negatively affected by gluten,
- Low-carb dieters,
- Those who prefer to eat foods low on the glycemic scale,
- People on low-sodium diets, and
- Individuals who need to boost their fiber intake.

Quinoa provides a wide array of saponins, phytosterols, polyphenols, polysaccharides, free-radical fighting molecules, minerals, and other nutrients.

A typical serving of quinoa, 1 cup (**185 grams**), contains:³⁵

Calories	222
Calories from fat	32
Protein	8.1 grams
Total fat	3.6 grams
Saturated fat	0 grams
Cholesterol	0 grams
Vitamin E	1.2 mg
Thiamin	0.2 mg
Riboflavin	0.2 mg
Vitamin B6	0.2 mg
Folate	77.7 micrograms
Copper	0.4 mg
Iron	2.8 mg
Magnesium	118 mg
Manganese	1.2 mg
Phosphorus	281 mg
Sodium	13 mg
Zinc	2.0 mg



Potent inflammation-inhibiting phytonutrients found in quinoa are now known to include hydroxycinnamic and hydroxybenzoic acids; polysaccharides such as arabinans and rhamnogalacturonans; the flavonoids quercetin and kaempferol; and novel saponins, including molecules derived from oleanic acid, hederagenin, and serjanic acid. Quinoa also provides a form of vitamin E called gamma-tocopherol and small amounts of alpha-linolenic acid, an anti-inflammatory omega-3 fatty acid.^{9,27,29,33}

Summary

Gluten-free quinoa is increasingly recognized as a superfood as scientists continue to confirm that its high content of fiber and high-quality protein—combined with a vast array of potent compounds—delivers diverse and powerful health benefits. The saponins, phytosterols, polyphenols, polysaccharides, free-radical fighting molecules, minerals, vitamins, and other constituents in quinoa provide strong protection against cardiovascular disease, diabetes, cancer, and inflammation.

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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Blood testing provides the ultimate information regarding correctable risk factors that may predispose you to disorders such as cancer, diabetes, cardiovascular disease, and more. Information about general health and nutritional status can also be gained through standard blood analysis. Standing behind the belief that blood testing is an essential component of any program designed to attain optimal health and longevity, *Life Extension*[®] offers this innovative and convenient service at a very affordable price. Not only is comprehensive blood testing an important step in safeguarding your health, it is a simple process from virtually anywhere in the United States.

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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.

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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**
- WEIGHT LOSS PANEL-COMPREHENSIVE (LC100028) \$275**
CBC/Chemistry profile (see description at right), **DHEA-S**, free and total Testosterone, Estradiol, Progesterone, Cortisol, TSH, Free T3, Free T4, Reverse T3, Insulin, Hemoglobin A1c, Vitamin D 25-hydroxy, C-Reactive Protein (high sensitivity), and Ferritin.
- MALE ELITE PANEL* (LC100016) \$575**
Chem/CBC profile, Free and Total Testosterone, Total Estrogens, Estradiol, DHEA-S, Progesterone, Pregnenolone, DHT, FSH, LH, TSH, Free T3, Free T4, Reverse T3, Free and Total PSA, IGF-1, SHBG, Vitamin D 25-OH, hs-CRP, Ferritin, Homocysteine
- FEMALE ELITE PANEL* (LC100017) \$575**
Chem/CBC profile, Free and Total Testosterone, Total Estrogens, Estradiol, Estrone, DHEA-S, Progesterone, Pregnenolone, DHT, FSH, LH, TSH, Free T3, Free T4, Reverse T3, IGF-1, SHBG, Vitamin D 25-OH, hs-CRP, Ferritin, Homocysteine
- 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 right), **DHEA-S**, **Estradiol**, **Total Estrogens**, **Progesterone**, **Pregnenolone**, **Total and Free Testosterone**, **SHBG**, **TSH**, **Free T3**, **Free T4**, **Cortisol**.
- MALE COMPREHENSIVE HORMONE PANEL* (LC100010) \$299**
CBC/Chemistry Profile (see description above right), **DHEA-S**, **Estradiol**, **DHT**, **PSA**, **Pregnenolone**, **Total and Free Testosterone**, **SHBG**, **TSH**, **Free T3**, **Free T4**, **Cortisol**.
- 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.
- STRESS MANAGEMENT PROFILE (LC100043) \$125**
Cortisol AM/PM, DHEA-S, Glucose, Insulin, Progesterone, Free T3, Lipid Panel
- HEALTHY AGING PANEL-COMPREHENSIVE* (LC100026) \$249**
CBC/Chemistry profile (see description above), **C-Reactive Protein** (high sensitivity), **Vitamin B12**, **Folate**, **Homocysteine**, **Vitamin D 25-hydroxy**, **Hemoglobin A1c**, **TSH**, **Free T3**, **Free T4**, **Ferritin**, **Urinalysis**, **Fibrinogen**, and **Insulin**.
- HEALTHY AGING PANEL-BASIC* (LC100025) \$149**
CBC/Chemistry profile (see description above), **C-Reactive Protein** (high sensitivity), **Vitamin B12**, **Folate**, **Vitamin D 25-hydroxy**, **Hemoglobin A1c**, **TSH**, **Ferritin**, and **Insulin**.
- 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.
- VAP™ PLUS* (LC100009) \$330**
VAP, C-Reactive Protein (high sensitivity), **Homocysteine**, **Fibrinogen**, **PLAC® Test (Lp-PLA2)**, **Vitamin D 25-hydroxy**.



Other Popular Tests and Panels Life Extension Member Pricing

- | | |
|--|---|
| <p><input type="radio"/> NUTRIENT PANEL* (LC100024) \$349
Vitamin B12, Folate, Vitamin D 25-hydroxy, Vitamin C, Vitamin A, Selenium, Zinc, CoQ10, and RBC Magnesium.</p> <p><input type="radio"/> ENERGY PROFILE (LC100005) \$375
CBC/Chemistry Profile (see description previous page), 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.</p> <p><input type="radio"/> ANEMIA PANEL* (LC100006) \$79
CBC/Chemistry Profile (see description previous page), Ferritin, Total Iron Binding Capacity (TIBC), Vitamin B12, Folate, Reticulocyte Count.</p> <p><input type="radio"/> AUTOIMMUNE DISEASE SCREEN* (L100041) \$199
ANA screen, hs-CRP, TNF, Immunoglobulins, IgA, IgG, IgM</p> <p><input type="radio"/> DIABETES MANAGEMENT PROFILE – COMPREHENSIVE (LC100040) \$129
Hemoglobin A1C, Glucose, Insulin, Lipid Panel, Glycomark</p> <p><input type="radio"/> DIABETES MANAGEMENT PROFILE – BASIC (LC100039) \$39
Hemoglobin A1C, Glucose, Insulin</p> <p>ADVANCED CARDIAC BIOMARKERS</p> <p><input type="radio"/> ADVANCED OXIDIZED LDL PANEL* (LC100035) \$285
This panel looks at vascular inflammatory biomarkers, beginning with lifestyle choices to the development of metabolic as well as cardiovascular disease and the formation of vulnerable plaque. The panel contains the following tests: F2-Isoprostanes, Myeloperoxidase, and Oxidized LDL.</p> <p><input type="radio"/> OXIDIZED LDL PANEL* (LC100034) \$175
This panel looks at vascular inflammatory biomarkers, beginning with the development of metabolic as well as cardiovascular disease and the formation of vulnerable plaque. The panel contains the following tests: Myeloperoxidase and Oxidized LDL.</p> <p><input type="radio"/> OXIDIZED LDL* (LC817472) \$75
OxLDL is a powerful initiator of inflammatory changes in the artery wall, which eventually lead to the formation of plaque.</p> | <p>HORMONES</p> <p><input type="radio"/> DHEA-SULFATE (LC004020) \$61
This test shows if you are taking the proper amount of DHEA. This test normally costs \$100 or more at commercial laboratories.</p> <p><input type="radio"/> MALE BASIC HORMONE PANEL (LC100012) \$75
DHEA-S, Estradiol, Free and Total Testosterone, PSA</p> <p><input type="radio"/> FEMALE BASIC HORMONE PANEL (LC100013) \$75
DHEA-S, Estradiol, Free and Total Testosterone, Progesterone</p> <p><input type="radio"/> DIHYDROTESTOSTERONE (DHT)* (LC500142) \$99
Measures serum concentrations of DHT.</p> <p><input type="radio"/> ESTRADIOL (LC004515) \$33
For men and women. Determines the proper amount in the body.</p> <p><input type="radio"/> INSULIN FASTING (LC004333) \$25
Can predict those at risk of diabetes, obesity, heart and other diseases.</p> <p><input type="radio"/> PREGNENOLONE* (LC140707) \$116
Used to determine ovarian failure, hirsutism, adrenal carcinoma, and Cushing's syndrome.</p> <p><input type="radio"/> PROGESTERONE (LC004317) \$55
Primarily for women. Determines the proper amount in the body.</p> <p><input type="radio"/> SEX HORMONE BINDING GLOBULIN (SHBG) (LC082016) \$33
This test is used to monitor SHBG levels which are under the positive control of estrogens and thyroid hormones, and suppressed by androgens.</p> <p>GENERAL HEALTH</p> <p><input type="radio"/> VITAMIN D (25OH) (LC081950) \$47
This test is used to rule out vitamin D deficiency as a cause of bone disease. It can also be used to identify hypercalcemia.</p> <p><input type="radio"/> FERRITIN (LC004598) \$28
Ferritin levels reflect your body's iron stores and is also a biomarker for insulin resistance.</p> <p><input type="radio"/> VITAMIN B12/FOLATE* (LC000810) \$79
Measurements of B12 and Folate help evaluate your general health and nutritional status since the B vitamins are important for cardiac health as well as energy production.</p> <p><input type="radio"/> PSA (PROSTATE SPECIFIC ANTIGEN) (LC010322) \$31
Screening test for prostate disorders and possible cancer.</p> |
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 L-Glutamine
 L-Glutamine Powder
 L-Lysine
 L-Taurine Powder
 L-Tyrosine Powder
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 Taurine

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 Acetyl-L-Carnitine Arginate
 Blast
 Brain Shield® Gastrodin
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 Cognitex® with Pregnenolone & Brain Shield®
 Cognizin® CDP-Choline Caps
 DMAE Bitartrate (dimethylaminoethanol)
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 Huperzine A
 Lecithin Granules
 Migra-Eeze™
 Migra-Mag with Brain Shield®
 Neuro-Mag™ Magnesium L-Threonate
 Neuro-Mag™ Magnesium L-Threonate
 with Calcium and Vitamin D3
 Optimized Ashwagandha Extract
 Prevagen
 PS (Phosphatidylserine) Caps
 Super Ginkgo Extract 28/7
 Vinpocetine

Cholesterol Management

Advanced Lipid Control
 Cho-Less™
 CHOL-Support™
 Endothelial Defense™ with Full-Spectrum
 Pomegranate™
 Endothelial Defense™ with GliSODin®
 Full-Spectrum Pomegranate™
 Policosanol
 Pomegranate Extract Capsules
 Red Yeast Rice
 Theaflavins Standardized Extract
 Vitamin B3 Niacin Capsules

Digestion Support

Artichoke Leaf Extract
 Carnosoothe with PicroProtect™
 Digest RC®
 Effervescent Vitamin C - Magnesium Crystals
 Enhanced Super Digestive Enzymes
 Esophageal Guardian
 Extraordinary Enzymes
 Fem Dophilus

Ginger Force
 Gutsy Chewy Digestive Tablets
 Organic Golden Flax Seed
 Pancreatin
 Regimint
 Specially-Coated Bromelain
 Tranquil Tract™
 TruFiber™
 WellBetX PGX plus Mulberry

Energy Management

Adrenal Energy Formula
 Asian Energy Boost
 D-Ribose Powder
 D-Ribose Tablets
 Forskolin
 Mitochondrial Basics with BioPQQ®
 Mitochondrial Energy Optimizer with BioPQQ®
 NAD+ Cell Regenerator™
 Peak ATP® with GlycoCarn®
 PQQ Caps with BioPQQ®
 Rhodiola Extract
 Ribogen™ French Oak Wood Extract

