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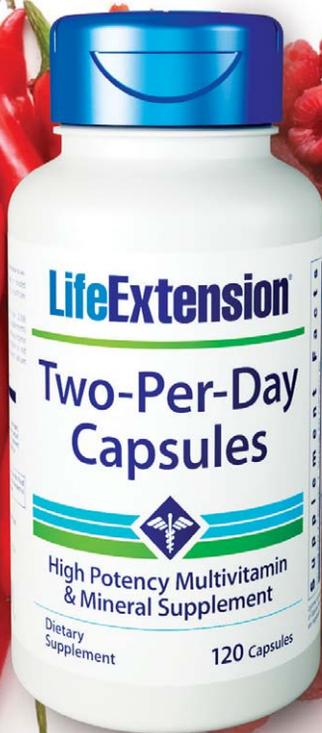
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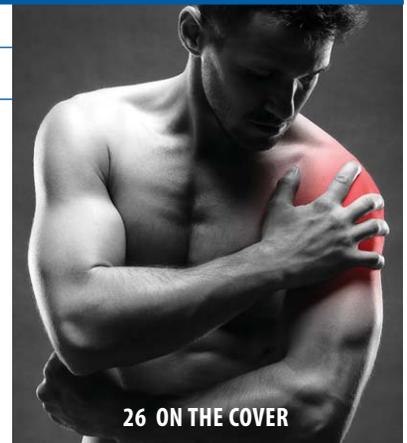
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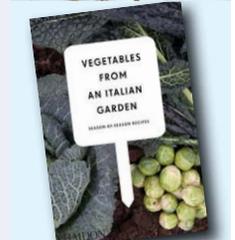
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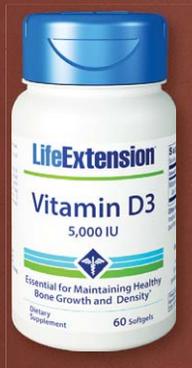
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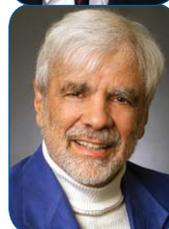
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* Br J Pharmacol. 2004 Mar;141(5):825-30.



BY WILLIAM FALOON

SEPSIS: Is There Now a Cure?

This article has a lot of personal meaning because it reveals information that could have saved the lives of some of my family members...if only I had known about this sooner.

Here is what the **Centers for Disease Control and Prevention** reports on the impact of **sepsis**:¹

- About **250,000** Americans **die** from **sepsis** each year.
- More than **1.5 million** Americans get **sepsis** each year.
- **One in three** patients who **die** in a **hospital** have **sepsis**.

Despite these staggering numbers, most people have never heard of **sepsis**.

Sepsis is a complex syndrome characterized by oxidative damage, hyper-inflammation, immune dysfunction, poor tissue oxygenation, and hyper-coagulation, usually brought on by an infectious agent.^{2,3}

When susceptible persons are exposed to a **pathogen**, there can be an uncontrolled **inflammatory** response that disrupts organ function and blood flow.

Instead of **targeting** the offending bacteria or virus, the immune system mounts **inflammatory** reactions that can result in circulatory collapse, multi-organ failure, and eventual death.

In a study published in **2017**, a group of 47 hospitalized **sepsis** patients were treated with intravenous **vitamin C**, **hydrocortisone**, and **vitamin B1**.

Compared to sepsis patients treated with conventional therapy, those receiving the **intravenous vitamins** and **hydrocortisone** had a striking **87%** reduced **mortality**.⁴

These impressive small-scale studies have ignited **eight** new **clinical trials** in **2018** that will use this three-prong approach, i.e., intravenous **vitamin C**, **vitamin B1**, and **hydrocortisone**.

As you're about to learn, this kind of approach to **sepsis treatment** was demonstrated **decades** ago. Millions may have needlessly succumbed because this therapy was overlooked by the medical establishment.



Sepsis. Bacteria in blood with red blood cells and leukocytes.

I recently came across a set of Power Point slides that one of our scientists presented in **1999**.

It described the staggering costs of hospitalized **sepsis** patients, along with better ways to treat **sepsis** that had been published in the **1990s**.

Move forward **20 years** and virtually none of those published methods to save **sepsis** patients have been adopted into hospital practice.

Sepsis is a frustrating condition to offer suggestions for from the outside. That's because the septic patient is confined to a hospital, where the treating physician exerts dictatorial authority.

Over the past decades, we at **Life Extension®** have tried to assist sepsis patients' family members who request intravenous **vitamin C**, **thiamine**, and **glutathione**. The ICU physician's response is consistently "no" and the result too often is agonizing death of the patient.

There has been fierce hostility by many physicians against the use of **intravenous vitamins** in the hospital setting, despite persuasive evidence of efficacy. This prejudice may soon change.

How Sepsis Kills

Sepsis can strike at any age, but **elderly** people with compromised **immunity** are the most vulnerable.

Sepsis often arises from a **bacterial** infection that results in widespread blood clotting, abnormal immune and inflammatory responses, oxidative stress, and mitochondrial dysfunction.^{2,3}

As **inflammatory cytokines** destroy **endothelial** linings, blood abnormally **coagulates** and **organs** (lungs, kidneys, brain) lose **circulation**.

This can lead to a dangerous drop in **blood pressure** (septic shock) that results in patients **dying** from multisystem **organ failure**.⁵

Sepsis is the most **expensive** cause of **hospitalization** in the United States and contributes to **35%-56%** of all in-hospital deaths.^{6,7}

It's the primary reason that older people are admitted to **intensive care units** (ICU).

Lingering Effects of Sepsis

It used to be thought that if a patient could survive the **acute inflammatory** response and make it out of the hospital, they would slowly return to normal.

But that is not how it works. It turns out that more than **40%** of **sepsis** patients are readmitted to the hospital within 3 months after going home.⁸

This creates a chronic problem that becomes costlier and more dangerous as patients get weaker with each new septic-related attack.

Sepsis survivors are at increased risk of dying for months to years after the acute infection is cured.

Better initial and follow-up treatments are urgently needed.

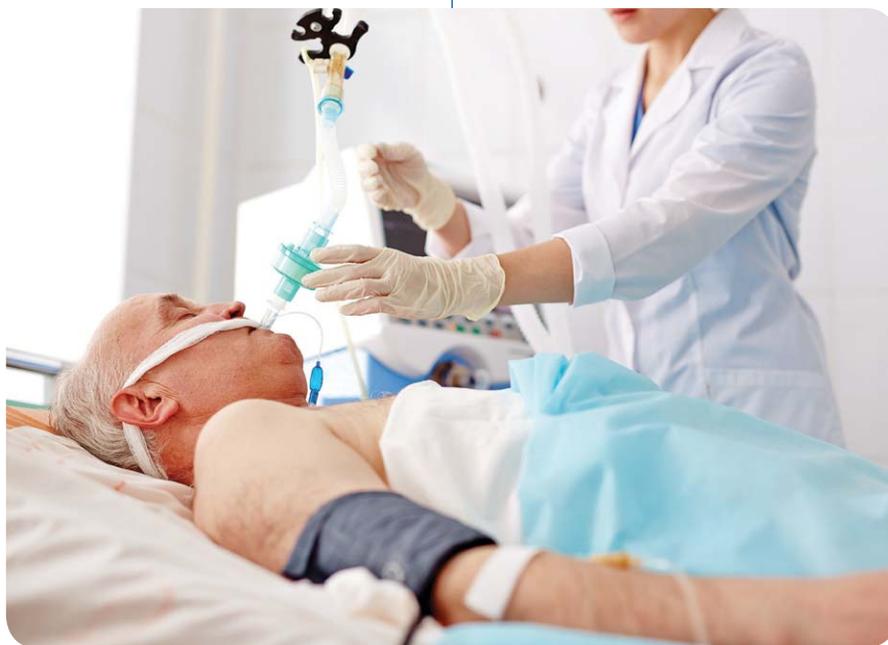
Low Vitamin C in Sepsis Patients

A study published in **2017** looked at **vitamin C** plasma levels in **sepsis** patients.⁹

This study found overall that critically ill sepsis patients had low **vitamin C** levels with one-third having frank **vitamin C deficiency**.

Nearly **40%** of **septic shock** patients in this study were deficient in **vitamin C** compared to **25%** of non-septic patients.⁹ (Septic shock is severe sepsis that often precedes death.)

The doctors who conducted this study noted these low levels of **vitamin C** despite sepsis patients being given, on average, **125 mg** a day of **vitamin C** by mouth or IV.⁹



Readers of this magazine know a daily **vitamin C** dose of **125 mg** is trivial. Yet much of conventional medicine still views this as adequate.

This misconception is startling when considering hospitalized patients rapidly use up their **vitamin C** to suppress acute **oxidative reactions** brought on by sepsis-induced **inflammation**.

This is not the first study that identified **low vitamin C** levels in septic patients. This finding was uncovered more than 20 years earlier.^{10,11}

A 2018 published report titled “**Vitamin C: The next step in sepsis management?**” describes mechanisms through which **vitamin C** functions to suppress **inflammation** and **oxidation** while improving **blood flow** to organs.¹²

Despite making robust arguments for patients presenting with sepsis symptoms to be treated with vitamin C, the conclusions from this 2018 review paper were that “**further evidence is needed to support this in practice.**”¹²

When initially reading this, I wondered who the author thinks is going to **fund** future studies of a non-patentable therapy like **intravenous vitamin C**?

