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November 2017

VITAMIN K

Reverses

Arterial Stiffness

DHEA Protects Aging Minds

Blueberries Improve Brain Blood Flow

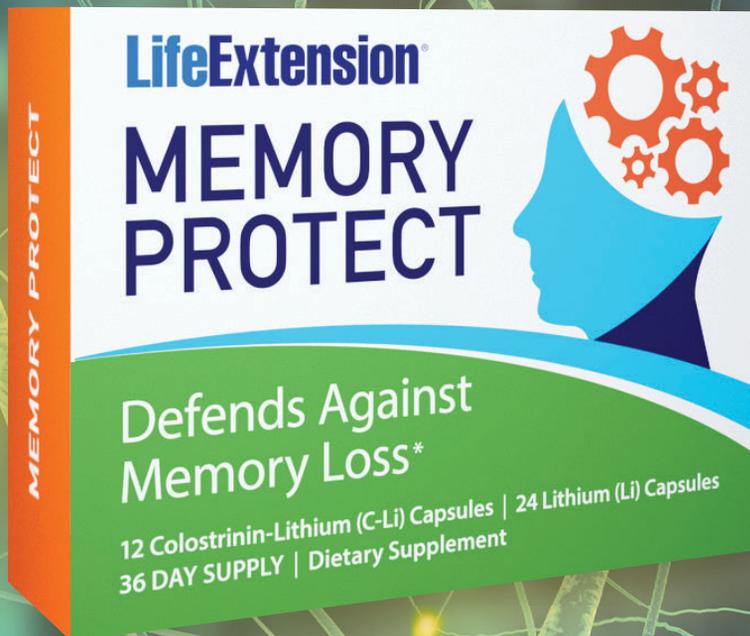
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REVERSES ARTERIAL STIFFNESS

Arterial stiffness *increases* risk of cardiovascular disorders and dementia. A clinical trial using long-acting **vitamin K2** showed significant reductions of arterial stiffening. This provides a new opportunity to restore more youthful *flexibility* to aging blood vessels.

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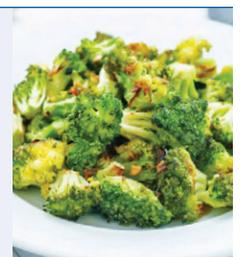


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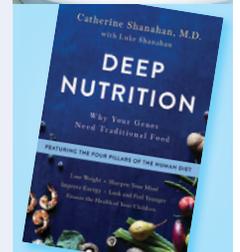
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BY WILLIAM FALOON

Vitamin K Reverses Arterial Stiffness

Healthy **arteries** expand and contract smoothly with each heartbeat.

With age, **soft tissues** such as arteries **stiffen** and lose youthful flexibility.

The phrase “**hardening of the arteries**” describes loss of arterial elasticity and obstructed blood flow. This “**hardening**” is an important predictor of heart attack and stroke.¹⁻³

In severe cases, the **aortic artery** becomes so **stiff** and **brittle** that it cannot be repaired.

This is how actress **Lucille Ball** died. She suffered a dissecting **aortic aneurysm** that surgeons spent many hours repairing. They replaced her **aortic valve** and five inches of her upper **aortic artery**. It was too risky to attempt to replace her entire aortic artery. One week later Lucy died from a second rupture in her lower (abdominal) aorta.⁴



Lucy, with her incredible fame and fortune, perished from the **structural failure** of the largest artery (the aorta) in her body.

Arterial stiffness is associated with increased risk of cardiovascular disorders, dementia, and death.⁵⁻¹¹

When the aorta stiffens, it elevates **blood pressure** as the **heart** must pump harder to force blood through the body.

Factors that contribute to **arterial stiffness** include **inflammation, glycation, hypertension,** and poor **glucose** control.¹²⁻¹⁵

A less understood cause of **arterial stiffening** is **calcification**.¹⁶

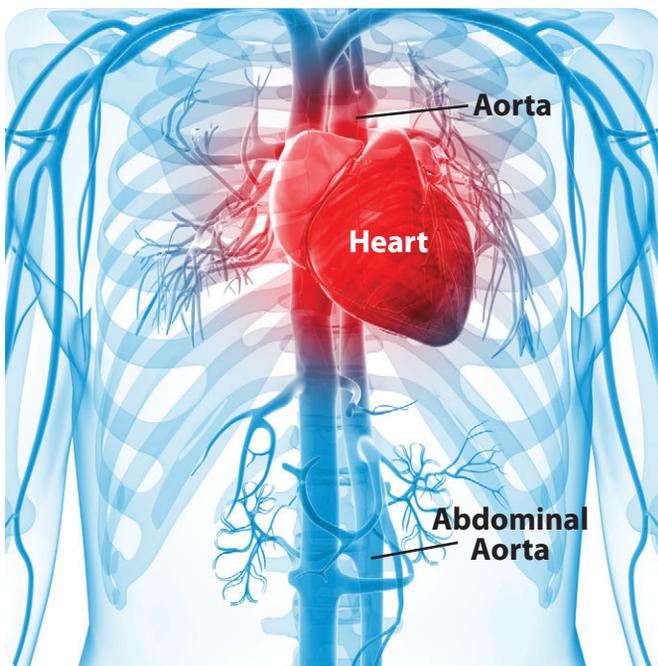
In **1999**, we published a report on the importance of consuming high-dose **vitamin K** to **block calcium infiltration** into our soft tissues.¹⁷

Over the years we received many calls asking if **higher** dose **vitamin K2** could **reverse** vascular calcification. Until recently, we did not know the answer.

In **2007**, an animal study demonstrated significant **reduction** of **arterial calcification** in response to **vitamin K** supplementation.¹⁸ While intriguing, we did not know if this would work in people.

A landmark clinical trial using a long-acting form of **vitamin K2** has demonstrated significant **reductions** of **arterial stiffening** in **humans**.¹⁹

This provides us all with an opportunity to restore more youthful **flexibility** to aging blood vessels and other soft tissues.



Modern medicine combined with healthier lifestyles has enabled maturing people to **postpone** the time when they suffer **vascular-related** disorders.

Protection against **coronary artery occlusion** can be achieved in mid-life via control of lipids, glucose, and pro-inflammatory factors.²⁰⁻²⁴

As people age past 65 years, however, the cumulative buildup of soft-tissue **calcification** sharply elevates incidence of stroke, heart failure and aortic valve stenosis.^{1,2,25-28}

Heart Valve Disorders

Each year more than five million Americans are diagnosed with **heart valve disorders**.²⁹

Without treatment, about **50%** of those with symptomatic **aortic stenosis** will die within two years.³⁰

While drugs known as **ACE inhibitors** (angiotensin-converting enzyme inhibitors) may slow progression of early-stage aortic valve stenosis, **surgical** interventions are the **only** way to treat advanced **aortic stenosis**.^{31,32}

People with surgically-replaced **aortic valves** often require lifelong **anticoagulant** drugs to reduce ischemic **stroke** risk.³³

A more rational approach to reduce the epidemic of vascular disorders facing the elderly is to **block** soft-tissue **calcification** starting **earlier** in life. This is readily accomplished with low-cost **vitamin K2** supplements.

While it's never too late to impede soft-tissue calcification, the dilemma facing aging humans is how to **reverse** **arterial stiffness** that occurred **before** the importance of taking **vitamin K** was recognized.

Measuring Arterial Health

Calcification inflicts severe injury to **arteries** and **heart valves**.³⁶⁻³⁸ The pictures on this page show deformed **calcified** aortic valves.

Observational studies show **lower** prevalence of **coronary disease** and **arterial calcification** in those with **higher** intake of **vitamin K2**.³⁹⁻⁴²

The "gold standard" for measuring regional **arterial stiffness** is the "**carotid-femoral pulse wave velocity**" test.^{43,44}

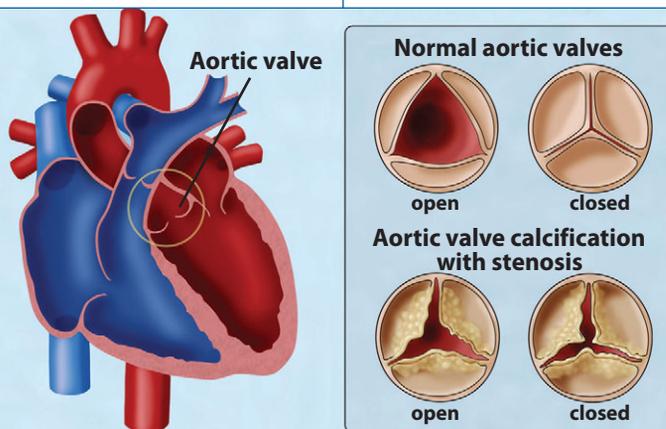
People who score poorly on this test have **higher** rates of cardiovascular diseases.

Reversing Arterial Stiffness

A clinical trial was designed using **carotid-femoral pulse wave velocity** as one of the tests to evaluate the effects of supplementing with **180 mcg** a day of a long-acting form of **vitamin K2** (MK-7).¹⁹

This randomized, placebo-controlled study was comprised of 244 postmenopausal women aged 55-65 years. Baseline tests of **arterial stiffness** were performed and the tests repeated yearly for **three years**.

At the end of three years, otherwise healthy postmenopausal women in the **vitamin K2** group



A healthy aortic valve opens and closes normally. However, calcification of the aortic valve, also called aortic sclerosis, frequently occurs with advancing age. In the United States, this age-related calcification of the aortic valve is the number one cause of aortic stenosis, which is a narrowing of the valvular outflow tract. Over time, the heart muscle weakens as a result of aortic stenosis, and can progress to heart failure.

Preventable Causes of Aortic Valve Calcification and Aortic Stenosis

Aging is considered a risk factor for **aortic valve calcification** and **aortic stenosis**. Congenital defects and infections can also severely damage the aortic valve.^{31,32,34}

A large case-control study showed that the calcific degeneration observed in severe **aortic stenosis** is **increased** by these unhealthy factors:³⁵

Hypertension	117%
History of smoking	72%
Cholesterol (>200 mg/dL)	111%
Obesity	103%

Gaining **control** over these **risk factors** for **aortic valve stenosis** can enable aging people to dramatically reduce their overall mortality risk.



experienced a statistically significant **5.8% reduction** in the **stiffness index beta**, a parameter for arterial stiffness, and a **3.6% reduction** in **carotid-femoral pulse wave velocity**. The placebo group had a slight **increase** of **1.3%** in the stiffness index and a **0.22%** increase in carotid-femoral pulse wave velocity.¹⁹

The benefit was conferred upon the women with a **higher** baseline index of **arterial stiffness** in comparison with those women with **lower** baseline levels of arterial stiffness. This suggests that those postmenopausal women with more advanced atherosclerosis derive **more** benefit with vitamin K2.

This is the first long-term **human** trial showing improvements in measures of **arterial stiffness** in response to long-acting **vitamin K2**. While the **5.8%** and **3.6%** improvements might not appear substantial, when realizing that **calcification** often worsens with age, the fact that there was a

reversal in **arterial stiffness** compared to placebo is quite remarkable.

This study helps support population-based studies associating **higher** intake of vitamin **K2** with **reduced** cardiovascular incidence and mortality.^{39,42,45}

Importance of Calcium Balance

Calcium is essential to sustain life.

Without sufficient calcium, we would not be able to maintain the **electrolyte balance** needed for proper rhythmic heart beats.⁴⁶ If one were to deplete their bloodstream of calcium, they would die from a **heart attack** caused by an acute arrhythmic disorder.⁴⁷

In a healthy body, **99%** of calcium is stored in **bone** where it provides structural support.⁴⁸ The amount of calcium allowed into the bloodstream is tightly controlled.⁴⁹

In our bones, **vitamin K2** *activates* proteins that beneficially bind **calcium** to bone.⁵⁰ Human populations with high dietary intake of vitamin K2 have **lower** rates of **osteoporosis**.⁵¹⁻⁵⁶

How K2 Prevents Vascular Calcification

Vitamin K activates your body's ability to store calcium in the **bone** (where it belongs) and blocks it from **infiltrating** soft tissues.^{42,45,56}

To visualize how **vitamin K2** protects against **calcification**, just imagine a **protein** lining your vascular system that allows calcium in or out. The factor that regulates whether this protein is turned "**on**"—meaning it **blocks calcium infiltration**—is **vitamin K2**.

Vitamin K2 *activates* **matrix GLA** proteins in **soft tissues** to keep **calcium out**.^{40,42} On the flip side, K2 activates calcium-binding proteins in **bone** to maintain skeletal density.⁵⁰

In the absence of vitamin K, bony structures form in soft tissues. Early pathologists discovered that arteries that are soft and pliable in youth often **turned to stone** in the elderly.⁵⁷

Modern findings 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.

The take home lesson as it relates to healthy blood flow is:

Matrix GLA Protein + Vitamin K2 = Barrier against calcium infiltration

Matrix GLA Protein – Vitamin K2 = Vascular/soft tissue calcification

Where We Stand Today

Most adults probably suffer some degree of **calcification**, as intake of vitamin K2 in Western societies remains at low levels.

A study published in 2007 tested **vitamin K1** and the **MK-4** form of **vitamin K2** on rats.¹⁸

In the groups receiving high-dose vitamin **K1** or **K2** (MK-4), not only was there no further arterial calcium accumulation, there was a **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**. This study provided intriguing evidence that vascular **calcification** may be reversible by high vitamin K intake.¹⁸

When we reported on this study, we postulated that people taking vitamin K supplements over an extended time period “might” induce a **regression** of **arterial calcification**. We emphasized, however, that “**more human research is needed to establish this.**”

That human research has now demonstrated (for the first time) a significant improvement in **arterial health** in postmenopausal women with higher **arterial stiffness** who supplement with a modest dose of **vitamin K2**.¹⁹

This study also demonstrated a favorable **50% decrease** in a marker of a calcium-blocking protein in the **K2** supplemented group compared to placebo.¹⁹ Previous studies show that people with **higher** levels of this circulatory marker (uncarboxylated matrix GLA protein) have elevated rates of chronic kidney disease and heart failure.⁵⁸⁻⁶⁰

For those who like technical details, **vitamin K2** is essential for the enzyme that “**carboxylates**” the **matrix GLA** protein. When matrix GLA is “carboxylated,” it **shields** arteries from calcium infiltration. **Uncarboxylated matrix GLA**, on the other hand, facilitates vascular **calcification**.⁵⁸⁻⁶⁰

In the new **human** study described in this article, a modest dose of **vitamin K2** reduced **uncarboxylated matrix GLA** by **50%**, which is an indicator of improved cardiovascular health.¹⁹

What are Ideal Vitamin K Supplements?

A review of the published scientific literature provides a rationale for aging people to supplement with **three** different forms of vitamin K. These include **vitamin K1**, **vitamin K2 (MK-4)**, and **vitamin K2 (MK-7)**.^{40,45,61}

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

Some may ask why not 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.

Interestingly, the **MK-4** form of vitamin K2 has been used in very high doses as a prescription drug in Japan to treat **osteoporosis**.⁶²

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



Potential to Spare Millions of Lives

An enormous body of published evidence indicates that common degenerative illnesses striking aging humans may be prevented by taking sufficient potencies of by taking sufficient potencies of the proper forms of **vitamin K**.

Yet most physicians don't understand vitamin K's critical role of blocking **calcification** of heart valves, arterial linings, and other soft tissues, while keeping calcium in **bone** where it is needed.

Eye-opening studies shed light on the importance for people of all ages 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**.

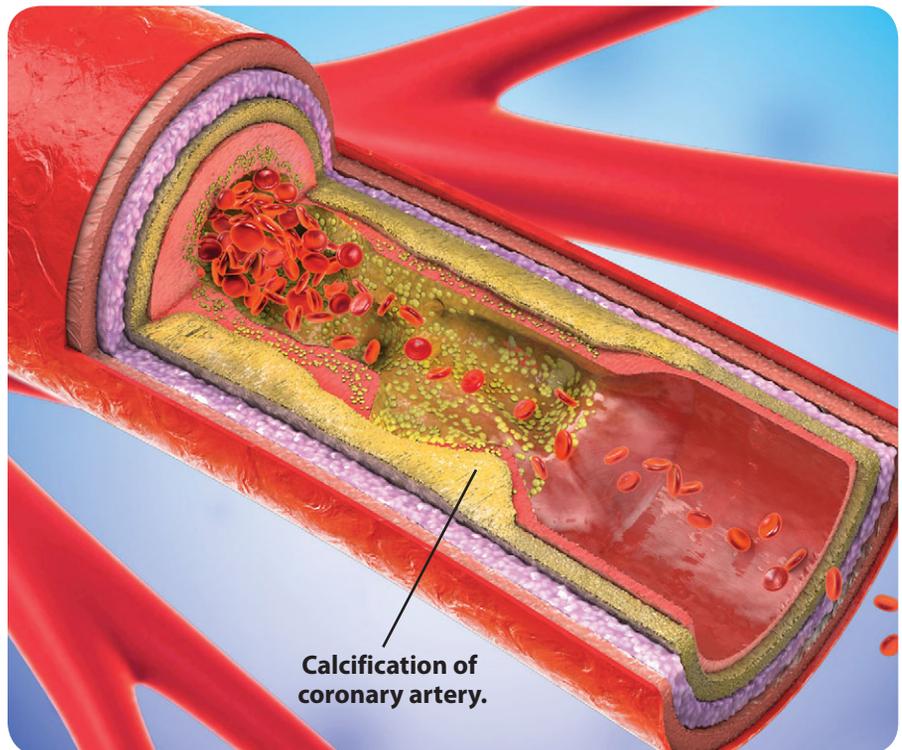
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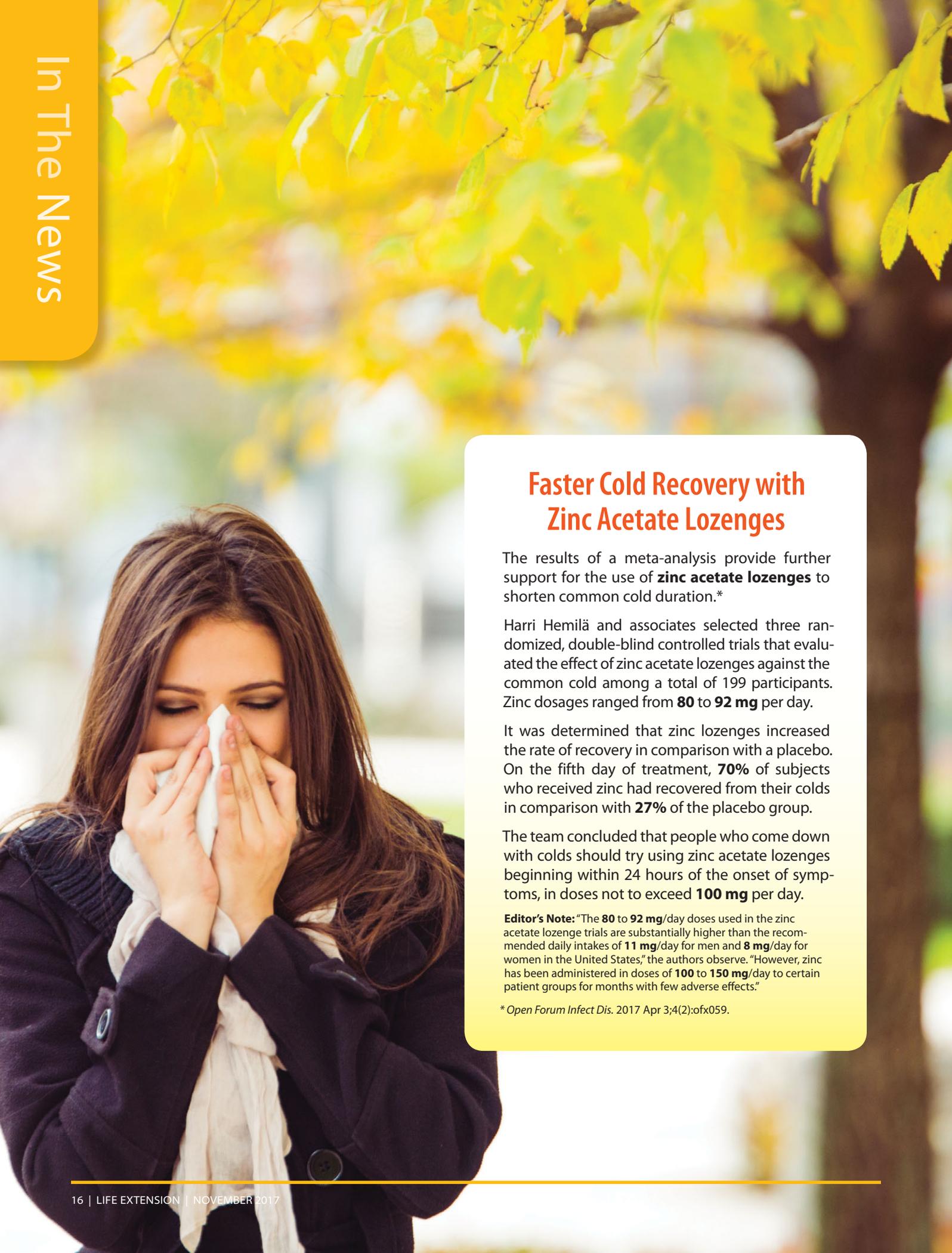
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Faster Cold Recovery with Zinc Acetate Lozenges

The results of a meta-analysis provide further support for the use of **zinc acetate lozenges** to shorten common cold duration.*

Harri Hemilä and associates selected three randomized, double-blind controlled trials that evaluated the effect of zinc acetate lozenges against the common cold among a total of 199 participants. Zinc dosages ranged from **80 to 92 mg** per day.

It was determined that zinc lozenges increased the rate of recovery in comparison with a placebo. On the fifth day of treatment, **70%** of subjects who received zinc had recovered from their colds in comparison with **27%** of the placebo group.

The team concluded that people who come down with colds should try using zinc acetate lozenges beginning within 24 hours of the onset of symptoms, in doses not to exceed **100 mg** per day.

Editor's Note: "The **80 to 92 mg/day** doses used in the zinc acetate lozenge trials are substantially higher than the recommended daily intakes of **11 mg/day** for men and **8 mg/day** for women in the United States," the authors observe. "However, zinc has been administered in doses of **100 to 150 mg/day** to certain patient groups for months with few adverse effects."

* *Open Forum Infect Dis.* 2017 Apr 3;4(2):ofx059.

PQQ Protects Against Fatty Liver

An association has been found between the intake of **pyrroloquinoline quinone** (PQQ) in obese mice and a lower risk of developing nonalcoholic fatty liver disease (NAFLD) in their offspring.*

“We know that infants born to mothers with obesity have a greater chance of developing NAFLD over their lifetime, and in fact one-third of obese children under 18 may have undiagnosed fatty liver disease,” stated lead author Karen Jonscher, PhD.

Researchers fed female mice either a healthy diet or a Western diet that contained a high amount of fat and sugar. Some of the animals in both groups received drinking water enhanced with PQQ. Mice born to the animals were kept on the diets for 20 weeks. While offspring that received a Western diet experienced greater weight gain, the addition of PQQ was associated with less fat and less inflammation in the liver.

Editor’s Note: “Pyrroloquinoline quinone, or PQQ, is a natural oxidant reducer found in soil and many foods and enriched in human breast milk,” Dr. Jonscher noted. “Perhaps supplementing the diet of obese pregnant mothers with PQQ, which has proven safe in several human studies, will be a therapeutic target worthy of more study in the battle to reduce the risk of NAFLD in babies.”

*FASEB J. 2017 Apr;31(4):1434-1448.

Special Presentation on Traumatic Brain Injury

Dr. Mark L. Gordon of the Millennium Warrior Angels Foundation TBI Project plans to present a program on the science behind traumatic brain injury (TBI) and post-traumatic stress disorder (PTSD). The presentation, which is hosted by Age Management Medical Group, will be held in Tucson, Ariz., on November 2.*

Dr. Gordon's group, which he created in 2014 with Green Beret Andrew Marr, is dedicated to providing help to veterans and active military members who are struggling with TBI and PTSD.

The organization's program, says Dr. Gordon, "provides a step-by-step understanding of the epidemiology of traumatic brain injury and the biological mechanisms that trauma sets off to cause personality changes and cognitive deficit."

The Millennium-WAF TBI Project has funded hundreds of veterans and active military personnel for laboratory evaluation and treatment protocols, which focus **90%** of the time on natural supplements rather than pharmaceuticals.

For information about attending this conference, log on to: **agedmed.org**

Editor's Note: A study has found that **91%** of participants in Dr. Gordon's treatment protocol have had a **50%** improvement. "At present, we have a **64.3%** recovery rate where the veterans are back in school, off medication, and being part of their family again."

*Press release, Millennium-WAF TBI Project.

Omega-3 Improves Amyloid Clearance

An article published in *The FASEB Journal* reports the ability of **omega-3** to promote the brain's clearance of beta-amyloid, a toxic protein that accumulates in the form of plaque in Alzheimer's disease patients.*

Omega-3 fatty acids accomplish this by improving the function of the glymphatic system, a functional waste-clearance pathway for the central nervous system.

Huixia Ren and colleagues compared normal mice to mice genetically modified to express high brain-levels of omega-3 fatty acids. The researchers observed that higher omega-3 levels enhanced the glymphatic system's clearance function, including its ability to remove beta-amyloid.

Glymphatic system function was also boosted in normal mice supplemented with fish oil (a significant source of omega-3 fatty acids), in comparison with mice that did not receive omega-3.

Editor's Note: "These now-famous fatty acids have been the subject of major studies both in academia and industry," observed Thoru Pederson, PhD, editor-in-chief of *The FASEB Journal*. "Just when we thought we had heard everything, here is something new, and it is provocative indeed. This study should not turn attention away from the roles of these substances in maintaining vascular health, but neither should they restrict our view. The brain is an extremely vascularized organ, while we might also bear in mind that omega-3 fatty acids may impact neurons, glia, and astrocytes themselves."

* *FASEB J.* 2017 Jan;31(1):282-293.

Vitamin C Linked to Decrease in Irregular heartbeat

The results of a review and meta-analysis reveal an association between supplementation with **vitamin C** and a reduction in postoperative atrial fibrillation, or irregular heartbeat. The analysis also found a reduction in the length of hospital stay among vitamin C-treated patients.*

Harri Hemilä of the University of Helsinki and Timo Suonsyrjä of Helsinki University Central Hospital reviewed 14 randomized trials involving a total of 2,006 cardiac surgery patients and one trial that investigated atrial fibrillation recurrence following successful cardioversion (correction of cardiac arrhythmia) in 44 patients. The majority of trials administered vitamin C before and after surgery.

Nine trials revealed a risk of postoperative atrial fibrillation that averaged **44% lower** among vitamin C-treated compared to untreated patients. Additionally, length of hospital stay was decreased by **12.6%** and time spent in the intensive care unit by **8%** in vitamin C-treated patients in non-U.S. trials.

Editor's Note: In the trial that examined the effects of vitamin C following cardioversion, there was an **87%** reduction in atrial fibrillation recurrence in association with treatment.

* *BMC Cardiovasc Disord.* 2017 Feb 1;17(1):49.

Low Calcium in Arteries Indicates Low Heart-Attack Risk

New research has found that patients whose coronary arteries are not significantly **calcified** have a considerably reduced risk of stroke or heart attack, even with the presence of other high-risk factors such as high cholesterol, diabetes, or high blood pressure.*

Subjects in a study by cardiologists from UT Southwestern were found to have a dramatically reduced heart-disease risk factor of a less than **3%** chance of a cardiovascular event over the next ten years when their calcium buildup was at low levels even though they may have other risk factors such as high cholesterol. This finding is well below the **7.5%** set by the American College of Cardiology and the American Heart Association as a guideline as to when to prescribe statin therapy.

Over time, arteries stiffen and lose flexibility, increasing the risk of heart attack and stroke. Besides the well-known high-risk factors, calcification is a less understood cause of arterial stiffening.

“The event rates when coronary calcium is absent are low,” said cardiologist Dr. Parag Joshi.

Editor’s Note: Studies show **vitamin K** prevents calcium from being deposited in arteries, suggesting significant beneficial effects of supplementation.

**Atherosclerosis*. 2016 Mar;246:367-73

Just-Published Protocols in the *Disease Prevention and Treatment Book*

The scientists and writers at **Life Extension**® continuously update the online *Disease Prevention and Treatment* protocol chapters based on the latest research. Recent updates are briefly summarized here with complete versions of these chapters and references available online at:

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Chronic Venous Disease: Varicose Veins and Venous Insufficiency

Chronic venous disease encompasses varicose veins and more serious conditions like leg ulcers that result from impaired circulation. Chronic venous disease affects **35%** of US adults. Emerging treatment strategies, such as the VenaSeal system, are improving the management of varicose veins. Moreover, bioengineered skin substitutes such as Dermagraft and Apligraf can aid in the healing of venous ulcers. In addition, several natural phlebotonic compounds can improve circulatory function, such as **horse chestnut seed extract, diosmin, French maritime pine bark extract, and Centella asiatica.**

Alcohol: Reducing the Risks

Excessive alcohol intake is linked to many health problems, including heart disease and cancer.