Eye Health

Astaxanthin with Phospholipids
 Brite Eyes III
 Certified European Bilberry Extract
 Eye Pressure Support with Mirtogenol®
 MacuGuard® Ocular Support
 MacuGuard® Ocular Support with Astaxanthin

Food

Rich Rewards® Breakfast Blend
 Rich Rewards® Breakfast Blend
 Natural Mocha Flavor
 Rich Rewards® Breakfast Blend
 Natural Vanilla Flavor
 Rich Rewards® Breakfast Blend
 Whole Bean Coffee
 Rich Rewards® Cruciferous Vegetable Soup
 Rich Rewards® Decaf Roast
 Stevia Extract

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 CoffeeGenic® Green Coffee Extract
 Mega Benfotiamine
 Natural Glucose Absorption Control
 Super Alpha-Lipoic Acid w/ Biotin
 Super R-Lipoic Acid
 Tri Sugar Shield™

Heart Health

Aspirin (Enteric Coated)
 Cardio Peak™ with Standardized Hawthorn
 and Arjuna
 Fibrinogen Resist™ with Nattokinase
 FlorAssist® Heart Health Probiotic
 Super Ubiquinol CoQ10
 Super Ubiquinol CoQ10 with BioPQQ®
 Super Ubiquinol CoQ10 with Enhanced
 Mitochondrial Support™
 Super-Absorbable CoQ10 Ubiquinone with
 d-Limonene
 TMG Powder
 TMG Liquid Capsules
 Vegetarian Sourced DHA

Hormone Balance

DHEA (Dehydroepiandrosterone)
 DHEA Complete
 Inner Power
 Pregnenolone
 Triple Action Cruciferous Vegetable Extract
 with Resveratrol
 Triple Action Cruciferous Vegetable Extract

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 Echinacea Extract
 Enhanced Zinc Lozenges
 i26 Hyperimmune Egg
 Immune Modulator with Tinofend®
 Immune Protect with PARACTIN®
 Immune Senescence Protection Formula™
 Kyolic® Garlic Formula 102
 Kyolic® Garlic Formula 105
 Kyolic® Reserve
 Lactoferrin (apolactoferrin) Caps
 NK Cell Activator™
 Optimized Garlic
 Optimized Quercetin
 Peony Immune
 ProBoost Thymic Protein A
 Reishi Extract Mushroom Complex
 Standardized Cistanche
 Zinc Lozenges

Inflammation Management

5-LOX Inhibitor with AprèsFlex®
 Advanced Bio-Curcumin® with Ginger &
 Turmerones
 Black Cumin Seed Oil with Bio-Curcumin®
 Black Cumin Seed Oil
 Boswellia
 Cytokine Suppress™ with EGCG
 Nervia®
 Serrafazyme
 Super Bio-Curcumin®
 Zyflamend® Whole Body

Joint Support

Arthro-Immune Joint Support
 Arthromax® Advanced with UC-II® & AprèsFlex®
 ArthroMax® with Theaflavins & AprèsFlex®
 Bio-Collagen with Patented UC-II®
 Fast-Acting Joint Formula
 Glucosamine/Chondroitin Capsules
 Krill Healthy Joint Formula
 MSM (Methylsulfonylmethane)

Kidney & Bladder Support

Cran-max® Cranberry Whole Fruit Concentrate
 Optimized Cran-Max with Ellirose™
 Water-Soluble Pumpkin Seed Extract

Liver Health & Detoxification

Anti-Alcohol Antioxidants with HepatoProtection
 Complex
 Calcium D-Glucarate
 Chlorella
 Chlorophyllin
 European Milk Thistle
 Glutathione, Cysteine & C
 HepatoPro
 Liver Efficiency Formula
 Mega L-Glutathione Capsules
 N-Acetyl-L-Cysteine
 PectaSol-C®
 Silymarin
 SODzyme® with GliSODin® & Wolfberry

Longevity & Wellness

AMPK Activator
 AppleWise Polyphenol Extract
 Berry Complete
 Blueberry Extract
 Blueberry Extract with Pomegranate
 CR Mimetic Longevity Formula
 DNA Protection Formula
 Enhanced Berry Complete with Acai
 Essential Daily Nutrients
 Grapeseed Extract with
 Resveratrol & Pterostilbene
 Mega Green Tea Extract (decaffeinated)
 Mega Green Tea Extract (lightly caffeinated)
 Once-Daily Health Booster

Optimized Fucoidan with Maritech® 926
Optimized Resveratrol with NAD+
Cell Regenerator™
Optimized Resveratrol with Synergistic
Grape-Berry Actives
pTeroPure®
Pycnogenol® French Maritime
Pink Bark Extract
Resveratrol with Pterostilbene
RNA (Ribonucleic Acid)
Whole Grape Extract

Men's Health

Mega Lycopene Extract
PalmettoGuard® Saw Palmetto with
Beta-Sitosterol
PalmettoGuard® Saw Palmetto/Nettle Root
Formula with Beta-Sitosterol
Pomi-T®
Prelox® Natural Sex for Men®
Super MiraForte with Standardized Lignans
Triple Strength ProstaPollen™
Ultra Natural Prostate

Minerals

Boron
Chromium Ultra
Copper
Iron Protein Plus
Magnesium (Citrate)
Magnesium Caps
Only Trace Minerals
Optimized Chromium with Crominex® 3+
Sea-Iodine™
Se-Methyl L-Selenocysteine
Super Selenium Complex
Vanadyl Sulfate
High Potency Zinc

Miscellaneous

Advanced Iodine Complete
Potassium Iodide
Solarshield Sunglasses

Mood & Stress Management

5 HTP
L-Theanine
Natural Stress Relief
Pharma GABA
SAME (S-Adenosyl-Methionine)

Multivitamins

Children's Formula Life Extension Mix™
Comprehensive Nutrient Packs ADVANCED
Life Extension Mix™ Capsules without Copper
Life Extension Mix™ Capsules
Life Extension Mix™ Powder without Copper
Life Extension Mix™ Powder
Life Extension Mix™ Tablets with Extra Niacin
Life Extension Mix™ Tablets without Copper
Life Extension Mix™ Tablets
One-Per-Day Tablets
Two-Per-Day Capsules
Two-Per-Day Tablets

Personal Care

Advanced Oral Hygiene
Anti-Aging Rejuvenating Scalp Serum
Biosil
Dr. Proctor's Advanced Hair Formula
Dr. Proctor's Shampoo
European Leg Solution Featuring Certified
Diosmin 95
Face Master Platinum
Hair Suppress Formula
Life Extension Toothpaste
Sinus Cleanser
Venotone
Xyliwhite Mouthwash

Pet Care

Cat Mix
Dog Mix

Skin Care

Advanced Lightening Cream
Advanced Peptide Hand Therapy
Advanced Triple Peptide Serum
Advanced Under Eye Serum with Stem Cells
Amber Self MicroDermAbrasion
Anti-Aging Mask
Anti-Aging Rejuvenating Face Cream
Anti-Glycation Serum with
Blueberry & Pomegranate Extracts
Antioxidant Facial Mist
Anti-Oxidant Rejuvenating Foot Cream
Anti-Oxidant Rejuvenating Foot Scrub
Anti-Oxidant Rejuvenating Hand Cream
Anti-Oxidant Rejuvenating Hand Scrub
Anti-Redness & Adult Blemish Lotion
Bioflavonoid Cream
Broccoli Sprout Cream
Collagen Boosting Peptide Serum
Corrective Clearing Mask
DNA Repair Cream
Dual-Action MicroDermAbrasion
Enhanced FernBlock® with
Red Orange Complex
Essential Plant Lipids Reparative Serum
Face Rejuvenating Anti-Oxidant Cream
Fine Line-Less
Healing Formula
Healing Mask
Healing Vitamin K Cream
Hyaluronic Facial Moisturizer
Hyaluronic Oil-Free Facial Moisturizer
Hydrating Anti-Oxidant Facial Mist
Hydroderm
Lifting & Tightening Complex
Lycopene Cream
Melatonin Cream
Mild Facial Cleanser
Neck Rejuvenating Anti-Oxidant Cream
Pigment Correcting Cream
Rejuvenating Serum
Rejuvenex® Body Lotion
RejuvенеX® Factor Firming Serum
Renewing Eye Cream
Resveratrol Anti-Oxidant Serum
Skin Lightening Serum
Skin Restoring Phytoceramides with Lipowheat®
Skin Stem Cell Serum
Stem Cell Cream with Alpine Rose
Tightening & Firming Neck Cream
Ultra Lip Plumper
Ultra Rejuvenex®
Ultra RejuvенеNight®
Ultra Wrinkle Relaxer
Under Eye Refining Serum
Under Eye Rescue Cream
Vitamin C Serum
Vitamin D Lotion
Vitamin E-ssential Cream
Youth Serum

Sleep

Bioactive Milk Peptides
Enhanced Natural Sleep® with Melatonin
Enhanced Natural Sleep® without Melatonin
Fast-Acting Liquid Melatonin
Glycine
L-Tryptophan
Melatonin
Optimized Tryptophan Plus

Sports Performance

Creatine Capsules
Creatine Whey Glutamine Powder
(Vanilla Flavor)

DMG (N, N-dimethylglycine)
New Zealand Whey Protein Concentrate,
(Natural Chocolate and Vanilla Flavor)
Pure Plant Protein
Tart Cherry Extract
Whey Protein Isolate
(Chocolate and Vanilla Flavor)

Vitamins

Ascorbyl Palmitate
Benfotiamine with Thiamine
Beta-Carotene
Biotin
Buffered Vitamin C Powder
Complete B-Complex
Daily C+
Fast-C® with Dihydroquercetin
Folate & Vitamin B12
Gamma E Tocopherol with Sesame Lignans
Gamma E Tocopherol/Tocotrienols
High Potency Optimized Folate
Inositol Caps
Liquid Emulsified Vitamin D3
Liquid Vitamin D3
Low-Dose Vitamin K2
Methylcobalamin
MK-7
Natural Vitamin E
No Flush Niacin
Optimized Folate (L-Methylfolate)
Pantothenic Acid (Vitamin B-5)
Pyridoxal 5'-Phosphate Caps
Super Absorbable Tocotrienols
Super Ascorbate C Capsules
Super Ascorbate C Powder
Super K with Advanced K2 Complex
Tocotrienols with Sesame Lignans
Vitamin B12
Vitamin B6
Vitamin C with Dihydroquercetin
Vitamin D3 with Sea-Iodine™
Vitamin D3
Vitamins D and K with Sea-Iodine™

Weight Management

7-Keto® DHEA Metabolite
Advanced Anti-Adipocyte Formula
Advanced Natural Appetite Suppress
CalReduce Selective Fat Binder
DHEA Complete
Garcinia HCA
HCAActive
Integra-Lean®
Mediterranean Trim with Sinetrol™-XPur
Optimized Irvingia with Phase 3™ Calorie
Control Complex
Optimized Saffron with Satiereal®
Super Citrimax®
Super CLA Blend with Guarana and
Sesame Lignans
Super CLA Blend with Sesame Lignans
Waist-Line Control™
Weight Management Formula

Women's Health

Advanced Natural Sex for Women® 50+
Breast Health Formula
Calorie Control Weight Management Formula
Femmenessence MacaPause
Natural Estrogen without Soy Isoflavones
Natural Estrogen
Natural Female Support
ProgestaCare® for Women
Super-Absorbable Soy Isoflavones
Ultra Soy Extract