I was gratified to learn there are **eight** new clinical trials initiating this year (2018) that will study the effects of intravenous **vitamin C**, **thiamine**, and **hydrocortisone** in **sepsis** patients. Funding is coming largely from philanthropic donors.¹³

Hydrocortisone + Vitamin C = Synergy

The introduction to this editorial described a **2017** published study whereby **sepsis** patients were given intravenous **vitamin C**, **vita-**



min B1, and the anti-inflammatory drug **hydrocortisone**.

This study showed only **four of 47 (8.5%) septic** patients treated with these **vitamins (+ hydrocortisone)** died compared to **19 of 47 (40.4%)** of historic controls. This represents a remarkable **87%** reduction in mortality.⁴

In this 2017 study, the **Sepsis-Related Organ Failure Assessment** score decreased in **all** patients in the **treatment** group (vitamins + hydrocortisone). None of these treated patients developed progressive **organ failure**.⁴

Patients in the **treatment** group were weaned off a class of drug used to support **blood pressure** (vasopressors) **18 hours** after starting the **vitamins + hydrocortisone** protocol.

Control patients, on the other hand, needed these blood pressure-boosting **drugs** for about **54 hours**...three times longer than the group treated with intravenous **vitamins + hydrocortisone**.⁴

(Vasopressors constrict blood vessels and thereby boost dangerously low blood pressure.)

Why Hydrocortisone + Vitamins Are Effective

The same researchers who showed remarkable survival improvements (**87%** better) in human sepsis patients sought to clarify why **vitamin C + hydrocortisone** was so effective in their study.

These researchers pursued answers by identifying lethal pathologies of **sepsis** including **endothelial dysfunction** and **capillary leakage**.¹⁴

Using endothelial cells from **human lungs**, the researchers were able to identify how **vitamin C** and **hydrocortisone** together enable robust protective effects against **inflammatory** damage to vascular cells.

This finding showed that **vitamin C** or **hydrocortisone** alone was not satisfactory. But when combined before or after **inflammation** was induced, **vitamin C + hydrocortisone** demonstrated a dramatic reversal of loss of vascular barrier function, i.e., capillary permeability.

The ability of **vitamin C** to protect against **capillary leakage**

should not be surprising since that is a critical role this nutrient plays in a healthy body.

Death by **scurvy** (severe vitamin C deficiency) often comes from massive internal bleeding as the scurvy victim's vasculature can no longer contain blood volume.¹⁵

A paper published in **2017** describes prior studies in animal and experimental models of sepsis, which demonstrate the ability of **vitamin C** to protect against **microvascular dysfunction** caused by the kind of **systemic inflammation** that occurs in **sepsis**.¹⁶

Pioneering ICU Doctor Defies the Critics

If you happen to reside anywhere near Norfolk, Virginia, and require hospitalization, you may want to enroll as a patient of **Dr. Paul Marik** at Sentara Norfolk General Hospital.

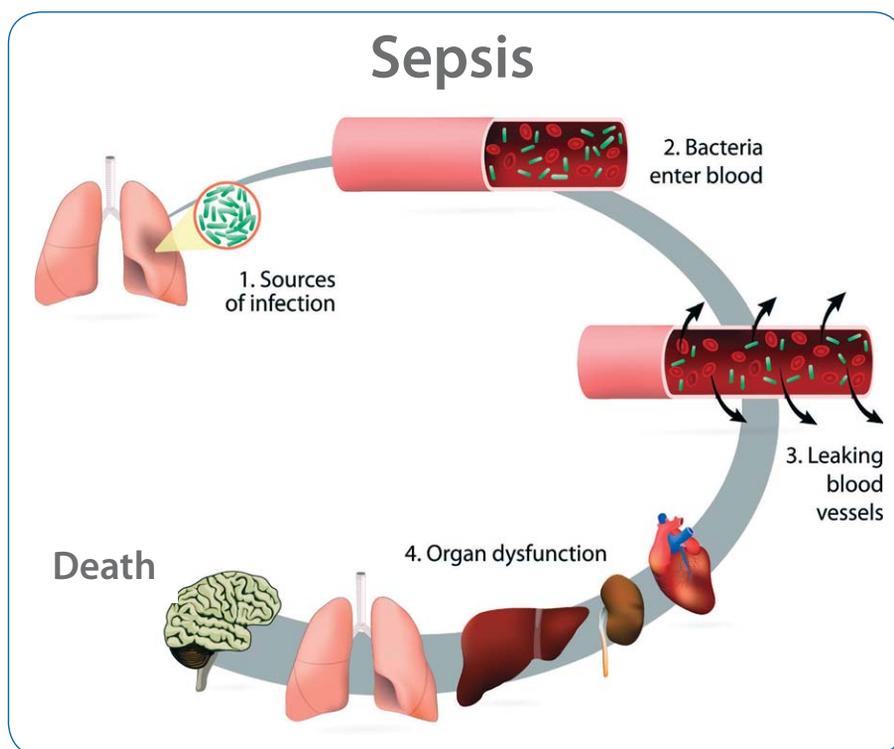
Dr. Marik has incorporated **intravenous vitamins + hydrocortisone** therapy into routine treatment of **sepsis**. Patients threatened with death are instead leaving the hospital alive within days.

Local media are reporting on Dr. Marik's "**miracle juice**," quoting an ICU nurse:¹⁸

"We started having patient after patient have these remarkable results...They'd be at death's door and, 24 to 48 hours later, they had turned around. We have seen patients walk out of here we didn't think would leave."

Critics state that full blown clinical trials involving large numbers of septic patients are required to prove this therapy is really working.

Dr. Marik agrees, but initially noted it may be difficult to **fund**



large studies because it uses a **drug** (hydrocortisone) and **vitamins** that have been on the market for decades. Dr. Marik was quoted earlier this year:¹⁸

"We are curing (sepsis) for \$60. No one will make any money off it."

The good news is that new studies using this protocol are being launched this year, despite there being no blockbuster new drug involved.

Our Correspondence with Dr. Marik

In response to these incredible findings, we reached out to **Dr. Marik** to see how his protocol was working in large numbers of hospitalized sepsis patients.

He replied that over **700** American patients have now been treated with consistent response.

He stated there was no evidence of side effects in thousands of patients treated around the world using his protocol of **intravenous vitamin C, thiamine and hydrocortisone**.

When asked if additional nutrients or drugs might provide greater benefits, Dr. Marik replied:

"I believe that our current combo is safe, cheap and very effective...so it's difficult to beat this."

He went on to state that there are **three** new clinical trials using his protocol underway or about to begin in the United States and another **five** around the world are beginning.

With **250,000** Americans perishing each year from sepsis, I am gratified to learn that this protocol of **intravenous vitamins + hydrocortisone** is being studied and may soon be incorporated into standard medical practice.

Example of Cynicism in Year 2018

In response to successful case histories published in 2017, a review of the science behind **intravenous vitamin C** in **sepsis** treatment was published in 2018.¹²

While acknowledging the beneficial mechanisms and findings of efficacy of **intravenous vitamin C**, the concluding remarks of this 2018 review were:

“Further research is required to prove its value in treatment.”¹²

This conclusion did not surprise me, because it is similar to virtually *every* other study showing remarkable benefits against sepsis, but insisting that “more” research is needed.

With hundreds of thousands of Americans likely to die from **sepsis** this year,²³ and robust data indicating that large numbers can

be saved, it is beyond cruel to deny a septic patient the option of intravenous **vitamin C**, **thiamine** plus **hydrocortisone**.

Economics of Sepsis Treatment

The annual cost of treating sepsis in the United States is **\$23 billion**.²⁴ Sepsis treatment is a huge revenue driver for hospitals.

Patients who present or contract sepsis are confined to the ICU for days, weeks or months, often on ventilators and receiving multiple IVs.

Hospitals can bill Medicare and insurance companies hundreds of thousands of dollars for each septic patient.

There is now a way for people with symptoms that indicate sepsis to potentially prevent it, possibly utilizing intravenous **vitamin C** and **thiamine** in outpatient infusion centers.

Even if one is contracting the flu or other infections/trauma, these nutrients may help protect against short- and long-term tissue damage inflicted by **inflammation-induced** oxidative stress, while improving **immune** responses.

For those who develop sepsis, Dr. Marik’s protocol of intravenous **vitamin C**, **thiamine** plus **hydrocortisone** may enable most to leave the hospital in days instead of lingering at death’s door for agonizing periods.

With **Medicare**, **Medicaid** and **private insurers** so financially stressed, this represents a unique opportunity to significantly slash the healthcare cost burden.

How to Avoid Becoming a Sepsis Casualty

Anyone over **age 60** is likely to suffer some degree of **immune senescence** leading to higher septic risk. Sepsis can strike people of any age, however, including neonates.