No nutritional intervention can eliminate the **deadly effects** of **excessive alcohol consumption.** The good news is that certain strategies may minimize some ill effects, such as hangover, caused by isolated instances of overindulgence. Supplementation with **clove bud extract** and **N-acetylcysteine** reduce oxidative and inflammatory stress. Other integrative interventions that may offset some of the detrimental effects of alcohol consumption are grape seed extract, resveratrol, milk thistle, picrorhiza, and glutathione. A unique compound called **polyenylphosphatidylcholine (PPC)**, may help protect the liver. Also, **probiotics** may help reverse the negative impact of alcohol on the intestinal microbiota.

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Arterial Protect supports the body's ability to control arterial plaque formation.¹

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Item# 02004 • 30 vegetarian capsules

Reference

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Note: Do not change dosing or discontinue cardiovascular medications unless advised to do so by your physician.

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For full product description and to order **Arterial Protect**, call **1-800-544-4440** or visit **www.LifeExtension.com**

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Restore Youthful Cellular Energy

with

PQQ

PQQ (pyrroloquinoline quinone) activates genes involved in the production of cellular energy.¹⁻⁵

Studies show **PQQ** supports heart health and cognitive function, complementing CoQ10.^{6,7}

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BioPQQ® is the **highest quality PQQ** available on the market today.



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Also available are **10 mg PQQ caps with BioPQQ®** (Item #1500) and **100 mg Super Ubiquinol CoQ10 with BioPQQ®** (Item #01733).

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GO TO THE MAX

Humans don't manufacture **vitamin C** internally, so it must be obtained through dietary sources or supplements.

Vitamin C is water soluble and needs to be constantly replenished.¹

Fortunately, a *flavonoid* known as *dihydroquercetin* functions as a **vitamin C** "supercharger" that helps maintain its concentration throughout the body.^{2,3}

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3. *J Food Tech.* 1969;4:255-67.

Vitamin C

Item #00927 • 250 vegetarian tablets

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BY ALEXIS SANDRO





DHEA

Protects the Aging Mind

New studies are pointing to a novel way of protecting the aging mind: supplementation with DHEA.

In animal models, DHEA has the remarkable ability to **increase** the number of **brain cells**, while combating specific features of **metabolic syndrome** that contribute to cognitive decline.

Human studies show that supplementation with DHEA has dramatic impacts on mood disorders—especially depression—and can improve memory and cognition in older adults.

DHEA also helps combat conditions that contribute to brain aging such as diabetes and vascular disease.

DHEA and the Brain

DHEA (*dehydroepiandrosterone*) is the most abundant steroid hormone in humans, and has biological effects throughout the body.^{1,2}

DHEA has its own receptors on many cells including cells in the brain.²

As people age, adrenal gland secretion of DHEA markedly declines.

Epidemiological studies link lower levels of DHEA with degenerative illnesses including cardiovascular, metabolic, and neurological disorders.²

Because DHEA acts so powerfully on the brain, it is hardly surprising to find that it is intimately associated with a variety of brain-health issues. Studies show, for example, that people with **higher** DHEA levels have less mental confusion, lower anxiety, and a less negative mood.³

Other studies have found that DHEA levels (in its circulating, sulfated form, DHEA-S) correlate with overall cognitive function in men and women, and with better working memory, attention, and verbal fluency found in women with the highest levels.⁴

DHEA also plays a significant role in mental illness—especially **depression**. A recent study found that among people with major depression, those with higher DHEA levels were more likely to experience **remission** of their symptoms when treated with antidepressants, suggesting that such drugs may require a particular level of DHEA to be most effective.¹

Low DHEA levels are also correlated with brain **shrinkage** in major depression. One **2016** study showed that high cortisol/low DHEA ratios are associated with smaller volume of the hippocampus (the main memory-processing region of the brain) in people with major depression.⁵ This could contribute to some of the memory and decision-making problems often experienced by people with depression.

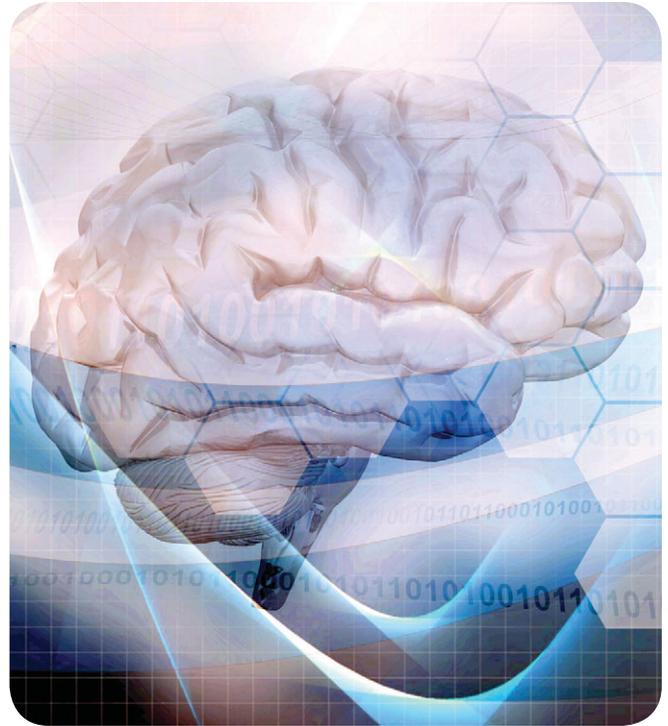
Indeed, low DHEA levels are now associated with multiple brain-related disorders, including stress-induced clinical burnout, bipolar disorder, major depression, anxiety, and chronic fatigue syndrome.⁶⁻¹⁵

Fortunately, DHEA supplements cost only pennies a day, and numerous studies show that supplementation can **directly oppose** loss of brain function.

Memory and Cognition

Postmenopausal women taking **50 mg/day** of DHEA can boost memory recognition tasks and enhance a variety of cognitive skills—especially those relating to perception and judgment.^{16,17}

In a study of older women with mild-to-moderate cognitive impairment (a likely precursor to Alzheimer's), taking **25 mg/day** of DHEA increased cognitive scores



and prevented loss of skills needed for activities of daily living, while also improving verbal test scores.¹⁸

Larger doses appear to have more potent effects. Among healthy young men, **300 mg/day** of DHEA for seven days improved mood and memory, lowered evening cortisol levels, and caused changes in nerve impulses in memory-related brain regions.¹⁹ (This dose is experimental and not recommended for routine supplementation.)

In a follow-up study, healthy young men who took a single dose of **400 mg** of DHEA experienced **activity changes** in the brain that were associated with a reduction in negative emotions (sadness, anger, etc.), as well as reduced memory of emotionally-disturbing events, when compared to patients taking a placebo.²⁰ (Doses to replenish DHEA to physiological youthful levels typically require only **15 mg** to **25 mg** a day.)

A specialized MRI scan revealed that DHEA reduced activity in the aggression-dominated **amygdala** region of the brain and increased connectivity between the amygdala and the **hippocampus**. These are changes that would be expected to produce less emotionally reactive and more positive rational thoughts.²⁰

Interestingly, the other common stress-induced steroid hormone, **cortisol**, has directly opposite effects, contributing, when high, to depression and anxiety.³ This makes DHEA an appealing **counterbalance** to stress-induced cortisol elevations. Studies confirm that those with higher ratios of cortisol-to-DHEA have more anxiety, general mood disturbances, greater confusion, and lower memory performance on visual-spatial tasks.³

Mood Disorders

Studies show that DHEA supplementation may be a promising addition to—or even replacement for—some of today’s powerful psychoactive drugs.

In one study, schizophrenic patients taking **200 mg/day** of DHEA for six weeks had improvements in sustained attention, visual, and movement skills—all of which help to mitigate some of the impact of the disease.²¹

But it is in the treatment and prevention of **mood disorders** (commonly including depression and anxiety) that DHEA is showing the most dramatic mental-health promise.

In one study, subjects with midlife **dysthymia** (a mild but chronic form of depression) took **90 mg** of DHEA daily for three weeks and then **450 mg** daily for another three weeks, or placebo for six weeks.¹¹ A significant treatment response was detectable after the first three weeks. After six weeks, **60%** of people supplementing with DHEA experienced more than a **50%** reduction in symptoms, compared with just **20%** of placebo recipients.¹¹

In another study, middle-aged and elderly patients with major depression and low plasma DHEA levels received **30-90 mg/day** of DHEA, with the dose adjusted to raise plasma levels to those of healthy young people.¹⁵ After four weeks, depression ratings and memory performance improved significantly in proportion to rising DHEA levels.

The findings of DHEA’s potent antidepressant action have now been replicated in many individual studies using daily doses of **25 mg** or more. These improvements are often accompanied by additional benefits such as memory and libido enhancements.^{8-10,12,14}



How it Works

Animal studies are shedding some light on the specific mechanisms involved in DHEA’s beneficial effects on cognition, memory, and mood.

One study showed that DHEA switched on expression of steroid-responsive genes in close correlation with cognitive performance, which suggests that DHEA operates at least in part by modulating gene expression in brain cells.²²

A **2017** study showed that DHEA treatment in middle-aged rats undergoing chronic mild stress (a cause of cognitive and memory problems) increased the number of specific brain cells, while also enhancing maturation of the multiple branching projections of those cells (dendrites).²³ Boosting these connections help brain cells sustain normal cognition and memory in the face of connections lost to aging and disease.

But other factors are likely at work in DHEA-induced brain protection. Two of the most important are its impact on **metabolic disorders** (diabetes, obesity) and **cardiovascular diseases** (atherosclerosis, endothelial dysfunction), since these areas have known consequences in the brain.

Let’s examine these connections.

What You Need to Know

DHEA Protects Brain Health

- Levels of the abundant steroid hormone DHEA fall with advancing age.
- Studies now show that insufficient DHEA is a risk factor for declining cognitive and memory function, as well as mood disorders including depression and anxiety.
- Supplemental DHEA is a proven means of combating those neurological conditions.
- DHEA also mitigates conditions that contribute to cognitive decline, such as metabolic syndrome and its consequences, including diabetes and cardiovascular disease.
- In combination, DHEA’s direct effects on the brain, as well as its indirect effects through reduction in cardiometabolic dysfunctions, make it an ideal supplement for sustaining a healthy mind in a healthy body.

DHEA Combats Metabolic Disorders

Metabolic syndrome (the combination of obesity, hypertension, elevated blood sugar, excess body fat around the waist, and abnormal cholesterol or triglycerides levels) raises the risk of cognitive dysfunction over time.²⁴ High blood sugar and insulin levels play major roles. DHEA is emerging as an important factor in governing those metabolic parameters.

Studies show that middle-aged and elderly people with higher DHEA levels are at about **20%** lower risk for new-onset diabetes compared with those with lower DHEA levels—with that protection rate as great as **77%** among men.^{25,26} The reason for this protective effect is clear: DHEA has a remarkable impact on body fat and blood sugar. In men with metabolic syndrome, supplementation with just **25 mg/day** of DHEA lowered blood sugar by **26%**.²⁷

One study found that DHEA *is as effective in reducing body fat and maintaining insulin sensitivity as exercise*.²⁸ Specifically, older rats supplemented with DHEA gained **11%** less weight than control animals, reflecting a **25%** reduction in body fat with minimal impact on muscle mass. They also cleared glucose from their blood **30%** more effectively than control animals.²⁸ (Human studies do not show as dramatic an effect on body fat mass.²⁹)

Together, these findings suggest that DHEA-mediated blood glucose and insulin reductions could provide protection against neurodegenerative diseases like Alzheimer's, which has sometimes been called "type III diabetes" because of its close association with uncontrolled glucose levels.^{30,31}

DHEA Protects Arteries

Diabetes isn't the only consequence of our typical high-fat, high-sugar Western diet. It also causes a significant amount of blood-vessel damage. In addition to setting us up for heart disease, strokes, and other cardiovascular disasters, this type of damage paves the way for diminished neurological and cognitive function. DHEA is showing promise in protecting the arteries against some of those destructive effects.

In men with elevated cholesterol, taking **25 mg** of DHEA daily for 12 weeks produced an impressive **115%** improvement in **endothelial function**, a measure of arterial health and resistance to atherosclerosis.²⁷ That study also showed a significant **44%** reduction in **plasminogen activator inhibitor**, which is a measure of blood-clotting potential. This important finding indicates an independent reduction in cardiovascular risk.²⁷



DHEA supplementation in elderly males also increases the ability of platelets to produce artery-dilating **nitric oxide** (NO) and lowers LDL cholesterol levels.³²

Animal studies offer additional insights. For example, diabetic rats supplemented with DHEA showed significant improvement in their ability to dilate (widen) their arteries, particularly the tiny arterioles that feed nerve cells. This reduces the potential for diabetic vascular and neurological disorders.³³

In rabbits fed a high-fat diet, DHEA supplementation reduced or **reversed** the pro-inflammatory state induced by fat tissue, while lowering blood lipid levels and, ultimately, delaying the onset of heart-muscle damage.³⁴

Finally, DHEA shows promise for protecting against nonalcoholic fatty liver disease (NAFLD), a manifestation of metabolic syndrome and an early risk factor for chronic liver disease.³⁵

Collectively, these findings demonstrate that DHEA combats metabolic syndrome by reducing weight gain, lowering blood lipids, improving vascular function, reversing inflammatory changes, and preventing fat-induced liver damage.

All of these properties show just how powerfully DHEA reduces the risk of neurological disorders related to vascular dysfunctions.

Summary

DHEA has powerful brain-preserving properties. Levels of DHEA fall with advancing age, which leaves brain tissue and structures increasingly vulnerable to metabolic, toxic, and chemical threats. It may also contribute to problems ranging from mild cognitive impairment to neurodegenerative diseases, as well as mood and other mental health disorders.

Supplementation with DHEA has been shown to help prevent or mitigate mood disorders, especially major depression, and to significantly improve cognitive and memory functions in older adults.

DHEA also combats the metabolic and vascular disorders that can promote brain dysfunction with age. Studies show that DHEA can reduce blood sugar, raise insulin sensitivity, reduce weight gain, lower cholesterol levels, and improve blood-vessel functioning—all of which lower one's risk for metabolic syndrome and its consequences, heart disease, diabetes, and neurological damage.

For those interested in optimizing their nutritional and hormonal balances to fight the ravages of aging, DHEA represents an ideal multitargeted supplement with known safety and a growing number of anti-aging properties. ●



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

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* *J Clin Endocrinol Metab.* 2002 Feb;87(2):589-98.

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DHEA 50 mg capsules

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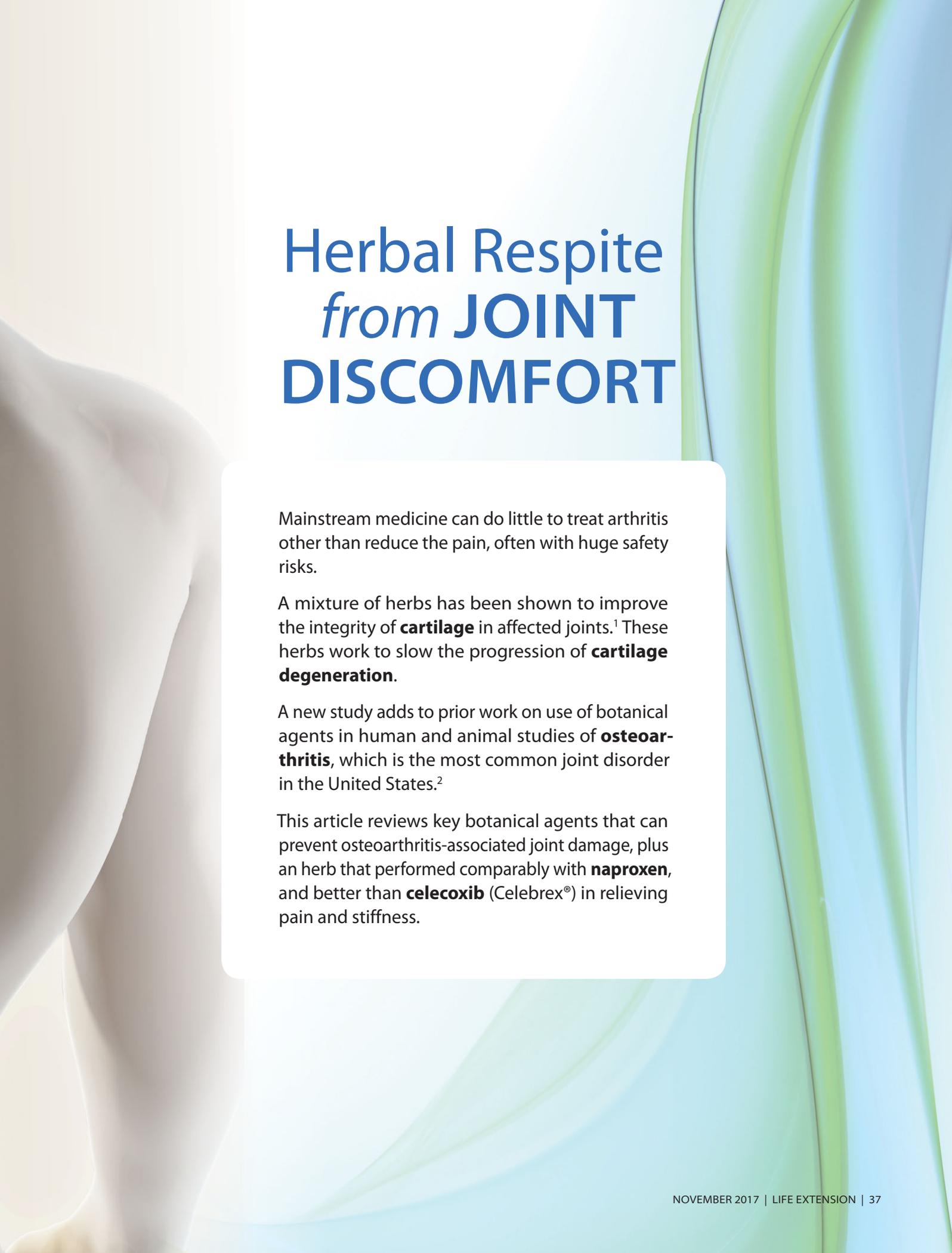


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Caution: Consult a physician or licensed, qualified healthcare professional before using these products if you have, or have a family history of, breast cancer, prostate cancer, or other hormone-sensitive diseases.

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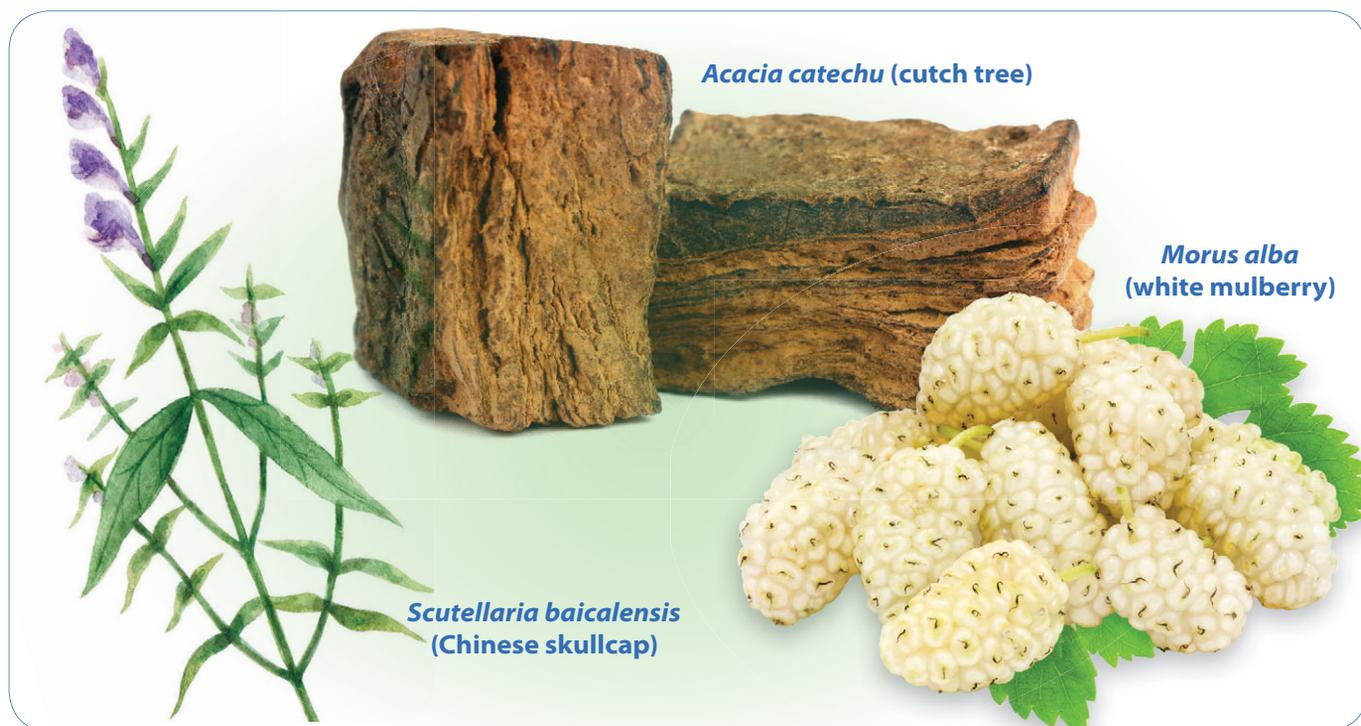
Herbal Respite *from* JOINT DISCOMFORT

Mainstream medicine can do little to treat arthritis other than reduce the pain, often with huge safety risks.

A mixture of herbs has been shown to improve the integrity of **cartilage** in affected joints.¹ These herbs work to slow the progression of **cartilage degeneration**.

A new study adds to prior work on use of botanical agents in human and animal studies of **osteoarthritis**, which is the most common joint disorder in the United States.²

This article reviews key botanical agents that can prevent osteoarthritis-associated joint damage, plus an herb that performed comparably with **naproxen**, and better than **celecoxib** (Celebrex®) in relieving pain and stiffness.



Three botanical extracts – *Scutellaria baicalensis*, *Acacia catechu*, and *Morus alba* can enable a significant reduction in the progression of arthritis.

These herbs have been shown to reduce destruction of cartilage and bone in arthritis-afflicted joints, and to significantly reduce pain and inflammation.^{1,3,4}

These botanical extracts may also act as the **disease-modifying agents** so eagerly sought for many years by scientists and physicians.

Mainstream medicine has yet to find true disease-modifying drugs for osteoarthritis,^{5,6} leaving us mainly with drugs in the class called **non-steroidal anti-inflammatory drugs** (NSAIDs, like ibuprofen), or with painkillers in the opioid narcotic category.

White Mulberry and Cutch Tree Extracts Restore Joint Integrity

The combination of *Morus alba* (white mulberry) and *Acacia catechu* (cutch tree) extracts is the result of a research program that began with **12,000** plant samples known to be used in human food or medical traditions.⁴ The winning combination has been

extensively evaluated in human, animal, and basic laboratory studies for its ability to fight the inflammation, pain, and joint degradation seen in osteoarthritis.⁴

The most recent advance with this natural supplement mixture came in early **2017**, with the release of a rat study, where conditions can be carefully controlled and all variables isolated.

In this study, scientists first examined the impact of the formulation on degradation of **proteoglycans**, essential components of the cartilage matrix. Here, they demonstrated that the formulation reduced cartilage breakdown by **31.5% to 54.8%**, depending on the dose used.¹ This was a powerful demonstration of the mixture's cartilage-protecting abilities.

Next, the scientists created a rat model of osteoarthritis by injecting the animals' joints with a chemical known to induce the inflammatory changes that produce arthritis.¹ Administering the combination supplement and measuring the animals' pain sensitivity weekly, the researchers detected reductions in pain sensitivity of **17.5%** in the first week, which rose steadily through week five to **40.9%**.¹

In addition to this reduction in pain sensitivity in the living animals, significant improvements in joint cartilage integrity were recorded, and bone damage below the protective cartilage layer in joints was found to be minimal.¹

The finding of reduced bone and cartilage destruction in arthritis joints, by direct examination of the affected joints, represents a **disease-modifying effect**

that has never been shown with *any* pain-relieving drug (NSAIDs or opiates) commonly used to treat osteoarthritis. This represents a novel advance in the management of arthritis, making it a potentially reversible disorder.

Some additional work sheds light on the mechanisms involved.

The same scientists carried out a study using a well-established rat model of pain: injection of a compound, carrageenan, into the paw, which induces temporary pain and swelling. The results of that study confirmed that the combined extracts were superior to no treatment in improving pain and reducing swelling, while the highest dose tested proved similar to ibuprofen for those effects.⁷

That study and others also showed this herbal combination inhibition of the enzymes COX-1, COX-2, and 5-LOX, which produce pro-inflammatory signaling molecules.^{4,7} Suppressing these pro-inflammatory enzymes is an essential mechanism when seeking to protect against joint cartilage destruction.

Human Studies on these Herbs

The most compelling studies are those in which supplements show meaningful effects in **humans**, where we cannot impose pain deliberately, nor can we expose joints and look inside.

A study completed in **2015** evaluated 135 adults between the ages of 35 and 75 who had knee pain and arthritis. The study subjects were randomly assigned to receive **200 mg** twice daily of the herbal combination supplement, a glucosamine **750 mg**/chondroitin **600 mg** combination twice daily, or an inactive placebo.⁴

A main outcome measure in this study was urinary levels of **C-terminal crosslinking telopeptide of type II collagen (CTX-II)**, a breakdown product of collagen that serves as a useful indirect biomarker of joint destruction.

Levels of urinary CTX-II dropped from baseline in the patients receiving the herbal combination, while rising dramatically in placebo-treated patients, producing a significant difference between the drug and herb-extract treatments. No significant changes were seen in the glucosamine/chondroitin group.⁴

In summary, the combination of *Morus alba* and *Acacia catechu* reduces **joint destruction** in both human and animal studies, doing so in large part by inhibition of pro-inflammatory signaling molecule production.^{4,8}

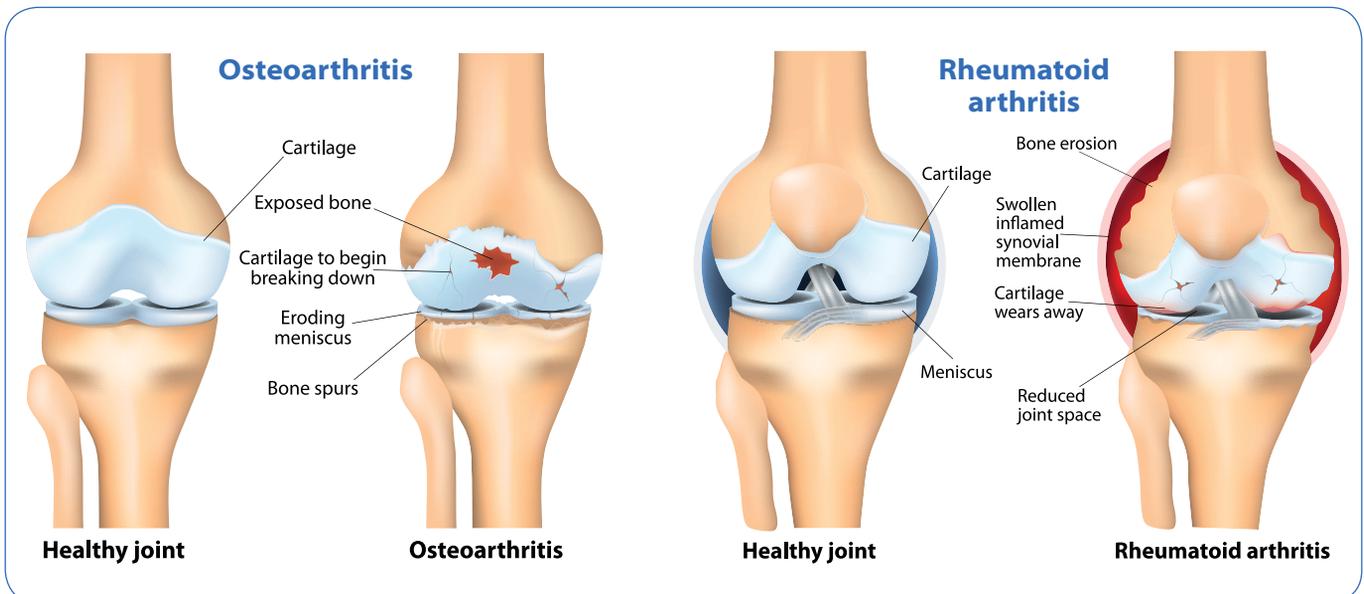
Human studies have also demonstrated a good safety record, showing mild side effects comparable to those seen in placebo subjects.^{4,8}

Chinese Skullcap and Cutch Tree Extracts Outperform Standard Pain Relievers

Chinese skullcap (*Scutellaria baicalensis*) is rich in a compound called **baicalin**, with known anti-inflammatory properties that complement those in **cutch tree** (*Acacia catechu*).^{9,10}

Animal and basic lab studies have established that the combination of these two herbs acts as a dual inhibitor of inflammatory signaling molecule production and activity, and is capable of significantly reducing pain and swelling.^{3,8,11-14}

Two important human randomized, controlled trials have emerged, demonstrating that, in people with



osteoarthritis, the *Scutellaria/Acacia* extract combination performs as well, or better, than the NSAID pain relievers most commonly used to treat osteoarthritis.