Buyers Club Order Form

To order call: 1.954.766.8433 or 1.800.544.4440

No.		Retail Each	Member Each	Qty	Total
A					
01524	ACETYL-L-CARNITINE - 500 mg, 100 veg. caps	\$34.00	\$25.50		
	Buy 4 bottles, price each	30.00	22.50		
01525	ACETYL-L-CARNITINE ARGINATE - 100 veg. caps	59.00	44.25		
	Buy 4 bottles, price each	50.99	38.24		
01628	ADRENAL ENERGY FORMULA - 60 veg. caps	24.00	18.00		
	Buy 4 bottles, price each	22.00	16.50		
01630	ADRENAL ENERGY FORMULA - 120 veg. caps	46.00	34.50		
	Buy 4 bottles, price each	42.00	31.50		
01828	ADVANCED LIPID CONTROL - 60 veg. caps	30.00	22.50		
	Buy 4 bottles, price each	27.00	20.25		
01521	ADVANCED ORAL HYGIENE - 60 mint lozenges	20.00	15.00		
	Buy 4 bottles, price each	18.00	13.50		
00681	AHCC - 500 mg, 30 caps	59.98	44.99		
00457	ALPHA-LIPOIC ACID w/BIOTIN (SUPER) - 250 mg, 60 caps	37.00	27.75		
	Buy 4 bottles, price each	32.00	24.00		
01907	AMPK ACTIVATOR - 90 veg. caps	48.00	36.00		
	Buy 4 bottles, price each	44.00	33.00		
01440	ANTI-ALCOHOL ANTIOXIDANTS w/HEPATOPRO - 100 caps	26.00	19.50		
	Buy 4 bottles, price each	23.00	17.25		
01509	ANTI-ADIPOCYTE FORMULA w/MERATRIM® & INTEGRA LEAN® (ADVANCED) - 60 veg. caps	39.00	29.25		
	Buy 4 bottles, price each	36.00	27.00		
01625	APPLEWISE POLYPHENOL EXTRACT - 600 mg, 30 veg. caps	21.00	15.75		
	Buy 4 bottles, price each	19.00	14.25		
01039	ARGININE/ORNITHINE - 500/250, 100 caps	17.99	13.49		
00038	ARGININE/ORNITHINE POWDER - 150 grams	22.95	17.21		
	Buy 4 bottles, price each	19.00	14.25		
01624	(L)-ARGININE CAPS - 700 mg, 200 veg. caps	26.50	19.88		
	Buy 4 bottles, price each	23.25	17.44		
01617	ARTHROMAX® w/THEAFLAVINS & APRESFLEX® - 120 veg. caps	44.00	33.00		
	Buy 4 bottles, price each	40.00	30.00		
01618	ARTHROMAX® ADVANCED w/UC-II® & APRESFLEX® - 60 caps	36.00	27.00		
	Buy 4 bottles, price each	32.00	24.00		
01404	ARTHRO-IMMUNE JOINT SUPPORT - 60 veg. caps	32.00	24.00		
	Buy 4 bottles, price each	28.00	21.00		
00919	ARTICHOKE LEAF EXTRACT - 500 mg, 180 veg. caps	30.00	22.50		
	Buy 4 bottles, price each	28.00	21.00		
01533	ASCORBYL PALMITATE - 500 mg, 100 veg. caps	22.50	16.88		
	Buy 4 bottles, price each	20.00	15.00		
00888	ASHWAGANDHA EXTRACT (OPTIMIZED) - 60 veg. caps	10.00	7.50		
	Buy 4 bottles, price each	9.00	6.75		
01805	ASIAN ENERGY BOOST - 90 veg. caps	24.00	18.00		
	Buy 4 bottles, price each	22.00	16.50		
01066	ASPIRIN - 81 mg, 300 enteric coated tablets	6.00	4.50		
	Buy 4 bottles, price each	5.33	4.00		
01720	ASTAXANTHIN WITH PHOSPHOLIPIDS - 4 mg, 30 softgels	16.00	12.00		
	Buy 4 bottles, price each	14.00	10.50		
B					
00920	BENFOTIAMINE w/ THIAMINE - 100 mg, 120 veg. caps	\$19.95	\$14.96		
	Buy 4 bottles, price each	18.60	13.95		
00925	BENFOTIAMINE (MEGA) - 250 mg, 120 veg. caps	30.00	22.50		
	Buy 4 bottles, price each	27.00	20.25		

SUB-TOTAL OF COLUMN 1

No.		Retail Each	Member Each	Qty	Total
01206	BERRY COMPLETE - 30 veg. caps	\$21.00	\$15.75		
	Buy 4 bottles, price each	18.67	14.00		
01496	BERRY COMPLETE w/ACAI (ENHANCED) - 60 veg. caps	29.00	21.75		
	Buy 4 bottles, price each	26.00	19.50		
00664	BETA-CAROTENE - 25,000 IU, 100 softgels	11.25	8.44		
01622	BIFIDO GI BALANCE - 60 veg. caps	20.00	15.00		
	Buy 4 bottles, price each	18.00	13.50		
01073	BILBERRY EXTRACT - 100 mg, 100 veg. caps	42.00	31.50		
	Buy 4 bottles, price each	38.00	28.50		
01512	BIOACTIVE MILK PEPTIDES - 30 caps	18.00	13.50		
	Buy 4 bottles, price each	16.00	12.00		
01631	BIO-COLLAGEN w/PATENTED UC-II® - 40 mg, 60 small caps	36.00	27.00		
	Buy 4 bottles, price each	32.00	24.00		
*01006	BIOSIL™ - 5 mg, 30 veg. caps	18.95	15.16		
*01007	BIOSIL™ - 1 fl oz	31.99	25.59		
00102	BIOTIN - 600 mcg, 100 caps	7.50	5.63		
	Buy 4 bottles, price each	6.50	4.88		
01709	BLACK CUMIN SEED OIL - 60 softgels	16.00	12.00		
	Buy 4 bottles, price each	14.00	10.50		
01710	BLACK CUMIN SEED OIL w/BIO-CURCUMIN® - 60 softgels	32.00	24.00		
	Buy 4 bottles, price each	30.00	22.50		
01008	BLAST™ - 600 grams of powder	26.95	20.21		
70000	BLOOD PRESSURE MONITOR w/AC ADAPTOR - MED CUFF	79.99	49.99		
70004	BLOOD PRESSURE MONITOR - Digital WRIST (cuff)	69.95	52.46		
01214	BLUEBERRY EXTRACT - 60 veg. caps	22.50	16.88		
	Buy 4 bottles, price each	20.00	15.00		
01438	BLUEBERRY EXTRACT w/ POMEGRANATE - 60 veg. caps	30.00	22.50		
	Buy 4 bottles, price each	27.00	20.25		
01506	BONE FORMULA (DR. STRUM'S INTENSIVE) - 300 caps	56.00	42.00		
	Buy 4 bottles, price each	50.00	37.50		
01726	BONE RESTORE - 120 caps	22.00	16.50		
	Buy 4 bottles, price each	19.00	14.25		
01727	BONE RESTORE w/VITAMIN K2 - 120 caps	24.00	18.00		
	Buy 4 bottles, price each	22.00	16.50		
01725	BONE STRENGTH FORMULA w/KOACT® - 120 caps	45.00	33.75		
	Buy 4 bottles, price each	40.00	30.00		
00313	BONE-UP® - 240 caps	28.95	21.71		
	Buy 4 bottles, price each	27.21	20.41		
01661	BORON - 3 mg, 100 veg. caps	5.95	4.46		
	Buy 4 bottles, price each	5.25	3.94		
00202	BOSWELLA - 100 caps	38.00	28.50		
	Buy 4 bottles, price each	30.00	22.50		
01802	BRAIN SHIELD® GASTRODIN - 60 veg. caps	33.00	24.75		
	Buy 4 bottles, price each	30.00	22.50		
01253	BRANCHED CHAIN AMINO ACIDS - 90 veg. caps	19.50	14.63		
	Buy 4 bottles, price each	17.00	12.75		
01699	BREAST HEALTH FORMULA - 60 caps	34.00	25.50		
	Buy 4 bottles, price each	30.00	22.50		
00893	BRITE EYES III - 2 vials, 5 ml each	34.00	25.50		
	Buy 4 boxes, price each	32.00	24.00		
01203	BROMELAIN (SPECIALLY-COATED) - 500 mg, 60 enteric coated tablets	21.00	15.75		
	Buy 4 bottles, price each	19.00	14.25		

SUB-TOTAL OF COLUMN 2

No.		Retail Each	Member Each	Qty	Total
C					
01653	CALCIUM CITRATE w/VITAMIN D - 300 caps Buy 4 bottles, price each	\$24.00 21.25	\$18.00 15.94		
01651	CALCIUM D-GLUCARATE - 200 mg, 60 veg. caps Buy 4 bottles, price each	18.00 15.00	13.50 11.25		
01823	CALREDUCE SELECTIVE FAT BINDER - 120 mint chewable tablets Buy 4 bottles, price each	45.00 38.00	33.75 28.50		
01700	CARDIO PEAK™ W/STANDARDIZED HAWTHORN & ARJUNA - 120 veg. caps Buy 4 bottles, price each	36.00 32.00	27.00 24.00		
00916	CARNITINE w/GLYCOCARN® (OPTIMIZED) - 60 veg. caps Buy 4 bottles, price each	36.00 32.00	27.00 24.00		
01532	L-CARNITINE - 500 mg, 30 veg. caps Buy 4 bottles, price each	15.00 13.20	11.25 9.90		
01258	CARNOOOTHIE w/PICROPROTECT™ - 60 veg. caps Buy 4 bottles, price each	29.95 27.00	22.46 20.25		
01687	CARNOSINE (SUPER) - 500 mg, 90 veg. caps Buy 4 bottles, price each	66.00 60.00	49.50 45.00		
01830	CAT MIX - 100 grams powder Buy 4 jars, price each	14.00 11.00	10.50 8.25		
01891	CHILDREN'S FORMULA LIFE EXTENSION MIX™ - 100 chewable tablets Buy 4 bottles, price each	20.00 18.00	15.00 13.50		
00550	CHLORELLA - 500 mg, 200 tablets	23.50	17.63		
01571	CHLOROPHYLLIN - 100 mg, 100 veg. caps Buy 4 bottles, price each	24.00 20.00	18.00 15.00		
01359	CHO-LESS™ - 90 capsules	35.00	26.25		
01910	CHOL-SUPPORT™ - 60 liquid veg. caps Buy 4 bottles, price each	52.00 46.00	39.00 34.50		
01477	CHROMIUM ULTRA - 100 veg. caps Buy 4 bottles, price each	24.00 21.00	18.00 15.75		
01504	CHROMIUM W/CROMINEX® 3+ (OPTIMIZED) - 500 mcg, 60 veg. caps Buy 4 bottles, price each	9.00 8.00	6.75 6.00		
01503	CINSULIN® W/INSEA® AND CROMINEX® 3+ - 90 veg. caps Buy 4 bottles, price each	38.00 34.00	28.50 25.50		
01906	CISTANCHE (STANDARDIZED) - 30 veg. caps Buy 4 bottles, price each	20.00 16.00	15.00 12.00		
01818	CITRIMAX® (SUPER) - 180 veg. caps Buy 4 bottles, price each	40.00 38.00	30.00 28.50		
00818	CLA BLEND W/SESAME LIGNANS (SUPER) - 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	CLA BLEND w/GUARANA & SESAME (SUPER) - 1,000 mg, 120 softgels Buy 4 bottles, price each	42.00 38.33	31.50 28.75		
01896	COGNITEX® w/BRAIN SHIELD® - 90 softgels Buy 4 bottles, price each Buy 8 bottles, price each	60.00 52.00 48.00	45.00 39.00 36.00		
01897	COGNITEX® w/PREGNENOLONE & BRAIN SHIELD® - 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	COGNITEX® BASICS - 60 softgels Buy 4 bottles, price each Buy 12 bottles, price each	38.00 35.00 32.00	28.50 26.25 24.00		
01659	COGNIZIN® CDP CHOLINE CAPS - 250 mg, 60 veg. caps Buy 4 bottles, price each	36.00 34.00	27.00 25.50		