In reviewing Dr. Marik’s sepsis protocol that is now being studied in several clinical trials, an **intravenous dosage** protocol administered in the hospital might consist of:

- **Vitamin C: 1.5 grams** (administered as an infusion over 30 to 60 minutes) every six hours for four days or until ICU discharge;
- **Thiamine: 200 mg** every 12 hours for four days or until ICU discharge;
- **Hydrocortisone: 50 mg** every six hours for seven days or until ICU discharge, followed by a taper over three days.

New Definitions of Sepsis

Recognizing that cases of sepsis are being **underreported** and **undertreated**, an article published by the **American Medical Association** proposed new definitions as follows:¹⁷

- **Sepsis** should be defined as life-threatening organ dysfunction caused by a dysregulated host response to infection.
- **Septic shock** should be defined as a subset of sepsis in which particularly profound circulatory, cellular, and metabolic abnormalities are associated with a greater risk of mortality than with sepsis alone.

These new definitions may assist physicians in recognizing sepsis signs and symptoms before irreversible **inflammatory/oxidative** damage occurs, along with loss of **organ function** and needless deaths.

But for too many people, progressive treatments (such as high-dose intravenous antioxidants) for sepsis are delayed or not even instituted before the patient “**expires**.”

Symptoms of Sepsis

The clinical presentation of sepsis is highly variable depending on a wide range of clinically relevant factors.³

Common sites of primary infection are respiratory, genital/urinary, gastrointestinal, skin, and soft tissue.

Fever is often the first manifestation of sepsis, with pneumonia being one of the most common presentations leading to sepsis.

Early initiation of therapy decreases in-hospital mortality. Some early indicators of sepsis include:²⁵

- Fever
- Hypothermia (lower than normal body temperature)
- Heart rate >90 beats per minute
- Fast respiratory rate
- Altered mental status (confusion/coma)
- Edema (swelling)
- High blood glucose (without diabetes)

Since some of these symptoms might indicate a flu virus or other infection, it might make sense for people developing these symptoms to load up on oral **antioxidant nutrients**, or ideally, go to a local infusion center for **intravenous** administration of vitamin C, vitamin B1, and possibly glutathione.

The physician at the infusion center may also determine if a **50 mg** dose of **hydrocortisone** is warranted.

Prompt treatment might enable one to avoid a hospital setting, assuming symptoms are mild.

If sepsis occurs while in a hospital, one's choices may be more limited.

My suggestion for **Life Extension** supporters is to call local hospitals and your doctor and inquire if progressive sepsis

protocols (such as intravenous vitamin C, thiamine and hydrocortisone therapy) will be administered on request.

Hospitals (or physicians with hospital privileges) that agree to use this protocol might be the place to go if hospitalization is needed, or if sepsis symptoms occur.



Vitamin C for Non-Bacterial Sepsis

While **bacterial** infection underlies most sepsis cases, it can also manifest from **viral** (influenza) infections and **trauma** (including wounds inflicted by surgery).

A case report published in **2017** described a 20-year-old girl with **acute respiratory distress syndrome** treated with **high-dose intravenous vitamin C**.¹⁹

The vitamin C was initiated because the girl appeared on the verge of death from **septic shock**.

The most common risk factor for acute respiratory distress syndrome is sepsis.²⁰⁻²²

When respiratory support with **mechanical ventilation** failed, extracorporeal membrane oxygenation (providing oxygen directly into blood circulated outside the body) was initiated in a desperate attempt to save this young girl.

After 12 hours on **extracorporeal membrane oxygenation**, her doctors went further by administering **intravenous vitamin C**.

The doctors report that infusing **high-dose intravenous vitamin C** into this young girl resulted in "**rapid resolution of lung injury**" with no evidence of any lung damage just one month later.¹⁹

Not all septic patients this far advanced are as fortunate.

With **250,000** Americans perishing each year from sepsis,¹ we eagerly await results from **clinical trials** that will study the effects of intravenous **vitamin C**, **thiamine** and **hydrocortisone** on large numbers of **sepsis** patients.

My only regret is that these approaches were not implemented 20 years sooner, as data from the **mid-1990s** indicated a high degree of probable efficacy.

When winter approaches, one might want to bump up their oral **vitamin C** intake by a few thousand milligrams based on consistent data that **sepsis patients** often present with what we consider severe **vitamin C** deficiencies.

For longer life,



William Faloon, Co-Founder
Life Extension Buyers Club

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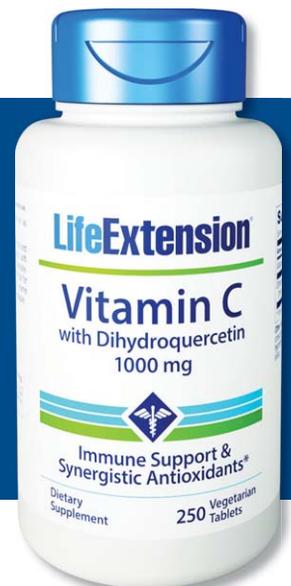
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Probiotics Prompt Better Lipids and Blood Pressure

The results of a meta-analysis of 10 randomized, controlled trials found reductions in lipids, blood pressure, and blood glucose among diabetic men and women who received **probiotics** in comparison with those who did not receive them.*

For their analysis, the researchers selected 10 trials that included 297 participants who received probiotics and 294 participants who served as controls.

Compared to the controls, **probiotic** treatment was associated with a significant decrease in total cholesterol, LDL cholesterol, triglycerides, systolic blood pressure, diastolic blood pressure, and fasting blood glucose, as well as an increase in HDL cholesterol.

Editor's Note: "It has been demonstrated that probiotics can ameliorate the state of insulin resistance and regulate lipid metabolism in in-vitro studies or animal models," write the study authors in their introduction. They add that studies have shown that probiotics can change the intestinal micro-ecosystem and play a positive role in type II diabetes treatment.

* *Medicine* (Baltimore). 2017 Dec;96(51):e9166.

New Evidence Links Omega-3 and Lower Heart Rate

An elevated resting heart rate increases cardiovascular and all-cause mortality.

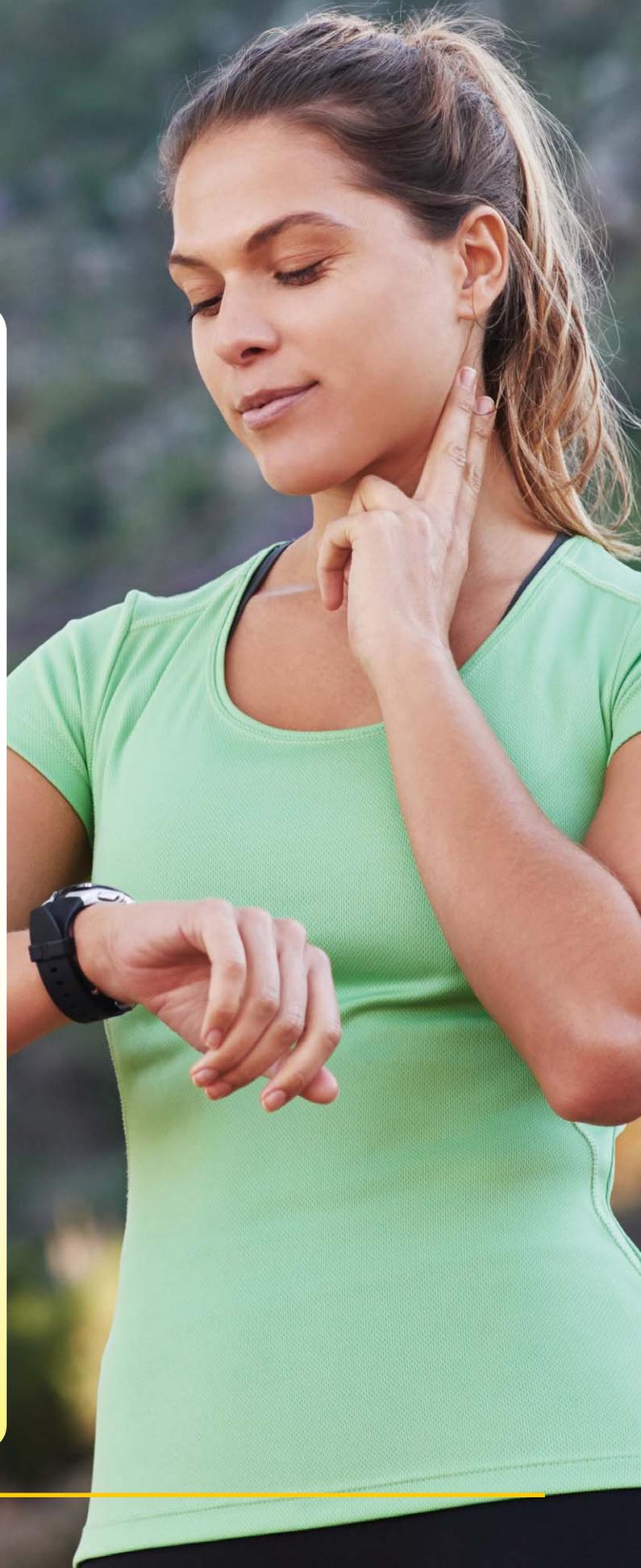
The *European Journal of Clinical Nutrition* published the results of a meta-analysis which affirmed an association between supplementing with **omega-3** fatty acids and a decrease in heart rate.*

For their analysis, Khemayanto Hidayat of China's Soochow University and his associates selected 51 randomized controlled trials that included a total of approximately 3,000 men and women. Thirty-two of the intervention groups consisted of participants with at least one chronic condition, including coronary artery disease, kidney failure, hypertension, and heart arrhythmia.