One study, conducted by pain relief experts in Montreal, included 52 subjects (40-75 years old) with osteoarthritis of the knee or hip severe enough to require treatment.¹⁵

Subjects were randomly assigned a placebo, **200 mg/day** of the **celecoxib**, or one of two doses of the combination **herbal** supplement (**250** or **500 mg/day**). Study subjects were followed-up at 30, 60, and 90 days for pain, stiffness, functional impairment, and physical function using standard measurement scales.



Study results were impressive, showing that at days 30 and 90, both doses of the dual-action supplement were significantly more effective at **reducing pain** than celecoxib. The higher, **500-mg/day** herbal dose proved superior to celecoxib already at day 30, and was superior to placebo by the 90-day endpoint of the study. By contrast, celecoxib was not significantly more effective than placebo at days 30 or 90.

For **reducing stiffness**, both herbal supplement doses were effective at all time points compared with baseline measures.¹⁵ Similarly, both doses were superior to placebo for stiffness relief at 30 and 90 days, while no changes compared with baseline stiffness were seen in either the placebo or the celecoxib groups.

Functional impairment was significantly better in the **500 mg herb-supplement** group compared to **celecoxib** or **placebo** at all time points, with a significant improvement compared with baseline as well, an effect not seen in either the celecoxib or placebo groups.

Finally, scores for **physical function** were significantly improved compared to baseline for both doses of the herb-supplement combination and for celecoxib at all time points, while by day 90, the supplement was superior to celecoxib.

No significant adverse events were reported, and screening blood tests showed no abnormalities in any of the groups.

What is Osteoarthritis?

Arthritis is an imprecise term, meaning simply “inflammation of a joint.” Types of arthritis include **osteoarthritis** (formerly called “degenerative arthritis”) and **rheumatoid arthritis**, which is an autoimmune disease in which the body attacks and destroys its own joints.

A thick layer of cartilage lines the surfaces of the bones that form a normal healthy joint, providing lubrication and protection against wear and tear from everyday movement.

Cartilage is made up of extracellular material, primarily water, collagen, and specialized proteins called proteoglycans, which break apart over time.⁴

For many years, scientists and physicians thought that inflammation was a key feature only of rheumatoid arthritis, and that osteoarthritis was a simple, natural, and inevitable degeneration of joint components, primarily cartilage and bone.

That simplistic picture has changed.

Scientists now recognize that **inflammation** does indeed play a crucial role in osteoarthritis, contributing directly to the loss of cushioning cartilage, and eventually bone, that we see in this debilitating and potentially crippling condition.

Signs and symptoms of osteoarthritis are consistent with progressive, inflammation-promoted loss of cartilage, eventually leading to pain, stiffness, and loss of mobility.¹ As the collagen matrix that makes up cartilage becomes disorganized, bits of collagen enter the joint space, where they induce a further inflammatory reaction.¹⁷⁻¹⁹

Osteoarthritis can become severe enough that cartilage thins to become virtually absent, leading to bone grinding directly on bone, producing severe pain and ultimately leading to joint destruction and immobility.

Scientists can now measure products of cartilage degradation that are excreted in the urine—a molecule called **C-terminal crosslinking telopeptide of type II collagen** (CTX-II) is a valid indicator of the degree of collagen loss, and therefore a useful measure of disease progression.²⁰

CTX-II is therefore a useful standard by which to measure the **disease-modifying** potential of any drug, supplement, or other therapeutic intervention. As shown in this article, the combination of *Morus alba* and *Acacia catechu* extracts significantly reduced urinary concentrations of CTX-II in subjects with knee osteoarthritis, indicating a disease-modifying capability.



Follow-Up Second Human Study

A second study extended these impressive findings, comparing a daily **500 mg**-dose of the combined **herbal** supplement with the NSAID **naproxen, 440 mg/day**, in 79 adults aged 40-90 years, with mild to moderate osteoarthritis.¹⁶

This study lasted just one week to evaluate the short-term effects of this supplement combination.

Results showed that, for pain, the **Scutellaria/ Acacia** supplement significantly reduced pain scores from baseline to end of study, with no significant reduction seen in the naproxen recipients.¹⁶

Both herbal- and naproxen-treated patients had significant reductions of stiffness from baseline to final values, whereas the herbal group, but not the naproxen group, had significant improvements in joint range of motion compared with baseline. Naproxen recipients had an insignificant decrease in range of motion.

These two studies, combined with the wealth of lab and animal data, establishes a role for *Scutellaria baicalensis* and *Acacia catechu* extracts in combination for reductions in the pain, stiffness, and loss of mobility seen in patients with osteoarthritis, and strongly suggest its superiority to existing NSAID drugs.

Summary

Osteoarthritis is a potentially crippling joint condition suffered by millions of Americans, for whom pain relief has only been possible through the use of damaging NSAID drugs or opioid narcotics, none of which make any difference in severity or progression of the disease.

Three **herbal extracts** have been shown to reduce the destruction of cartilage and bone in osteoarthritis, while outperforming two popular NSAID drugs at relieving pain, stiffness, and loss of mobility.

Now available in a single convenient supplement, standardized extracts *Acacia catechu*, *Morus alba*, and *Scutellaria baicalensis* can bring significant pain relief to osteoarthritis sufferers, while exerting a true **disease-modifying** effect unlike any existing pain medication.

People with moderate to severe osteoarthritis should consider trying this herbal combination in an effort to avoid the potentially destructive long-term effects of NSAID and narcotic drugs. ●





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

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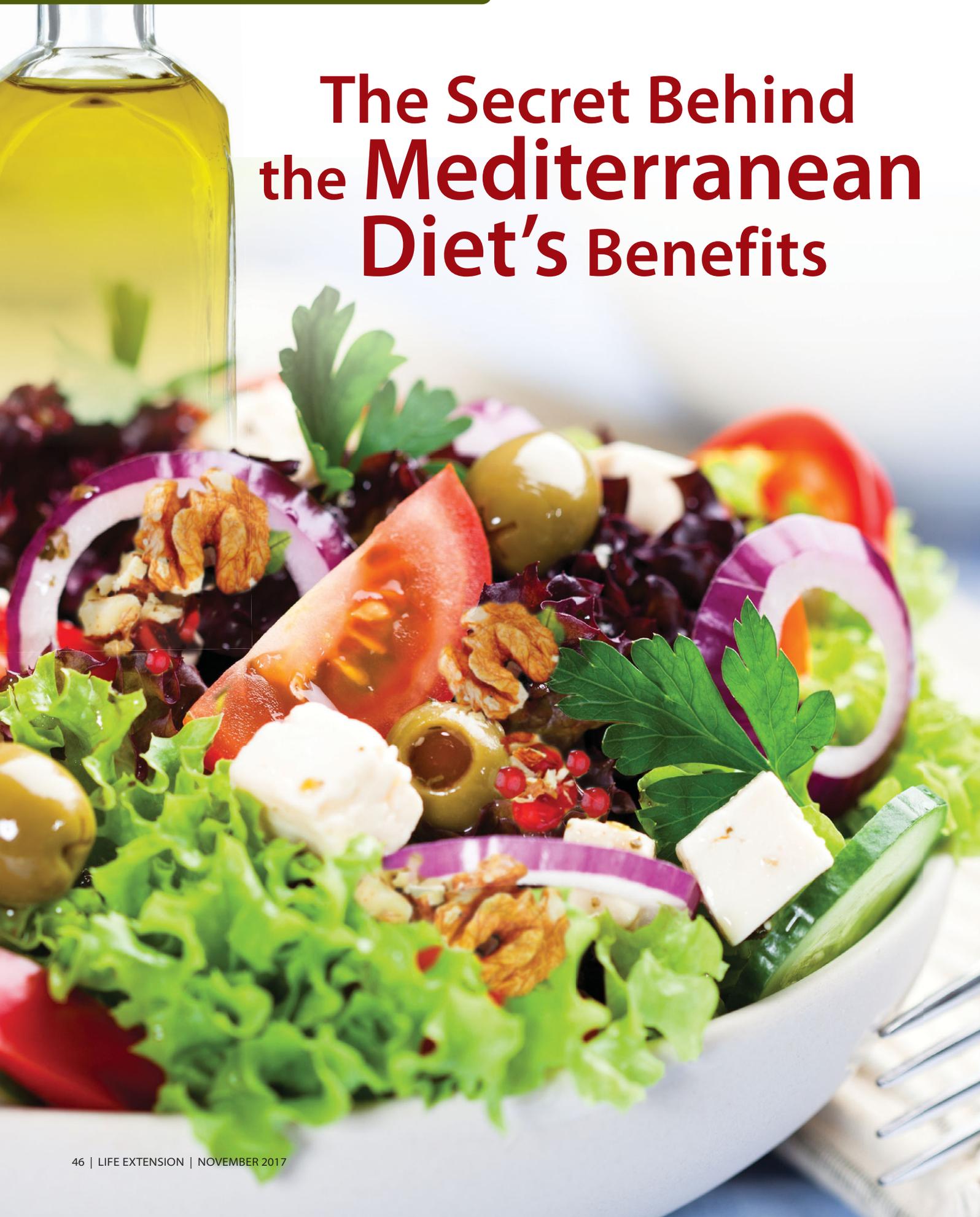
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BY MICHAEL DOWNEY

The Secret Behind the Mediterranean Diet's Benefits





Abundant research continues to reveal the longevity benefits of the **Mediterranean diet**. But we never knew the main factor behind the diet's remarkable effects...*until now*.

Research has revealed that the polyphenols (a plant-based compound) found in the Mediterranean diet may be responsible for its ability to reduce mortality risk.¹⁻³

This is the diet's prime **weapon** driving its capacity to lower risks of heart attack, stroke, high blood pressure, and inflammatory markers.²⁻⁴

In a just-published study, researchers found that those eating a Mediterranean diet experienced about a **60%** reduction in cardiovascular risk.⁵

Most people fail to obtain sufficient **polyphenols** on a daily basis. A recent study recommended that people should ideally eat 10 servings of fruit and vegetables every day to reduce disease risk.⁶ For most people this is nearly impossible.

Using a water-based technology, researchers have found a way to naturally extract an array of **polyphenols** from Mediterranean food sources such as walnuts, artichokes, lentils, grapes, pomegranates, olives, and more.

Health and Longevity Effects

The Mediterranean diet is rich in fresh fruits and vegetables, whole grains, nuts, legumes, fish, wine, olive oil, and lean meat. Its overall longevity benefits have been well-documented in published studies.

Research has shown that following this diet is *specifically* associated with improvements in blood pressure, insulin sensitivity, lipid and lipoprotein profiles, inflammation, oxidative stress, and carotid atherosclerosis.^{7,8}

In fact, not only has the Mediterranean diet been linked in *epidemiological* research to a remarkable **37% reduction** in mortality among cardiovascular-disease patients⁹—but scientists have also demonstrated in a controlled clinical trial that this diet reduces mortality as a direct intervention.⁴ Even greater reductions in heart disease and stroke risk of about **60%** were recently discovered by Italian scientists.⁵

The benefits of the Mediterranean Diet have been of great interest to scientists for years, and recent research is confirming that, with its impressive content of polyphenols, it can reduce mortality.

Human Studies on Heart-Disease Reduction

Last year at the **European Society of Cardiology Congress**, a study was presented that analyzed the survival rates for cardiovascular disease patients who followed the Mediterranean Diet. The study lasted over seven years and showed that people who ate the Mediterranean Diet died **37%** less than those who ate a non-Mediterranean Diet.⁹

In many ways, following the Mediterranean Diet provides more protection against heart disease than many of today's prescription drugs.¹⁰

In one study, investigators wanted to evaluate the impact of the diet on blood pressure in the elderly, a high-risk population for heart disease and stroke.

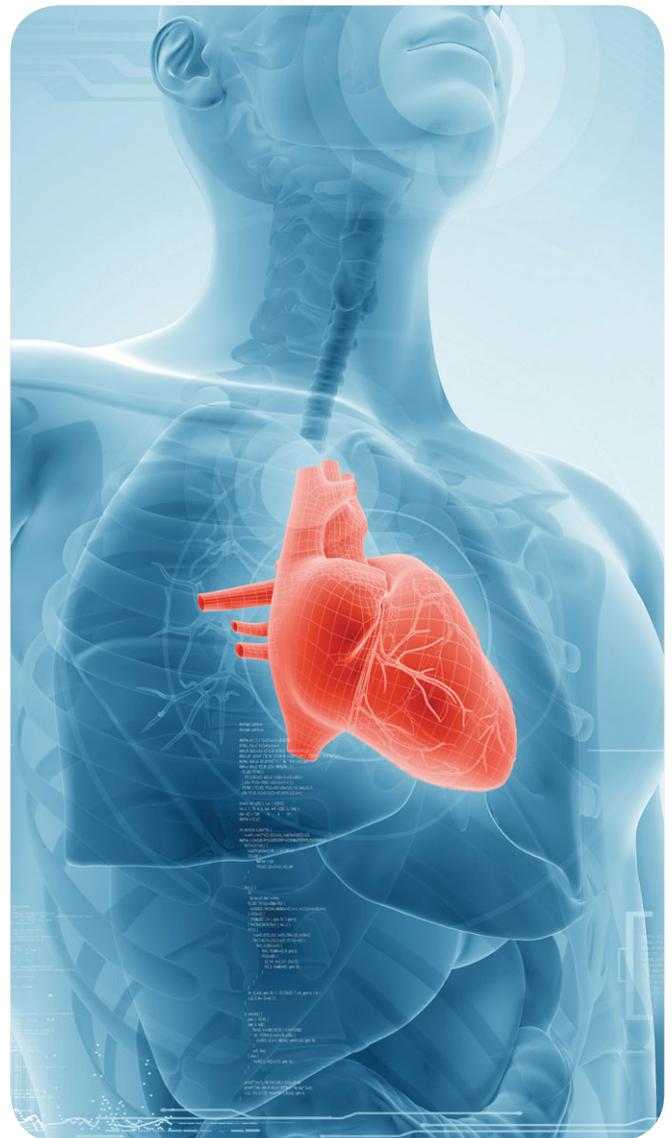
During this *year-long study*, patients were provided with a choice of two slightly different versions of the Mediterranean diet *or* a low-fat diet. One was the typical Mediterranean diet *with added extra-virgin olive oil* and the other, a typical Mediterranean diet *with added nuts*. It is important to note that both of these diets were rich in *healthy fats* as opposed to the low-fat diet eaten by the control group.³

After one year, both of the Mediterranean diets (with added olive oil or added nuts) led to *reductions* in diastolic and systolic blood pressure. Interestingly, what the scientists found in the Mediterranean diet group were *increased* levels of **polyphenols** being excreted in the urine and *increased* production levels of **nitric oxide**, the body's natural blood-vessel relaxant and a

biomarker of good cardiovascular function and healthy aging.¹¹ The implication was that the rich supply of **polyphenols** in this diet stimulated the body's natural defense mechanisms against high blood pressure.³

In a larger follow-up substudy published in **2017**, researchers analyzed 1,139 participants at high risk for cardiovascular disease on the two Mediterranean diets (with added olive oil or nuts) or the control low-fat diet to determine if polyphenol levels were associated with inflammatory markers.² Chronic inflammation is a recognized fundamental contributor to cardiovascular disease, and polyphenols are known anti-inflammatory agents.

After one year, participants who followed either of the two Mediterranean diets showed the greatest increase in urinary polyphenols vs those who ate the low-fat diet.





What You Need to Know

Polyphenols: A Key Factor from the Mediterranean Diet

- Recent research reveals that the polyphenol abundance in the Mediterranean diet may be primarily responsible for its potent cardioprotective, metabolic, and longevity effects.
- Consistently replicating the Mediterranean diet is challenging.
- A novel extraction process has allowed scientists to concentrate these specific polyphenols into capsule format, making it possible to be certain that you are getting a wide array of polyphenols every day.

In a vivid illustration of the impact that increased polyphenols have on reducing inflammation, the Mediterranean diet groups not only had increased urinary polyphenols but *also* had significantly *lower levels* of **five** important markers of inflammation that correlate with cardiovascular risk. These include:²

- Vascular cell adhesion molecule-1 (VCAM-1),
- Intercellular adhesion molecule-1 (ICAM-1),
- Interleukin-6 (IL-6),
- Tumor necrosis factor alpha (TNF-alpha), and
- Monocyte chemotactic protein-1 (MCP-1).

The people who experienced the greatest rise in polyphenol levels were shown to have significantly lower systolic and diastolic blood pressure, as well as increased levels of beneficial HDL cholesterol, compared to those with the lowest polyphenol elevations.²

Reduction in Brain Shrinkage

In a **2017** study published in the journal *Neurology*, researchers demonstrated that individuals who closely followed the Mediterranean diet experienced **half** as much age-related brain shrinkage as those who were less faithful to the diet.¹²

But aside from recognizing the role of the Mediterranean diet, the exact details of the underlying secret behind the diet's benefits had never been established. Finally, scientists have found strong evidence that the credit goes to the specific **polyphenols** abundantly found in the key foods.

The takeaway from these studies? The diverse array of polyphenols in the specific foods of the Mediterranean diet constitute what is very likely one of the most important factors behind its protection against catastrophic heart disease, stroke, brain shrinkage, and cardiovascular-related mortality.^{1-3,7,8,12}



Intense Bioactivity of Polyphenols

Consuming the foods in the Mediterranean diet—including fruits, olive oil, nuts, legumes, and vegetables—delivers a potent arsenal of **polyphenols**. Polyphenols play critical roles in neutralizing free radicals, anti-inflammation, and cell signaling, and they have been associated with a reduced risk of many of the same diseases as the Mediterranean diet itself.⁷

When the diverse polyphenols arrive in the colon, bacteria break them down into smaller molecules, notably *phenols*.⁷ These phenols (and other polyphenol-derived molecules) are then carried to the liver, where they are further transformed before being released into the circulation for transport to specific tissues that greatly benefit from their bioactive effects.⁷

For example, one of these phenols, resulting from the breakdown of polyphenols in the colon, travels to the liver. There it can act on various bone-marrow progenitor cells that circulate to tissues throughout the body, where they signal for new cell and tissue generation, particularly turning on bone-cell lines and turning off fat-cell lines.⁷

This body-wide bioactivity explains a compelling study conducted on 807 men and women aged 65 and over that was published in *The Journal of Nutrition*.

Those in the highest third of total urinary polyphenols (which reflect circulating levels of polyphenols in the blood) had a **30%** lower all-cause mortality over the 12-year follow up, compared with those in the lowest third.¹

Harnessing the full power of the Mediterranean diet requires including sufficient amounts of the broad assortment of its key polyphenol-rich foods. Fortunately, an exciting new option is available.

Meeting the Polyphenol Targets of the Mediterranean Diet

Data shows that achieving the longevity benefits of the Mediterranean diet may require eating ten servings of fruits and vegetables *a day*.⁶ For most people this is a major challenge and may hinder their chances of receiving all the longevity benefits associated with this diet.

However, an innovative **water-based** process has been developed that safely extracts high quality polyphenols from a number of Mediterranean foods.

After pressurization, water can more powerfully break down plant-cell walls and solubilize bioactive compounds, which substantially enhances extraction. By lowering its polarity, this unique technology causes the water to create purified and potent phytonutrient extracts.

This process is then combined with a method that preserves the bioactive compounds by removing water through evaporation. The result is a **highly concentrated** extract, free of solvents and containing bioactives previously considered unrecoverable.

Using this process, scientists have concentrated a wide array of polyphenols extracted from **seven** of the most polyphenol-rich foods in the Mediterranean diet.

Let's examine each of these extracts separately.

Polyphenol Extracts of Mediterranean Foods

Research documents that **87%** of Americans fail to get the recommended intake of vegetables,¹³ **76%** fall short on fruit intake,¹³ and most do not consume sufficient legumes and nuts.^{14,15}

The following extracts support the Mediterranean diet's capacity to block insulin insensitivity, oxidative stress, inflammation, brain shrinkage, and especially reduce cardiovascular disease—and to lower all-cause mortality.^{1-4,7,9,12}

Grape-Seed Extract

Loaded with polyphenols, grape-seed extracts reduce oxidized LDL cholesterol (an early atherosclerosis trigger) and prevent oxidized LDL from binding to its receptor on endothelial cells, a highly vascular-protective effect.^{16,17} They prevent the death of cardiac muscle cells¹⁸ and activate eNOS (the enzyme responsible for producing nitric oxide).^{19,20}

Critically, grape-seed extracts also prevent low-grade inflammation—a key contributor to atherosclerosis and cardiovascular risk—by inhibiting the production of inflammatory signaling molecules (cytokines).²¹

Olive-Leaf Extract

Olives are central to the Mediterranean diet. Polyphenol extracts of the leaf of the olive have been shown to powerfully protect cultured heart muscle cells from destruction caused by intense oxidative damage.²² They decrease oxidative-stress-induced tissue damage and boost intracellular resistance systems.²³

In a rat model of metabolic syndrome, these extracts improved or normalized abdominal- and liver-fat accumulation, excessive collagen deposition in the heart and liver, cardiac stiffness, poor glucose tolerance, and abnormal lipid profiles.²⁴

Pomegranate Extract

The various anti-inflammatory effects of pomegranate peel extracts are particularly beneficial for people at risk for cardiovascular disease.²⁵

For example, these extracts increase resistance to oxidative stress in animals with high cholesterol.^{26,27} They have been found to reduce the accumulation of oxidized LDL cholesterol in the foam cells found in the earliest stages of atherosclerosis, shrinking plaque size by up to **39%**.²⁸ And impressive studies show that pomegranate extracts reduce the overall cholesterol burden by promoting cholesterol flow out of these cells by **147%**.²⁶





Walnut Extract

Extracts of polyphenol-rich²⁹ walnuts inhibit highly inflammatory LDL oxidation in human plasma.³⁰ In addition, walnuts have been shown to reduce aortic plaque development in mice by **55%**, while lowering plasma triglycerides **36%**, cholesterol **23%**, and prothrombin (a blood-clot formation enhancer) **21%**, compared to controls.³¹

Pecan Extract

Associated with reductions in cardiovascular disease risk—in part due to their important role in reducing LDL cholesterol³²—pecans boost plasma antioxidant capacity in the critical *after-meal period*, helping to decrease the oxidation of LDL cholesterol that leads to atherosclerosis.³³

Artichoke Extract

Extracts made from the leaf, stem, and root of artichokes—another staple of the Mediterranean diet—have demonstrated numerous cardioprotective effects, such as inhibiting cholesterol synthesis and LDL oxidation.^{34,35}

Lentil Extract

Prominent in the Mediterranean diet, lentils abound in fiber, B vitamins—and polyphenols. Lentil extracts have been shown to prevent high blood pressure induced by the hormone angiotensin-II (a vessel-constricting signaling molecule), which helps protect against arterial narrowing.³⁶

When combined into a single supplement, these food extracts provide the **broad spectrum** of unique polyphenols that give the Mediterranean diet its unparalleled longevity effects.

Summary

The Mediterranean diet is well known for its cardioprotective, metabolic, and longevity effects. Recent studies have confirmed that these impressive benefits may stem primarily from the diet's extremely rich **polyphenol** content.

For most people, consuming enough Mediterranean diet foods every day can be extremely difficult.

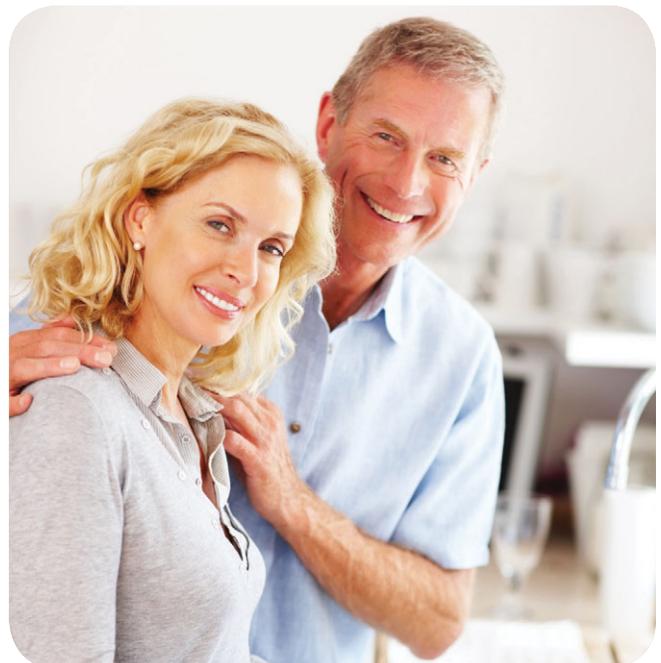
Fortunately, a novel extraction process has made it possible to concentrate these specific polyphenols into a capsule. This allows you to be certain that you're getting enough of the Mediterranean diet's polyphenol content on a daily basis. ●

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Blueberries Enhance Brain Blood Flow

BY AMANDA GHERING

Numerous studies have shown the brain-boosting benefits of blueberries, especially with regard to cognition and improved memory.

Now, an important **human** study has confirmed the connection between blueberries and brain health.

This study showed that blueberries increase brain activity and improve working memory. It is the first to link these cognitive benefits to specific changes in brain function and improvements in **brain blood flow**.¹

Brain **blood flow** is a vital component of brain function, memory, and cognition.²

Diminished **brain blood flow** is a cause of ischemic stroke, mild cognitive impairment, and neurodegenerative disorders.³⁻⁵

One of many ways that **blueberries** promote brain function is to improve cerebral circulation, which has strong implications in helping to combat **neurodegenerative** disorders.

Blueberry Enhances Brain Activation

Research has shown that the flavonoids found in blueberries protect brain cells from oxidative stress and inflammation.⁶

British researchers conducted a study investigating the impact of using a blueberry concentrate or a placebo for 12 weeks in two groups of older adults (averaging 68 years old).

Their focus was on brain blood flow, localized brain activation, and cognition.¹

What makes this study unique is that the scientists evaluated subjects' brain function with a battery of cognitive tests *while the subjects were inside a powerful MRI scanner*. This allowed the researchers to observe brain activity in **real time**, while the subjects performed the tests.¹

This is called a *functional MRI* (or "fMRI"), and it allows the researchers to detect the activity of areas of the brain that are in use for specific cognitive functions. They can then correlate that activity with the amount of blood flowing to those brain regions.⁷

Here are findings from this study revealing how blueberries benefit brain health:

1. Blueberries increased brain activity. Compared to the placebo group, subjects in the blueberry-supplemented group showed *significant increases* in brain activity while taking the cognitive tests.¹ The relevant brain areas were those called upon for performance of each of the tests.

2. Blueberries improved blood flow to the grey-matter brain regions. In the blueberry group, the brain blood flow was *significantly improved* in the grey matter of the parietal and occipital lobe.



This is where sensory, touch, and visual information is processed.¹ Such changes were not significant in the placebo recipients.

3. Blueberries improved working memory. The blueberry-supplemented people demonstrated improved working memory compared with those receiving placebo.¹ Working memory has to do with holding temporary information, like remembering those five items you needed at the grocery store. It's also important for decision-making.⁸

This seminal study revealed in real time the impact of blueberries on cognition in human subjects. It is also the first to link blueberries' cognitive benefits to specific changes in brain function and blood flow.

One reason this is exciting is because *diminished brain blood flow* can sometimes be a cause of acute events like strokes. It also underlies more chronic, slowly progressive problems such as mild cognitive impairment, and it is associated with neurodegenerative disorders such as Alzheimer's.³⁻⁵

This impressive human study shows us that blueberry anthocyanins have the capacity to enhance brain blood flow, potentially preventing further mental decline.¹

Blueberries Enhance Cognition

Two previous human studies of blueberry supplementation and cognition provide some context.

In one case, researchers evaluated a small group of older adults with early changes in their memory, which is often one of the first warning signs of more severe trouble to follow.⁹

When the subjects consumed wild blueberry juice daily for 12 weeks, they experienced significant improvements in learning and memory functions (there were also statistical trends suggesting a reduction in depressive symptoms and glucose levels).

A later comparison of this data with a separate placebo group confirmed the learning improvements in the supplemented subjects.⁹

This study provided one of the *earliest* human indicators of the effect of blueberries on cognition when taken over a period of a few weeks.