SUB-TOTAL OF COLUMN 3

No.		Retail Each	Member Each	Qty	Total
01835	COMPLETE B-COMPLEX - 60 veg. caps Buy 4 bottles, price each	\$10.00 9.00	\$7.50 6.75		
01999	COMPREHENSIVE NUTRIENT PACKS ADVANCED - 30 packs Buy 4 boxes, price each	90.00 82.00	67.50 61.50		
00119	COPPER CAPSULES - 2 mg, 100 caps	9.91	7.43		
00949	COQ10 w/ α-LIMONENE (SUPER-ABSORBABLE) - 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	COQ10 w/ α-LIMONENE (SUPER-ABSORBABLE) - 100 mg, 100 softgels Buy 4 bottles, price each Buy 10 bottles, price each	25.00 22.00 20.00	18.75 16.50 15.00		
01226	COQ10 (SUPER-UBIQUINOL) - 100 mg, 60 softgels Buy 4 bottles, price each Buy 10 bottles, price each	56.00 48.00 44.00	42.00 36.00 33.00		
01733	COQ10 w/BIOPQQ® (SUPER UBIQUINOL) - 100 mg, 30 softgels Buy 4 bottles, price each Buy 10 bottles, price each	54.00 44.00 40.00	40.50 33.00 30.00		
01426	COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (SUPER UBIQUINOL) - 100 mg, 60 softgels Buy 4 bottles, price each Buy 10 bottles, price each	62.00 52.00 48.00	46.50 39.00 36.00		
01425	COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (SUPER UBIQUINOL) - 50 mg, 100 softgels Buy 4 bottles, price each Buy 10 bottles, price each	58.00 46.00 42.00	43.50 34.50 31.50		
01427	COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (SUPER UBIQUINOL) - 50 mg, 30 softgels Buy 4 bottles, price each	20.00 16.00	15.00 12.00		
01431	COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (SUPER UBIQUINOL) - 200 mg, 30 softgels Buy 4 bottles, price each Buy 10 bottles, price each	62.00 52.00 48.00	46.50 39.00 36.00		
80154	COSMESIS ADVANCED LIGHTENING CREAM - 1 oz jar Buy 2 bottles, price each	65.00 57.00	48.75 42.75		
80155	COSMESIS ADVANCED PEPTIDE HAND THERAPY - 4 oz bottle Buy 2 bottles, price each	46.00 39.00	34.50 29.25		
80152	COSMESIS ADVANCED TRIPLE PEPTIDE SERUM - 1 oz bottle Buy 2 bottles, price each	65.00 57.00	48.75 42.75		
80140	COSMESIS ADVANCED UNDER EYE SERUM w/STEM CELLS - .33 oz Buy 2 bottles, price each	49.00 42.00	36.75 31.50		
80139	COSMESIS AMBER SELF MICRODERMABRASION - 2 oz Buy 2 jars, price each	49.00 42.00	36.75 31.50		
80118	COSMESIS ANTI-AGING MASK - 2 oz Buy 2 bottles, price each	72.00 63.36	54.00 47.52		
80151	COSMESIS ANTI-AGING REJUVENATING FACE CREAM - 2 oz jar Buy 2 jars, price each	65.00 57.00	48.75 42.75		
80153	COSMESIS ANTI-AGING REJUVENATING SCALP SERUM - 2 oz bottle Buy 2 bottles, price each	46.00 39.00	34.50 29.25		
80157	COSMESIS ANTI-GLYCATION PEPTIDE SERUM - 1 oz Buy 2 bottles, price each	53.00 46.00	39.75 34.50		
80134	COSMESIS ANTI-GLYCATION SERUM - 1 oz w/BLUEBERRY & POMEGRANATE EXTRACTS Buy 2 bottles, price each	33.00 31.35	24.75 23.51		
80133	COSMESIS ANTIOXIDANT FACIAL MIST - 2 oz Buy 2 bottles, price each	32.00 30.40	24.00 22.80		
80127	COSMESIS ANTIOXIDANT REJUVENATING FOOT CREAM - 2 oz Buy 2 jars, price each	45.00 42.80	33.75 32.10		

SUB-TOTAL OF COLUMN 4

Buyers Club Order Form

To order call: 1.954.766.8433 or 1.800.544.4440

No.		Retail Each	Member Each	Qty	Total
C CONTINUED					
80128	COSMESIS ANTIOXIDANT REJUVENATING FOOT SCRUB - 2 oz Buy 2 jars, price each	\$59.00 51.92	\$44.25 38.94		
80117	COSMESIS ANTIOXIDANT REJUVENATING HAND CREAM - 2 oz Buy 2 jars, price each	64.00 57.49	48.00 43.12		
80121	COSMESIS ANTIOXIDANT REJUVENATING HAND SCRUB - 2 oz Buy 2 jars, price each	58.00 51.04	43.50 38.28		
80105	COSMESIS ANTI-REDNESS & ADULT BLEMISH LOTION - 1 oz Buy 2 bottles, price each	74.50 65.56	55.88 49.17		
80147	COSMESIS BIOFLAVONOID CREAM - 1 oz jar Buy 2 jars, price each	46.00 39.00	34.50 29.25		
80144	COSMESIS BROCCOLI SPROUT CREAM - 1 oz Buy 2 jars, price each	46.00 39.00	34.50 29.25		
80156	COSMESIS COLLAGEN BOOSTING PEPTIDE SERUM - 1 oz Buy 2 jars, price each	59.00 52.00	44.25 39.00		
80120	COSMESIS CORRECTIVE CLEARING MASK - 2 oz Buy 2 jars, price each	64.50 56.76	48.38 42.57		
80141	COSMESIS DNA REPAIR CREAM - 1 oz jar Buy 2 jars, price each	49.00 42.00	36.75 31.50		
80108	COSMESIS ESSENTIAL PLANT LIPIDS REPARATIVE SERUM - 1 oz Buy 2 bottles, price each	74.95 65.95	56.21 49.46		
80123	COSMESIS FACE REJUVENATING ANTIOXIDANT CREAM - 2 oz Buy 2 jars, price each	69.50 61.16	52.13 45.87		
80107	COSMESIS FINE LINE-LESS - 1 oz Buy 2 bottles, price each	74.50 65.56	55.88 49.17		
80131	COSMESIS HAIR SUPPRESS FORMULA - 4 oz Buy 2 bottles, price each	59.00 51.92	44.25 38.94		
80137	COSMESIS HEALING FORMULA ALL-IN-ONE CREAM - 1 oz Buy 2 jars, price each	53.00 45.43	39.75 34.07		
80115	COSMESIS HEALING MASK - 2 oz Buy 2 bottles, price each	64.50 56.76	48.38 42.57		
80102	COSMESIS HEALING VITAMIN K CREAM - 1 oz Buy 2 bottles, price each	79.50 69.96	59.63 52.47		
80109	COSMESIS HYALURONIC FACIAL MOISTURIZER - 1 oz Buy 2 bottles, price each	58.00 51.04	43.50 38.28		
80110	COSMESIS HYALURONIC OIL-FREE FACIAL MOISTURIZER - 1 oz Buy 2 bottles, price each	58.00 51.04	43.50 38.28		
80138	COSMESIS HYDRATING ANTIOXIDANT FACE MIST - 4 oz Buy 2 bottles, price each	39.95 38.00	29.96 28.50		
80103	COSMESIS LIFTING & TIGHTENING COMPLEX - 1 oz Buy 2 tubes, price each	74.50 65.56	55.88 49.17		
80146	COSMESIS LYCOPENE CREAM - 1 oz jar Buy 2 jars, price each	28.00 25.40	21.00 19.05		
80135	COSMESIS MELATONIN CREAM - 1 oz Buy 2 jars, price each	33.00 27.10	24.75 20.33		
80114	COSMESIS MILD FACIAL CLEANSER - 8 oz Buy 2 bottles, price each	59.00 51.92	44.25 38.94		
80122	COSMESIS NECK REJUVENATING ANTIOXIDANT CREAM - 2 oz Buy 2 jars, price each	64.00 56.32	48.00 42.24		
80111	COSMESIS PIGMENT CORRECTING CREAM - 1/2 oz Buy 2 bottles, price each	74.00 65.12	55.50 48.84		
80106	COSMESIS REJUVENATING SERUM - 1 oz Buy 2 bottles, price each	74.50 65.56	55.88 49.17		

SUB-TOTAL OF COLUMN 5

No.		Retail Each	Member Each	Qty	Total
80150	COSMESIS RENEWING EYE CREAM - 1/2 oz Buy 2 jars, price each	\$65.00 57.00	\$48.75 42.75		
80142	COSMESIS RESVERATROL ANTI-OXIDANT SERUM - 1 oz Buy 2 bottles, price each	46.00 39.00	34.50 29.25		
80112	COSMESIS SKIN LIGHTENING SERUM - 1/2 oz Buy 2 bottles, price each	85.00 74.80	63.75 56.10		
80130	COSMESIS SKIN STEM CELL SERUM - 1 oz Buy 2 bottles, price each	74.00 69.00	55.50 51.75		
80143	COSMESIS STEM CELL CREAM W/ALPINE ROSE - 1 oz jar Buy 2 jars, price each	66.00 58.00	49.50 43.50		
80148	COSMESIS TIGHTENING & FIRMING NECK CREAM - 2 oz jar Buy 2 jars, price each	39.00 35.00	29.25 26.25		
80116	COSMESIS ULTRA LIP PLUMPER - 1/3 oz Buy 2 bottles, price each	64.00 56.32	48.00 42.24		
80101	COSMESIS ULTRA WRINKLE RELAXER - 1 oz Buy 2 bottles, price each	89.95 79.76	67.46 59.82		
80113	COSMESIS UNDER EYE REFINING SERUM - 1/2 oz Buy 2 bottles, price each	74.50 65.56	55.88 49.17		
80104	COSMESIS UNDER EYE RESCUE CREAM - 1/2 oz Buy 2 bottles, price each	74.50 65.56	55.88 49.17		
80129	COSMESIS VITAMIN C SERUM - 1 oz Buy 2 bottles, price each	85.00 74.80	63.75 56.10		
80136	COSMESIS VITAMIN D LOTION - 4 oz Buy 2 bottles, price each	36.00 33.66	27.00 25.25		
80145	COSMESIS VITAMIN E-ESSENTIAL CREAM - 1 oz Buy 2 jars, price each	28.00 26.00	21.00 19.50		
80149	COSMESIS YOUTH SERUM - 1 oz Buy 2 bottles, price each	65.00 57.00	48.75 42.75		
00862	CRAN-MAX® - 500 mg, 60 veg. caps Buy 4 bottles, price each	17.50 15.00	13.13 11.25		
01424	CRAN-MAX® with ELLIROSE™ (OPTIMIZED) - 60 veg. caps Buy 4 bottles, price each	18.00 16.00	13.50 12.00		
01529	CREATINE CAPSULES - 120 veg. caps Buy 4 bottles, price each	10.95 9.25	8.21 6.94		
01746	CREATINE WHEY GLUTAMINE POWDER - 454 grams (vanilla) Buy 4 jars, price each	30.00 27.00	22.50 20.25		
01429	CR MIMETIC LONGEVITY FORMULA - 60 veg. caps Buy 4 bottles, price each	39.00 36.00	29.25 27.00		
*33840	CRWAY GREAT GLUCOSE CONTROL CD	98.00	82.00		
**CRWAY	CR WAY OPTIMAL HEALTH PROGRAM SOFTWARE	195.00	195.00		
00407	CURCUMIN® (SUPER BIO) - 400 mg, 60 veg. caps Buy 4 bottles, price each	38.00 35.00	28.50 26.25		
01808	CURCUMIN® w/GINGER & TURMERONES (ADVANCED BIO)-30 softgels Buy 4 bottles, price each	30.00 27.00	22.50 20.25		
01804	CYTOKINE SUPPRESS™ w/EGCG - 30 veg. caps Buy 4 bottles, price each	30.00 27.00	22.50 20.25		
D					
01912	DAILY C+ CITRUS FLAVOR - 30 stick packs Buy 4 boxes, price each	\$21.00 19.00	\$15.75 14.25		
00658	7-KETO® DHEA METABOLITE - 25 mg, 100 caps Buy 4 bottles, price each	28.00 24.00	21.00 18.00		
01479	7-KETO® DHEA METABOLITE - 100 mg, 60 veg. caps Buy 4 bottles, price each	40.00 36.00	30.00 27.00		