In comparison with those who received a placebo, participants who received omega-3 experienced a significant reduction in heart rate of 2.23 beats per minute. When the omega-3 fatty acids **EPA** and **DHA** were administered separately, a 2.47 beat-per-minute decrease was observed in association with DHA.

Editor's Note: According to the study authors, elevated resting heart rate has emerged as a risk factor for cardiovascular mortality and all-cause mortality. "The HR [heart rate] of the majority of participants included in this meta-analysis was within normal range—the state where reducing heart rate is conventionally not a medical indication," they note. "At the population level however, such HR reduction may have significant public health implications, as a reduction of 3.2 bpm [beats-per-minute] HR would roughly correspond to **7.5%** lower risk of SCD [sudden cardiac death]."

**Eur J Clin Nutr.* 2017 Dec 28.



Calcium Supplementation May Be Widely Needed

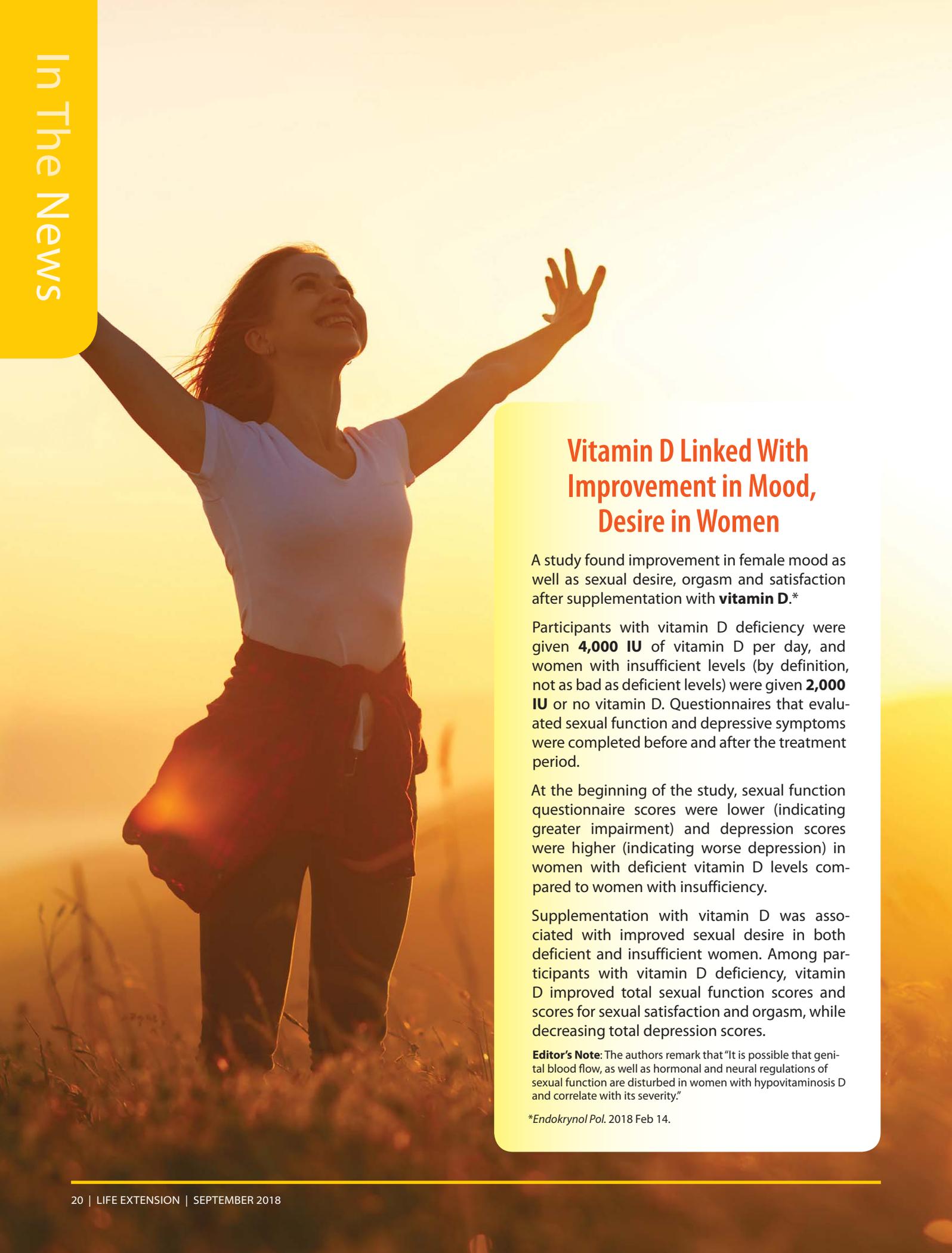
A global map of dietary **calcium** intake in adults released by the International Osteoporosis Foundation on April 20, 2018, shows that people in many parts of the world fail to consume diets that provide adequate amounts of the mineral, putting these populations at risk of osteoporosis. The map is based on findings from a study published in *Osteoporosis International*.*

Although **800-1,000 mg** of calcium per day is the usual recommendation for healthy adults, global intake varies significantly. The amount of calcium consumed by adult residents of Nepal averages just **175 mg** per day, in contrast with **1,233 mg** per day in Iceland. Most African, Asian and South American countries have a daily intake that ranges from to **400 to 700 mg**.

"Increasing calcium intake throughout the lifespan is an important strategy to improve bone health," noted senior author Bess Dawson-Hughes.

Editor's Note: "For people who may not be able to get enough calcium through their diets, calcium supplementation may be needed to reach the intake requirement of **800 to 1,000 mg/day**," Dr. Dawson-Hughes suggested. "This is particularly important for older adults who do not consume enough calcium-rich foods. In this population group, calcium supplementation combined with vitamin D may lower the risk of broken bones."

* *Osteoporos Int.* 2017 Dec;28(12):3315-3324.

A woman with long dark hair, wearing a white t-shirt and dark pants, stands in a field of tall grass. She has her arms raised and is looking up towards the sky with a joyful expression. The background is a bright, hazy sunset or sunrise, with the sun low on the horizon, creating a warm, golden glow. The overall mood is one of happiness and freedom.

Vitamin D Linked With Improvement in Mood, Desire in Women

A study found improvement in female mood as well as sexual desire, orgasm and satisfaction after supplementation with **vitamin D**.*

Participants with vitamin D deficiency were given **4,000 IU** of vitamin D per day, and women with insufficient levels (by definition, not as bad as deficient levels) were given **2,000 IU** or no vitamin D. Questionnaires that evaluated sexual function and depressive symptoms were completed before and after the treatment period.

At the beginning of the study, sexual function questionnaire scores were lower (indicating greater impairment) and depression scores were higher (indicating worse depression) in women with deficient vitamin D levels compared to women with insufficiency.

Supplementation with vitamin D was associated with improved sexual desire in both deficient and insufficient women. Among participants with vitamin D deficiency, vitamin D improved total sexual function scores and scores for sexual satisfaction and orgasm, while decreasing total depression scores.

Editor's Note: The authors remark that "It is possible that genital blood flow, as well as hormonal and neural regulations of sexual function are disturbed in women with hypovitaminosis D and correlate with its severity."

**Endokrynol Pol.* 2018 Feb 14.

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Item #02022 • 60 vegetarian capsules

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INFLAMMATION

CANCER

**CARDIOVASCULAR
DISEASE**

DIABETES

**ALZHEIMER'S
DISEASE**

**NEUROLOGICAL
DISEASES**

**PULMONARY
DISEASES**

**AUTOIMMUNE
DISEASES**

ARTHRITIS

Anti-Inflammatory Effects of Gamma-Linolenic Acid (GLA)

The term “**inflammation**” is used in so many different ways that the role of **chronic inflammation** in accelerating degenerative processes remains largely **overlooked**.

Endless advertisements tout drugs (like ibuprofen) that temporarily relieve localized pain.

Other ads promote immune-modulating drugs that help suppress rheumatoid-like disease, but have deadly side effect risks.

Few realize that normal **aging** ignites low-level **inflammation** that causes or contributes to virtually every chronic disease.¹⁻⁴

Most readers of *Life Extension Magazine*[®] take definitive steps to reduce their inflammatory burden. This includes avoiding **toxic foods** and supplementing with **curcumin, fish oil, vitamin D**, and other nutrients that have specific **inflammation-reducing** properties.

This article describes published scientific findings as to how **gamma-linolenic acid (GLA)** and **healthier diets** can suppress chronic inflammatory reactions that are a leading killer of aging Americans.

Inflammation seems to be the buzzword these days, and for good reason.

Chronic inflammation underlies major diseases of aging, from cancer and atherosclerosis, to arthritis and diabetes.⁵

Unhealthy dietary patterns contribute to today's inflammation epidemic.⁶

Getting at root causes of chronic inflammatory disorders can play a major role in achieving maximum longevity and optimal healthspan.