Fast-Acting Brain Boost

A more recent study examined the *acute* impact of blueberry supplementation on cognitive function in children to determine how quickly any cognitive improvements made their appearance.¹⁰

Children ages 7-10 years old received either a placebo drink, or one containing low- or high-dose freeze-dried wild blueberry powder. They underwent a battery of cognitive tests before supplementation, and at 1.25, 3, and 6.25 *hours* after supplementation.

Compared with placebo, the blueberry group showed significant improvements in **memory** in as few as 1.25 *hours*, improvements in word recognition over the entire evaluation period, and improved **accuracy** on cognitively demanding tests by 3 hours.¹⁰

The higher dose consistently produced better results than the lower dose or placebo across all tests.

This study demonstrates the *fast-acting* nature of blueberry constituents on brain tissue—and shows just how quickly this leads to improvements in everyday, practical brain performance.

Numerous laboratory and animal studies have given us insight into the broad-spectrum, multitargeted *mechanisms* by which blueberries enhance brain performance.

Multitargeted Brain-Boosting Mechanisms

The decline in cognitive function that occurs with aging is the result of the complex interactions of myriad cellular and molecular events. To improve cognition, any intervention must be capable of addressing multiple degenerative factors.

Studies are showing that blueberries and their anthocyanin constituents act at precisely the multiple targets necessary to *prevent* age-related cognitive decline, and, potentially, to reverse at least some of its features.

A growing body of animal research documents that blueberry supplementation can not only prevent cognitive decline and memory deficits, but can also *enhance* cognitive function.¹¹⁻¹⁶

We noted earlier that blueberry anthocyanins enhance brain blood flow,¹ which is critical, since diminished brain blood flow is a root cause of mild cognitive impairment and neurodegenerative disorders.³⁻⁵

Another powerful and far-reaching cause of deteriorating cognition and memory in aging adults is *excitotoxicity*.¹⁷ This term describes the damage done to brain cells by persistent *excitatory* stimuli, which are those that trigger ever-increasing activity of brain cells. This activity generates massive oxidative stress, and over time it results in chronic, low-grade inflammation, which imposes even more oxidative stress in a vicious, age-promoting cycle.¹⁸

Lab studies show that blueberry *polyphenols* can fight the brain cell-destroying effects of excitotoxicity, the oxidative stress it induces, and the resulting *inflammatory* damage.^{6,11,17}



Not Everyone can Afford Blueberries

Blueberries in stores can be expensive. This is in part due to the high rate of spoilage if they are not sold and eaten quickly and the price of shipping this heavy fruit.

A more cost-effective way of receiving the benefits of the active components in blueberries is to take a blueberry extract supplement every day. These, on the other hand, are inexpensive, since shipping and spoilage are not an issue.



Supplementation studies in rats reveal that **whole blueberries** also fight **oxidative stress** directly, providing an important layer of additional protection.¹⁹

Blueberry supplementation in aged animals also promotes levels of a **growth factor** called BDNF, which enhances brain cell growth and repair, with clear-cut improvements in certain types of memory formation.¹²

And now, blueberries have been shown in rats to protect against the toxicity caused by **beta-amyloid** proteins, which are implicated in Alzheimer's disease.²⁰ Beta-amyloid imposes massive oxidative stress and triggers inflammation in brain tissue—effects that blueberries combat with precision, in part by promoting natural defense systems in brain tissue, and in part by downregulating inflammatory responses.^{20,21}

Research also shows that blueberry supplements can fight the accumulation of equally toxic

tau proteins associated with both Alzheimer's and Parkinson's disease.²²

It's important to note that in many of these animal studies, blueberries' effects are most prominent in protecting or enhancing **spatial** and **working** memory.^{6,12,14-16}

Spatial memory is what we use to locate things and people in three-dimensional space. Defects in spatial memory are associated with distressing behaviors, such as getting lost or wandering off.

Working memory is the brain's central processing function, where memories and current sensory inputs are integrated to produce an appropriate response, such as joy on encountering a loved one, or suspicion on hearing a deal that's too good to be true from a telemarketer.

The animal and lab studies presented here show the promising impact that blueberries may have in improving the quality of

life of older adults with memory dysfunction, and ease the load on their caregivers as well. We look forward to seeing further human research confirming these findings.

Summary

Aging Americans are at risk for cognitive decline, neurodegenerative disorders, and strokes.

Underlying the epidemic of dwindling cognitive function is a small group of age-accelerating factors: declining brain blood flow, excitotoxicity from overactive brain cells, chemical stress, inflammation, and accumulation of toxic proteins in brain tissue.

A human study has now shown that supplementation with blueberries can improve brain blood flow, brain activity in memory- and cognition-intensive regions, and, most importantly, can enhance cognitive function.

Lab and animal studies demonstrate that blueberries and their active polyphenol constituents such as anthocyanins have multiple additional targets for their beneficial activity. These include potent chemical stress-protection, anti-inflammatory properties, prevention of toxic protein accumulations, and fighting the long-term effects of excitotoxicity.

Scientific studies continue to show that supplementing with blueberries can help protect against the detrimental effects of age-accelerating factors, which may help preserve cognition and memory well into advanced age. ●

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

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BY BEN BEST

EXCLUSIVE CONFERENCE REPORT

INSULIN *Resistance* and OBESITY





Insulin is a major hormone controlling systemic metabolism. Insulin-related defects are associated with **diabetes**.

In **type I diabetes**, there is no insulin production by beta-cells in the pancreas. In **type II diabetes**, not only do beta-cells not function well, but various organs of the body become resistant to insulin action.

The major cause of insulin resistance is obesity,¹ either because of excess fat interfering with insulin action,² or because of interference of insulin action by inflammation resulting from obesity³ or both. Obesity can shorten lifespan by many years.⁴

Elevated blood insulin due to insulin resistance or other causes increases **obesity**, whereas a reduction in blood insulin can enable **weight loss**.⁵ It's a vicious circle of obesity increasing insulin resistance and insulin resistance increasing obesity.

A major function of insulin is to cause glucose to enter cells. Muscle absorbs more glucose with the help of insulin than any other body tissue, so **insulin resistance** of muscle results in the greatest elevation of blood **glucose** and **insulin**.¹

Glucose entering fat cells is converted to fat for energy storage. When fat cells become insulin resistant, they dump fats into the bloodstream which become abnormally deposited in other tissues, causing those tissues to become insulin resistant.⁶

Insulin action on the liver is more complex. Normally the liver releases glucose into the bloodstream, but when insulin rises after a meal, the insulin should suppress liver glucose release while stimulating the liver's conversion of glucose to fat. For an insulin resistant liver, insulin does not suppress liver-glucose release and increases the conversion of glucose to fat (more fat production).¹

Insulin resistance most often originates in fat tissue (due to obesity), skeletal muscle, or the liver (due to excess fructose or alcohol consumption), but will eventually cause some insulin resistance in all of the insulin-responsive organs and tissues.⁶

Chronic high blood-glucose due to insulin resistance damages many tissues, which is why so many diabetics suffer from neuropathy, kidney damage, blood-vessel damage, and damage to the pancreas beta-cells such that insulin can no longer be secreted.⁷

The presentations below are mostly taken from the **December 2016** World Congress on Insulin Resistance, Diabetes & Cardiovascular Disease, or the **January 2017** Keystone Symposium on Obesity and Adipose Tissue Biology.

Macrophages Causing Insulin Resistance

Anthony Ferrante, MD, PhD (professor of medicine, Columbia University, New York City), has studied the relationship between obesity, macrophages, and insulin resistance.



Macrophages are white blood cells of the immune system that can promote wound-healing during acute inflammation by “eating” pathogens and debris.

In obesity, expansion of fat cell mass can lead to reduced blood flow⁸ and increased fat-cell death, which attracts macrophages to clean-up the dead-cell debris.⁹

Dr. Ferrante has shown that macrophages accumulate in fat tissue in proportion to the amount of obesity.¹⁰ He estimates that fat tissue in lean humans consists of less than **10%** macrophages, but that there are nearly **40%** macrophages in the fat tissue in very obese humans.¹⁰

The macrophages in fat tissue become engulfed with ingested fat, developing a “foamy” appearance similar to the fat-filled macrophages in blood-vessel walls that contribute to atherosclerosis.¹

The chronic inflammatory factors produced by persistent resident macrophages in fat causes **insulin resistance**.¹¹

These macrophages become incapable of many cellular functions, including the **autophagy** that could remove malfunctioning mitochondria. The result is mitochondria that produce large quantities of free radicals.¹² It is thus understandable that approximately **85%** of **type II diabetic** patients are insulin resistant and obese.¹²

Brown Fat May Reduce Obesity

Aaron Cypess, MD, PhD (acting section chief, National Institute of Diabetes and Digestive and Kidney Diseases, Bethesda, Maryland), is interested in the possible use of **brown fat** to treat obesity and obesity-associated problems.



Unlike white fat, **brown fat** generates heat by containing large amounts of mitochondria¹³ (which creates the brown color). Brown fat is plentiful

and active in newborn babies, which protects them from cold. Most fat in adults is white fat. It was only recently learned that brown fat exists at all in adults. Brown fat declines with age, and especially declines with the increased white fat due to obesity.¹³

In contrast to the **inflammatory cytokines** produced by white fat, **brown fat** produces more anti-inflammatory factors.¹⁴ Brown fat can consume large amounts of glucose and fat from the bloodstream.¹⁵

Brown fat transplanted from one age-matched mouse to another decreased body weight, fat mass, and insulin resistance.¹⁶ Cold exposure stimulates brown fat development. Lean, healthy human volunteers subjected to 50°F for two hours daily for four weeks showed a **45%** increase in brown fat volume and a **2.2 times** increase in brown fat activity.¹⁷

To investigate the possible use of brown fat to treat obesity, Dr. Cypess administered the adrenalin-like drug **mirabegron** to healthy human volunteers. The volunteers experienced increased basal metabolic rate, much of which was due to increased brown fat activity. But heart rate increased by about 14 beats per minute, and systolic blood pressure increased by about **11 mmHg**.¹⁸ These effects are not good for health. Dr. Cypess would like to increase brown fat activity without negative side effects.

Endothelial Cell Insulin Resistance

Zachary Bloomgarden, MD (clinical professor of Medicine, Mount Sinai School of Medicine, New York City) spoke of the role of blood-vessel insulin resistance in cardiovascular disease.



Endothelial cells lining the walls of blood vessels mediate insulin action by transporting insulin to muscle, heart, fat, and brain. When the endothelial cells become **insulin resistant**, insulin transport is reduced and blood-vessel dilation is impeded

(**endothelial dysfunction**).¹⁹

Free radicals due to obesity cause endothelial cell dysfunction leading to insulin resistance.²⁰ Endothelial-cell insulin resistance is associated with fat tissue surrounding blood vessels becoming inflamed, thereby increasing blood-vessel stiffness.²¹ Sustained high blood-glucose is also associated with increased arterial stiffness.²²

Blood vessel stiffness increases systolic blood pressure and decreases diastolic blood pressure, resulting in failure of the heart to function properly.²³ Endothelial-cell insulin resistance leads to high blood pressure and atherosclerosis.²⁴

Obesity in Children and Adolescents

Sonia Caprio, MD (professor of pediatric endocrinology, Yale School of Medicine, New Haven Connecticut), studies obesity and diabetes in children and adolescents.



She showed that about **10%** of obese children between ages 4 and 18 who had not been glucose intolerant developed glucose intolerance within two years. Of those who had initially been glucose intolerant, **24%** developed type II diabetes within two years.²⁵ This rate of metabolic deterioration is much faster than what is seen in obese adults.²⁶

Most women show some increase in insulin resistance during pregnancy, which is of benefit to the fetus by facilitating glucose²⁷ and fat²⁸ transport across the placenta. But insulin resistance is greater in pregnant women who are obese. Such women have a greater risk of miscarriage or of congenital abnormalities in the infant.²⁹

The question of whether women who develop diabetes during pregnancy (**gestational diabetes**) cause their children to develop diabetes has been hard to establish because of shared genes and lifestyle between mother and child.³⁰

Dr. Caprio showed that nearly a third of obese children between ages 4 and 20 born from mothers who had gestational diabetes developed type II diabetes or impaired glucose tolerance within the three year period of being studied.³¹ A plant-based Mediterranean-style diet may benefit both mother and child during gestational diabetes.³²

Incretins: GLP-1 and GIP

Jens Holst, MD (professor of medical physiology, University of Copenhagen, Copenhagen, Denmark), studies the effects of **incretins** in type II diabetes.



Incretins are hormones secreted by the small intestine in response to glucose from a meal. More than half of the insulin released by the pancreas from a meal is due to the two incretins **GLP-1** (glucagon-like peptide 1) and **GIP** (glucose-dependent insulinotropic peptide).³³

Small meals mostly activate GIP, which is from the upper small intestine, whereas GLP-1 in the lower part is also activated when a meal is large.³³ GLP-1 enhances insulin synthesis and reduces appetite.³³ GLP-1 also makes liver and muscle cells more sensitive to insulin.³⁴

In type II diabetes GLP-1 secretion is reduced, whereas GIP secretion is not.^{34,35} But GIP ceases to cause insulin secretion in diabetes, whereas GLP-1 retains its capacity to stimulate insulin secretion.³⁵

The antidiabetic drug **metformin** enhances GLP-1 secretion,³⁶ among its other effects.

Natural GLP-1 or synthetic GLP-1 analogs have been shown to result in significant **weight loss** when administered to obese humans.³⁷ Dr. Holst conducted a study administering **GIP** to persons at risk for type II diabetes in hope of benefit, but found an increase in visceral fat among men.³⁸

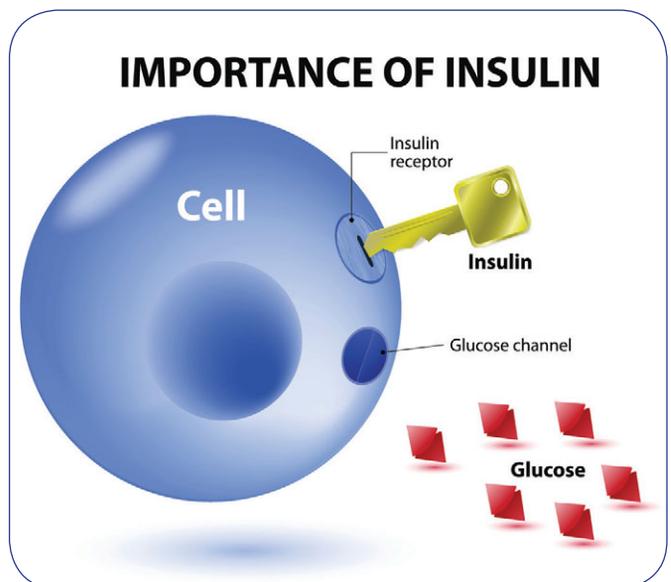
Treating Obesity With Bacteria

Patrice D. Cani, PhD (professor, Universite catholique de Louvain, Brussels, Belgium). Obesity has



often been associated with reduced levels of gut bacteria in the phylum **Bacteroides**, and increased levels of bacteria in the phylum **Firmicutes**.³⁹ But phylum is a classification rank that includes too many species, and can be misleading. In particular, *Firmicutes* includes both harmfully infectious **Clostridia** (including tetanus and botulism), and beneficial **Lactobacillus** (found in yogurt).

Dr. Cani has shown that mice treated with prebiotics (oligofructose) show increased release of GLP-1 and reduced insulin resistance.⁴⁰ He has also shown that mice fed lard show reduced levels of the bacterial species **Akkermansia muciniphila** and increased inflammation, whereas mice fed fish oil showed increased levels of *A. muciniphila* and better intestinal function.⁴¹



By administering *A. muciniphila* to obese mice, Dr. Cani reduced fat mass and insulin resistance in the mice.⁴² *A. muciniphila* gut levels decline with age in humans.⁴³ Dr. Cani found that obese and overweight human subjects with higher levels of intestinal *A. muciniphila* were less insulin resistant and more metabolically healthy.⁴⁴

Dr. Cani is recruiting for a clinical trial to show that administration of *A. muciniphila* to obese humans can improve metabolic health.

Treating Obesity With Balloons

Shelby Sullivan, MD (director of Gastroenterology Metabolic and Bariatric Program, University of Colorado School of Medicine, Denver, Colorado), has investigated alternatives to drugs and bariatric surgery for treatment of obesity.

Although bariatric surgery can be very effective, it is expensive, and there is often a long waiting list.



A fluid-filled balloon that can occupy nearly **80%** of stomach volume has been shown to result in about **15%** weight loss in a period of one year (more than twice what is usually seen with drug therapy).⁴⁵ Dr. Sullivan showed a stomach balloon plus diet and exercise to be significantly more effective than diet and exercise alone to achieve weight loss.⁴⁶



Dr. Sullivan has also shown that partial removal of stomach contents 20 minutes after every meal enabled test subjects to maintain a **20%** weight loss for two years.⁴⁷ She attributed some of this loss to disgust subjects felt when looking at their stomach contents.

Testosterone for Obese Male Diabetics

Pareh Dandona, MD, PhD (distinguished professor of Medicine, State University of New York, Buffalo, New York) has shown that low levels of **testosterone** are common in adults with type II diabetes.⁴⁸ He has also found that obese males between ages 14 to 20 have **40%-50%** lower **testosterone** than normal-weight males the same age.⁴⁹



By treating male type II diabetics with **testosterone**, Dr. Dandona has been able to reduce insulin resistance and decrease fat⁵⁰ as well as decrease signs of anemia.⁵¹

Dietary Fasting

Jason Fung, MD (nephrologist, Scarborough General Hospital, Ontario, Canada) is a foremost authority on the health benefits of dietary fasting. Dr. Fung has written a book entitled *The Complete Guide to Fasting*.

Insulin causes weight gain, and any food causes some insulin release, so fasting is a way to reduce weight. Fasting reduces fat mass, blood pressure, and insulin resistance.⁵²

With extended fasting, ketones rather than glucose become the primary energy source.⁵³ Ketones generate fewer free radicals, and inhibit cancer-cell growth (in contrast to glucose, which promotes cancer).^{54,55} Fasting activates **autophagy**, a process that cleanses cells of damaged molecules and organelles.⁵⁶ Fasting improves cognitive function, and reduces the likelihood of neurodegenerative diseases (like Alzheimer's disease).³⁴

A 250-pound obese person has enough stored energy in fat to survive about 150 days of complete fasting.⁵⁷ The longest recorded fast was 382 days by a very obese man who used only calorie-free fluids and vitamin supplements.⁵⁸ Forty-four of forty-six obese patients completed a two-week fast without ill effects, in many cases reporting feelings of euphoria.⁵⁹

The hunger hormone **ghrelin** peaks within two days and declines thereafter.⁶⁰ After the first few days of fasting, hunger becomes less of a concern. Even when hunger occurs, it rarely persists very long. Oddly, many people find even the slightest amount of hunger intolerable, but will strenuously exercise in an attempt to lose weight.



In the **1970s**, when most Americans ate only three meals per day, a 12-hour fast between dinner and breakfast was normal. By **2006** Americans were eating more snacks with less time between eating and nearly **500** additional calories consumed per day.⁶¹ Skipping breakfast and eating only two meals per day could reduce daily calorie consumption by more than 500 Calories.⁶²

Some fasting experts recommend against fasting more than a day without medical supervision.⁵² This is especially important for people with health problems, or who are on medications.

Concluding Remarks

Location of fat can be a more important determinant of metabolic health than the amount of fat.

Fat attached to **visceral organs** like the liver, pancreas, and intestine (**visceral fat**) produces more **inflammation** and **insulin resistance** than fat under the skin (**subcutaneous fat**).⁶³

Japanese Sumo wrestlers, for example, are metabolically healthy because they have large amounts of subcutaneous fat, but not much visceral fat.⁶⁴ By contrast, non-obese persons with large amounts of visceral fat tend to be insulin resistant.⁶⁵

Persons subject to chronic stress secrete large amounts of the stress hormone **cortisol**, which results in increased visceral fat and insulin resistance.^{66,67} Inadequate sleep increases cortisol, which increases insulin resistance in muscle and fat (but not liver) and causes weight gain.⁶⁸ Cigarette smoking increases visceral fat and insulin resistance.⁶⁹ Surgical removal of visceral fat from rats substantially reduces insulin resistance and increases lifespan.⁷⁰

Table sugar (sucrose) is composed of both glucose, which spikes blood-glucose levels, and fructose. Excessive blood glucose raises blood insulin and can cause insulin resistance, but fructose does not have this effect in small amounts. When fructose is consumed in limited quantities, as in fruit, it is far less harmful.⁷¹ But when fructose is consumed in large amounts, such as in soft drinks sweetened with **high-fructose corn syrup**, the fructose increases visceral fat, insulin resistance and fatty liver disease.^{72,73}

About **30%** of the general population (and about **70%** of the obese) suffer from nonalcoholic fatty liver disease (NAFLD), which causes insulin resistance of the liver.⁷⁴ Besides fructose, cigarette smoking increases the likelihood of NAFLD.⁷⁵ Excess alcohol consumption causes both fatty liver disease and insulin resistance of the liver.⁷⁶

When insulin resistance develops in the hypothalamus, mental function becomes impaired.⁷⁷ Inflammatory factors in the blood circulation from insulin resistant fat or liver cells can result in insulin resistance of the brain.⁷⁸ High fructose consumption can lead to brain insulin resistance and increased appetite, as well as impaired learning and memory.⁷⁹

Some Dietary Advice to Reduce or Avoid Obesity

All calories do not have the same effect on obesity. The **glycemic index** of foods measures the amount by which a food increases blood glucose, and thus increases blood insulin. Pure glucose is the standard, but refined carbohydrates such as white bread and pasta have a high glycemic index. Rodents fed a **high** glycemic index diet gained **70%** more fat than rodents on a low glycemic index diet.⁸⁰

Fructose has a low glycemic index, but fructose causes obesity by causing insulin resistance in the liver and brain. Elevated blood insulin due to insulin resistance causes obesity. Sucrose, fruit juices, and foods such as soft drinks sweetened with high-fructose corn syrup should be avoided.

Carbohydrates high in fiber such as whole grains are not believed to cause insulin resistance.⁸¹ A Mediterranean diet high in vegetables, whole grains, fish, and nuts is associated with reduced obesity.⁸² Not only is olive oil an important component of the Mediterranean diet, but **olive oil** has been shown to prevent accumulation of visceral fat even if body weight is not affected.⁸³ ●

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

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People who take meaningful steps to control blood-glucose levels are thriving. In their 60s and with blood sugar at healthy levels, they have no plans to retire anytime soon. They enjoy full, active lives, working at jobs they love.

Ellen T., 64, of Madison, Wisconsin, reports that she saw her fasting blood-glucose levels reduce from the **80s (mg/dL)** to the **70s**. As research suggests,⁵ her control of postprandial (post-meal) glucose is just as important: “My fasting blood sugar this morning was **76 mg/dL** and my current blood sugar, 3 hours postprandial, is **86 mg/dL**.”

In a recorded CR Way Member-Profile Teleconference, Ellen describes her life: She eats a mostly plant-based diet, she keeps her mind open to what *else* might be helpful, and she reports, “My mental acuity is sharp. I juggle a lot of details and am able to keep it all straight without anxiety or forgetting.”

Dave B., 60, from Arlington, Virginia, started the *Great Glucose Control* program with fasting glucose readings in the high **90s (mg/dL)**, a level that increases risk for heart attack and brain shrinkage.^{6,7} After taking the *Great Glucose Control* classes, Dave says, “I’m down to a fasting glucose of **78 mg/dL**, and after my walk recently, I was at **67 mg/dL**. It blows my mind to have glucose levels that low.”

While living younger is not a certainty, many people join *The CR Way to Great Glucose Control* program to improve their overall health and vitality rather than because their blood sugar is dangerously high.

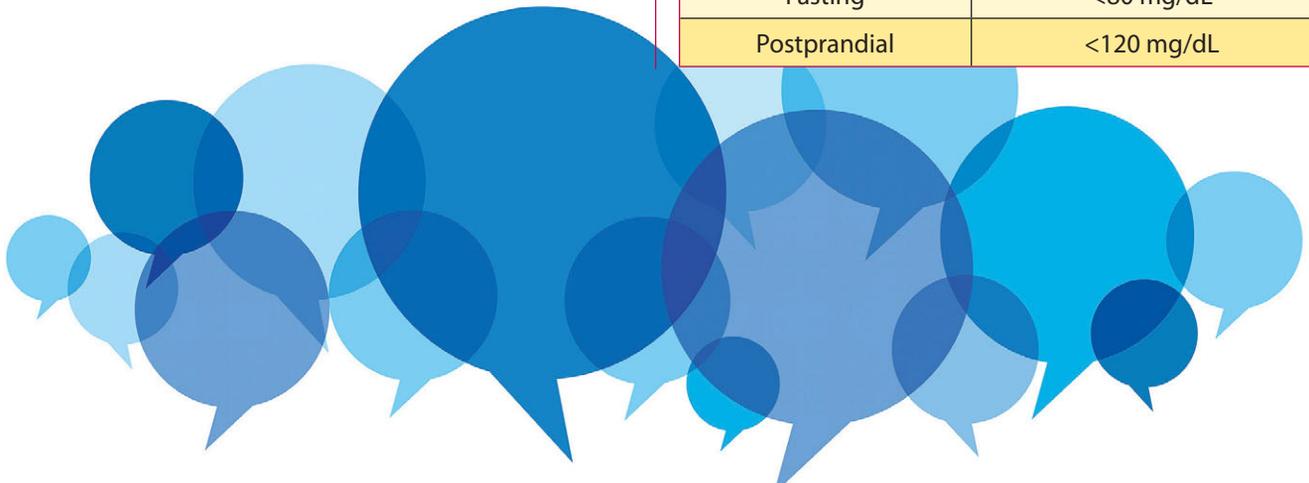
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The CR Way to Great Glucose Control is an online education program that can help you learn to control your blood glucose levels naturally. You choose the learning methods that suit you: videos, podcasts, and/or live classes via teleconference. Whatever ways you prefer to learn the steps to take control of your blood-glucose levels. The classes are recorded and lesson summaries posted, so you can listen on your favorite device in your car, while exercising, or any time and place you choose.

You first learn the basic steps to take control of your glucose levels, second, the foods to choose, and third, how to combine them into delicious, easy-to-fix recipes. Then you progress to lifestyle plans, which include full meal plans and suggested schedules to help you manage glucose from the time you get up in the morning to when you go to sleep at night.

The course offers innovative ways to use the content, even if you have a busy schedule. For starters, you get the beautiful five-part e-book (by download or CD) that includes all the lessons for the nine-week course. You can read it in a day or a week, and/or use it as a reference for troubleshooting your glucose challenges. Other course materials are available online in *The CR Way to Great Glucose Control* library, so participants can access them easily anytime they wish.

Glucose Control Goals ⁸ for Optimal Health	
Fasting	<80 mg/dL
Postprandial	<120 mg/dL





Support From CR Way Friends

The CR Way Support Group is an important new benefit for *Great Glucose Control* participants.

Support Group meetings are live, moderated teleconferences where participants share their successes and challenges. The meetings are friendly and pressure-free. Participants are encouraged to share their experiences, but they are free to just listen if that's their preference.

The Support Group meets every week, so participants can resolve their glucose challenges with friends who want to help.

"The Support Group helps participants discover what's at the root of their glucose control problems," observes Meredith Averill, co-creator of *The CR Way to Great Glucose Control*. "People get a chance to share their challenges, many of which are common within the group. Just by discovering easy-to-fix mistakes in the sharing process, many participants lower their blood glucose readings from dangerous to healthy levels."

Live, Personal Instruction

The CR Way to Great Glucose Control is taught by its creators, glucose-control experts Paul McGlothlin and Meredith Averill. Before the program begins, participants are invited to get-to-know-you sessions so that Paul & Meredith can tailor course material to participants' individual needs.

Support Longevity Research at the Same Time!

Proceeds from participation in *The CR Way to Great Glucose Control* go to The CR Way Longevity Center, a not-for-profit, tax-exempt organization that operates mostly online and is driven by the vision of helping you live better, longer. As a *Great Glucose Control* participant, you will feel good knowing that proceeds from your participation fee support CR Way research to extend life in good health.

Affordable

You may expect the nine-week course with the class materials and live, personalized instruction to be priced like other online courses at well over \$1,000. Instead, participation fees have been kept low and affordable at only **\$225**. Managing disease can cost hundreds of dollars a month. So reducing your disease risk by gaining control over your glucose levels could save you tens of thousands of dollars and endless personal hardship. Participation is limited and will close on Friday, November 3, 2017.

Turn to next page to enroll in upcoming *CR Way to Great Glucose Control* class. ●

Paul McGlothlin and Meredith Averill are a bridge, translating the research into the longevity benefits of low-calorie diets and into practical application of the results. Their CR Way® lifestyle is based on decades of research showing favorable changes in genes, gene expression, and other aging biomarkers. They've played a pivotal role in this research on aging at Washington University in St. Louis School of Medicine, and the University of California at both San Francisco and Riverside.