SUB-TOTAL OF COLUMN 6

To order online visit: www.LifeExtension.com

Buyers Club Order Form

No.		Retail Each	Member Each	Qty	Total
01640	DHA (VEGETARIAN SOURCED) - 30 veg. softgels Buy 4 bottles, price each	\$20.00 18.00	\$15.00 13.50		
00607	DHEA - 25 mg, 100 tablets (dissolve in mouth) Buy 4 bottles, price each	14.00 11.75	10.50 8.81		
01478	DHEA COMPLETE - 60 veg. caps Buy 4 bottles, price each	48.00 43.20	36.00 32.40		
00335	DHEA - 25 mg, 100 caps Buy 4 bottles, price each	18.00 15.00	13.50 11.25		
00454	DHEA - 15 mg, 100 caps Buy 4 bottles, price each	14.00 12.00	10.50 9.00		
00882	DHEA - 50 mg, 60 caps Buy 4 bottles, price each	19.00 17.00	14.25 12.75		
01689	DHEA - 100 mg, 60 veg. caps Buy 4 bottles, price each	24.00 22.00	18.00 16.50		
01358	DIGEST RC - 30 tablets Buy 4 boxes, price each	19.95 17.00	14.96 12.75		
01272	DIGESTIVE ENZYMES (ENHANCED SUPER) - 100 veg. caps Buy 4 bottles, price each	18.95 16.00	14.21 12.00		
01671	D,L-PHENYLALANINE CAPSULES - 500 mg, 100 veg. caps Buy 4 bottles, price each	18.75 16.00	14.06 12.00		
01540	DMAE BITARTRATE - 150 mg, 200 veg. caps Buy 4 bottles, price each	18.00 15.00	13.50 11.25		
00059	DMG - 125 mg, 60 tablets Buy 4 boxes, price each	24.80 22.69	18.60 17.02		
01570	DNA PROTECTION FORMULA - 60 veg. caps Buy 4 bottles, price each	34.00 32.00	25.50 24.00		
01831	DOG MIX - 100 grams powder Buy 4 jars, price each	18.00 15.00	13.50 11.25		
00321	DR. PROCTOR'S ADVANCED HAIR FORMULA - 2 oz Buy 4 bottles, price each	39.95 32.00	29.96 24.00		
00320	DR. PROCTOR'S HAIR FORMULA SHAMPOO - 8 oz Buy 4 bottles, price each	24.95 22.00	18.71 16.50		
00899	DUAL-ACTION MICRODERMABRASION ADV. EXFOLIATE - 2.4 oz Buy 4 jars, price each	39.95 38.95	29.96 29.21		
E					
01528	ECHINACEA EXTRACT - 250 mg, 60 veg. caps Buy 4 bottles, price each	\$14.35 12.50	\$10.76 9.38		
01498	ENDOTHELIAL DEFENSE™ w/FULL-SPECTRUM POMEGRANATE™ - 60 softgels Buy 4 bottles, price each	56.00 52.00	42.00 39.00		
00997	ENDOTHELIAL DEFENSE™ w/GLISODIN® - 60 veg. caps Buy 4 bottles, price each	54.00 48.00	40.50 36.00		
00625	EPA/DHA (MEGA) - 120 softgels Buy 4 bottles, price each	19.95 18.00	14.96 13.50		
01737	ESOPHAGEAL GUARDIAN (Berry flavor) - 60 chewable tablets Buy 4 bottles, price each	36.00 32.00	27.00 24.00		
01042	EUROPEAN LEG SOLUTION DIOSMIN 95 - 600 mg, 30 veg. tabs Buy 4 bottles, price each	20.00 18.00	15.00 13.50		
01706	EXTRAORDINARY ENZYMES - 60 caps Buy 4 bottles, price each	26.00 24.00	19.50 18.00		
01514	EYE PRESSURE SUPPORT w/MIRTOGENOL® - 30 veg. caps Buy 4 bottles, price each	38.00 34.00	28.50 25.50		

SUB-TOTAL OF COLUMN 7

No.		Retail Each	Member Each	Qty	Total
F					
01054	FACE MASTER® PLATINUM	\$199.00	\$199.00		
00965	FAST-ACTING JOINT FORMULA - 30 caps Buy 4 bottles, price each	39.00 36.00	29.25 27.00		
01717	FAST-C® w/DIHYDROQUERCETIN - 120 veg. tabs Buy 4 bottles, price each	26.00 24.00	19.50 18.00		
20053	FEM DOPHILUS® - 30 caps	25.95	19.46		
20055	FEM DOPHILUS® - 60 caps	39.95	29.96		
01064	FEMMESENCE MACAPAUSE® - 120 veg. caps	34.99	26.24		
01728	FERNBLOCK® w/RED ORANGE COMPLEX (ENHANCED) - 30 veg. caps Buy 4 bottles, price each	42.00 38.00	31.50 28.50		
00718	FIBRINOGEN RESIST™ - 30 veg. caps Buy 4 bottles, price each	49.00 44.00	36.75 33.00		
01749	FLAX SEED (ORGANIC GOLDEN GROUND) - 14 oz.	11.67	8.75		
01821	FLORASSIST® HEART HEALTH PROBIOTIC - 60 caps Buy 4 bottles, price each	32.00 28.00	24.00 21.00		
01825	FLORASSIST® PROBIOTIC - 30 liquid caps Buy 4 bottles, price each	32.00 28.00	24.00 21.00		
01913	FOLATE (OPTIMIZED HIGH-POTENCY) 5,000 mcg, 30 veg. tablets Buy 4 bottles, price each	25.00 22.00	18.75 16.50		
01939	FOLATE (OPTIMIZED) (L-METHYLFOLATE) 1,000 mcg, 100 veg. tablets Buy 4 bottles, price each	19.00 17.00	14.25 12.75		
01841	FOLATE + B12 CAPS - 200 veg. caps Buy 4 bottles, price each	10.50 9.50	7.88 7.13		
01544	FORSKOLIN - 10 mg, 60 veg.caps Buy 4 bottles, price each	16.00 14.00	12.00 10.50		
01513	FUCOIDAN w/MARITECH® 926 (OPTIMIZED) - 60 veg. caps Buy 4 bottles, price each	36.00 33.00	27.00 24.75		
G					
00559	GAMMA E TOCOPHEROL/TOCOTRIENOLS - 60 softgels Buy 4 bottles, price each	\$42.00 37.00	\$31.50 27.75		
00759	GAMMA E TOCOPHEROL w/SESAME LIGNANS - 60 softgels Buy 4 bottles, price each	32.00 29.00	24.00 21.75		
01394	(OPTIMIZED) GARLIC - 200 veg. caps Buy 4 bottles, price each	24.95 21.00	18.71 15.75		
**01122	GINGER FORCE® - 60 liquid caps	34.95	26.21		
01658	GINKGO BILOBA CERTIFIED EXTRACT™ - 120 mg, 365 veg. caps Buy 2 bottles, price each	46.00 43.50	34.50 32.63		
01648	GINKGO EXTRACT 28/7 (SUPER) - 120 mg, 100 veg. caps Buy 4 bottles, price each	29.00 26.50	21.75 19.88		
00756	GLA WITH SESAME LIGNANS (MEGA) - 60 softgels Buy 4 bottles, price each	19.50 18.00	14.63 13.50		
00345	(L) GLUTAMINE CAPSULES - 500 mg, 100 caps Buy 4 bottles, price each	14.95 13.50	11.21 10.13		
00141	(L)-GLUTAMINE POWDER - 100 grams Buy 4 bottles, price each	22.00 20.00	16.50 15.00		
00522	GLUCOSAMINE/CHONDROITIN CAPSULES - 100 caps Buy 4 bottles, price each	38.00 32.00	28.50 24.00		
01541	GLUTATHIONE, CYSTEINE & C - 100 veg. caps Buy 4 bottles, price each	20.00 18.00	15.00 13.50		
00314	L-GLUTATHIONE (MEGA) - 250 mg, 60 caps	39.64	29.73		

SUB-TOTAL OF COLUMN 8

Buyers Club Order Form

To order call: 1.954.766.8433 or 1.800.544.4440

No.		Retail Each	Member Each	Qty	Total
G CONTINUED					
01669	GLYCINE - 1,000 mg, 100 veg. caps Buy 4 bottles, price each	\$12.00 10.80	\$9.00 8.10		
01091	GRAPE EXTRACT w/RESVERATROL (WHOLE) - 60 veg. caps Buy 4 bottles, price each	36.00 34.00	27.00 25.50		
01411	GRAPE SEED EXTRACT w/RESVERATROL & PTEROSTILBENE - 100 mg, 60 veg. caps Buy 4 bottles, price each	36.00 34.00	27.00 25.50		
01604	GREEN COFFEE EXTRACT COFFEEGENIC® - 200 mg, 90 veg. caps Buy 4 bottles, price each	22.00 20.00	16.50 15.00		
01620	GREEN COFFEE EXTRACT COFFEEGENIC® - 400 mg, 90 veg. caps Buy 4 bottles, price each	32.00 28.00	24.00 21.00		
00953	GREEN TEA EXTRACT (MEGA) - lightly caffeinated - 100 veg. caps Buy 4 bottles, price each	30.00 24.00	22.50 18.00		
00954	GREEN TEA EXTRACT (MEGA) - decaffeinated - 100 veg. caps Buy 4 bottles, price each	30.00 24.00	22.50 18.00		
01545	GUTSY CHEWY DIGESTIVE (CITRUS FLAVOR) - 8 tablets	11.50	8.63		
01546	GUTSY CHEWY DIGESTIVE (WILD BERRY FLAVOR) - 8 tablets	11.50	8.63		
H					
01074	5 HTP - 100 mg, 60 caps	\$27.95	\$20.96		
01738	HCA (GARCINIA) - 90 veg. caps Buy 4 bottles, price each	17.00 15.00	12.75 11.25		
29754	HCACTIVE - 90 caps (Jarrow)	30.00	22.50		
01393	HEPATOPRO - 900 mg, 60 softgels Buy 4 bottles, price each	50.00 46.00	37.50 34.50		
01527	HUPERZINE A - 200 mcg, 60 veg caps Buy 4 bottles, price each	40.00 36.00	30.00 27.00		
00661	HYDRODERM® - 1 oz Buy 2 bottles, price each	79.95 65.33	59.96 49.00		
I					
*01060	i26® HYPERIMMUNE EGG - 140 grams powder	\$54.99	\$46.75		
01704	IMMUNE MODULATOR w/TINOFEND® - 60 veg. caps Buy 4 bottles, price each	17.00 15.00	12.75 11.25		
00955	IMMUNE PROTECT w/PARACTIN® - 30 veg. caps Buy 4 bottles, price each	29.50 26.55	22.13 19.91		
01905	IMMUNE SENEESCENCE PROTECTION FORMULA™ - 60 veg. caps Buy 4 bottles, price each	40.00 36.00	30.00 27.00		
01049	INNERPOWER™ - 530 grams powder	42.00	31.50		
01674	INOSITOL CAPSULES - 1,000 mg, 360 veg. caps Buy 4 bottles, price each	62.00 58.00	46.50 43.50		
01292	INTEGRA-LEAN® AFRICAN MANGO IRVINGIA - 150 mg, 60 veg. caps Buy 4 bottles, price each	28.00 24.00	21.00 18.00		
01248	IODINE COMPLETE (ADVANCED) - 180 tablets	46.00	36.50		
01677	IRON PROTEIN PLUS - 300 mg, 100 caps Buy 4 bottles, price each	28.00 26.00	21.00 19.50		
01492	IRVINGIA W/PHASE 3™ - 120 veg. caps CALORIE CONTROL COMPLEX (OPTIMIZED AFRICAN MANGO) Buy 4 bottles, price each	56.00 48.00	42.00 36.00		
J, K					
00056	JARRO-DOPHILUS EPS™ - 60 veg. caps	\$22.95	\$17.21		
01759	JARRO-DOPHILUS EPS™ - 30 caps	39.95	29.96		
01724	K w/ADVANCED K2 COMPLEX (SUPER) - 90 softgels Buy 4 bottles, price each	30.00 27.00	22.50 20.25		
01600	KRILL HEALTHY JOINT FORMULA - 30 softgels Buy 4 bottles, price each	32.00 29.00	24.00 21.75		