Healthy fats such as **gamma-linolenic acid (GLA)** and **omega-3s** work by several pathways to reduce the dangers of inflammation throughout the body.

What is Inflammation?

When most people stub their toe or hit their elbow, they take an aspirin or ibuprofen to suppress the inflammation. These over-the-counter anti-inflammatory medications work by reducing pro-inflammatory substances.

Acute inflammation is beneficial, as it allows for the healing of a cut or wound, which, if left uncontrolled, could lead to infection or even death. Once inflammation is no longer necessary, the body has mechanisms that turn it off.

The body uses two particular fats to “turn on” and “turn off” inflammation:

An **omega-6** fat called **arachidonic acid** forms necessary **pro-inflammatory** substances like prostaglandin E2.

Omega-3 fats produce **anti-inflammatory** substances that bring the overall state of inflammation into balance.

Consuming too many **omega-6** fats—while not eating enough **omega-3s**—contributes to uncontrolled systemic inflammation, which can cause chronic degenerative illnesses associated with pathological aging.

One way the body controls inflammation is by balancing anti-inflammatory substances from omega-3s and pro-inflammatory substances from omega-6 fats.

Understanding Dietary Fats

For optimal health, we must ingest both **omega-3** and **omega-6** fats. While necessary in moderate amounts, most Americans overconsume omega-6-rich foods, while they underconsume foods that provide **EPA** and **DHA**.

Omega-6 fats are known for their **pro-inflammatory** properties.

But not all omega-6 fats are pro-inflammatory. Of particular interest is the omega-6 fat **GLA (gamma-linolenic acid)**, which has remarkable **anti-inflammation** mechanisms.

GLA is found in trace amounts in some nuts and green leafy vegetables. The body can make small amounts of **GLA** from linoleic acid. As a result of this small amount of production by the body, **GLA** has been called a *conditionally essential nutrient*.^{7,8}



Rheumatoid Arthritis

Patients with rheumatoid arthritis have inflamed, swollen, and painful joints due to an overactive immune system. Evidence suggests that the anti-inflammatory effects of GLA can provide benefit to those with this disease.

One study found that supplementing rheumatoid arthritis patients with borage oil (providing **1.4 grams** of GLA daily) for six months significantly improved joint tenderness, swelling, and pain.⁹

Another study in rheumatoid arthritis patients found meaningful improvements in over **75%** of participants when given **2.8 grams** of GLA a day for 12 months.¹⁰

A third study in rheumatoid arthritis patients found that supplementation with **2 grams** of GLA/day for six months improved joint tenderness.¹¹

Finally, a study in rheumatoid arthritis patients found that those who were given **540 mg** of GLA/day or **450 mg** GLA/day plus **240 mg** EPA had significant subjective improvement in their disease state and a significant reduction in the use of NSAIDs (anti-inflammatory pain relievers). Moreover, once the patients were switched over to **placebo** they had a relapse in their disease state.

The authors concluded that GLA and the combination of GLA/fish oil, “...**produce a subjective improvement and allow some patients to reduce or stop treatment with NSAIDs.**”¹²

This study indicates that supplementation with **GLA** and fish oil containing **EPA/DHA** may be particularly beneficial in those suffering from rheumatoid arthritis.

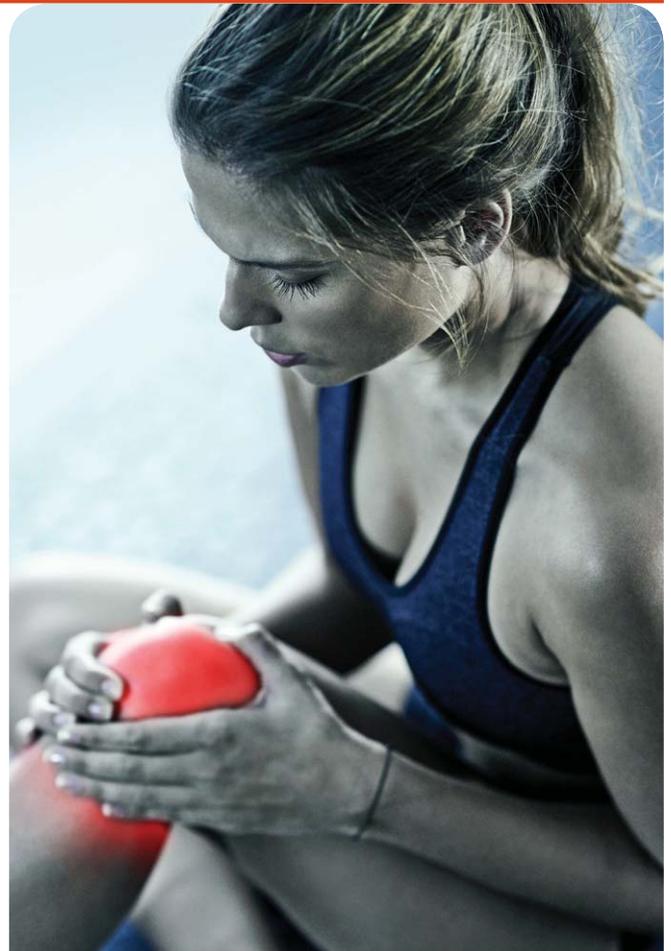
Bone Health

It is estimated that 200 million people worldwide suffer from **osteoporosis**.¹³ Osteoporosis primarily affects the elderly, including **30%** of postmenopausal women in the United States and Europe.¹³

Supplementation of **GLA** and **EPA** can improve bone health by enhancing calcium absorption and deposition of calcium into bones.

In one clinical study, 65 elderly women with a history of a diet low in calcium were assigned to receive either a combination of GLA plus EPA or a coconut oil placebo for 18 months. In addition, all participants received a calcium supplement.

The supplement combination, **GLA/EPA** plus **calcium**, increased the bone mineral **density** of the femur (the long, thick bone in the thigh) and helped maintain mineral density in the lumbar spine compared to the placebo group. In contrast, women who took the placebo plus calcium *lost* mineral density in the lumbar spine.¹⁴



What You Need to Know

The Anti-Inflammatory Benefits of GLA

- GLA is an anti-inflammatory compound that is found in very small amounts in some leafy greens and nuts, while the pro-inflammatory fats linoleic acid and arachidonic acid are present in ample amounts in vegetable oils and chicken, and eggs and meat, respectively.
- Chronic inflammation throughout the body contributes to numerous diseases.
- Supplementing with GLA may reduce chronic low-grade inflammation and provide benefit to patients with rheumatoid arthritis, osteoporosis, cancer, atopic dermatitis, and acute respiratory distress.



This suggests that the correct fats serve as beneficial signaling molecules to help properly orchestrate what happens to vitamins and minerals in your body, including your bones.

Increasing and maintaining bone strength is important over time because our body's capacity to heal declines with age.

Supplementing daily with **GLA** and **omega-3s** may improve bone health in the elderly.¹⁴

Eczema

Atopic dermatitis, also called **eczema**, is a common condition, particularly in children.

Symptoms may include red, itchy, scaly rashes and vary in location depending on age (scalp, forehead, and face, including cheeks). While conventional treatments include topical creams and steroids as well as oral antihistamines, these treat symptoms rather than the root of the problem.

One of the underlying causes of atopic dermatitis in infants may be insufficient *delta-6-desaturase* activity, the *enzyme* responsible for converting linoleic acid to GLA. Patients with atopic dermatitis or eczema have low levels of GLA but adequate levels of linoleic acid, suggesting impaired conversion of linoleic acid to GLA.¹⁵

Additionally, many infant formulas, unlike breast milk, are low in GLA. Thus, formula-fed infants in particular are at risk of GLA deficiency and may benefit from GLA supplementation.¹⁶

Numerous studies show that **GLA** is helpful for patients with atopic dermatitis and eczema.¹⁷⁻²⁵ A meta-analysis of 26 clinical studies in 1,207 patients established that GLA is beneficial for itch/pruritus, crusting, edema, and redness.²⁶

Diabetic Neuropathy

Damage to the eyes, kidneys, and peripheral nerves are a common consequence of **diabetes**. These diabetic microvascular complications may be related to an impairment of *delta-6 desaturase*, the enzyme that converts linoleic acid to GLA.

Loss of delta-6 desaturase activity is a key factor in aging.²⁷

In animal studies, the combination of GLA and EPA can prevent and may even reverse diabetic neuropathy.²⁸ This may be due to an increase in myelin sheath formation and improved nerve-conduction velocities.