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The plant compounds in the new **AMPK Metabolic Activator** provide powerful support for youthful levels of AMPK activity, an enzyme that fights belly fat and promotes metabolic health.

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Item #02207 • 30 vegetarian tablets

NOTE: This new one-per-day formula will replace the current **AMPK Activator** that requires three capsules a day. A full description of its improved benefits will be published in a future issue of *Life Extension Magazine*®. It also costs **20% less** than current **AMPK Activator**.



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This supplement should be taken in conjunction with a healthy diet and regular exercise program. Individual results may vary and are not guaranteed.

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



the **CR** way[®] to Great Glucose Control!

Don't let high blood sugar shorten your life!

The CR Way to Great Glucose Control is an online course that can help you learn how to keep your blood glucose at optimal levels.

Since it was introduced in 2009, hundreds of **The CR Way to Great Glucose Control** participants have benefited:

"...my fasting blood glucose levels reduced from the 80s (mg/dL) (4.4 to 5.0 mmol/L) to the 70s (3.9 to 4.4 mmol/L)." – Ellen, June 3, 2017

"...I'm down to a fasting glucose of 78 mg/dL (4.3 mmol/L) and after my walk recently I was at 67 mg/dL (3.7 mmol/L). It blows my mind to have glucose levels that low." – Dave, May 27, 2017.

Take advantage of the new, expanded glucose-control course:

- Glucose-control experts Paul McGlothlin and Meredith Averill teach all classes—in person!
- **Nine live 30-minute teleconference classes**—easy to work into your busy schedule.
- **Nine weeks of live CR-Way-Support-Group teleconferences**, in which we often resolve glucose challenges with friends who want to help.
- **Instructional videos**, describing key steps to great glucose control.
- Beautifully illustrated **five-part e-book** with glucose control basics—recipes, food suggestions, and meal plans.

Live, Personal Guidance at an Affordable Price!

Personal guidance by experts can cost thousands. To make it possible for all Life Extension[®] supporters to participate, **The CR WAY TO GREAT GLUCOSE CONTROL** course (item #38840) is offered for \$225. Act now to join Paul & Meredith for the live classes, the five-part, beautifully illustrated e-book, instructional videos, and the support group. Live classes begin Saturday, November 4, 2017.

The enrollment period runs from September 29 through November 3, and will not be offered again this year.

Don't risk the suffering and financial ruin that come with memory loss, heart disease, diabetes, cancer, Alzheimer's disease, and shorter life span—all associated with high blood glucose.

Take advantage of this life-saving opportunity to lower your glucose and live better, longer!

The CR Way to Great Glucose Control Course

Item #38840

Your Price \$225



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BY ROBERT GOLDFADEN AND GARY GOLDFADEN, MD





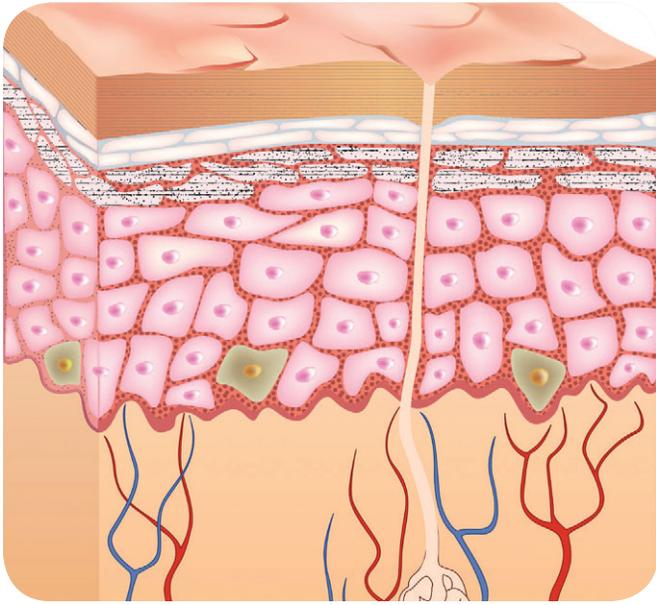
Protect Your Skin from Toxic Pollution

By now, most people know that air pollution directly affects their overall health and well-being, but few realize the heavy toll it takes on their skin.

Mounting research shows that a form of air pollution known as **particulate matter** can penetrate the skin to induce oxidative stress and inflammation, paving the way for wrinkles, fine lines, mottled pigmentation, and cancer.¹⁻⁵ This is quite alarming in light of the fact that almost **44%** of Americans, as of 2015, live in areas with dangerously high levels of pollution.⁶

Fortunately, scientists have uncovered a novel plant extract that significantly reduces the particulate matter entering your skin, while boosting repair mechanisms to help it recover from existing pollution damage.

The benefits of this plant extract can be obtained using a push-button-operated dropper created for the application of highly concentrated ingredients. This technologically advanced delivery system allows for a more accurate dosage to the target area of the skin to leave it healthier, smoother, and softer.



How Air Pollution Ages Your Skin

Life Extension® readers are well aware of the skin-aging effects of repeated sun exposure. What many might not know is that air pollution is rapidly becoming another major threat to the health and appearance of your skin.

Every day we're bombarded by dust, soot, pollen, and smoke in the air from various sources, despite our best efforts to avoid them. These particles—collectively referred to as particulate matter—are small enough to penetrate the skin, where they generate a storm of free radicals.¹⁷ The ensuing oxidative stress creates an unfavorable environment of inflammation, lipid peroxidation, and DNA damage that compromises the skin's structural integrity to accelerate aging.^{8,9}

The impact of air pollution can appear quickly. Researchers discovered that healthy steel workers exposed to particulate matter for three consecutive days experienced blood-cell DNA damage that reduced the expression of cancer-preventing genes.¹⁰

Abundant research shows a strong association between particulate-matter exposure and the hallmarks of skin aging. One study found that participants were **20%** more likely to suffer from skin pigmentation on the forehead and cheeks when exposed to increased levels of soot and traffic particles.¹¹ Another study showed that higher levels of indoor air pollution from cooking fuels increased the likelihood of wrinkle formation on the face by **5%-8%** and on the back of the hands by **74%**.¹²

When researchers examined the totality of evidence that exists to date, they concluded that **“air pollution exerts detrimental effects on human skin.”**¹³

Let's take a look at how an edible plant grown throughout Europe and Asia fills the need for a safe way to defend skin against air pollution.

Marrubium Vulgare Extract

Marrubium vulgare, also known as White Horehound, is a medicinal plant that belongs to the *Lamiaceae* family. While celebrated in ancient times by the Romans and Arabs for its ability to treat respiratory disorders and indigestion, research today reveals that *Marrubium vulgare* extracts show promise in lowering lipids,¹⁴ blood pressure,¹⁵ and blood sugar.^{16,17}

These benefits are mostly related to its free-radical scavenging and anti-inflammatory properties,^{18,19} which translates into vital skin protection and rejuvenation. *Marrubium vulgare* was shown in vitro to exhibit four key characteristics that make it an ideal pollution fighter:²⁰

- **Protects** against the entry of particulate matter into the skin, reducing uptake by **76%**.
- **Removes** and neutralizes damaging free radicals as evident by a **21%**, **26%**, and **38%** reduction in DNA damage, carbonylation, and lipoperoxidation, respectively.
- **Strengthens** the skin's barrier function by **18.6%** versus control after exposure to particulate matter.
- **Repairs** cell metabolism by boosting adenosine triphosphate (ATP) production by **66%**.



© Patrick J. Alexander



What You Need to Know

Effectiveness Validated in Human Trials

By blocking and repairing some of the skin-aging effects of air pollution, *Marrubium vulgare* extract has been demonstrated in human studies to provide both immediate and long-lasting results.

When 100 volunteers ages 18 to 60 topically applied *Marrubium vulgare* extract for **10 to 15 minutes** as part of a facial mask, roughly **80%** of them reported improved skin moisture and restoration of a healthy glow within just **one hour!** The morning after using *Marrubium vulgare* extract, more than **70%** of participants felt they had a less tired and polluted appearance, as well as cleaner skin with a revived complexion. In addition, **84%** of them felt their skin was fresher the next morning.²⁰

Longer use of *Marrubium vulgare* extract confers additional skin benefits. In the first study, researchers evaluated the impact of *Marrubium vulgare* extract on 40 participants ages 21 to 67 with blackheads and comedones. After four weeks of twice-daily topical application, the number of blackheads was reduced up to **50%** and the surface area they occupied decreased up to **67%**. The color and size of comedones were reduced up to **52%**, and their number decreased up to **93%**.²⁰

Marrubium vulgare extract can reverse the appearance of rough and grainy skin. This was clearly shown in a study in which human volunteers topically applied *Marrubium vulgare* extract or a placebo twice daily for 28 days. Researchers observed that the treatment group reduced skin roughness and graininess up to **50%** and **34%**, respectively, compared to the placebo group.²⁰

Fight Pollution-Induced Skin Aging

- Air pollution in the form of particulate matter such as soot, dust, pollen, and smoke can penetrate the skin, creating a storm of free radicals that accelerate skin aging.
- Exposure to air pollution is strongly associated with the development of wrinkles and excess pigmentation.
- An extract from the *Marrubium vulgare* plant may protect against air pollution, while stimulating repair mechanisms to regenerate damaged skin.
- Human studies show that *Marrubium vulgare* extract produces both immediate and long-lasting skin effects.
- Topical application of *Marrubium vulgare* extract improved skin moisture and restored a healthy glow within just one hour, as well as reduced the appearance of blackheads and rough-textured skin after four weeks.
- This results in skin that is fresher, cleaner, smoother, and younger-looking.

Summary

People today avoid visible pollutants without realizing that invisible ones can easily penetrate the skin. The surge of oxidative stress and inflammation that soon follows alters the structure of skin tissues and cells, leading to the hallmarks of aging that include wrinkles and undesirable pigmentation.

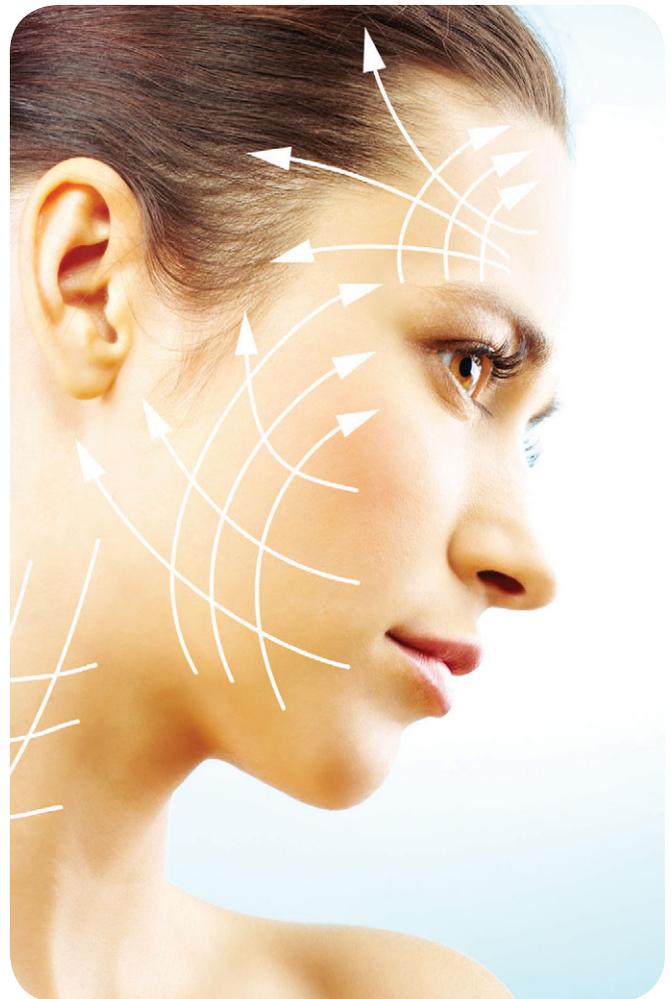
Compelling evidence implicates a role for air pollution—especially particulate matter—in premature aging of the skin. Scientists have found that a novel extract derived from the plant *Marrubium vulgare* may help prevent and repair air pollution damage. When applied using a unique push-button operated system, this novel plant extract results in smoother, fresher, younger-looking skin. ●

Gary Goldfaden, MD, is a clinical dermatologist and lifetime member of the American Academy of Dermatology. He is the founder of Academy Dermatology in Hollywood, FL, and Cosmesis Skin Care. Dr. Goldfaden is a member of Life Extension®'s Medical Advisory Board. All Cosmesis products are available online.

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

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BY GARRY MESSICK

Almonds

Almonds are the snack of choice among informed, health-conscious consumers.

The almond, contrary to popular belief, is not a nut, but the seed of the almond tree, which is native to the Middle East, North Africa, and the Indian Subcontinent.

Cholesterol

Plant sterols, or phytosterols, are a class of compounds similar to cholesterol that may inhibit cholesterol absorption in the gastrointestinal tract and reduce cholesterol in the blood. Almonds are an excellent source of phytosterols and research has shown beneficial impacts on LDL cholesterol.¹

In addition, almonds may play a role in normalizing a particularly dangerous blood lipid abnormality—the small, dense LDL particles that are strongly atherogenic and toxic to the delicate endothelial cells that line blood vessels.²

Reduced Heart-Disease Risk

When added to the diet of subjects with hyperlipidemia (high cholesterol) almonds have been found to significantly reduce risk factors of coronary heart disease. Researchers attribute this effect at least in part to almonds' fiber, protein, and monounsaturated fatty acid content.³

Weight Loss

Research shows that a low-calorie diet that includes almonds leads to greater and better-sustained weight loss compared to diets without them.⁴ The same study found that an almond-infused diet improves a preponderance of the abnormalities linked to metabolic syndrome.

Digestive System Benefits

Research has shown almonds and almond oil can help relieve symptoms of irritable bowel syndrome, and are associated with a reduced incidence of colon cancer.⁵

Dairy Substitute

Almonds are very nutritious and research suggests that almond milk may be an efficacious substitute for cow's milk for those who are lactose intolerant, or have a cow-milk allergy.⁶

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Caution: Avoid use during pregnancy.

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Environmental Protection For Your Skin

Environmental Support Serum with *Marrubium vulgare* plant extract helps block the cumulative effects of **environmental** and oxidative pollutants—for smoother, clearer, and younger-looking skin.

Cosmesis Environmental Support Serum

Item #80167 • 1 fl. oz. (30 ml) bottle

	Retail Price	Your Price
1 bottle	\$59	\$44.25
4 bottles		\$39 each



Not tested on animals. Keep out of reach of children. For external use only. Avoid contact with eyes.

For full product description and to order **Cosmesis Environmental Support Serum**, call **1-800-544-4440** or visit **www.LifeExtension.com**

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NIGHT CREAM

Ultra-rich **melatonin**-based formula provides **retinyl palmitate (1.0%)** and moisturizing **ceramides (0.5%)** along with science-based botanicals to help rejuvenate facial skin while sleeping.

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BODY LOTION

Enhances hydration with **ceramides (0.5%)** and **shea butter** while revitalizing skin cells with **plant extracts, vitamins** and other nourishing topical agents—all designed to retain a soft, smooth look and feel.

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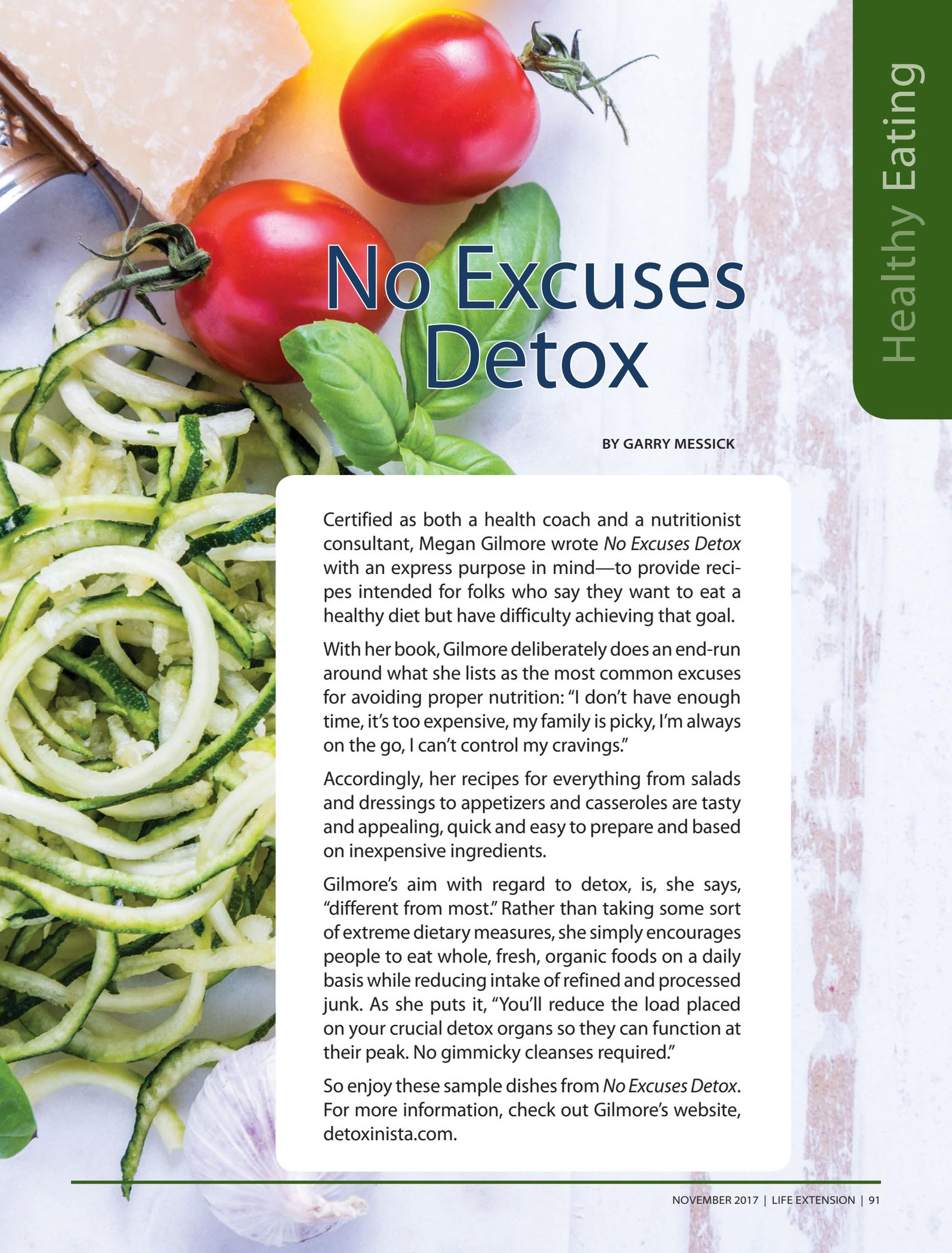
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No Excuses Detox

BY GARRY MESSICK

Certified as both a health coach and a nutritionist consultant, Megan Gilmore wrote *No Excuses Detox* with an express purpose in mind—to provide recipes intended for folks who say they want to eat a healthy diet but have difficulty achieving that goal.

With her book, Gilmore deliberately does an end-run around what she lists as the most common excuses for avoiding proper nutrition: “I don’t have enough time, it’s too expensive, my family is picky, I’m always on the go, I can’t control my cravings.”

Accordingly, her recipes for everything from salads and dressings to appetizers and casseroles are tasty and appealing, quick and easy to prepare and based on inexpensive ingredients.

Gilmore’s aim with regard to detox, is, she says, “different from most.” Rather than taking some sort of extreme dietary measures, she simply encourages people to eat whole, fresh, organic foods on a daily basis while reducing intake of refined and processed junk. As she puts it, “You’ll reduce the load placed on your crucial detox organs so they can function at their peak. No gimmicky cleanses required.”

So enjoy these sample dishes from *No Excuses Detox*. For more information, check out Gilmore’s website, detoxinista.com.

Mushroom & Black Bean Tacos with Avocado Crema

Makes 8 tacos

FILLING

- 1 tablespoon coconut oil
- 1 red onion, diced
- 8 ounces mushrooms, coarsely chopped
- 2 cloves garlic, minced
- Fine sea salt
- 1 teaspoon ground cumin
- ½ teaspoon chili powder
- ½ teaspoon paprika
- 1 ½ cups cooked black beans or 1 (15-ounce) can, rinsed and drained
- 1/8 teaspoon cayenne pepper (optional)

AVOCADO CREMA

- 1 ripe Hass avocado
- 2 tablespoons freshly squeezed lime juice
- ¼ teaspoon fine sea salt
- ½ teaspoon ground cumin
- 1 teaspoon raw honey
- ¼ cup fresh cilantro
- 1 clove garlic minced

- 8 gluten-free tortillas or butter lettuce leaves
- Radishes and cilantro, to garnish (optional)

To prepare the filling: In a 3.5-quart or larger Dutch oven, melt the coconut oil over medium heat and sauté the onion until translucent, about 8 minutes. Add the mushrooms and garlic and continue to sauté until the mushrooms release their liquid, about 8 minutes more.

Add ½ teaspoon salt, the cumin, chili powder, paprika, and black beans and sauté until heated through. Add the cayenne, then taste and adjust any seasonings. (I typically use ¾ teaspoon salt total.) Lower the heat to keep the filling warm while you prepare the crema.

To prepare the crema: In a high-speed blender or mini food processor, combine the avocado, lime juice, salt, cumin, honey, cilantro, garlic, and 1 tablespoon water and blend until smooth. Add additional water, if needed, to facilitate blending, then taste and adjust any seasonings.

Fill each tortilla generously with the filling, then top with garnishes and a spoonful of the crema. Serve warm. Store any leftover filling and crema in separate airtight containers in the refrigerator for up to 3 days. To help prevent the crema from browning, press a piece of parchment paper to the top surface and remove it right before serving again, scraping away any brown spots that might have developed.

Mediterranean Quinoa Salad

Serves 6

- 2 cups quinoa, rinsed and drained
- 4 cups water
- ½ cup freshly-squeezed lemon juice
- ¼ cup extra-virgin olive oil
- 2 teaspoons fine sea salt
- Freshly ground black pepper
- 1 cup minced green onions, white and green parts
- ½ red onion, chopped
- 1 cup loosely packed chopped fresh dill
- 1 cup loosely packed chopped fresh-leaf parsley
- 1 cucumber, chopped
- 1 large red bell pepper, chopped
- 10 to 15 olives, chopped

In a saucepan, combine the quinoa and water and bring to a boil. Cover and lower the heat, cooking until the quinoa has absorbed all of the water, about 15 minutes. Fluff with a fork and allow to cool.

In a large bowl, whisk together the lemon juice, olive oil, salt, and a few grinds of pepper. Add the cooked quinoa and toss in the dressing to coat well. Add the green onion, red onion, dill, parsley, cucumber, bell pepper, and olives, and toss well to combine. Allow the mixture to marinate in the refrigerator for 1 hour before serving. This salad may be served cold or at room temperature. Store leftovers in an airtight container in the refrigerator for up to 4 days.





Zucchini Bolognese

Serves 4 to 6

1 teaspoon coconut oil
4 medium zucchini, spiralized into “noodles”
Dash of nutritional yeast (optional)

SAUCE

8 ounces cauliflower, cut into florets
1 large carrot, cut into a few chunks
1 tablespoon coconut oil
½ yellow onion, chopped
1 red bell pepper, chopped
2 cloves garlic, minced
1 (28-ounce) box or jar chopped tomatoes (no salt or sugar added)
2 tablespoons tomato paste
1 teaspoon fine sea salt
1 teaspoon dried oregano
1 teaspoon dried basil
1 teaspoon maple syrup (optional)
½ cup crushed walnuts

To prepare the sauce: In the bowl of a large food processor, combine the cauliflower and carrot and pulse until a rice-like texture is achieved. Set aside.

In a large pan, melt the coconut oil over medium heat and sauté the onion and bell pepper for 5 minutes. Add the garlic and cauliflower-carrot “rice” and sauté until tender and the size has reduced, another 5 to 8 minutes. Add the tomatoes, tomato paste, salt, oregano, and basil and simmer uncovered for 10 minutes to let the flavors meld. Taste and adjust the seasonings and add the maple syrup if a bit of sweetness is needed. Remove the sauce from the heat and stir in the crushed walnuts for texture.

While the sauce is simmering, in a separate large, deep skillet, melt the coconut oil over medium-high heat and sauté the zucchini noodles until tender, 5 to 8 minutes.

Serve the sauce over the zucchini noodles and top with the nutritional yeast for a “cheesy” flavor. Store leftovers in an airtight container in the refrigerator for up to 5 days.

Addictive Garlic-Roasted Broccoli

Serves 4

1 pound broccoli florets (see note)
2 tablespoons coconut oil, melted
1 tablespoon freshly squeezed lemon juice
1 clove garlic, minced
Fine sea salt
3 to 4 tablespoons grated Pecorino Romano cheese (optional)

Preheat the oven to 350° F.

In a large bowl, toss the broccoli with the coconut oil, lemon juice, and garlic and arrange in a single layer on a large baking sheet. Sprinkle generously with sea salt.

Bake for about 30 minutes, until the broccoli is lightly brown and fork-tender. Remove from the oven and sprinkle with the cheese. Toss well to coat and serve immediately. Store leftovers in an airtight container in the refrigerator for up to 3 days.

Note: To ensure quick and even roasting, be sure to slice each broccoli stem in half. The stems are usually the part that take the longest to cook, leaving the florets burned by the time the stems are fork-tender. Burnt vegetables can be a sign of acrylamide formation, a cancer-causing substance, so you definitely don’t want to eat burnt broccoli!

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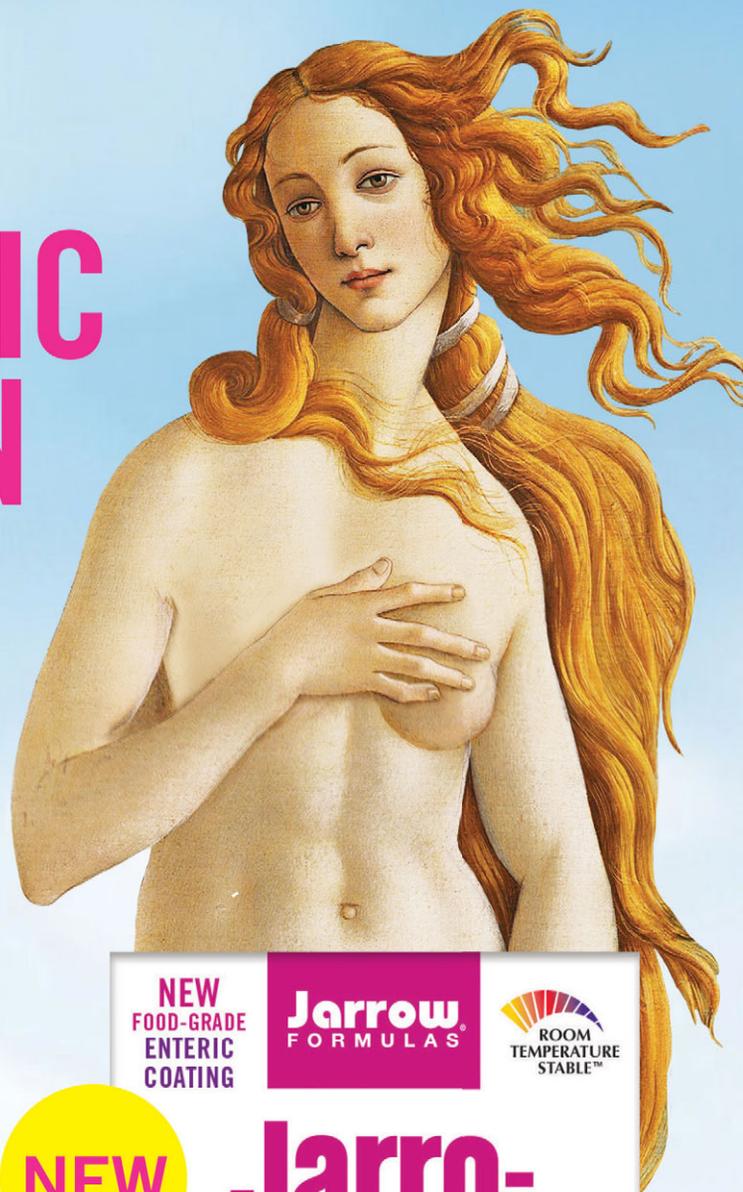
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BY GARRY MESSICK

Catherine Shanahan, MD, Author of *Deep Nutrition: Why Your Genes Need Traditional Food*

Author Interview

Dr. Catherine Shanahan says her book, *Deep Nutrition*, written in collaboration with her husband, Luke, grew out of being “overwhelmed by the amount of medical research that did nothing to explain chronic illnesses, or what to do to actually cure them.” Thus began her journey delving into various diets from all over the world, looking for the ones most closely associated with fostering good health and longer lifespans.