SUB-TOTAL OF COLUMN 9

No.		Retail Each	Member Each	Qty	Total
01050	KRILL OIL PHOSPHOMEGA™ - 60 softgels	\$33.95	\$25.46		
00316	KYOLIC® GARLIC FORMULA 102 - 200 veg. caps	26.45	19.84		
00214	KYOLIC® GARLIC FORMULA 105 - 200 caps	27.45	20.59		
00789	KYOLIC® RESERVE - 600 mg, 120 caps	27.95	20.96		
01681	LACTOFERRIN (APOLACTOFERRIN) CAPS - 60 caps Buy 4 bottles, price each	52.00 48.00	39.00 36.00		
00020	LECITHIN - 16 oz. granules Buy 4 jars, price each	18.00 16.00	13.50 12.00		
01955	LIFE EXTENSION MIX™ - 315 tablets Buy 4 bottles, price each Buy 10 bottles, price each	98.00 86.00 69.50	73.50 64.50 52.13		
01957	LIFE EXTENSION MIX™ W/EXTRA NIACIN - 315 tablets Buy 4 bottles, price each Buy 10 bottles, price each	98.00 86.00 69.50	73.50 64.50 52.13		
01954	LIFE EXTENSION MIX™ - 490 caps Buy 4 bottles, price each Buy 10 bottles, price each	110.00 98.00 85.00	82.50 73.50 63.75		
01956	LIFE EXTENSION MIX™ POWDER - 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		
01965	LIFE EXTENSION MIX™ - 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		
01964	LIFE EXTENSION MIX™ - 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		
01966	LIFE EXTENSION MIX™ POWDER - 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	LIVER EFFICIENCY FORMULA - 30 veg. caps Buy 4 bottles, price each	18.00 16.00	13.50 12.00		
01639	5-LOX INHIBITOR W/APRESFLEX® - 100 mg, 60 veg. caps Buy 4 bottles, price each	22.00 20.00	16.50 15.00		
01678	L-LYSINE - 620 mg, 100 veg. caps Buy 4 bottles, price each	9.00 8.00	6.75 6.00		
00455	LYCOPENE EXTRACT (MEGA) - 15 mg, 90 softgels Buy 4 bottles, price each	35.00 30.00	26.25 22.50		
M					
01885	MACUGUARD® OCULAR SUPPORT - 60 softgels Buy 4 bottles, price each	\$22.00 19.80	\$16.50 14.85		
01886	MACUGUARD® OCULAR SUPPORT w/ASTAXANTHIN - 60 softgels Buy 4 bottles, price each	42.00 38.00	31.50 28.50		
01459	MAGNESIUM CAPS - 500 mg, 100 veg. caps Buy 4 bottles, price each	12.00 10.00	9.00 7.50		
01682	MAGNESIUM CITRATE - 160 mg, 100 veg. caps Buy 4 bottles, price each	9.00 7.50	6.75 5.63		
01908	MEDITERRANEAN TRIM WITH SINETROL™-XPUR - 60 veg. caps Buy 4 bottles, price each	18.00 16.00	13.50 12.00		
01668	MELATONIN - 300 mcg, 100 veg. caps Buy 4 bottles, price each	5.75 5.00	4.31 3.75		
01083	MELATONIN - 500 mcg, 200 veg. caps Buy 4 bottles, price each	18.00 16.00	13.50 12.00		

SUB-TOTAL OF COLUMN 10

To order online visit: www.LifeExtension.com

Buyers Club Order Form

No.		Retail Each	Member Each	Qty	Total
00329	MELATONIN - 1 mg, 60 caps Buy 4 bottles, price each	\$5.00 4.63	\$3.75 3.47		
00330	MELATONIN - 3 mg, 60 caps Buy 4 bottles, price each	8.00 6.88	6.00 5.16		
01786	MELATONIN TIME RELEASE - 3 mg, 60 veg. tabs Buy 4 bottles, price each	12.00 11.00	9.00 8.25		
00331	MELATONIN - 10 mg, 60 caps Buy 4 bottles, price each	28.00 24.00	21.00 18.00		
00332	MELATONIN - 3 mg, 60 veg. lozenges Buy 4 bottles, price each	8.00 6.88	6.00 5.16		
01734	MELATONIN (Fast Acting Liquid) - 3 mg (Natural Citrus-Van) Buy 4 bottles, price each	12.00 11.00	9.00 8.25		
01787	MELATONIN TIME RELEASE - 300 mcg, 100 veg. tabs Buy 4 bottles, price each	12.00 11.00	9.00 8.25		
01788	MELATONIN TIME RELEASE - 750 mcg, 60 veg. tablets Buy 4 bottles, price each	8.00 7.00	6.00 5.25		
01536	METHYLCOBALAMIN - 1 mg, 60 veg. lozenges (vanilla) Buy 4 bottles, price each	9.95 8.00	7.46 6.00		
01537	METHYLCOBALAMIN - 5 mg, 60 veg. 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	MIGRA-EEZE™ (BUTTERBUR) - 60 softgels Buy 4 bottles, price each	29.50 26.33	22.13 19.75		
01800	MIGRA-MAG w/BRAIN SHIELD® - 90 veg. caps Buy 4 bottles, price each	22.00 20.00	16.50 15.00		
01522	MILK THISTLE (EUROPEAN) - 60 veg. caps Buy 4 bottles, price each	34.00 30.00	25.50 22.50		
01822	MILK THISTLE (EUROPEAN) - 60 softgels Buy 4 bottles, price each	28.00 25.00	21.00 18.75		
01817	MILK THISTLE (EUROPEAN) - 120 softgels Buy 4 bottles, price each	44.00 40.00	33.00 30.00		
01698	MIRAFORTE w/STANDARDIZED LIGNANS (SUPER) - 120 caps Buy 4 bottles, price each	62.00 56.00	46.50 42.00		
01769	MITOCHONDRIAL BASICS w/BIOPQQ® - 30 caps Buy 4 bottles, price each	52.00 42.00	39.00 31.50		
01768	MITOCHONDRIAL ENERGY OPTIMIZER w/BIOPQQ® - 120 caps Buy 4 bottles, price each	94.00 78.00	70.50 58.50		
00065	MK-7 - 90 mcg, 60 softgels Buy 4 bottles, price each	28.00 25.00	21.00 18.75		
00451	MSM (METHYLSULFONYLMETHANE) - 1,000 mg, 100 caps Buy 4 bottles, price each	14.00 11.95	10.50 8.96		
N					
01534	N-ACETYL-L-CYSTEINE - 600 mg, 60 veg. caps Buy 4 bottles, price each	\$14.00 13.50	\$10.50 10.13		
01904	NAD+ CELL REGENERATOR™ - 100 mg, 30 veg. caps Buy 4 bottles, price each	34.00 26.00	25.50 19.50		
00066	NATTOKINASE - 60 softgels	25.50	19.13		
01807	NATURAL APPETITE SUPPRESS (ADVANCED) - 60 veg. caps Buy 4 bottles, price each	38.00 34.00	28.50 25.50		
00984	NATURAL BP MANAGEMENT - 60 tablets Buy 4 bottles, price each	44.00 40.00	33.00 30.00		
01892	NATURAL ESTROGEN - 60 veg. tabs 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
01893	NATURAL ESTROGEN w/o SOY ISOFLAVONES - 30 veg. caps Buy 4 bottles, price each	\$32.00 28.00	\$24.00 21.00		
01221	NATURAL FEMALE SUPPORT - 30 veg. caps Buy 4 bottles, price each	28.00 24.00	21.00 18.00		
01471	NATURAL GLUCOSE ABSORPTION CONTROL - 60 veg. caps Buy 4 bottles, price each	39.00 36.00	29.25 27.00		
01626	NATURAL SEX FOR WOMEN® 50+ (ADVANCED) - 90 veg. caps Buy 4 bottles, price each	59.00 45.33	44.25 34.00		
01444	NATURAL SLEEP® - 60 veg. caps Buy 4 bottles, price each	13.00 10.00	9.75 7.50		
01551	NATURAL SLEEP® w/ MELATONIN (ENHANCED) - 30 caps Buy 4 bottles, price each	22.00 20.00	16.50 15.00		
01511	NATURAL SLEEP® w/o MELATONIN (ENHANCED) - 30 caps Buy 4 bottles, price each	20.00 18.00	15.00 13.50		
01445	NATURAL SLEEP® MELATONIN - 5 mg, 60 veg. caps Buy 4 bottles, price each	18.00 16.00	13.50 12.00		
00987	NATURAL STRESS RELIEF - 30 veg. caps Buy 4 bottles, price each	28.00 24.00	21.00 18.00		
01121	NERVIA® - 60 softgels	49.95	37.46		
01603	NEURO-MAG™ MAGNESIUM L-THREONATE - 90 veg. caps Buy 4 bottles, price each	40.00 36.00	30.00 27.00		
01602	NEURO-MAG™ L-THREONATE w/CALCIUM & VITAMIN D 225 grams - Lemon flavor Buy 4 bottles, price each	40.00 36.00	30.00 27.00		
01903	NK CELL ACTIVATOR™ - 30 veg. tablets Buy 4 bottles, price each	45.00 42.00	33.75 31.50		
00373	NO-FLUSH NIACIN - 800 mg, 100 caps Buy 4 bottles, price each	19.00 17.00	14.25 12.75		
O					
01824	OLIVE LEAF VASCULAR SUPPORT w/CELERY SEED EXTRAT(ADVANCED) 500 mg, 60 veg. caps • Buy 4 bottles, price each	\$36.00 32.00	\$27.00 24.00		
01819	OMEGA WITH KRILL & ASTAXANTHIN (SUPER) - 120 softgels Buy 4 bottles, price each Buy 10 bottles, price each	45.00 42.00 33.00	33.75 31.50 24.75		
01483	OMEGA 3 EPA/DHA w/SESAME LIGNANS & OLIVE FRUIT EXTRACT (SUPER) - 60 softgels Buy 4 bottles, price each Buy 10 bottles, price each	18.00 16.00 12.50	13.50 12.00 9.38		
01482	OMEGA 3 EPA/DHA w/SESAME LIGNANS & OLIVE FRUIT EXTRACT (SUPER) - 120 softgels Buy 4 bottles, price each Buy 10 bottles, price each	32.00 28.00 22.73	24.00 21.00 17.05		
01484	OMEGA 3 EPA/DHA w/SESAME LIGNANS & OLIVE FRUIT EXTRACT (SUPER) - 120 enteric coated softgels Buy 4 bottles, price each Buy 10 bottles, price each	34.00 31.00 24.00	25.50 23.25 18.00		
01485	OMEGA 3 EPA/DHA w/SESAME LIGNANS & OLIVE FRUIT EXTRACT (SUPER) - 60 enteric coated softgels Buy 4 bottles, price each Buy 10 bottles, price each	20.00 18.00 14.00	15.00 13.50 10.50		
01619	OMEGA 3 EPA/DHA w/SESAME LIGNANS & OLIVE FRUIT EXTRACT (SUPER) (SMALL SOFTGEL) Buy 4 bottles, price each Buy 10 bottles, price each	32.00 28.00 23.00	24.00 21.00 17.25		