In humans, a randomized trial of 22 diabetic patients with peripheral neuropathy was conducted using **360 mg** of **GLA** a day. After six months, there were clinical improvements in neuropathy symptom scores, whereas those in the **placebo** group remained unchanged or deteriorated.²⁹

A larger, randomized, double-blind trial, the **Gamma-Linolenic Acid Multicenter Trial Group**, compared **placebo** to **GLA (480 mg/day)** in 111 patients with mild diabetic neuropathy for one year. People in the **GLA**-supplemented group showed favorable results compared to placebo based on 16 parameters tested.³⁰

Acute Respiratory Distress and Asthma

Critically ill patients with **acute respiratory distress syndrome** caused by **sepsis/pneumonia**, **trauma**, or **aspiration injury** improved when given tube-feeding nutrition that combined **GLA**, **EPA**, and **antioxidants**. This study noted a reduction in the requirement for ventilation, length of intensive care-unit stay, and reduced organ failure.³¹

Low (**750 mg/day GLA + 500 mg/day EPA**) and high dose (**1,130 mg/day GLA + 750 mg/day EPA**) supplementation with **GLA** plus **EPA** has been found to benefit **mild-to-moderate asthmatics**, improving quality of life and decreasing the reliance on rescue medications.³²

Cancer

Breast cancer patients (34 women with nonmetastatic breast cancer and four with metastatic) were supplemented with GLA (**2.8 grams/day**) plus **20 mg** tamoxifen or tamoxifen alone. In the GLA *plus* tamoxifen group, there was a faster response to treatment and a greater estrogen-receptor fall compared to those taking tamoxifen alone.³³

Another study evaluated nine patients with **grade four recurrent cerebral glioma**, an advanced form of brain cancer. After surgery, radiation, or chemotherapy, a small amount of GLA was delivered directly (by injection) into the brain or the tumor itself for seven consecutive days.

Computed tomography and magnetic resonance imaging showed regression of the brain tumors. The authors concluded that “...**GLA is a safe antitumor agent and higher doses of GLA should be investigated in future studies.**”³⁴



Risk Factors for GLA Deficiency

- Formula feeding
- Insulin resistance
- Advanced age
- Smoking
- Consumption of alcohol, refined sugars, trans fats, and partially hydrogenated oils
- Deficiency in magnesium and zinc
- Deficiency in vitamins B3, B6, C, and E

What is the Ideal Dose of GLA?

The studies reported in this article describe effective **daily** doses of GLA of **360 mg, 450 mg, 480 mg, 540 mg, 1,130 mg, 2,000 mg** and in one study extending up **2,800 mg**.

Research that **Life Extension®** uncovered two decades ago indicates that if one supplements with omega-3-rich **fish oil**, then **lower** doses (**400 mg**) of **GLA** may be all that are needed.

Also, the addition of **sesame lignans** to a **GLA formula** can enhance its efficacy by guiding GLA down an **anti-inflammatory pathway** (see charts and descriptions on next two pages).

So most of you should consider initiating **400 mg** of **GLA** with **sesame lignans** daily. If there are not noticeable improvements in a week or two, then slowly increase dose until desired results are obtained.

There is nothing wrong with starting off at higher doses, but for most readers of this magazine who supplement with omega-3s, lower doses of GLA (with sesame lignans) may be all that are needed.

Placement of GLA (**1.0-2.5 mg/ml**) directly into the bladder through a catheter (intravesical) was tested in a phase II trial in patients with recurrent, superficial bladder cancer, which is found on the surface of the inside lining of the bladder. A single placement of **50 ml** of the intravesical GLA retained for one hour resulted in tumor shrinkage in **43%** of the patients.³⁵

The authors concluded that intravesical GLA was safe and well-tolerated and had significant cytotoxic effects against early bladder cancer.

Oral supplementation of GLA or injecting GLA directly into cancerous areas may improve treatment of breast cancer as well as brain and recurrent superficial bladder cancers. These types of treatments require further investigation and larger studies.

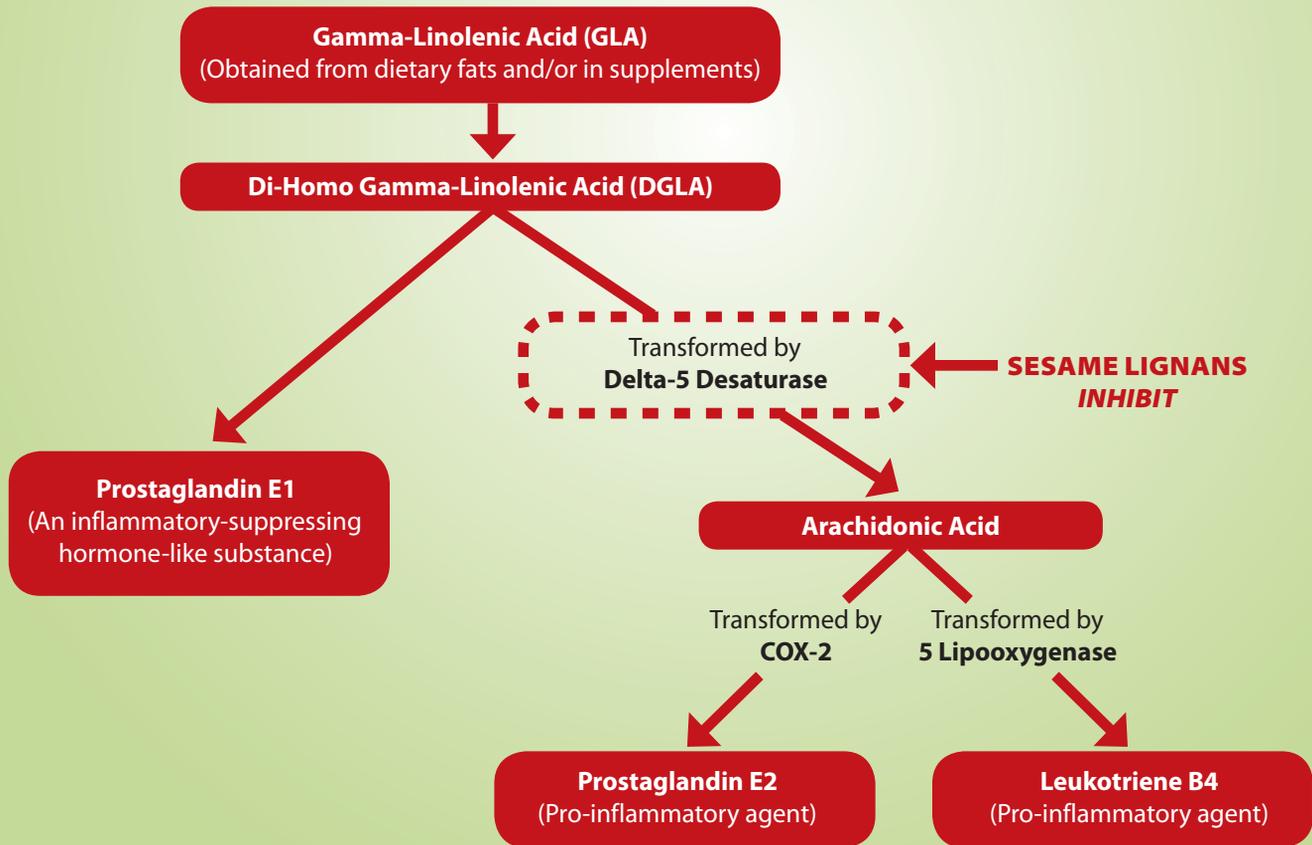
Summary

GLA deficiency can be caused by aging, hyperinsulinemia, and a Western diet, which leads to chronic low-grade inflammation and a host of chronic diseases.

Supplementing with anti-inflammatory **GLA** may provide benefits to patients with rheumatoid arthritis, osteoporosis, cancer, eczema, acute respiratory distress, asthma, and common degenerative disorders. ●

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

Two Paths that GLA Can Follow in the Body



GLA (gamma-linolenic acid) obtained from diet or supplements can convert to beneficial **prostaglandin E1** or be shuttled into the **arachidonic acid** pathway. **Sesame lignans** inhibit the enzyme **delta-5 desaturase** thereby enabling **GLA** to transform into more **prostaglandin E1**.

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How Sesame Helps Optimize GLA

Gamma-Linolenic Acid (GLA) reduces **inflammation** by converting to **prostaglandin E1** in the body.³⁶⁻³⁹

If **GLA** goes down the wrong pathway and excessively converts to **arachidonic acid**, then greater levels of inflammation may occur.

Sesame lignans suppress the **enzyme** that causes GLA to excessively convert into **arachidonic acid**.³⁷

By blocking the **delta-5 desaturase** enzyme with **sesame lignans**, more **GLA** can be converted to beneficial **prostaglandin E1**, which helps suppress **inflammatory reactions**.³⁶⁻³⁹

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Painkiller Drug Price Jumps Astronomically

In the latest example of out-of-control drug costs, a manufacturer has increased the price of a painkiller to 22 times its original 2013 cost, bringing it to an astounding **\$2,979** per bottle.*

The Irish company Horizon Pharma's incredible price-hike of Vimovo is particularly notable because the drug is comprised of **naproxen** and **esomeprazole**, two medications that are available separately for much less—about \$36 total.

Horizon Pharma insists that the nearly three-grand wholesale price is not passed down to consumers, who usually pay a fraction of that amount. But critics say it exemplifies a wasteful, complicated system that leads to generally higher sick care insurance costs.

In reaction to the hike, Express Scripts and CVS Caremark—pharmacy benefit managers which negotiate with

drug manufacturers on behalf of employers and health insurers—initially put Vimovo on their list of excluded drugs. Horizon responded by setting up rebate deals that lower the cost.