Dr. Shanahan eventually arrived at what she calls “the human diet,” which is based on the four nutritional strategies of consuming fresh foods, fermented and sprouted foods, meat cooked on the bone, and organ meats. She also discovered the ways in which what we eat interacts with our DNA and affects not just our health but the health of our offspring.

In the following interview, Dr. Shanahan focuses on some of the most important foods to avoid—namely certain types of vegetable oils and sugar, and the serious damage they can do to your health.

LE: In your book, you mention olive oil, peanut oil, macadamia nut oil and coconut oil as healthy fats that are good for cooking, but you're extremely critical of other types of commonly used vegetable oils such as corn or canola oil. Can you explain why?

CS: Vegetable oil is the lipid extracted from corn, canola, soy, sunflower, cottonseed, safflower, rice bran, and grapeseed. Vegetable oil doesn't come from broccoli, and it doesn't equate to a serving of greens. It is found in almost all ready-made foods, from granola and squishy-soft baked goods, to rice milk and soy milk, to vegetarian cheese and meat substitutes, to frozen meals and side dishes... Dietary vegetable oil can transform ordinary fatty acids into a kind of atomic tornado. Tearing through cellular structures and leaving molecular wreckage in its wake.

Eating vegetable oil doesn't just mess up your arteries. Those disruptive free radicals can interfere with nearly everything a cell might need to do, leading to almost any

disease you can name. At no point in our life cycle is this disruption more devastating than while we're developing in the womb.

In 2006, when researchers tested the blood of mothers whose babies were born with congenital spinal and heart defects, they found evidence of oxidative stress, exactly what you would expect to find in someone eating lots of vegetable oil. In 2007, an article in *Genes to Cells* showed how oxidative stress can disrupt hormone production and interfere with hormonal responses, suggesting that women who consume vegetable oil while pregnant are increasing their child's risk of all kinds of growth deformities and disease. So if you are pregnant or plan on getting pregnant, banish vegetable oil and foods containing vegetable oil from your kitchen, and get the stuff out of your life.

LE: Expand, if you would, on the dangers of commercially processed vegetable oils as they relate to oxidative stress.

CS: Lipid scientists have been publishing papers on this topic for decades, trying to warn us that vegetable oil-rich diets can cause dangerous oxidative stress and are an under-recognized cause of heart disease and accelerated aging. But the most terrifying aspect about vegetable oil is that it's also destroying the organ most susceptible to oxidative stress, our brains. It's no exaggeration to say that vegetable oil attacks your family legacy at both ends of the generational spectrum, robbing your children of their physiologic birthright and erasing memories from our parents' and grandparents' minds.

Thanks to vegetable oil's inherent ability to inhibit life, vegetable oils are the chemicals that preserve a Twinkie for years on end. More than any other ingredient, vegetable oil is what puts the "junk" in junk food. A patient of mine on Kauai told me that the paniolos (Hawaiian cowboys) used to cure hide leather to make their saddles using cottonseed oil, but did they eat the stuff? *Ho, brah, dat's lolo* ("crazy"). They didn't eat it, and neither should you.

LE: In what part of the body do the adverse effects of vegetable oil first manifest?

CS: Vegetable oil often initiates its attack on the brain by first attacking the gut. More and more researchers are appreciating the connection between gut and brain function. Inflammation in the gut causes heartburn, which is just the tip of the inflammation iceberg and should serve as a kind of red flag telling us that whatever we're eating is harmful.

LE: Let's move on to another major enemy of good health: sugar. People often have a really difficult time cutting it from their diet.



CS: I promise, even if you really love sweet stuff, cutting your sugar intake way down will not be a big deal. Getting rid of sugar allows you to taste the natural sweetness in foods that your palate couldn't previously detect.

Of course, we need sugar in our bloodstream just to stay alive. But things go awry when you eat more than your body can deal with. Because sugar—in high concentration—is a rarity in nature, the human metabolism is simply not prepared for exposure to the 100-plus pounds the average American now consumes yearly. In a different century, only the wealthy could indulge in sweets made with refined sugar. Now, sugar is a mainstay of the modern diet.

LE: What were your findings after your research into sugar?

CS: I found that the consequences of excess sugar consumption are disastrous, especially in childhood. As sugar seeps into your tissues, it coats the surface of cell membranes, with life-changing consequences.

As a young girl, I would often sneak away to the corner candy store or munch on handfuls of the chocolate chips I would sometimes find hidden in the kitchen pantry, stressing my body's connective tissues already weakened by my low-fat, low-cholesterol, no-meat-on-the-bone diet. And the sugar encrusting my cells interfered with hormone receptor function, disrupting the complex series of physiologic developments scheduled to take place during puberty. As a result, I had no idea what all the fuss over boys was about until shortly after I went to college.

You may have heard that, on average, we gain ten pounds a decade after the age of 35. Women,

in particular, start reporting that they can't eat like they used to. This phenomenon may be directly related to the biochemical effects of sugar binding to hormone receptors, jamming them, and rendering us insensitive to the hormone insulin. Once you are insulin resistant, blood-sugar levels rise higher still, leading to diabetes and all its related disorders, including weight gain and circulatory and sexual dysfunction.

For the same reasons sugar jams hormone signals, it also clogs nutrient channels, weakening bone and muscle and slowing neural communication, which can impair mood and memory and lead to dementia. While all this is going on, sugar stiffens the collagen in your tendons, joints, and skin, causing arthritis and premature wrinkling, while interfering with the production of new collagen throughout your entire body. And because sugar changes the surface markers your white blood cells need to distinguish indigenous cells from invaders, it opens the door to cancer and infection.

LE: How does sugar do all this damage?

CS: Ever notice how licked lollipops and half-chewed taffy have a tacky feeling? Sugar feels sticky because, once dissolved in water, it reacts with proteins on the surface of your skin to form easily breakable chemical bonds. When you pull your fingers apart and feel that sticky resistance, you're feeling the tug of those bonds being broken. The process by which sugar sticks to stuff is called glycation. Glycation reactions become permanent due to oxidation reactions. The products of these later oxidation reactions

are called advanced glycation end products, or AGEs. And that's a useful acronym, because AGEs make you age unnaturally fast.

When you toast bread, oxidation reactions generate AGEs in the proteins and sugars present in the wheat. These AGEs change the bread from soft, pliable, and pale, to hard, stiff, and brown because the proteins and sugars form cross-links that stiffen the bread. The same thing happens inside your body as AGEs cross-link normally mobile proteins. This hardens your cells and tissues, making them brittle and stiff. Fortunately, at normal blood-sugar levels, the reactions occur so slowly that cleanup crews of white blood cells keep them under control by breaking them down. The kidney cleans these AGEs from the blood and excretes them from the body. It is principally these waste chemicals that give urine its characteristic yellow color.

LE: What kind of damage does all of this do to your health?

CS: The clinical implications of having your tissues hardened by sugar-protein cross-links are vast and far-reaching. Cross-links turn the semi-permeable surfaces of arteries into impervious walls, preventing nutrients from exiting the bloodstream. When trapped nutrients can't escape your bloodstream, where do you think they end up? Lining your arteries. When lipoproteins deposit on the arterial lining, they attract white blood cells, and can cause blood clots and/or atherosclerotic plaques. A few cross-links on your white blood cells slow them down, making infections more likely and more serious. Debilitated white blood cells permit nascent cancer cells to grow under their noses,

unchallenged. Are your joints creaky and stiff? AGEs can form in them, too. AGEs (primarily from high blood sugar) are one of two major biochemical phenomena that make us look and feel old, the other being free radicals, primarily from vegetable oils.

LE: Collagen is also vulnerable to the effects of vegetable oil and sugar, isn't it?

CS: You hear all the time about supernutritious foods touted as anti-aging miracles. The combination of sugar and vegetable oil, and its effects on the tissue whose integrity is most related to your physiologic age—collagen—might rightly be called the miracle foods of age acceleration. Because when it comes to staying young and feeling young, collagen is a big deal.

Like other tissue types, collagen is made from raw materials you must eat. Unlike other tissues, however, collagen is uniquely sensitive to metabolic imbalances. When your body is making collagen, it's performing a physiologic high-wire act, a feat of extraordinary timing and mechanical precision. This level of complexity makes collagen more dependent on good nutrition and more vulnerable to the effects of proinflammatory foods than other tissue types.

Collagens are a family of extracellular proteins that give skin its ability to move, stretch, and rebound into shape... Collagens aren't just in skin; they're everywhere, imparting strength to all your tissues. Just as strands of collagen running between skin cells hold our outermost layer of skin together, collagens unite adjacent cells in all your glands and organs, from collagen-rich robust tissues like bone and heart valves

to squishy soft lower collagen-content organs like brain, liver, and lungs. Bundles of collagen form extended strips and sheets in the sturdier tissues like ligaments and tendons that surround your joints and hold your skeleton together.

If any one of the thousands of steps involved in making collagen goes haywire—which is likely to happen if your diet was poor during critical growth periods, meaning your diet was low in nutrient-rich foods and high in sugar and vegetable oils—the integrity of the finished product is compromised and may break down prematurely. You might imagine that with lesser-quality collagen holding us together, our tissues would start pulling apart and separating after a certain number of years. That's exactly what causes wrinkling, arthritis, and even circulatory problems.

No matter the strength of your collagen today, how good you feel tomorrow depends a lot on your diet. People who eat proinflammatory foods experience more joint damage on a daily basis because sugar acts like an abrasive in the joints. At night, the small frays and tiny breaks in the collagen that formed during the day must be repaired. But inflammation interferes with healing. Instead of waking up feeling recovered, people on bad diets wake up with stiff joints. Their scars and stretch marks will be more obvious too, because inflammation disorganizes the collagen fibers so that, as tissue heals, it forms irregular lumpy mounds or deep pits, with more disfiguring results.

LE: In closing, how do you advise people to start on a path to better nutrition, as outlined in your book?

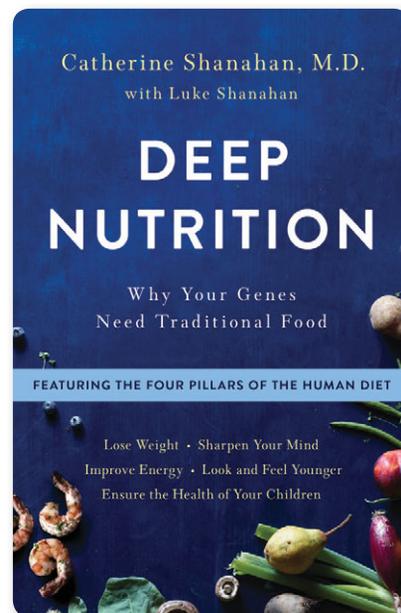
CS: I'm not going to try to convince you that adapting a *Deep Nutrition* lifestyle is something you can do overnight. Unless you're a chef, or majored in home economics, there are likely quite a few skills you may need to acquire. But there's no reason you must do it all at once.

Food is like a language, an unbroken information stream that connects every cell in your body to an aspect of the natural world. The better the source and the more undamaged the message when it arrives in your cells, the better your health will be. ●

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

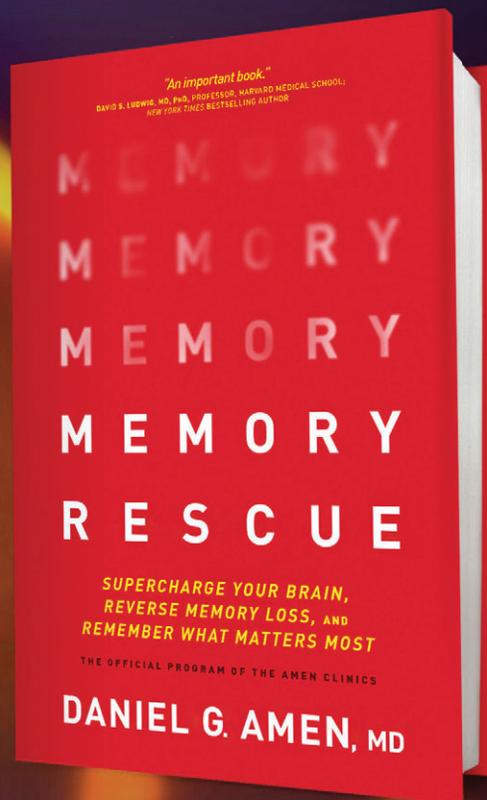
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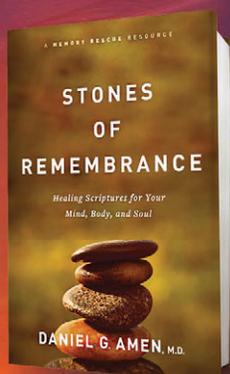
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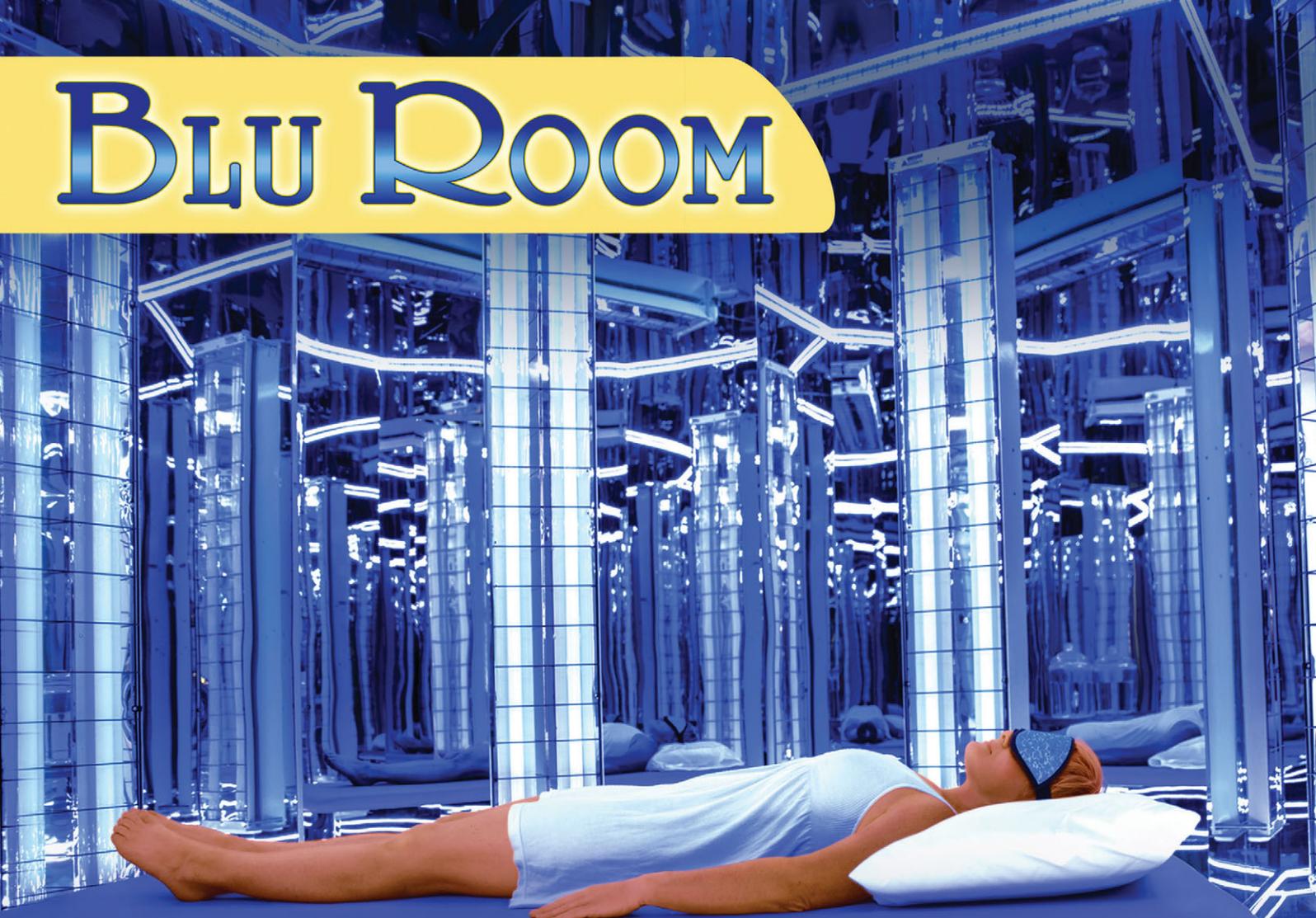
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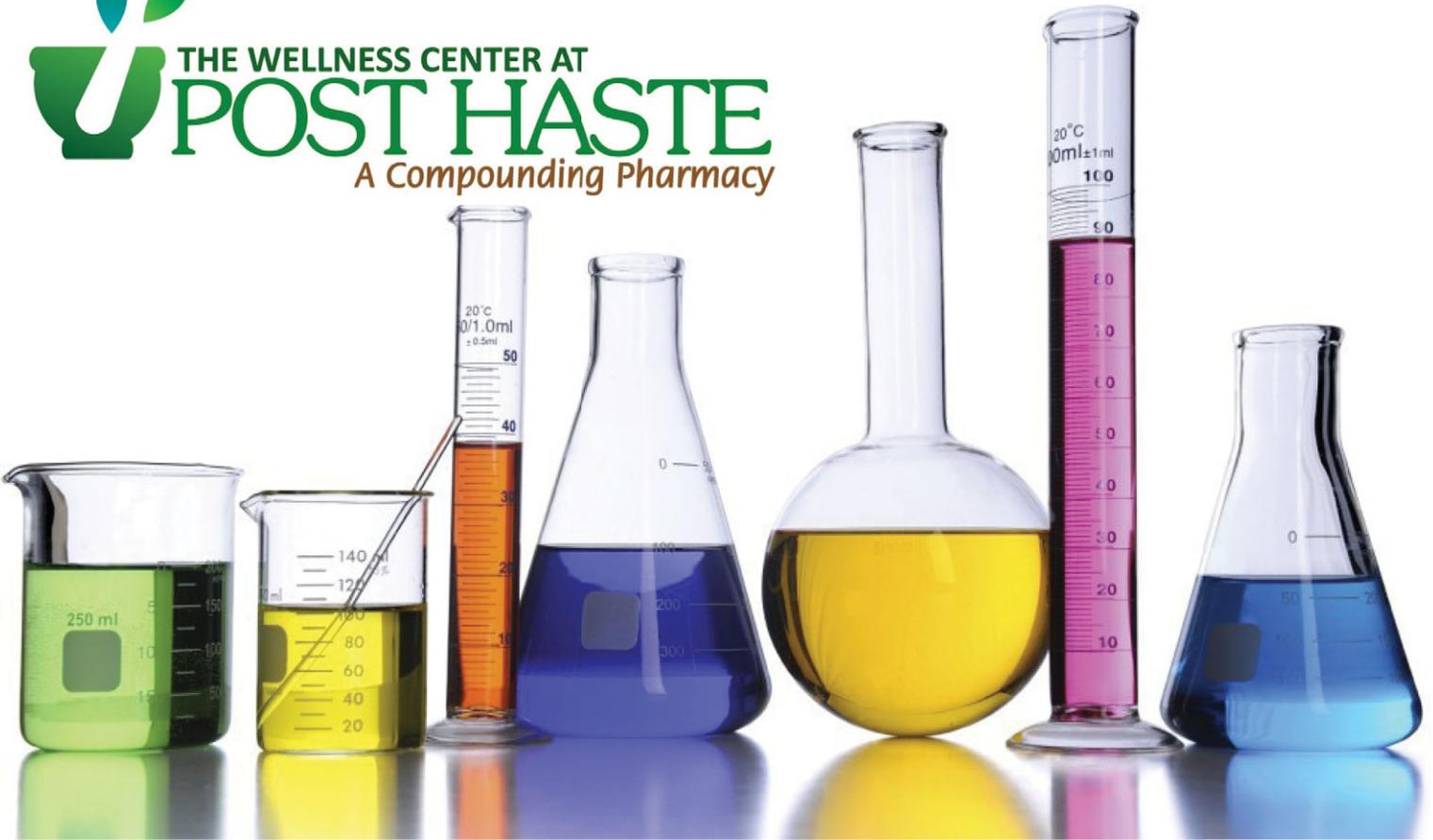
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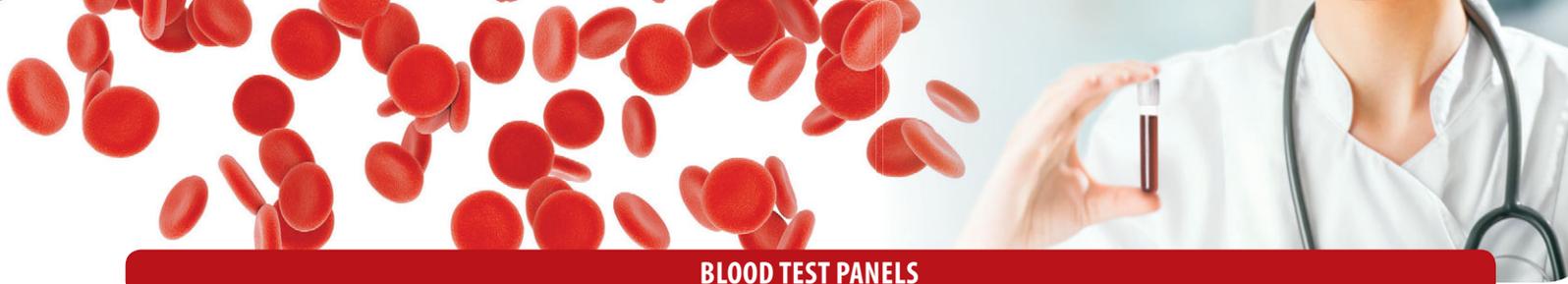
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<p>THYROID ADD-ON PANEL (LCTHYROID) Free T3 & Free T4.</p>	\$55	<p>HEALTHY AGING PANEL-COMPREHENSIVE (LC100026)* CBC/Chemistry Profile • C-reactive protein (high sensitivity) Vitamin B12 • Folate • Homocysteine • Vitamin D 25-hydroxy • Hemoglobin A1c TSH • Free T3 • Free T4 • Ferritin • Urinalysis • Fibrinogen • Insulin</p>	\$249
<p>INSULIN (LC004333) Helpful to assess insulin resistance.</p>	\$29.90	<p>DIABETES MANAGEMENT PROFILE – COMPREHENSIVE (LC100040) Hemoglobin A1C • Glucose • Insulin • Lipid Panel • Glycomark</p>	\$129
<p>NMR LIPOPROFILE® (LC123810) The NMR Lipoprofile® directly measures LDL particle size and number as well as HDL particle number, total cholesterol, and triglycerides. It also provides a calculation of one's risk of insulin resistance by assessing abnormalities in lipoprotein markers.</p>	\$99		
<p>ADVANCED OXIDIZED LDL PANEL*(LC100035) This panel looks at vascular inflammatory biomarkers, beginning with lifestyle choices to the development of metabolic and cardiovascular disease as well as the formation of vulnerable plaque. The panel contains the following tests: F2-Isoprostanes, Myeloperoxidase and Oxidized LDL.</p>	\$285		
<p>HOMOCYSTEINE (LC706994) High homocysteine is associated with heart attack, stroke, and dementia. Find out your homocysteine level so you can take steps to lower it if necessary.</p>	\$54		



With **Your Healthy Rewards**, you earn **LE Dollars** back on every purchase you make — including blood tests!
 See www.LifeExtension.com/Rewards for details.

This is NOT a complete listing of LE blood test services.
 Call 1-800-208-3444 for additional information.

* This test requires samples to be shipped to the lab on dry ice for customers using a Blood Draw Kit and will incur an additional \$35 charge. If the customer is having blood drawn at a LabCorp facility, this extra charge does not apply.
 ** This test is packaged as a kit.

Blood tests available in the continental United States only. Restrictions apply in NY, NJ, RI, and MA. Not available in Maryland. Kits not available in Pennsylvania.

Amino Acids

Arginine/L-Ornithine Capsules
 Arginine Ornithine Powder
 Branched Chain Amino Acids
 D,L-Phenylalanine Capsules
 L-Arginine Caps
 L-Carnitine
 L-Glutamine
 L-Glutamine Powder
 L-Lysine
 L-Taurine Powder
 L-Tyrosine Powder
 Super Carnosine
 Taurine

Blood Pressure & Vascular Support

Advanced Olive Leaf Vascular Support with Celery Seed Extract
 Arterial Protect
 Blood Pressure Monitor Arm Cuff
 Dual Action Blood Pressure
 Endothelial Defense™ with Pomegranate Complete and CORDIART™
 Endothelial Defense™ with GliSODin®
 Natural BP Management
 NitroVasc with CORDIART™
 Pomegranate Complete
 Pomegranate Fruit Extract
 Triple Action Blood Pressure AM/PM Venoflow™

Bone Health

Bone Restore
 Bone Restore with Vitamin K2
 Bone Strength Formula with KoAct®
 Bone-Up™
 Calcium Citrate with Vitamin D
 Dr. Strum's Intensive Bone Formula
 Strontium Caps

Brain Health

Acetyl-L-Carnitine
 Acetyl-L-Carnitine Arginate
 Blast™
 Brain Shield® Gastrodin
 CocoaMind™
 Cognitex® Basics
 Cognitex® with Brain Shield®
 Cognitex® with Pregnenolone & Brain Shield®
 Cognizin® CDP-Choline Caps
 DMAE Bitartrate (dimethylaminoethanol)
 Dopa-Mind™
 Ginkgo Biloba Certified Extract™
 Huperzine A
 Lecithin Granules
 Memory Protect
 Migra-Eeze™
 Neuro-Mag® Magnesium L-Threonate
 Neuro-Mag® Magnesium L-Threonate with Calcium and Vitamin D3
 Optimized Ashwagandha Extract
 PS (Phosphatidylserine) Caps
 Vinpocetine

Cholesterol Management

Advanced Lipid Control
 Cho-Less™
 CHOL-Support™
 Red Yeast Rice
 Theaflavins Standardized Extract
 Vitamin B3 Niacin Capsules

Digestion Support

Artichoke Leaf Extract
 Digest RC®
 Effervescent Vitamin C - Magnesium Crystals
 Enhanced Super Digestive Enzymes
 Enhanced Super Digestive Enzymes w/Probiotics
 EsophaCool™
 Esophageal Guardian

Extraordinary Enzymes
 Gastro-Ease™
 Ginger Force®
 Pancreatin
 Regimint
 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™
 Optimized NAD+ Cell Regenerator™ with Resveratrol
 PQQ Caps with BioPQQ®
 Rhodiola Extract
 RiboGen™ French Oak Wood Extract
 Triple Action Thyroid

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
 Tear Support with MaquiBright®

Fish Oil & Omegas

OMEGA FOUNDATIONS® Mega EPA/DHA
 OMEGA FOUNDATIONS® Mega GLA with Sesame Lignans
 OMEGA FOUNDATIONS® Super Omega-3 EPA/DHA with Sesame Lignans & Olive Extract
 OMEGA FOUNDATIONS® Super Omega-3 Plus EPA/DHA with Sesame Lignans, Olive Extract, Krill & Astaxanthin
 OMEGA FOUNDATIONS® Proval® Purified Omega-7
 OMEGA FOUNDATIONS® Vegetarian DHA Organic Golden Flax Seed

Food

California Estate Extra Virgin Olive Oil
 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® Decaf Roast
 Stevia Sweetener

Glucose Management

CinSulin® with InSea2® and Crominex® 3+
 Glycemic Guard™
 Mega Benfotiamine
 Tri Sugar Shield®

Heart Health

Aspirin (Enteric Coated)
 BioActive Folate & Vitamin B12 Caps
 Cardio Peak™ with Standardized Hawthorn and Arjuna
 Homocysteine Resist
 Optimized Carnitine with GlycoCarn®
 Super Ubiquinol CoQ10
 Super Ubiquinol CoQ10 with BioPQQ®
 Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™
 Super-Absorbable CoQ10 Ubiquinone with α -Limonene
 TMG Powder
 TMG Liquid Capsules

Hormone Balance

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

Immune Support

AHCC®
 Enhanced Zinc Lozenges
 Immune Modulator with Tinofend®
 Immune Protect with PARACTIN®
 Immune Senescence Protection Formula™
 Kinoko® Gold AHCC
 Kinoko® Platinum AHCC
 Kyolic® Garlic Formula 102
 Kyolic® Reserve
 Lactoferrin (apolactoferrin) Caps
 NK Cell Activator™
 Optimized Garlic
 Optimized Quercetin
 Peony Immune
 ProBoost Thymic Protein A
 Reishi Extract Mushroom Complex
 Standardized *Cistanche*
 Ten Mushroom Formula®
 Zinc Lozenges

Inflammation Management

5-LOX Inhibitor with AprèsFlex®
 Advanced Bio-Curcumin® with Ginger & Turmerones
 Black Cumin Seed Oil
 Black Cumin Seed Oil with Bio-Curcumin®
 Boswella
 Cytokine Suppress™ with EGCG
 Serraflazyme
 Specially-Coated Bromelain
 Super Bio-Curcumin®
 Zyflamend® Whole Body