SUB-TOTAL OF COLUMN 12

Buyers Club Order Form

To order call: 1.954.766.8433 or 1.800.544.4440

No.		Retail Each	Member Each	Qty	Total
CONTINUED					
01981	ONCE-DAILY HEALTH BOOSTER - 60 softgels Buy 4 bottles, price each	\$52.00 48.00	\$39.00 36.00		
01901	ONE-PER-DAY - 60 tablets Buy 4 bottles, price each	22.00 20.00	16.50 15.00		
01328	ONLY TRACE MINERALS - 90 veg. caps Buy 4 bottles, price each	15.00 12.50	11.25 9.38		
P					
01789	PALMETTOGUARD® SAW PALMETTO w/BETA SITOSTEROL - 30 softgels Buy 12 bottles, price each	\$15.00 12.00	\$11.25 9.00		
01790	PALMETTOGUARD® SUPER SAW PALMETTO/ NETTLE ROOT w/BETA-SITOSTEROL - 60 softgels Buy 4 bottles, price each Buy 12 bottles, price each	28.00 26.00 24.00	21.00 19.50 18.00		
00073	PANCREATIN - 500 mg, 50 caps	13.22	9.92		
01323	PEAK ATP® WITH GLYCOCARN® - 60 veg. caps Buy 4 bottles, price each	54.00 50.00	40.50 37.50		
00342	PECTA SOL-C® MODIFIED CITRUS PECTIN - 454 grams powder	109.95	82.46		
01080	PECTA SOL-C® MODIFIED CITRUS PECTIN - 270 veg. caps	79.95	59.96		
01811	PEONY IMMUNE - 60 veg. caps Buy 4 bottles, price each	36.00 32.00	27.00 24.00		
00673	PGX™ PLUS MULBERRY (WELLBETX®) -180 veg. caps	34.95	26.21		
00865	PHARMA GABA® - 60 chewable tablets Buy 4 bottles, price each	29.95 27.00	22.46 20.25		
01676	PHOSPHATIDYLSERINE CAPS - 100 mg, 100 veg. caps Buy 4 bottles, price each	54.00 48.00	40.50 36.00		
01436	POLICOSANOL - 10 mg, 60 veg. caps Buy 4 bottles, price each	20.00 15.00	15.00 11.25		
01423	POMEGRANATE™ (FULL-SPECTRUM) - 30 softgels Buy 4 bottles, price each	24.00 21.00	18.00 15.75		
00956	POMEGRANATE EXTRACT - 30 veg. caps Buy 4 bottles, price each	19.50 17.55	14.63 13.16		
01797	POMI-T® - 60 veg. caps Buy 4 bottles, price each	33.33 30.00	25.00 22.50		
00577	POTASSIUM IODIDE - 1 box, 14 tablets Buy 4 boxes, price each	6.95 5.25	5.21 3.94		
01500	PQQ CAPS W/BIOPQQ® - 10 mg, 30 veg. caps Buy 4 bottles, price each Buy 10 bottles, price each	24.00 18.00 16.00	18.00 13.50 12.00		
01647	PQQ CAPS W/BIOPQQ® - 20 mg, 30 veg. caps Buy 4 bottles, price each Buy 10 bottles, price each	40.00 32.00 28.00	30.00 24.00 21.00		
00302	PREGNENOLONE - 50 mg, 100 caps Buy 4 bottles, price each	26.00 22.00	19.50 16.50		
00700	PREGNENOLONE - 100 mg, 100 caps Buy 4 bottles, price each	30.00 27.00	22.50 20.25		
***01373	PRELOX® NATURAL SEX FOR MEN® - 60 tablets Buy 4 bottles, price each	52.00 48.00	39.00 36.00		
01576	PREVAGEN® - 10 mg, 30 caps	60.00	45.00		
01577	PREVAGEN® ES - 20 mg, 30 caps	70.00	60.00		
00525	PROBOOST THYMIC PROTEIN A™ - 4 mcg, 30 packets	59.95	44.96		
01441	PROGESTACARE® FOR WOMEN - 4 oz cream Buy 4 bottles, price each	35.50 32.50	26.63 24.38		

SUB-TOTAL OF COLUMN 13

No.		Retail Each	Member Each	Qty	Total
01898	PROSTATE FORMULA (ULTRA NAT) - 60 softgels Buy 4 bottles, price each Buy 12 bottles, price each	\$38.00 35.00 32.00	\$28.50 26.25 24.00		
01909	PROSTAPOLLEN™ (TRIPLE ACTION) - 30 softgels Buy 4 bottles, price each	28.00 25.00	21.00 18.75		
01742	PROTEIN-ISOLATE (WHEY) VANILLA - 1 lb. powder Buy 4 jars, price each	30.00 27.00	22.50 20.25		
01743	PROTEIN-ISOLATE (WHEY) CHOCOLATE - 1 lb. powder Buy 4 jars, price each	30.00 27.00	22.50 20.25		
01770	PROTEIN CONCENTRATE (New Zealand Whey) Vanilla - 520 gr Buy 4 bottles, price each	30.00 26.60	22.50 19.95		
01771	PROTEIN CONCENTRATE (New Zealand Whey) Chocolate - 660 gr Buy 4 bottles, price each	30.00 26.60	22.50 19.95		
01812	PROVINAL® PURIFIED OMEGA-7 - 30 softgels Buy 4 bottles, price each	27.00 24.00	20.25 18.00		
01508	PTEROPURE® - 50 mg Pterostilbene 60 veg. caps Buy 4 bottles, price each	32.00 30.00	24.00 22.50		
01209	PUMPKIN SEED EXTRACT (WATER-SOLUBLE) - 60 veg. caps Buy 4 bottles, price each	20.00 18.00	15.00 13.50		
01587	PURE PLANT PROTEIN - Veg. Vanilla 540 grams powder Buy 4 jars, price each	38.00 35.00	28.50 26.25		
01637	PYCNOGENOL® FRENCH MARITIME PINE BARK EXTRACT -100 mg, 60 veg. caps Buy 4 bottles, price each	64.00 60.00	48.00 45.00		
01217	PYRIDOXAL 5'-PHOSPHATE - 100 mg, 60 veg. caps Buy 4 bottles, price each	22.00 19.80	16.50 14.85		
Q, R					
01309	QUERCETIN (OPTIMIZED) - 250 mg, 60 veg. caps Buy 4 bottles, price each	\$22.00 20.00	\$16.50 15.00		
01030	RED YEAST RICE (Bluebonnet)- 600 mg, 60 veg. caps	16.95	13.56		
00605	REGIMINT - 60 enteric-coated caps Buy 4 bottles, price each	19.95 18.67	14.96 14.00		
01708	REISHI EXTRACT MUSHROOM COMPLEX - 60 veg. caps Buy 4 bottles, price each	30.00 27.00	22.50 20.25		
01448	REJUVENEX® BODY LOTION - 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	REJUVENEX® FACTOR FIRING SERUM - 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	REJUVENEX® (ULTRA) - 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	REJUVENIGHT® (ULTRA) - 2 oz Buy 4 jars, price each	39.95 36.00	29.96 27.00		
01410	RESVERATROL W/PTEROSTILBENE - 100 mg, 60 veg. caps Buy 4 bottles, price each	36.00 32.00	27.00 24.00		
01930	RESVERATROL W/NAD+ CELL REGENERATOR™ (OPTIMIZED) -30 veg. caps Buy 4 bottles, price each	42.00 36.00	31.50 27.00		
01430	RESVERATROL w/SYNERGISTIC GRAPE-BERRY ACTIVES (OPTIMIZED) - 250 mg, 60 veg. caps Buy 4 bottles, price each	46.00 41.33	34.50 31.00		

SUB-TOTAL OF COLUMN 14

No.		Retail Each	Member Each	Qty	Total
00889	RHODIOLA EXTRACT - 250 mg, 60 veg. caps Buy 4 bottles, price each	\$14.00 12.00	\$10.50 9.00		
01900	RIBOGEN™ FRENCH OAK WOOD EXTRACT - 200 mg, 30 veg. caps Buy 4 bottles, price each	36.00 33.00	27.00 24.75		
00972	(D) RIBOSE POWDER - 150 grams Buy 4 jars, price each	27.50 24.75	20.63 18.56		
01473	(D) RIBOSE TABLETS - 100 veg. tabs Buy 4 bottles, price each	32.00 28.00	24.00 21.00		
01609	RICH REWARDS® BREAKFAST GROUND COFFEE - 12 oz. bag	13.00	9.75		
01730	RICH REWARDS® BREAKFAST BLEND GROUND COFFEE - 12 oz. bag Natural Mocha	15.00	11.25		
01729	RICH REWARDS® BREAKFAST BLEND GROUND COFFEE - 12 oz. bag Natural Vanilla	15.00	11.25		
01612	RICH REWARDS® BREAKFAST BLEND WHOLE BEAN COFFEE -12 oz. bag	13.00	9.75		
01610	RICH REWARDS® DECAFFEINATED ROAST GROUND COFFEE - 12 oz. bag	14.00	10.50		
01530	RICH REWARDS® CRUCIFEROUS VEGETABLE SOUP - 32 oz. bottle Buy 6 bottles, price each	11.95 11.25	8.96 8.44		
01208	R-LIPOIC ACID (SUPER) - 240 mg, 60 veg. caps Buy 4 bottles, price each	49.00 45.00	36.75 33.75		
00070	RNA CAPSULES - 500 mg, 100 caps Buy 4 bottles, price each	17.95 16.16	13.46 12.12		
S					
01432	SAFFRON w/SATIREAL® (OPTIMIZED) - 60 veg. caps Buy 4 bottles, price each	\$36.00 32.00	\$27.00 24.00		
00358	SAME (S-ADENOSYL-METHIONINE) - 200 mg, 20 enteric coated tablets Buy 8 boxes, price each	16.00 14.00	12.00 10.50		
00557	SAME (S-ADENOSYL-METHIONINE) - 400 mg, 20 enteric coated tablets Buy 6 boxes, price each	28.00 24.00	21.00 18.00		
01740	SEA-IODINE™ - 1,000 mcg, 60 veg. caps Buy 4 bottles, price each	8.00 7.20	6.00 5.40		
00046	SELENIUM - 2 oz dropper bottle	11.95	8.96		
01679	SE-METHYL L-SELENOCYSTEINE - 200 mcg, 100 veg. caps Buy 4 bottles, price each	12.00 11.00	9.00 8.25		
00318	SERRAFLAZYME - 100 tablets Buy 4 bottles, price each	18.00 16.00	13.50 12.00		
01684	SILYMARIN - 100 mg, 50 veg. caps Buy 4 bottles, price each	9.25 8.25	6.94 6.19		
01249	SINUS CLEANSER - 4 oz. bottle	25.00	18.75		
01596	SKIN RESTORING PHYTCERAMIDES w/LIPOWHEAT® - 30 veg. liquid caps Buy 4 bottles, price each	25.00 23.00	18.75 17.25		
00961	SODZYME® w/GLISODIN® AND WOLFBERRY - 90 veg. caps Buy 4 bottles, price each	28.00 24.00	21.00 18.00		
00657	SOLARSHIELD SUNGLASSES - 1 pair smoke color Buy 2 pairs, price each	12.99 11.50	9.74 8.63		
01097	SOY EXTRACT (ULTRA) - 150 veg. caps Buy 4 bottles, price each	87.00 78.00	65.25 58.50		
00432	STEVIA™ EXTRACT (BETTER) - 100 packets, 1 gram each	9.95	7.46		
00438	STEVIA™ ORGANIC LIQUID EXTRACT (BETTER) - 2 oz liquid	11.00	8.25		
01476	STRONTIUM - 750 mg, 90 veg. caps Buy 4 bottles, price each	20.00 18.00	15.00 13.50		
01649	SUPER ABSORBABLE SOY ISOFLAVONES - 60 veg. caps Buy 4 bottles, price each	28.00 25.00	21.00 18.75		