Critics say side agreements, confidential rebates and murky deal-making between drug makers, insurers and pharmacy benefit managers make it very difficult to figure out just who is financially benefiting from jacked-up drug prices.

"There is no transparency," says Annabel Samimy, a Stifel Financial analyst. "It's a big black box."

Editor's Note: Horizon claims that Vimovo, while made up of naproxen and esomeprazole, is more than just a combination of the two much-cheaper drugs because it is a "special formulation."

* Available at: <https://tinyurl.com/ybbsauwt>. Accessed on March 1, 2018.

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BY JANET SEIKEN



BOOSTING CoQ10's Protective Effects

Coenzyme Q10 (CoQ10) has been reported to reduce cardiovascular risk factors, including improvement of outcomes after a **heart attack**.

Congestive **heart failure** patients have shown significant enhancement of clinical measures in response to **higher** dose **CoQ10** supplementation.

Those who rely solely on CoQ10 may be missing a **nutrient** that most **Life Extension®** readers obtain in their multi-ingredient formula. This nutrient is the bioactive form of vitamin B6 called **pyridoxal 5'-phosphate**.

One case-control study found that those with the *highest* blood levels of **CoQ10** and **pyridoxal 5'-phosphate** had a reduced risk of **coronary artery disease**.

They also found that coronary artery disease patients had significantly lower levels of **CoQ10** and **pyridoxal 5'-phosphate** compared to controls.¹

Pyridoxal 5'-phosphate costs so little that it can readily be obtained in more advanced multinutrient formulas.

CoQ10, Mitochondrial Function and Heart Health

Low blood levels of CoQ10 have been correlated with increased risks for cardiovascular disease along with two of its risk factors: diabetes and obesity.^{2,3}

CoQ10 is a critical co-factor for biochemical reactions that take place in **mitochondria**, the energy-manufacturing organelles that inhabit all human cells.⁴

A common contributor for diabetes and obesity is **mitochondrial dysfunction**. When mitochondria are excessively bombarded with food, as seen in obesity, there is an increased production of reactive oxygen species that lead to mitochondrial dysfunction, worsening of insulin resistance, and ultimately type II diabetes.⁵

CoQ10 helps scavenge free-radicals in mitochondria. Research shows that a deficiency of CoQ10 may impair the body's defense mechanism against oxidative stress induced by high **glucose** levels.⁵⁻⁷

Supplemental CoQ10 has been shown to reduce the risks and improve the outcomes for people with coronary artery disease, heart attacks, and congestive heart failure.^{4,8-19} A large meta-analysis of 14 randomized controlled trials involving **2,149** heart-failure patients revealed that **CoQ10** supplementation decreased mortality by **31%** compared with **placebo**.²⁰

Given the high energy needs of the heart muscle, it makes sense that *low* CoQ10 would impair heart-muscle function.

Recent publications show that better benefits occur when people have adequate levels of **vitamin B6**, whose bioactive form is **pyridoxal 5'-phosphate (P5P)**.

CoQ10 and P5P Boost Cardio Protection

Researchers evaluated blood levels of **CoQ10** and **pyridoxal 5'-phosphate (P5P)** in 45 people with coronary artery disease and compared them with the blood levels in 89 healthy subjects.¹

The study found that subjects with **coronary artery disease** had significantly *lower* levels of CoQ10 and P5P, compared to the healthy people.¹ It also showed that higher levels of CoQ10 resulted in higher levels of P5P. The opposite was also found—lower levels of CoQ10 showed lower levels of P5P.

But the key finding of this study was that people with **higher** CoQ10 and P5P levels had lower risks of coronary artery disease.¹

This study points to the connection between CoQ10 and P5P.¹ It also suggests that supplementation with **both** nutrients would be sensible in people with or at risk for coronary artery disease.

How it Works

How do CoQ10 and B6 levels interact to provide *improved* protection against coronary artery disease?

Back in the early 1990s, researchers at the University of Texas at Austin were studying immune response in the midst of the AIDS epidemic and found that administering CoQ10 and B6 *together* increased blood CoQ10 concentrations.²¹

The combination also increased levels of protective antibodies called **IgG** and boosted levels of **T-lymphocytes**, which are immune cells necessary for fighting off infections and for healing.²¹



Lymphocyte

Activated **T-cells** also play an important role in healing heart tissue after a **heart attack**,²² making the CoQ10/B6 combination appealing for its cardioprotective potential.

In a second study, also from the University of Texas at Austin, researchers collected blood specimens from 29 people not supplemented with either CoQ10 or B6.

They found that people with *greater* B6 activity had *higher* levels of CoQ10, once again highlighting the relationship between CoQ10 and vitamin B6-induced biochemical activity.²³ This finding suggested the wisdom of CoQ10 users ensuring they also obtain at least **75 mg** a day of **pyridoxal 5'-phosphate** or **P5P**.

Of interest is research showing that adequate levels of **P5P** are required for the body's own production (*biosynthesis*) of **CoQ10**.²³ While this is not sufficient to counter the sharp drop in CoQ10 that occurs with aging (and statin drug use), it shows how common nutrients can work together to achieve better results.

Anti-Inflammatory Properties

Critically ill patients have sharply elevated markers of systemic **inflammation**.

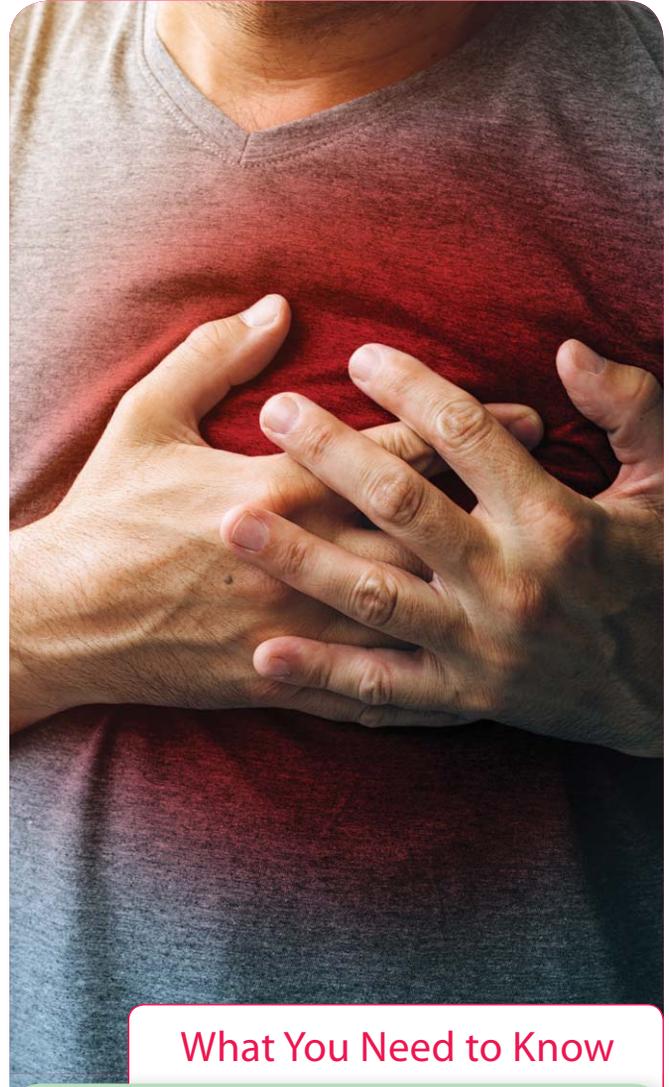
Each year, 250,000 Americans die from **sepsis**, which is a complex syndrome characterized by **oxidative damage**, **hyperinflammation**, **immune dysfunction**, **poor tissue oxygenation**, and **hypercoagulation** usually brought on by an **infectious** agent.

In critically ill patients undergoing extreme chemical stresses, higher **P5P** levels have been associated with elevated antioxidant *enzyme* activities.²⁴ This may provide a hint as to how P5P supports the antioxidant functions of CoQ10, which is itself a component of cellular chemical protection systems.

P5P also has direct, independent impact on cardiovascular health. Studies show that people with coronary artery disease have on average **34.2% lower P5P** blood levels compared to those without heart problems. This finding may relate to the nutrient's role in helping to lower levels of **homocysteine**, a cardiotoxic protein metabolite.²⁵⁻²⁷

In one study, the combination of **high homocysteine** and **low P5P** raised the risk of coronary disease by **330%**.²⁶

The connection with **homocysteine**, which is associated with **increased chronic inflammation**, suggests that P5P contributes to **lower** levels of inflammation. This represents a protective response for the heart and blood vessels. Low P5P and high homocysteine are features of chronic inflammatory disorders such as rheumatoid arthritis, which all carry higher risks of heart disease as well.²⁸



What You Need to Know

How to Optimize CoQ10

- Cardiovascular disease remains the leading killer around the world.
- Supplementation with coenzyme Q10 (CoQ10) may help to reduce the risk of coronary artery disease and improve outcomes after heart attack and stroke.
- Recent studies show that people with higher levels of active B6 have greater CoQ10 levels, and that P5P facilitates normal synthesis of CoQ10 in the body.
- Human studies show that taking CoQ10 and P5P boosts the availability of CoQ10.