Joint Support

Arthro-Immune Joint Support
 ArthroMax® Advanced with UC-II® & AprèsFlex®
 ArthroMax® with Theaflavins & AprèsFlex®
 ArthroMax® Herbal Joint Formula
 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™
 Uric Acid Control
 Water-Soluble Pumpkin Seed Extract

Liver Health & Detoxification

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

Longevity & Wellness

Alpha-Lipoic Acid
 AppleWise Polyphenol Extract
 Berry Complete
 Blueberry Extract
 Blueberry Extract with Pomegranate
 DNA Protection Formula
 Enhanced Berry Complete with Acai
 Essential Daily Nutrients

GEROPROTECT™ Ageless Cell™
 GEROPROTECT™ Longevity A.I.™
 Grapeseed Extract with
 Resveratrol & Pterostilbene
 Mediterranean Whole Food Blend
 Mega Green Tea Extract (decaffeinated)
 Mega Green Tea Extract (lightly caffeinated)
 Optimized Fucoïdan with Maritech® 926
 Optimized Resveratrol
 pTeroPure®
 Pycnogenol® French Maritime
 Pine Bark Extract
 Resveratrol with Pterostilbene
 RNA (Ribonucleic Acid)
 Super R-Lipoic Acid
 X-R Shield

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
 Extend-Release Magnesium
 Ionic Selenium
 Iron Protein Plus
 Magnesium (Citrate)
 Magnesium Caps
 Only Trace Minerals
 Optimized Chromium with Crominex® 3+
 Sea-Iodine™
 Se-Methyl L-Selenocysteine
 Vanadyl Sulfate
 Zinc Caps

Miscellaneous

Potassium Iodide
 Solarshield® Sunglasses

Mood & Stress Management

5 HTP
 L-Theanine
 Natural Cortisol Balance
 Natural Stress Relief
 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
 Once-Daily Health Booster
 One-Per-Day Tablets
 Two-Per-Day Capsules
 Two-Per-Day Tablets

Personal Care

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 Facial Toning System
 Hair, Skin & Nail Rejuvenation Formula
 w/VERISOL®
 Hair Suppress Formula
 Life Extension Toothpaste
 Sinus Cleanser
 Venotone
 Xyliwhite Mouthwash

Pet Care

Cat Mix
 Dog Mix

Probiotics

Bifido GI Balance
 FLORASSIST® Balance
 FLORASSIST® GI with Phage Technology
 FLORASSIST® Heart Health
 FLORASSIST® Immune Health
 FLORASSIST® Mood
 FLORASSIST® Oral Hygiene
 FLORASSIST® Throat Health
 Jarro-Dophilus® for Women
 Theralac® Probiotics
 TruFlora® Probiotics

Skin Care

Advanced Anti-Glycation Peptide Serum
 Advanced Growth Factor Serum
 Advanced Lightening Cream
 Advanced Peptide Hand Therapy
 Advanced Triple Peptide Serum
 Advanced Under Eye Serum with Stem Cells
 Amber Self MicroDermAbrasion
 Anti-Aging Face Oil
 Anti-Aging Mask
 Anti-Aging Rejuvenating Face Cream
 Anti-Glycation Serum with
 Blueberry & Pomegranate Extracts
 Antioxidant Facial Mist
 Anti-Redness & Adult Blemish Lotion
 Broccoli Sprout Cream
 Collagen Boosting Peptide Serum
 DNA Repair Cream
 Environmental Support Serum
 Essential Plant Lipids Reparative Serum
 Eye Lift Cream
 Face Rejuvenating Anti-Oxidant Cream
 Fine Line-Less
 Healing Formula
 Healing Vitamin K Cream
 Hyaluronic Facial Moisturizer
 Hyaluronic Oil-Free Facial Moisturizer
 Hydrating Anti-Oxidant Facial Mist
 Hydroderm
 Lifting & Tightening Complex
 Melatonin Cream
 Mild Facial Cleanser
 Multi Stem Cell Skin Tightening Complex
 Neck Rejuvenating Anti-Oxidant Cream
 Rejuvenex® Body Lotion
 Rejuvenex® Factor Firming Serum
 Resveratrol Anti-Oxidant Serum
 Shade Factor™
 Shade Factor™ Sunscreen Lotion
 Shade Factor™ Sunscreen Spray
 Skin Care Collection Anti-Aging Serum
 Skin Care Collection Body Lotion
 Skin Care Collection Day Cream
 Skin Care Collection Night Cream
 Skin Firming Complex
 Skin Lightening Serum
 Skin Restoring Phytoceramides with Lipowheat®
 Skin Stem Cell Serum
 Skin Tone Equalizer
 Stem Cell Cream with Alpine Rose
 Tightening & Firming Neck Cream
 Triple-Action Vitamin C Cream
 Ultimate MicroDermabrasion
 Ultra Eyelash Booster
 Ultra Lip Plumper
 Ultra Rejuvenex®
 Ultra RejuveNight®
 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)
 New Zealand Whey Protein Concentrate
 (Natural Chocolate and Vanilla Flavor)
 Tart Cherry with CherryPure®
 Whey Protein Isolate
 (Chocolate and Vanilla Flavor)

Vitamins

Ascorbyl Palmitate
 Benfotiamine with Thiamine
 Beta-Carotene
 BioActive Complete B-Complex
 Biotin
 Buffered Vitamin C Powder
 Fast-C® with Dihydroquercetin
 Gamma E Mixed Tocopherol Enhanced
 with Sesame Lignans
 Gamma E Mixed 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 K with Advanced K2 Complex
 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
 AMPK Metabolic Activator
 CalReduce Selective Fat Binder
 DHEA Complete
 Garcinia HCA
 HCAActive™ Garcinia Cambogia Extract
 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 Sesame Lignans
 Waist-Line Control™

Women's Health

Advanced Natural Sex for Women® 50+
 Breast Health Formula
 Femmenessence MacaPause®
 Natural Estrogen
 Progesta-Care®
 Super-Absorbable Soy Isoflavones
 Ultra Soy Extract

ITEM No.	PRODUCT	YOUR PRICE				QTY	Total
		Retail Each \$	1 Unit Each	4 Unit Each	10 Unit Each		
A							
01524	ACETYL-L-CARNITINE • 500 mg, 100 veg. caps	34.00	25.50	22.50			
01874	ACETYL-L-CARNITINE ARGINATE • 90 veg. caps	52.00	39.00	35.00			
01628	ADRENAL ENERGY FORMULA • 60 veg. caps	24.00	18.00	16.50			
01630	ADRENAL ENERGY FORMULA • 120 veg. caps	46.00	34.50	31.50			
01828	ADVANCED LIPID CONTROL • 60 veg. caps	30.00	22.50	20.25			
00681	AHCC® • 500 mg, 30 caps	59.98	44.99				
24404	AHCC® (KINOKO® PLATINUM) • 750 mg, 60 veg. caps	84.95	63.71				
29727	AHCC® (KINOKO® GOLD) • 500 mg, 60 veg. caps	74.95	52.47				
00457	ALPHA-LIPOIC ACID W/BIOTIN • 250 mg, 60 caps	37.00	27.75	24.00			
02207	AMPK METABOLIC ACTIVATOR • 30 veg. tabs	38.00	28.50	24.00			
01509	ANTI-ADIPOCYTE FORMULA W/MERATRIM® & INTEGRA LEAN® (Advanced) • 60 veg. caps	39.00	29.25	27.00			
02140	ANTI-ALCOHOL w/HEPATOPRO COMPLEX • 60 caps	22.00	16.50	15.00			
01625	APPLEWISE POLYPHENOL EXTRACT 600 mg, 30 veg. caps	21.00	15.75	14.25			
01039	ARGININE/ORNITHINE • 500/250, 100 caps	17.99	13.49				
00038	ARGININE/ORNITHINE POWDER • 150 grams	22.95	17.21	14.25			
01624	(L)-ARGININE CAPS • 700 mg, 200 veg. caps	26.50	19.88	17.44			
02004	ARTERIAL PROTECT • 30 veg. caps	44.00	33.00	29.00			
01617	ARTHROMAX® W/THEAFLAVINS & APRÈSFLEX® 120 veg. caps	44.00	33.00	30.00			
01618	ARTHROMAX® ADVANCED W/UC-II® & APRÈSFLEX® 60 caps	36.00	27.00	24.00			
02108	ARTHROMAX® HERBAL JOINT FORMULA • 60 veg. caps	40.00	30.00	27.00			
01404	ARTHRO-IMMUNE JOINT SUPPORT • 60 veg. caps	32.00	24.00	21.00			
00919	ARTICHOKE LEAF EXTRACT • 500 mg, 180 veg. caps	30.00	22.50	21.00			
01533	ASCORBYL PALMITATE • 500 mg, 100 veg. caps	22.50	16.88	15.00			
00888	ASHWAGANDHA EXTRACT (Optimized) • 60 veg. caps	10.00	7.50	6.75			
01805	ASIAN ENERGY BOOST • 90 veg. caps	24.00	18.00	16.50			
01066	ASPIRIN • 81 mg, 300 enteric coated tablets	6.00	4.50	4.00			
01923	ASTAXANTHIN WITH PHOSPHOLIPIDS • 4 mg, 30 softgels	16.00	12.00	10.50			
B							
00920	BENFOTIAMINE W/ THIAMINE • 100 mg, 120 veg. caps	19.95	14.96	13.95			
00925	BENFOTIAMINE (Mega) • 250 mg, 120 veg. caps	30.00	22.50	20.25			
01206	BERRY COMPLETE • 30 veg. caps	21.00	15.75	14.00			
01496	BERRY COMPLETE W/ACAI (Enhanced) • 60 veg. caps	29.00	21.75	19.50			
00664	BETA-CAROTENE • 25,000 IU, 100 softgels	11.50	8.63				
01622	BIFIDO GI BALANCE • 60 veg. caps	20.00	15.00	13.50			
01873	BILBERRY EXTRACT • 100 mg, 90 veg. caps	36.00	27.00	24.00			
01512	BIOACTIVE MILK PEPTIDES • 30 caps	18.00	13.50	12.00			
01631	BIO-COLLAGEN W/PATENTED UC-II® • 40 mg, 60 small caps	36.00	27.00	24.00			
**01006	BIOSIL™ • 5 mg, 30 veg. caps	19.99	15.99				
**01007	BIOSIL™ • 1 fl oz	31.99	25.59				
00102	BIOTIN • 600 mcg, 100 caps	7.50	5.63	4.88			
01709	BLACK CUMIN SEED OIL • 60 softgels	16.00	12.00	10.50			
01710	BLACK CUMIN SEED OIL W/BIO-CURCUMIN® • 60 softgels	32.00	24.00	22.50			

SUBTOTAL OF COLUMN 1

ITEM No.	PRODUCT	YOUR PRICE				QTY	Total
		Retail Each \$	1 Unit Each	4 Unit Each	10 Unit Each		
01008	BLAST™ • 600 grams of powder	26.97	20.23				
02025	BLOOD PRESSURE (Dual Action) • 60 veg. tabs	44.00	33.00	28.00			
70000	BLOOD PRESSURE MONITOR (ACCUFIT™) • med/lg cuff	79.99	49.99				
70004	BLOOD PRESSURE MONITOR • Digital wrist cuff	69.95	52.46				
02024	BLOOD PRESSURE (Triple Action AM/PM) • 60 veg. tabs	44.00	33.00	28.00			
01214	BLUEBERRY EXTRACT • 60 veg. caps	22.50	16.88	15.00			
01438	BLUEBERRY EXTRACT W/ POMEGRANATE • 60 veg. caps	30.00	22.50	20.25			
01506	BONE FORMULA (DR. STRUM'S INTENSIVE) • 300 caps	56.00	42.00	37.50			
01726	BONE RESTORE • 120 caps	22.00	16.50	14.25			
01727	BONE RESTORE W/VITAMIN K2 • 120 caps	24.00	18.00	16.50			
01725	BONE STRENGTH FORMULA W/KOACT® • 120 caps	45.00	33.75	30.00			
00313	BONE-UP® • 240 caps	28.95	21.71	20.41			
01661	BORON • 3 mg, 100 veg. caps	5.95	4.46	3.94			
00202	BOSWELLA • 100 caps	38.00	28.50	22.50			
01802	BRAIN SHIELD® GASTRODIN • 300 mg, 60 veg. caps	33.00	24.75	22.50			
01253	BRANCHED CHAIN AMINO ACIDS • 90 caps	19.50	14.63	12.75			
01942	BREAST HEALTH FORMULA • 60 caps	34.00	25.50	22.50			
00893	BRITE EYES III • 2 vials, 5 ml each	34.00	25.50	24.00			
01203	BROMELAIN (Specially-coated) 500 mg, 60 enteric coated tablets	21.00	15.75	14.25			
C							
01653	CALCIUM CITRATE W/VITAMIN D • 300 caps	24.00	18.00	15.94			
01651	CALCIUM D-GLUCARATE • 200 mg, 60 veg. caps	18.00	13.50	11.25			
01823	CALREDUCE SELECTIVE FAT BINDER 120 mint chewable tablets	45.00	33.75	28.50			
01700	CARDIO PEAK™ w/STANDARDIZED HAWTHORN & ARJUNA 120 veg. caps	36.00	27.00	24.00			
00916	CARNITINE W/GLYCOCARN® (Optimized) • 60 veg. caps	36.00	27.00	24.00			
01532	L-CARNITINE • 500 mg, 30 veg. caps	15.00	11.25	9.90			
01829	CARNOSINE • 500 mg, 60 veg. caps	36.00	27.00	24.00			
02020	CARNOSINE (Super) • 500 mg, 60 veg. caps	40.00	30.00	27.00			
01932	CAT MIX • 100 grams powder	14.00	10.50	8.25			
02199	CHILDREN'S FORMULA LIFE EXTENSION MIX™ 120 chewable tablets	25.00	18.75	17.00			
00550	CHLORELLA • 500 mg, 200 tablets	23.98	17.99				
01571	CHLOROPHYLLIN • 100 mg, 100 veg. caps	24.00	18.00	15.00			
01359	CHO-LESS™ • 90 capsules	35.00	26.25				
01910	CHOL-SUPPORT™ • 60 liquid veg. caps	48.00	36.00	32.00			
01504	CHROMIUM W/CROMINEX® 3+ (Optimized) 500 mcg, 60 veg. caps	9.00	6.75	6.00			
01503	CINSULIN® W/INSEAZ® AND CROMINEX® 3+ • 90 veg. caps	38.00	28.50	25.50			
01906	CISTANCHE (Standardized) • 30 veg. caps	20.00	15.00	12.00			
01818	CITRIMAX® (Super) • 180 veg. caps	40.00	30.00	28.50			
00818	CLA BLEND W/SESAME LIGNANS (Super) 120 softgels	36.00	27.00	24.75	19.75		
02103	COCOAMIND™ • 14 packets	24.00	18.00	16.00			
01896	COGNITEX® W/BRAIN SHIELD® • 90 softgels	60.00	45.00	39.00	36.00		
01897	COGNITEX® W/PREGNENOLONE & BRAIN SHIELD® 90 softgels	62.00	46.50	39.75	37.50		

SUBTOTAL OF COLUMN 2

ITEM No.	PRODUCT	Retail Each \$	YOUR PRICE			QTY	Total
			1 Unit Each	4 Unit Each	10 Unit Each		
01421	COGNITEX® BASICS • 60 softgels	38.00	28.50	26.25	24.00		
01659	COGNIZIN® CDP-CHOLINE CAPS • 250 mg, 60 veg. caps	36.00	27.00	25.50			
01945	COMPLETE B-COMPLEX (BioActive) • 60 veg. caps	12.00	9.00	8.00			
02198	COMPREHENSIVE NUTRIENT PACKS ADVANCED • 30 packs	90.00	67.50	61.50			
33840	CRWAY TO GREAT GLUCOSE CD •	225.00	225.00				
01949	COQ10 w/d-LIMONENE (Super-Absorbable) • 50 mg, 60 softgels	25.00	18.75	16.50	15.00		
01948	COQ10 w/d-LIMONENE (Super-Absorbable) 100 mg, 100 softgels	46.00	34.50	28.00	26.25		
01951	COQ10 w/d-LIMONENE (Super-Absorbable) 100 mg, 60 softgels	30.00	22.50	20.00			
01929	COQ10 (Super Ubiquinol) • 100 mg, 60 softgels	56.00	42.00	36.00	33.00		
01733	COQ10 w/BIOPQQ® (Super Ubiquinol) • 100 mg, 30 softgels	54.00	40.50	33.00	30.00		
01426	COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (Super Ubiquinol) • 100 mg, 60 softgels	62.00	46.50	39.00	36.00		
01425	COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (Super Ubiquinol) • 50 mg, 100 softgels	58.00	43.50	34.50	31.50		
01427	COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (Super Ubiquinol) • 50 mg, 30 softgels	20.00	15.00	12.00			
01431	COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (Super Ubiquinol) • 200 mg, 30 softgels	62.00	46.50	39.00	36.00		
00862	CRAN-MAX® • 500 mg, 60 veg. caps	17.50	13.13	11.25			
01424	CRAN-MAX® WITH ELLIROSE™ (Optimized) • 60 veg. caps	18.00	13.50	12.00			
01529	CREATINE CAPSULES • 120 veg. caps	10.95	8.21	6.94			
01746	CREATINE WHEY GLUTAMINE POWDER • 454 grams (vanilla)	30.00	22.50	19.50			
33840	CRWAY TO GREAT GLUCOSE CD	225.00	225.00				
00407	CURCUMIN® (Super Bio) • 400 mg, 60 veg. caps	38.00	28.50	26.25			
01924	CURCUMIN® W/GINGER & TURMERONES (Advanced Bio) 30 softgels	30.00	22.50	20.25			
01804	CYTOKINE SUPPRESS™ W/EGCG • 30 veg. caps	30.00	22.50	20.25			
COSMESIS							
80157	ADVANCED ANTI-GLYCATION PEPTIDE SERUM • 1 oz	53.00	39.75	34.50			
80165	ADVANCED GROWTH FACTOR SERUM • 30 ml	65.00	48.75	42.75			
80154	ADVANCED LIGHTENING CREAM • 1 oz	65.00	48.75	42.75			
80155	ADVANCED PEPTIDE HAND THERAPY • 4 oz	46.00	34.50	29.25			
80152	ADVANCED TRIPLE PEPTIDE SERUM • 1 oz	65.00	48.75	42.75			
80140	ADVANCED UNDER EYE SERUM W/STEM CELLS • .33 oz	49.00	36.75	31.50			
80139	AMBER SELF MICRODERMABRASION • 2 oz	49.00	36.75	31.50			
80158	ANTI-AGING FACE OIL • 1 oz	59.00	44.25	39.00			
80118	ANTI-AGING MASK • 2 oz	72.00	54.00	47.52			
80151	ANTI-AGING REJUVENATING FACE CREAM • 2 oz	65.00	48.75	42.75			
80153	ANTI-AGING REJUVENATING SCALP SERUM • 2 oz	46.00	34.50	29.25			
80134	ANTI-GLYCATION SERUM W/BLEUBERRY & POMEGRANATE EXTRACTS • 1 oz	33.00	24.75	23.51			
80133	ANTIOXIDANT FACIAL MIST • 2 oz	32.00	24.00	22.80			
80105	ANTI-REDNESS & ADULT BLEMISH LOTION • 1 oz	74.50	55.88	49.17			
80144	BROCCOLI SPROUT CREAM • 1 oz	46.00	34.50	29.25			
80156	COLLAGEN BOOSTING PEPTIDE SERUM • 1 oz	59.00	44.25	39.00			
80141	DNA REPAIR CREAM • 1 oz	49.00	36.75	31.50			
80167	ENVIRONMENTAL SUPPORT SERUM • 1 fl. oz	59.00	44.25	39.00			
SUBTOTAL OF COLUMN 3							

ITEM No.	PRODUCT	Retail Each \$	YOUR PRICE			QTY	Total
			1 Unit Each	4 Unit Each	10 Unit Each		
80108	ESSENTIAL PLANT LIPIDS REPARATIVE SERUM • 1 oz	74.95	56.21	49.46			
80163	EYE LIFT CREAM • 0.5 fl oz	59.00	44.25	39.00			
80123	FACE REJUVENATING ANTIOXIDANT CREAM • 2 oz	69.50	52.13	45.87			
80107	FINE LINE-LESS • 1 oz	74.50	55.88	49.17			
80137	HEALING FORMULA ALL-IN-ONE CREAM • 1 oz	53.00	39.75	34.07			
80102	HEALING VITAMIN K CREAM • 1 oz	79.50	59.63	52.47			
80109	HYALURONIC FACIAL MOISTURIZER • 1 oz	58.00	43.50	38.28			
80110	HYALURONIC OIL-FREE FACIAL MOISTURIZER • 1 oz	58.00	43.50	38.28			
80138	HYDRATING ANTIOXIDANT FACE MIST • 4 oz	39.95	29.96	28.50			
80103	LIFTING & TIGHTENING COMPLEX • 1 oz	74.50	55.88	49.17			
80135	MELATONIN CREAM • 1 oz	33.00	24.75	20.33			
80114	MILD FACIAL CLEANSER • 8 fl. oz	59.00	44.25	38.94			
80159	MULTI STEM CELL SKIN TIGHTENING COMPLEX • 1 oz	59.00	44.25	39.00			
80122	NECK REJUVENATING ANTIOXIDANT CREAM • 2 oz	64.00	48.00	42.24			
80150	RENEWING EYE CREAM • 1/2 oz	65.00	48.75	42.75			
80142	RESVERATROL ANTI-OXIDANT SERUM • 1 oz	46.00	34.50	29.25			
80166	SKIN FIRMING COMPLEX • 1 fl. oz	53.00	39.75				
80112	SKIN LIGHTENING SERUM • 1/2 oz	85.00	63.75	56.10			
80130	SKIN STEM CELL SERUM • 1 oz	74.00	55.50	51.75			
80164	SKIN TONE EQUALIZER • 0.4 fl oz	59.00	44.25	39.00			
80143	STEM CELL CREAM W/ALPINE ROSE • 1 oz	66.00	49.50	43.50			
80148	TIGHTENING & FIRMING NECK CREAM • 2 oz	39.00	29.25	26.25			
80161	TRIPLE ACTION VITAMIN C CREAM • 1 oz jar	59.00	44.25	39.00			
80162	ULTIMATE MICRODERMABRASION • 8 fl. oz	39.00	29.25	26.25			
80160	ULTRA EYELASH BOOSTER • 0.25 oz (2 units \$39)	59.00	44.25				
80116	ULTRA LIP PLUMPER • 1/3 oz	64.00	48.00	42.24			
80101	ULTRA WRINKLE RELAXER • 1 oz	89.95	67.46	59.82			
80113	UNDER EYE REFINING SERUM • 1/2 oz	74.50	55.88	49.17			
80104	UNDER EYE RESCUE CREAM • 1/2 oz	74.50	55.88	49.17			
80129	VITAMIN C SERUM • 1 oz	85.00	63.75	56.10			
80136	VITAMIN D LOTION • 4 oz	36.00	27.00	25.25			
80145	VITAMIN E-ESSENTIAL CREAM • 1 oz	28.00	21.00	19.50			
80149	YOUTH SERUM • 1 oz	65.00	48.75	42.75			
D							
00658	7-KETO® DHEA METABOLITE • 25 mg, 100 caps	28.00	21.00	18.00			
01479	7-KETO® DHEA METABOLITE • 100 mg, 60 veg. caps	40.00	30.00	27.00			
01640	DHA (Vegetarian) • 30 veg. softgels	20.00	15.00	13.50			
00607	DHEA • 25 mg, 100 tablets (Dissolve in mouth)	14.00	10.50	8.81			
01478	DHEA COMPLETE • 60 veg. caps	48.00	36.00	32.40			
00335	DHEA • 25 mg, 100 caps	16.00	12.00	11.00			
00454	DHEA • 15 mg, 100 caps	14.00	10.50	9.00			
00882	DHEA • 50 mg, 60 caps	19.00	14.25	12.75			
01689	DHEA • 100 mg, 60 veg. caps	24.00	18.00	16.50			
01358	DIGEST RC® • 30 tablets	19.95	14.96	12.75			
02021	DIGESTIVE ENZYMES (Enhanced Super) • 60 veg. caps	22.00	16.50	15.00			
02022	DIGESTIVE ENZYMES w/PROBIOTICS (Enhanced Super)•60 veg. caps	28.00	21.00	18.00			
SUBTOTAL OF COLUMN 4							

ITEM No.	PRODUCT	YOUR PRICE				QTY	Total
		Retail Each \$	1 Unit Each	4 Unit Each	10 Unit Each		
01671	D, L-PHENYLALANINE • 500 mg, 100 veg. caps	18.75	14.06	12.00			
01540	DMAE BITARTRATE • 150 mg, 200 veg. caps	18.00	13.50	11.25			
01570	DNA PROTECTION FORMULA • 60 veg. caps	34.00	25.50	24.00			
01931	DOG MIX • 100 grams powder	18.00	13.50	11.25			
02006	DOPA-MIND™ • 60 veg. tabs	44.00	33.00	28.00			
00321	DR. PROCTOR'S ADVANCED HAIR FORMULA • 2 oz	39.95	29.96	24.00			
00320	DR. PROCTOR'S HAIR SHAMPOO • 8 oz	24.95	18.71	16.50			
E							
01997	ENDOTHELIAL DEFENSE™ w/POMEGRANATE COMPLETE AND CORDIART™ • 60 softgels	68.00	51.00	46.50			
00997	ENDOTHELIAL DEFENSE™ w/GLISODIN® • 60 veg. caps	54.00	40.50	36.00			
01937	EPA/DHA (Mega) • 120 softgels	20.00	15.00	13.50			
02009	ESOPHACOOL™ • 120 chewable tablets	20.00	15.00	13.50			
01737	ESOPHAGEAL GUARDIAN (Berry flavor) • 60 chewable tablets	36.00	27.00	24.00			
01042	EUROPEAN LEG SOLUTION DIOSMIN 95 600 mg, 30 veg. tabs	20.00	15.00	13.50			
01706	EXTRAORDINARY ENZYMES • 60 caps	26.00	19.50	18.00			
02008	(CALIFORNIA ESTATE) EXTRA VIRGIN OLIVE OIL • 500 ml (16.9 fl. oz)	33.00	24.75	22.50			
01514	EYE PRESSURE SUPPORT W/MIRTOGENOL® • 30 veg. caps	38.00	28.50	25.50			
F							
01054	FACE MASTER® PLATINUM • Facial Toning System	199.00	199.00				
00965	FAST-ACTING JOINT FORMULA • 30 caps	39.00	29.25	27.00			
01717	FAST-C® W/DIHYDROQUERCETIN • 120 veg. tabs	26.00	19.50	18.00			
01064	FEMMENESSENCE MACAPAUSE® • 120 veg. caps	34.99	26.24				
02125	FLORASSIST® GI w/PHAGE TECHNOLOGY •30 liquid veg. caps	33.00	24.75	22.50			
01821	FLORASSIST® HEART HEALTH • 60 veg. caps	32.00	24.00	21.00			
02124	FLORASSIST® IMMUNE HEALTH • 30 veg. caps	26.00	19.50	18.00			
02120	FLORASSIST® ORAL HYGIENE • 30 lozenges	20.00	15.00	13.00			
01825	FLORASSIST® BALANCE • 30 liquid veg. caps	32.00	24.00	21.00			
02000	FLORASSIST® MOOD • 60 caps	33.00	24.75	22.50			
01920	FLORASSIST® THROAT HEALTH • 30 lozenges	20.00	15.00	13.50			
01913	FOLATE HIGH POTENCY (Optimized) • 5,000 mcg, 30 veg. tablets	18.00	13.50	12.00			
01939	FOLATE (Optimized) • 1,000 mcg, 100 veg. tablets	15.00	11.25	10.00			
01842	FOLATE + VITAMIN B12 (BioActive) • 90 veg. caps	12.00	9.00	8.00			
01544	FORSKOLIN • 10 mg, 60 veg. caps	16.00	12.00	10.50			
01513	FUCOIDAN W/MARITECH® 926 (Optimized) • 60 veg. caps	36.00	27.00	24.75			
G							
02070	GAMMA E MIXED TOCOPHEROL/TOCOTRIENOLS • 60 softgels	40.00	30.00	27.00			
02075	GAMMA E MIXED TOCOPHEROL w/ENHANCED SESAME LIGNANS • 60 softgels	32.00	24.00	21.75			
01394	GARLIC (Optimized) • 200 veg. caps	24.95	18.71	15.75			
02100	GASTRO-EASE™ • 60 veg. caps	44.00	33.00	30.00			
02119	GEROPROTECT™ AGELESS CELL™ • 30 softgels	40.00	30.00	27.00			
02133	GEROPROTECT™ LONGEVITY A.I.™ • 30 softgels	56.00	42.00	38.00			
01122	GINGER FORCE® • 60 liquid caps	34.95	26.21				
01658	GINKGO BILOBA CERTIFIED EXTRACT™ 120 mg, 365 veg. caps	50.00	37.50	33.00			
00756	GLA WITH SESAME LIGNANS (Mega) • 60 softgels	19.50	14.63	13.50			
SUBTOTAL OF COLUMN 5							