SUB-TOTAL OF COLUMN 15

No.		Retail Each	Member Each	Qty	Total
01778	SUPER SELENIUM COMPLEX - 200 mcg, 100 veg. caps Buy 4 bottles, price each Buy 12 bottles, price each	\$14.00 12.00 11.00	\$10.50 9.00 8.25		
T					
01723	TART CHERRY EXTRACT w/STANDARDIZED CHERRYPURE® - 60 veg. caps Buy 4 bottles, price each	\$22.00 20.00	\$16.50 15.00		
00199	TAURINE - 1,000 mg, 50 caps Buy 4 bottles, price each	8.95 8.00	6.71 6.00		
00133	L-TAURINE POWDER - 300 grams Buy 4 bottles, price each	20.00 16.88	15.00 12.66		
01304	THEAFLAVIN STANDARDIZED EXTRACT - 30 veg. caps Buy 4 bottles, price each	18.00 16.00	13.50 12.00		
01683	(L) THEANINE - 100 mg, 60 veg. caps Buy 4 bottles, price each	24.00 20.50	18.00 15.38		
**01038	THERALAC PROBIOTICS - 30 caps	47.95	35.96		
00668	THYROID FORMULA™ (METABOLIC ADVANTAGE) - 100 caps	21.95	16.46		
00349	TMG POWDER - 50 grams Buy 4 bottles, price each	14.00 11.00	10.50 8.25		
01859	TMG - 500 mg, 60 veg. liquid caps Buy 4 bottles, price each	13.00 12.00	9.75 9.00		
00781	TOCOTRIENOLS WITH SESAME LIGNANS - 60 softgels Buy 4 bottles, price each	38.00 36.00	28.50 27.00		
01400	TOCOTRIENOLS (SUPER-ABSORBABLE) - 60 softgels Buy 4 bottles, price each	30.00 28.00	22.50 21.00		
01278	TOOTH PASTE - 4 oz (Mint) Buy 4 tubes, price each	9.50 8.67	7.13 6.50		
01917	TRANQUIL TRACT™ - 60 veg. caps Buy 4 bottles, price each	52.00 46.00	39.00 34.50		
01468	TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT - 60 veg. caps Buy 4 bottles, price each	24.00 22.00	18.00 16.50		
01469	TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT W/RESVERATROL - 60 veg. caps Buy 4 bottles, price each	32.00 29.60	24.00 22.20		
01803	TRI SUGAR SHIELD™ - 60 veg. caps Buy 4 bottles, price each	36.00 32.00	27.00 24.00		
01386	TRUFIBER® - 180 grams	32.95	24.71		
01389	TRUFLORA PROBIOTICS - 32 veg. caps	42.95	32.21		
01722	L-TRYPTOPHAN - 500 mg, 90 veg. caps Buy 4 bottles, price each	33.00 30.00	24.75 22.50		
01721	TRYPTOPHAN PLUS (OPTIMIZED) - 90 veg. caps Buy 4 bottles, price each	32.00 29.00	24.00 21.75		
01916	TWO-PER-DAY - 60 tablets Buy 4 bottles, price each	10.50 9.50	7.88 7.13		
01915	TWO-PER-DAY - 120 tablets Buy 4 bottles, price each	20.00 18.00	15.00 13.50		
01914	TWO-PER-DAY - 120 caps Buy 4 bottles, price each	22.00 20.00	16.50 15.00		
00326	L-TYROSINE - 500 mg, 100 tablets	12.98	9.74		
V					
00213	VANADYL SULFATE - 7.5 mg, 100 veg. tablets Buy 4 bottles, price each	\$15.00 12.50	\$11.25 9.38		
00408	VENOTONE - 60 caps Buy 4 bottles, price each	18.95 16.00	14.21 12.00		

SUB-TOTAL OF COLUMN 16

Buyers Club Order Form

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No.		Retail Each	Member Each	Qty	Total
V CONTINUED					
01327	VINPOCETINE - 10 mg, 100 tablets	\$18.00	\$13.50		
	Buy 4 bottles, price each	14.00	10.50		
00372	VITAMIN B3 NIACIN - 500 mg, 100 caps	7.65	5.74		
	Buy 4 bottles, price each	6.65	4.99		
00098	VITAMIN B5 - 500 mg, 100 caps (Pantothenic Acid)	10.50	7.88		
	Buy 4 bottles, price each	9.38	7.04		
01535	VITAMIN B6 - 250 mg, 100 veg. caps	12.50	9.38		
	Buy 4 bottles, price each	11.00	8.25		
00361	VITAMIN B12 - 500 mcg, 100 lozenges	8.75	6.56		
	Buy 4 bottles, price each	7.25	5.44		
01634	VITAMIN C w/ DIHYDROQUERCETIN - 1,000 mg, 60 veg. tablets	10.00	7.50		
	Buy 4 bottles, price each	9.00	6.75		
00927	VITAMIN C w/ DIHYDROQUERCETIN - 1,000 mg, 250 veg. tablets	25.50	19.13		
	Buy 4 bottles, price each	23.25	17.44		
00084	VITAMIN C (BUFFERED) POWDER - 454 grams	23.95	17.96		
	Buy 4 bottles, price each	22.00	16.50		
01736	(EFFERVESCENT) VITAMIN C-MAGNESIUM CRYSTALS - 180 grams	20.00	15.00		
	Buy 4 bottles, price each	18.00	13.50		
01732	VITAMIN D3 - 2,000 IU, 1 fl oz, Mint flavor	28.00	21.00		
	Buy 4 bottles, price each	25.00	18.75		
01753	VITAMIN D3 - 1,000 IU, 90 softgels	7.00	5.25		
	Buy 4 bottles, price each	6.00	4.50		
01751	VITAMIN D3 - 1,000 IU, 250 softgels	12.50	9.38		
	Buy 4 bottles, price each	11.25	8.44		
01713	VITAMIN D3 - 5,000 IU, 60 softgels	11.00	8.25		
	Buy 4 bottles, price each	9.90	7.43		
01718	VITAMIN D3 - 7,000 IU, 60 softgels	14.00	10.50		
	Buy 4 bottles, price each	12.60	9.45		
01758	VITAMIN D3 w/SEA-IODINE™ - 5,000 IU, 60 caps	14.00	10.50		
	Buy 4 bottles, price each	12.50	9.38		
00864	VITAMIN D3 Liquid Emulsion - 2,000 IU, 1 oz.	28.00	21.00		
	Buy 4 bottles, price each	25.00	18.75		
01741	VITAMINS D AND K w/SEA-IODINE™ - 60 caps	24.00	18.00		
	Buy 4 bottles, price each	22.00	16.50		
01763	VITAMIN E (NATURAL) - 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	VITAMIN K2 (LOW-DOSE) - 45 mcg, 90 softgels	18.00	13.50		
	Buy 4 bottles, price each	16.00	12.00		
X					
00409	XYLIWHITE™ MOUTHWASH - 16 oz	\$10.00	\$7.50		
W					
01902	WAIST-LINE CONTROL™ - 120 veg. caps	\$42.00	\$31.50		
	Buy 4 bottles, price each	38.00	28.50		
01826	WEIGHT MANAGEMENT FORMULA - 60 veg. caps	40.00	30.00		
	Buy 4 bottles, price each	36.00	27.00		
Z					
01813	ZINC HIGH POTENCY - 50 mg, 90 veg. caps	\$7.95	\$5.96		
	Buy 4 bottles, price each	7.00	5.25		
01561	ZINC GLUCONATE/OXIDE LOZENGES - 18.75 mg, 60 veg. lozenges	9.00	6.75		
	Buy 4 bottles, price each	8.00	6.00		
01961	ZINC ACETATE LOZENGES (ENHANCED) - 18.75 mg, 30 veg. lozenges	12.00	9.00		
	Buy 2 bottles, price each	8.00	6.00		
**01051	ZYFLAMEND® WHOLE BODY - 120 softgels	64.95	48.71		

SUB-TOTAL OF COLUMN 17



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SUB-TOTAL COLUMN 5	
SUB-TOTAL COLUMN 6	
SUB-TOTAL COLUMN 7	
SUB-TOTAL COLUMN 8	
SUB-TOTAL COLUMN 9	
SUB-TOTAL COLUMN 10	
SUB-TOTAL COLUMN 11	
SUB-TOTAL COLUMN 12	
SUB-TOTAL COLUMN 13	
SUB-TOTAL COLUMN 14	
SUB-TOTAL COLUMN 15	
SUB-TOTAL COLUMN 16	
SUB-TOTAL COLUMN 17	

ORDER TOTALS

Sub-Total A (Sub-total of Columns 1 through 17)	
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C.O.D.s (Add \$7 for C.O.D. orders)	
Shipping	
GRAND TOTAL (Must be in U.S. dollars)	



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SIGNATURE

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No.	LIFE EXTENSION MEDIA		Retail	Member Price	Qty	Total
33878	TESTOSTERONE REPLACEMENT THERAPY • by Dr. John Crisler	2015	\$19.99	\$14.99		
33877	THE TRUTH ABOUT MEN AND SEX • by Abraham Morgentaler, MD FACS	2015	\$16.99	\$12.74		
33876	TOX-SICK • by Suzanne Somers	2015	\$26.00	\$19.50		
33875	DOCTORED THE DISILLUSIONMENT OF AN AMERICAN PHYSICIAN • by Sandeep Jauhar	2015	\$26.00	\$19.50		
33874	MISSING MICROBES • by Martin J. Blaser, MD	2014	\$28.00	\$21.00		
33873	EATING ON THE WILD SIDE • by Jo Robinson	2014	\$16.00	\$12.00		
33872	GET SERIOUS • by Brett Osborn, MD	2014	\$24.95	\$18.71		
33868	TOXIN TOXOUT: GETTING HARMFUL CHEMICAL OUT OF OUR BODIES AND OUR WORLD • by Bruce Lourie and Rick Smith	2014	\$25.99	\$19.49		
33871	DOCTORED RESULTS: THE SUPPRESSION OF LAETRILE AT SLOAN-KETTERING INSTITUTE • by Ralph W. Moss, PhD	2014	\$19.95	\$14.96		
33867	THE COMPLETE MEDITERRANEAN DIET • by Michael Ozner, MD	2014	\$19.95	\$14.96		
33869	UNLEASH THE POWER OF THE FEMALE BRAIN • by Daniel Amen, MD	2014	\$16.00	\$12.00		
33870	MAGNIFICENT MAGNESIUM • by Dennis Goodman, MD	2014	\$14.95	\$11.21		
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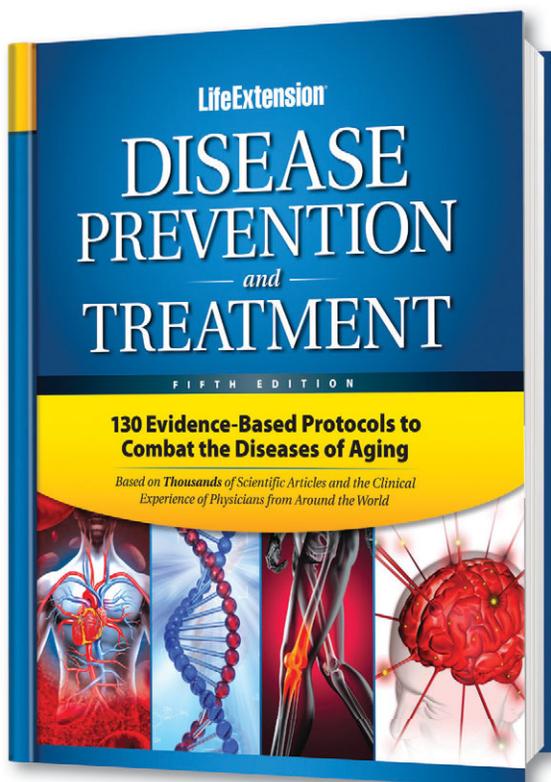
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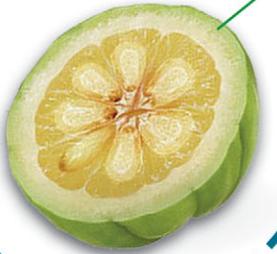
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References

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New data shows that **vitamin K** depletion results in **rapid** arterial calcification. Vitamin K blocks **calcification** of heart valves and arterial linings, while keeping calcium in the **bones**. An intriguing study shows that **vitamin K** may help reverse **arterial calcification**.



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