ITEM No.	PRODUCT	YOUR PRICE				QTY	Total
		Retail Each \$	1 Unit Each	4 Unit Each	10 Unit Each		
00345	(L-) GLUTAMINE CAPSULES • 500 mg, 100 veg. caps	14.95	11.21	10.13			
00141	(L-) GLUTAMINE POWDER • 100 grams	22.00	16.50	15.00			
00522	GLUCOSAMINE/CHONDROITIN CAPSULES • 100 caps	38.00	28.50	24.00			
01541	GLUTATHIONE, CYSTEINE & C • 100 veg. caps	20.00	15.00	13.50			
02122	GLYCEMIC GUARD™ • 30 veg. caps	42.00	31.50	28.00			
01669	GLYCINE • 1,000 mg, 100 veg. caps	12.00	9.00	8.10			
01411	GRAPE SEED EXTRACT W/RESVERATROL & PTEROSTILBENE 100 mg, 60 veg. caps	36.00	27.00	25.50			
01620	GREEN COFFEE EXTRACT COFFEEGENIC® 400 mg, 90 veg. caps	32.00	24.00	21.00			
00953	GREEN TEA EXTRACT (Mega) •lightly caffeinated, 100 veg. caps	30.00	22.50	18.00			
00954	GREEN TEA EXTRACT (Mega) •decaffeinated, 100 veg. caps	30.00	22.50	18.00			
H							
01074	5 HTP • 100 mg, 60 caps	27.95	20.96				
02002	HAIR, SKIN & NAIL REJUVENATION FORM W/VERISOL® 90 tabs	32.00	24.00	22.00			
01738	HCA (Garcinia) • 90 veg. caps	17.00	12.75	11.25			
29754	HCACTIVE™ GARCINIA CAMBOGIA EXTRACT • 90 caps	30.00	22.50				
01393	HEPATOPRO • 900 mg, 60 softgels	50.00	37.50	34.50			
02121	HOMOCYSTEINE RESIST • 60 veg. caps	26.00	19.50	17.50			
01527	HUPERZINE A • 200 mcg, 60 veg. caps	40.00	30.00	27.00			
00661	HYDRODERM® • 1 oz	79.95	59.96	49.00			
I							
01704	IMMUNE MODULATOR W/TINOFEND® • 60 veg. caps	17.00	12.75	11.25			
00955	IMMUNE PROTECT W/PARACTIN® • 30 veg. caps	29.50	22.13	19.91			
02005	IMMUNE SENESCENCE PROTECTION FORMULA™ •60 veg. tabs	40.00	30.00	27.00			
01049	INNERPOWER™ • 530 grams powder	44.97	33.73				
01674	INOSITOL CAPSULES • 1,000 mg, 360 veg. caps	62.00	46.50	43.50			
01292	INTEGRA-LEAN® AFRICAN MANGO IRVINGIA 150 mg, 60 veg. caps	28.00	21.00	18.00			
30731	IONIC SELENIUM • 2 oz, 300 mcg	13.69	10.27				
01677	IRON PROTEIN PLUS • 300 mg, 100 caps	28.00	21.00	19.50			
01492	IRVINGIA W/PHASE 3™ CALORIE CONTROL COMPLEX (Optimized African Mango)• 120 veg. caps	56.00	42.00	36.00			
J, K, L							
52142	JARRO-DOPHILUS® PROBIOTIC FOR WOMEN 30 enteric-coated veg. caps	27.95	20.96				
00056	JARRO-DOPHILUS EPS® • 60 veg. caps	23.95	17.96				
02034	K W/ADVANCED K2 COMPLEX (Super) • 90 softgels	30.00	22.50	20.25			
01600	KRILL HEALTHY JOINT FORMULA • 30 softgels	32.00	24.00	21.75			
01050	KRILL OIL (Jarrow) • 60 softgels	33.95	25.46				
00316	KYOLIC® GARLIC FORMULA 102 • 200 veg. caps	27.45	20.59				
00789	KYOLIC® RESERVE • 600 mg, 120 caps	28.95	21.71				
01681	LACTOFERRIN • 60 caps	44.00	33.00	30.00			
00020	LECITHIN • 16 oz granules	18.00	13.50	12.00			
02155	LIFE EXTENSION MIX™ • 315 tablets	80.00	60.00	52.00	43.75		
02157	LIFE EXTENSION MIX™ W/EXTRA NIACIN • 315 tablets	80.00	60.00	52.00	43.75		
02154	LIFE EXTENSION MIX™ • 490 caps	90.00	67.50	58.00	47.50		
SUBTOTAL OF COLUMN 6							

ITEM No.	PRODUCT	YOUR PRICE				QTY	Total
		Retail Each \$	1 Unit Each	4 Unit Each	10 Unit Each		
02156	LIFE EXTENSION MIX™ POWDER • 14.81 oz	80.00	60.00	52.00	43.75		
02165	LIFE EXTENSION MIX™ • 315 tablets w/o copper	80.00	60.00	52.00	43.75		
02164	LIFE EXTENSION MIX™ • 490 caps w/o copper	90.00	67.50	58.00	47.50		
02166	LIFE EXTENSION MIX™ POWDER • 14.81 oz w/o copper	80.00	60.00	52.00	43.75		
01608	LIVER EFFICIENCY FORMULA • 30 veg. caps	18.00	13.50	12.00			
01639	5-LOX INHIBITOR W/APRÈSFLEX® • 100 mg, 60 veg. caps	22.00	16.50	15.00			
01678	L-LYSINE • 620 mg, 100 veg. caps	9.00	6.75	6.00			
00455	LYCOPENE (Mega) • 15 mg, 90 softgels	35.00	26.25	22.50			
M							
01992	MACUGUARD® OCULAR SUPPORT w/SAFFRON• 60 softgels	25.00	18.75	17.50			
01993	MACUGUARD® OCULAR SUPPORT w/SAFFRON & ASTAXANTHIN• 60 softgels	44.00	33.00	30.00			
01459	MAGNESIUM CAPS • 500 mg, 100 veg. caps	12.00	9.00	7.50			
01682	MAGNESIUM (CITRATE) • 160 mg, 100 veg. caps	12.00	9.00	7.50			
02107	(EXTEND-RELEASE) MAGNESIUM • 60 veg. caps	13.00	9.75	8.75			
01908	MEDITERRANEAN TRIM WITH SINETROL™-XPUR 60 veg. caps	18.00	13.50	12.00			
02109	MEDITERRANEAN WHOLE FOOD BLEND • 90 veg. caps	44.00	33.00	30.00			
01668	MELATONIN • 300 mcg, 100 veg. caps	5.75	4.31	3.75			
01083	MELATONIN • 500 mcg, 200 veg. caps	18.00	13.50	12.00			
00329	MELATONIN • 1 mg, 60 caps	5.00	3.75	3.47			
00330	MELATONIN • 3 mg, 60 veg. caps	8.00	6.00	5.16			
00331	MELATONIN • 10 mg, 60 veg. caps	28.00	21.00	18.00			
00332	MELATONIN • 3 mg, 60 veg. lozenges	8.00	6.00	5.16			
01734	MELATONIN (Fast-Acting Liquid) • 2 fl. oz (Citrus-Vanilla)	12.00	9.00	8.25			
01787	MELATONIN TIMED RELEASE • 300 mcg, 100 veg. tabs	12.00	9.00	8.25			
01788	MELATONIN TIMED RELEASE • 750 mcg, 60 veg. tablets	8.00	6.00	5.25			
01786	MELATONIN TIMED RELEASE • 3 mg, 60 veg. tabs	12.00	9.00	8.25			
02101	MEMORY PROTECT • 36 day supply	24.00	18.00	16.00			
01536	METHYLCOBALAMIN • 1 mg, 60 veg. lozenges (vanilla)	9.95	7.46	6.00			
01537	METHYLCOBALAMIN • 5 mg, 60 veg. lozenges (vanilla)	32.00	24.00	18.75	17.25		
00709	MIGRA-EEZE™ (Butterbur) • 60 softgels	33.00	24.75	22.00			
01522	MILK THISTLE (European) • 60 veg. caps	34.00	25.50	22.50			
01922	MILK THISTLE (European) • 60 softgels	28.00	21.00	18.75			
01925	MILK THISTLE (European) • 120 softgels	44.00	33.00	30.00			
01940	MIRAFORTE w/STANDARDIZED LIGNANS (Super) • 120 veg caps	62.00	46.50	42.00			
01869	MITOCHONDRIAL BASICS W/BIOPQQ® • 30 caps	44.00	33.00	30.00			
01868	MITOCHONDRIAL ENERGY OPTIMIZER w/BIOPQQ®•120 caps	72.00	54.00	48.00			
00065	MK-7 • 90 mcg, 60 softgels	28.00	21.00	18.75			
00451	MSM (Methylsulfonylmethane) • 1,000 mg, 100 caps	14.00	10.50	8.96			
N							
01534	N-ACETYL-L-CYSTEINE • 600 mg, 60 veg. caps	14.00	10.50	9.25			
01904	NAD+ CELL REGENERATOR™ • 100 mg, 30 veg. caps	22.00	16.50	15.00			
02144	NAD+ CELL REGENERATOR™ NICOTINAMIDE RIBOSIDE 250 mg, 30 veg. caps	42.00	31.50	28.00			
02145	NAD+ CELL REGENERATOR™ W/RESVERATROL (Optimized) 30 veg. caps	50.00	37.50	34.00			

SUBTOTAL OF COLUMN 7

ITEM No.	PRODUCT	YOUR PRICE				QTY	Total
		Retail Each \$	1 Unit Each	4 Unit Each	10 Unit Each		
01807	NATURAL APPETITE SUPPRESS (Advanced) • 60 veg. caps	38.00	28.50	25.50			
00984	NATURAL BP MANAGEMENT • 60 tablets	44.00	33.00	30.00			
02012	NATURAL CORTISOL BALANCE • 30 veg. caps	45.00	33.75	30.00			
01892	NATURAL ESTROGEN • 60 veg. tabs	38.00	28.50	25.50			
01626	NATURAL SEX FOR WOMEN® 50+ (Advanced)•90 veg. caps	59.00	44.25	34.00			
01444	NATURAL SLEEP® • 60 veg. caps	13.00	9.75	7.50			
01551	NATURAL SLEEP® w/ MELATONIN (Enhanced) • 30 caps	22.00	16.50	15.00			
01511	NATURAL SLEEP® W/O MELATONIN (Enhanced) • 30 caps	20.00	15.00	13.50			
01445	NATURAL SLEEP® MELATONIN • 5 mg, 60 veg. caps	18.00	13.50	12.00			
00987	NATURAL STRESS RELIEF • 30 veg. caps	28.00	21.00	18.00			
01603	NEURO-MAG® MAGNESIUM L-THREONATE • 90 veg. caps	40.00	30.00	27.00			
02032	NEURO-MAG® MAGNESIUM L-THREONATE 93.35 grams • Tropical Punch Flavor	38.00	28.50	26.00			
01990	NITROVASC w/CORDIART™ • 30 veg. caps	18.00	13.50	12.00			
01903	NK CELL ACTIVATOR™ • 30 veg. tablets	45.00	33.75	31.50			
00373	NO FLUSH NIACIN • 800 mg, 100 caps	19.00	14.25	12.75			
O							
01824	OLIVE LEAF VASCULAR SUPPORT w/CELERY SEED EXTRACT (Advanced) • 60 veg. caps	36.00	27.00	24.00			
01988	OMEGA-3 PLUS EPA/DHA w/SESAME LIGNANS, OLIVE EXTRACT, KRILL & ASTAXANTHIN (SUPER)• 120 softgels	45.00	33.75	31.50	24.75		
01983	OMEGA-3 EPA/DHA w/SESAME LIGNANS & OLIVE EXTRACT (Super) • 60 softgels	18.00	13.50	12.00	9.38		
01982	OMEGA-3 EPA/DHA w/SESAME LIGNANS & OLIVE EXTRACT (Super) • 120 softgels	32.00	24.00	21.00	17.05		
01984	OMEGA 3 EPA/DHA w/SESAME LIGNANS & OLIVE EXTRACT (Super) • 120 enteric coated softgels	34.00	25.50	23.25	18.00		
01985	OMEGA 3 EPA/DHA w/SESAME LIGNANS & OLIVE EXTRACT (Super) • 60 enteric coated softgels	20.00	15.00	13.50	10.50		
01986	OMEGA 3 EPA/DHA w/SESAME LIGNANS & OLIVE EXTRACT (Super) • 240 small softgels	32.00	24.00	21.00	17.25		
02091	ONCE-DAILY HEALTH BOOSTER • 60 softgels	54.00	40.50	38.00			
02113	ONE-PER-DAY • 60 tablets	22.00	16.50	15.00			
01328	ONLY TRACE MINERALS • 90 veg. caps	15.00	11.25	9.38			
P							
01789	PALMETTOGUARD® SAW PALMETTO W/BETA-SITOSTEROL 30 softgels	15.00	11.25	10.50	9.00		
01790	PALMETTOGUARD® SAW PALMETTO/ NETTLE ROOT W/BETA-SITOSTEROL • 60 softgels	28.00	21.00	19.50	18.00		
*00342	PECTA SOL-C® MODIFIED CITRUS PECTIN • 454 grams powder	113.95	96.86				
*01080	PECTA SOL-C® MODIFIED CITRUS PECTIN • 270 veg. caps	82.95	70.51				
01811	PEONY IMMUNE • 60 veg. caps	36.00	27.00	24.00			
*00673	PGX® PLUS MULBERRY (WellBetX®) • 180 veg. caps	34.95	26.21				
01953	POMEGRANATE COMPLETE • 30 softgels	24.00	18.00	15.75			
00956	POMEGRANATE FRUIT EXTRACT • 30 veg. caps	19.50	14.63	13.16			
*01837	POMI-T® • 60 veg. caps	35.00	26.25	24.00			
00577	POTASSIUM IODIDE • 130 mg, 14 tabs	6.95	5.21	3.94			
01500	PQQ CAPS W/BIOPQQ® • 10 mg, 30 veg. caps	24.00	18.00	13.50	12.00		
01647	PQQ CAPS W/BIOPQQ® • 20 mg, 30 veg. caps	40.00	30.00	24.00	21.00		

SUBTOTAL OF COLUMN 8

ITEM No.	PRODUCT	Retail Each \$	YOUR PRICE			QTY	Total
			1 Unit Each	4 Unit Each	10 Unit Each		
00302	PREGNENOLONE • 50 mg, 100 caps	26.00	19.50	16.50			
00700	PREGNENOLONE • 100 mg, 100 caps	30.00	22.50	20.25			
*01373	PRELOX® NATURAL SEX FOR MEN® • 60 tablets	52.00	39.00	36.00			
00525	PROBOOST™ THYMIC PROTEIN A • 30 packets	66.60	49.95				
01441	PROGESTA-CARE® • 4 oz cream	36.39	27.29	25.72			
01928	PROSTATE FORMULA (Ultra Natural) • 60 softgels	38.00	28.50	26.25	24.00		
01909	PROSTAPOLLEN™ (Triple strength) • 30 softgels	28.00	21.00	18.75			
01742	PROTEIN-ISOLATE (Whey) Vanilla • 403 grams	30.00	22.50	19.50			
01743	PROTEIN-ISOLATE (Whey) Chocolate • 437 grams	30.00	22.50	19.50			
01770	PROTEIN CONCENTRATE (New Zealand Whey) Vanilla 500 grams	30.00	22.50	19.95			
01771	PROTEIN CONCENTRATE (New Zealand Whey) Chocolate 640 grams	30.00	22.50	19.95			
01812	PROVINAL® PURIFIED OMEGA-7 • 30 softgels	27.00	20.25	18.00			
01676	PS CAPS (Phosphatidylserine) • 100 mg, 100 veg. caps	54.00	40.50	36.00			
01508	PTEROPURE® Pterostilbene • 50 mg, 60 veg. caps	32.00	24.00	22.50			
01209	PUMPKIN SEED EXTRACT (Water-soluble) • 60 veg. caps	20.00	15.00	13.50			
01637	PYCNOGENOL® FRENCH MARITIME PINE BARK EXTRACT 100 mg, 60 veg. caps	64.00	48.00	45.00			
01217	PYRIDOXAL 5'-PHOSPHATE • 100 mg, 60 veg. caps	22.00	16.50	14.85			
Q, R							
01309	QUERCETIN (Optimized) • 250 mg, 60 veg. caps	22.00	16.50	15.00			
01030	RED YEAST RICE (Bluebonnet) • 600 mg, 60 veg. caps	18.08	13.56				
00605	REGIMINT • 60 enteric-coated caps	19.95	14.96	14.00			
01708	REISHI EXTRACT MUSHROOM COMPLEX • 60 veg. caps	30.00	22.50	20.25			
01448	REJUVENEX® BODY LOTION • 6 oz	24.00	18.00	14.85	12.75		
01621	REJUVENEX® FACTOR FIRING SERUM • 1.7 oz	65.00	48.75	37.50			
01220	REJUVENEX® (ULTRA) • 2 oz	52.00	39.00	33.00	29.25		
00676	REJUVENIGHT® (ULTRA) • 2 oz	39.95	29.96	27.00			
01410	RESVERATROL W/PTEROSTILBENE • 100 mg, 60 veg. caps	36.00	27.00	24.00			
02030	RESVERATROL (Optimized) • 60 veg. caps	46.00	34.50	31.00			
00889	RHODIOLA EXTRACT • 250 mg, 60 veg. caps	14.00	10.50	9.00			
01900	RIBOGEN™ FRENCH OAK WOOD EXTRACT 200 mg, 30 veg. caps	36.00	27.00	24.75			
00972	(D) RIBOSE POWDER • 150 grams	27.50	20.63	18.56			
01473	(D) RIBOSE TABLETS • 100 veg. tabs	32.00	24.00	21.00			
01609	RICH REWARDS® BREAKFAST GROUND COFFEE • 12 oz. bag	13.00	9.75				
01730	RICH REWARDS® BREAKFAST BLEND GROUND COFFEE Natural Mocha • 12 oz. bag	15.00	11.25	10.50			
01729	RICH REWARDS® BREAKFAST BLEND GROUND COFFEE Natural Vanilla • 12 oz. bag	15.00	11.25	10.50			
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				
01208	R-LIPOIC ACID (Super) • 240 mg, 60 veg. caps	49.00	36.75	33.75			
00070	RNA CAPSULES • 500 mg, 100 caps	17.95	13.46	12.12			

SUBTOTAL OF COLUMN 9

ITEM No.	PRODUCT	Retail Each \$	YOUR PRICE			QTY	Total
			1 Unit Each	4 Unit Each	10 Unit Each		
S							
01432	SAFFRON W/SATIREAL® (Optimized) • 60 veg. caps	36.00	27.00	24.00			
01935	SAME (S-ADENOSYL-METHIONINE) 200 mg, 30 enteric coated tablets	25.00	18.75	16.50			
01933	SAME (S-ADENOSYL-METHIONINE) 400 mg, 30 enteric coated tablets	36.00	27.00	24.00			
01934	SAME (S-ADENOSYL-METHIONINE) 400 mg, 60 enteric coated tablets	66.00	49.50	45.00			
01740	SEA-IODINE™ • 1,000 mcg, 60 veg. caps	8.00	6.00	5.40			
01879	SE-METHYL L-SELENOCYSTEINE • 200 mcg, 90 veg. caps	11.00	8.25	7.50			
00318	SERRAFLAZYME • 100 tablets	18.00	13.50	12.00			
01938	SHADE FACTOR™ • 120 veg. caps	44.00	33.00	30.00			
02110	SHADE FACTOR™ SUNSCREEN LOTION • 4 fl. oz	20.00	15.00	13.00			
02118	SHADE FACTOR™ SUNSCREEN SPRAY • 6 fl. oz	22.00	16.50	14.25			
01884	SILYMARIN • 100 mg, 90 veg. caps	14.00	10.50	9.50			
01249	SINUS CLEANSER • 4 oz. bottle	25.00	18.75				
02129	SKIN CARE COLLECTION ANTI-AGING SERUM • 1.75 fl. oz	60.00	45.00	37.50			
02132	SKIN CARE COLLECTION BODY LOTION • 6 oz	28.00	21.00	18.00			
02130	SKIN CARE COLLECTION DAY CREAM • 1.65 fl. oz	50.00	37.50	33.00			
02131	SKIN CARE COLLECTION NIGHT CREAM • 1.65 fl. oz	39.00	29.25	27.00			
01596	SKIN RESTORING PHYTOCERAMIDES w/LIPOWHEAT® 30 liquid veg. caps	25.00	18.75	17.25			
00961	SODZYME® w/GLISODIN® & WOLFBERRY • 90 veg. caps	28.00	21.00	18.00			
00657	SOLARSHIELD® SUNGLASSES • Smoke color	12.99	9.74	8.63			
01097	SOY EXTRACT (ULTRA) • 150 veg. caps	76.00	57.00	50.00			
01649	SOY ISOFLAVONES (SUPER ABSORBABLE) • 60 veg. caps	28.00	21.00	18.75			
00432	STEVIA™ (Better) • 100 packets, 1 gram each	9.95	7.46				
00438	STEVIA™ ORGANIC LIQUID SWEETENER (Better) • 2 oz	11.00	8.25				
01476	STRONTIUM • 750 mg, 90 veg. caps	20.00	15.00	13.50			
01778	SUPER SELENIUM COMPLEX • 200 mcg, 100 veg. caps	14.00	10.50	9.00	8.25		
T							
02023	TART CHERRY W/CHERRYPURE® 60 veg. caps	20.00	15.00	14.00			
01827	TAURINE • 1,000 mg, 90 veg. caps	13.00	9.75	9.00			
01918	TEAR SUPPORT w/MAQUIBRIGHT® • 60 mg, 30 veg. caps	18.00	13.50	12.00			
00133	L-TAURINE POWDER • 300 grams	20.00	15.00	12.66			
*13685	TEN MUSHROOM FORMULA® • 120 veg. caps	41.95	35.66				
01304	THEAFLAVIN STANDARDIZED EXTRACT • 30 veg. caps	18.00	13.50	12.00			
01683	(L) THEANINE • 100 mg, 60 veg. caps	24.00	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	14.00	10.50	8.25			
01859	TMG • 500 mg, 60 liquid veg. caps	13.00	9.75	9.00			
01400	TOCOTRIENOLS (Super-absorbable) • 60 softgels	30.00	22.50	21.00			
01278	TOOTH PASTE • 4 oz (Mint) tube	9.50	7.13	6.50			
01917	TRANQUIL TRACT™ • 60 veg. caps	52.00	39.00	34.50			
01468	TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT 60 veg. caps	24.00	18.00	16.50			
01469	TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT w/RESVERATROL • 60 veg. caps	32.00	24.00	22.20			

SUBTOTAL OF COLUMN 10

ITEM No.	PRODUCT	Retail Each \$	YOUR PRICE			QTY	Total
			1 Unit Each	4 Unit Each	10 Unit Each		
02003	TRIPLE ACTION THYROID • 60 veg. caps	36.00	27.00	24.00			
01803	TRI SUGAR SHIELD® • 60 veg. caps	36.00	27.00	24.00			
01386	TRUFIBER™ • 180 grams	32.95	24.71				
01389	TRUFLOA® PROBIOTICS • 32 veg. caps	42.95	32.21				
01722	L-TRYPTOPHAN • 500 mg, 90 veg. caps	33.00	24.75	22.50			
01721	TRYPTOPHAN PLUS (Optimized) • 90 veg. caps	32.00	24.00	21.75			
02116	TWO-PER-DAY • 60 tablets	10.50	7.88	7.13			
02115	TWO-PER-DAY • 120 tablets	20.00	15.00	13.50			
02114	TWO-PER-DAY • 120 caps	22.00	16.50	15.00			
00326	L-TYROSINE • 500 mg, 100 tablets	13.50	10.13				
U, V							
01921	URIC ACID CONTROL • 60 veg. caps	24.00	18.00	16.50			
00213	VANADYL SULFATE • 7.5 mg, 100 veg. tablets	15.00	11.25	9.38			
02102	VENOFLOW™ • 30 veg. caps	52.00	39.00	36.00			
00408	VENOTONE • 60 caps	18.95	14.21	12.00			
01327	VINPOCETINE • 10 mg, 100 veg. tablets	18.00	13.50	10.50			
00372	VITAMIN B3 NIACIN • 500 mg, 100 caps	7.65	5.74	4.99			
02028	VITAMIN B5 • 500 mg, 100 veg. caps (Pantothenic Acid)	11.00	8.25	7.50			
01535	VITAMIN B6 • 250 mg, 100 veg. caps	12.50	9.38	8.25			
00361	VITAMIN B12 • 500 mcg, 100 lozenges	8.75	6.56	5.44			
01634	VITAMIN C w/DIHYDROQUERCETIN 1,000 mg, 60 veg. tablets	10.00	7.50	6.75			
00927	VITAMIN C w/DIHYDROQUERCETIN 1,000 mg, 250 veg. tablets	27.00	20.25	18.00			
00084	VITAMIN C POWDER (BUFFERED) • 454 grams	23.95	17.96	16.50			
01736	VITAMIN C-MAGNESIUM CRYSTALS (EFFERVESCENT) 180 grams	20.00	15.00	13.50			
01732	VITAMIN D3 • 2,000 IU, 1 fl. oz, Mint flavor	28.00	21.00	18.75			
01753	VITAMIN D3 • 1,000 IU, 90 softgels	7.00	5.25	4.50			
01751	VITAMIN D3 • 1,000 IU, 250 softgels	12.50	9.38	8.44			
01713	VITAMIN D3 • 5,000 IU, 60 softgels	10.00	7.50	6.50			
01718	VITAMIN D3 • 7,000 IU, 60 softgels	14.00	10.50	9.45			
01758	VITAMIN D3 W/SEA-IODINE™ • 5,000 IU, 60 caps	14.00	10.50	9.38			
00864	VITAMIN D3 LIQUID • 2,000 IU, 1 fl. oz	28.00	21.00	18.75			
02040	VITAMINS D AND K W/SEA-IODINE™ • 60 caps	24.00	18.00	16.50			
01863	VITAMIN E (Natural) • 400 IU, 90 softgels	28.00	21.00	19.50	18.00		
01936	VITAMIN K2 (Low dose) • 45 mcg, 90 softgels	18.00	13.50	12.00			
W							
01902	WAIST-LINE CONTROL™ • 120 veg. caps	42.00	31.50	28.50			
X, Y							
01919	X-R SHIELD • 90 veg. caps	15.00	11.25	9.75			
00409	XYLIWHITE™ MOUTHWASH • 16 oz	10.00	7.50				
Z							
01813	ZINC HIGH POTENCY • 50 mg, 90 veg. caps	7.95	5.96	5.25			
01561	ZINC LOZENGES • 60 veg. lozenges	9.00	6.75	6.00			
01961	ZINC LOZENGES (Enhanced) • 30 veg. lozenges	12.00	9.00	6.00			
*01051	ZYFLAMEND® WHOLE BODY • 120 liquid veg. caps	72.95	54.71				

SUBTOTAL OF COLUMN 11

ITEM No.	PRODUCT	Retail Each \$	YOUR PRICE			QTY	Total
			1 Unit Each	4 Unit Each	10 Unit Each		
BOOKS							
33998	THE RIGHT TO TRY by Darcy Olsen • 2016	26.99	20.24				
33885	THE BLUE ZONES SOLUTION by Dan Buettner • 2015	26.00	19.50				
33877	THE TRUTH ABOUT MEN AND SEX by Abraham Morgentaler, MD, FACS • 2015	16.99	12.74				
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				
DPT05	DISEASE PREVENTION AND TREATMENT, EXPANDED FIFTH EDITION (Hardcover) • 2014	69.95	39.95	36.00			
33865	THE RESTORATION OF THE HUMAN BODY [IN 7 PARTS] by Sergey A. Dzugas, MD, PhD • 2014	29.95	22.46				
33862	I'M TOO YOUNG FOR THIS • by Suzanne Somers • 2013	26.00	19.50				
33835	PHARMOCRACY • by William Faloon • 2011	24.00	9.60	8.00			
33838	YOUR GUIDE TO HEALTHY SKIN THE NATURAL WAY by Gary Goldfaden, MD • 2012	26.00	15.00				
33815	KNOCKOUT • by Suzanne Somers • 2009	25.99	17.00				
SUBTOTAL OF COLUMN 12							

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Non-GMO



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Non-GMO

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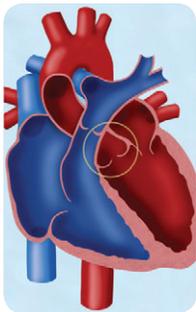


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