Low P5P is associated with **chronic inflammation** even in the absence of high homocysteine. This has been shown by studies in which mean P5P levels were significantly lower in subjects with the highest levels of inflammation.²⁹ Other studies have shown that breakdown of P5P is higher under conditions of inflammation, a situation that increases coronary artery disease risk.^{30,31}

One intriguing finding regarding P5P and inflammation is with regular use of nonsteroidal anti-inflammatory drugs (NSAIDs). This drug class includes widely used **ibuprofen** and **naproxen** and their use is linked to **lower P5P** levels in human and animal studies.³² This is a paradoxical finding, because the NSAIDs are intended to reduce inflammation, but their suppression of P5P potentially leads to worsening inflammation.

This shows the importance of supplementing with **P5P** as one good way to avoid the deficiency if NSAID use cannot be avoided. Those with elevated homocysteine should consider supplementing with **75-200 mg** a day of P5P, in addition to bioactive folate (5-MTHF) and vitamin B12.

Finally, there is now strong evidence that P5P can directly modulate inflammation and thereby contribute to lower cardiovascular risk.

Canadian researchers have identified binding of P5P to cell surface receptors called PX2, which mediate nerve transmission of pain, as well as cell damage and inflammation.³³ By inhibiting PX2 receptors, P5P reduced inflammatory responses and established itself as an important candidate for a PX2-inhibiting drug.



Summary

Coenzyme Q10 is widely recognized for its potential abilities to reduce cardiovascular risks.

Recent research indicates CoQ10's benefits may be augmented by ensuring one also supplements with P5P, the most active form of vitamin B6.

Vitamin B6 is required for the body to make adequate CoQ10,³⁴ it boosts blood levels of CoQ10, and it makes CoQ10 available for longer to the many body systems that require it.

Both CoQ10 and vitamin B6 have independent value as heart disease risk-reducing supplements.

Using the two supplements together offers more comprehensive protection against America's leading age-related killer, cardiovascular disease. ●

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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Role of FOLATE in Healthy Human Brain Function

B vitamins are critical for the production of **neurotransmitters** in the brain. Insufficiency is associated with **cognitive decline**.¹⁻³

Folate has a number of mechanisms by which it can enhance cognitive performance. These include lowering inflammation and reducing **homocysteine**.^{1,4}

Elevated homocysteine and chronic inflammation are linked to degenerative brain disorders.

Perhaps the most far-reaching implication of folate in the brain is its ability to modify **gene expression**.¹

This means that folate plays a role in turning a gene “on” or “off.”

Without enough folate, genes involved in the production of **beta-amyloid** are “turned on.”^{5,6}

Studies show that **adding** folate to brain cell cultures can **silence**—or “turn off”—genes that produce toxic **beta-amyloid** proteins.^{1,7}

The takeaway from these studies is that folic acid performs a host of functions that support youthful brain cell structure and function.

Folate's Anti-Dementia Properties

The primary sources of folate (vitamin B9) include vegetables like broccoli, asparagus, spinach and Brussels sprouts. Cooking vegetables causes folate loss,⁸ which means we consume less of this nutrient than we might think.

One research group has been studying folate supplementation in older adults for half a decade. Their research has demonstrated folate's beneficial effect on **cognitive** function.^{1,4,9}

In their latest study, they explored the cognitive effect of supplementing with folate for an average of *two years*.¹

The study included 180 subjects with **mild cognitive impairment**.¹ Half received **folic acid (400 mcg/day)**, while the other half received standard care (guidance on nutrition and activity aimed at enhancing memory late in life).

After 24 months, the people in the folate group experienced **three** encouraging results:

1. Improvements in cognitive testing

By the end of the study, the folate group demonstrated significant *increases* in cognitive test scores, including full-scale IQ (which indicates a person's average intelligence), verbal IQ, and measures of memory.

Combined treatment scores for the six verbal IQ tests were also significantly higher in the folate group, as was the combined treatment score for all 11 tests (full-scale IQ).¹

2. Improvements in markers of DNA methylation

Folate supplementation was shown to beneficially affect **genes** involved in DNA methylation,¹ thereby assisting the body to metabolize homocysteine.

In the supplemented group, two important blood markers were **increased**:

- Folate levels
- S-adenosylmethionine levels (SAME, a natural compound that helps in the production of several key neurotransmitters and alleviates depression)

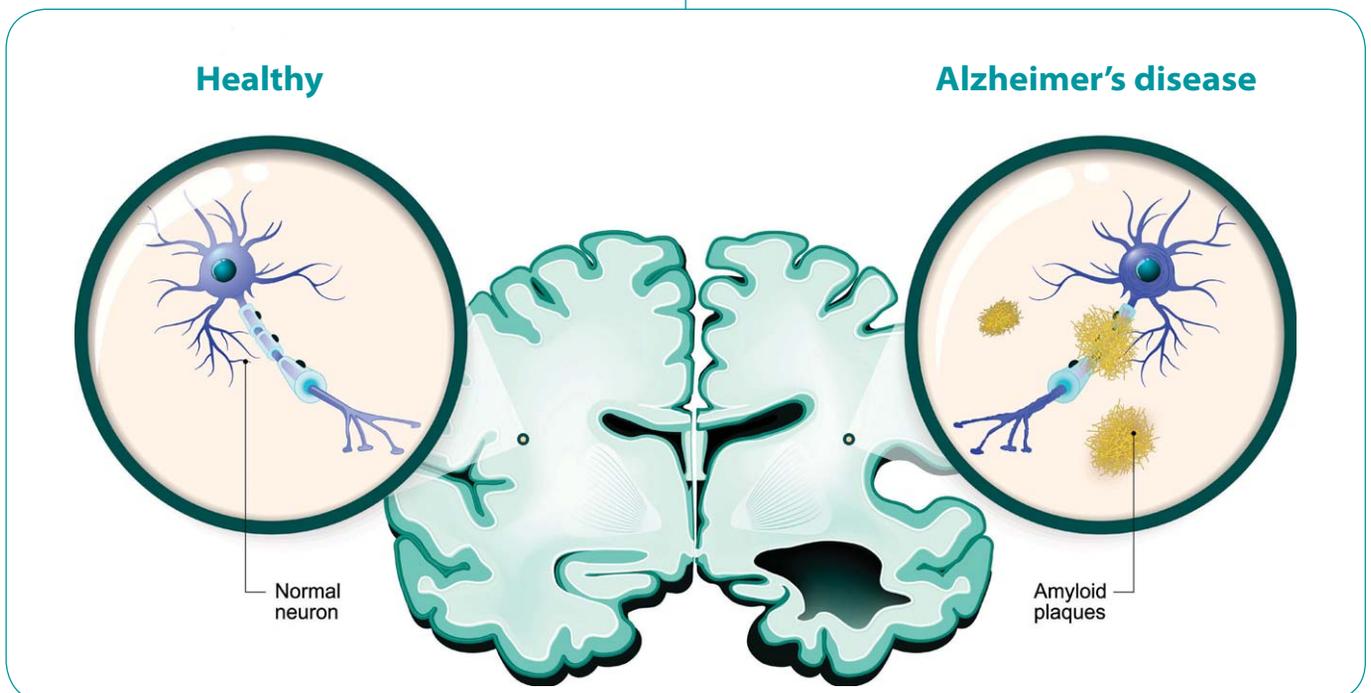
At the same time, two **blood markers** associated with poor cognitive outcomes were **reduced**:

- Homocysteine, a harmful amino acid that can lead to stroke, coronary disease, and dementia
- S-adenosylhomocysteine (SAH) levels, the precursor for homocysteine

The important ratio of SAME/SAH was also increased, indicating a return to a healthy methylation.¹

3. Reduced levels of brain-toxic proteins

Toxic **beta-amyloid plaques** are a hallmark of Alzheimer's disease. These distorted proteins accumulate in the brain, where they damage brain cells and interrupt the communication between neurons. The result is loss of memory and brain function.



Folate can help prevent *beta-amyloid* plaques from forming.

This study showed that subjects in the folate group had significantly lower blood levels of molecules involved in forming these brain-damaging *plaques*.¹ Blood levels of these plaque-forming molecules reflect their accumulation in the brain. The presence of plaque-forming molecules may predict early Alzheimer's disease or cognitive decline.^{1,10-12}

Overall, this study showed that folic acid supplementation significantly improved cognitive performance as seen by the *increases* in cognitive test scores. In addition, folic acid also reduced the abundance of *beta-amyloid* that directly damages brain cells.¹

What's interesting about this study is the **low-dose** of folate used. Many older people are deficient in folic acid and other B vitamins and essential nutrients, meaning their levels of the bioactive form of folate, called **5-MTHF** (5-methyltetrahydrofolate), are also perilously low.

People with elevated **homocysteine** often take **1,000 mcg to 10,000 mcg** of **5-MTHF** daily along with **vitamins B12, B6 and B2**. A number of previous studies have shown better results using 5-MTHF than standard folic acid.¹³⁻¹⁵

Summary

This new study has demonstrated that even low-dose folic acid supplementation produces changes in gene function and in biochemistry that benefit the aging brain.

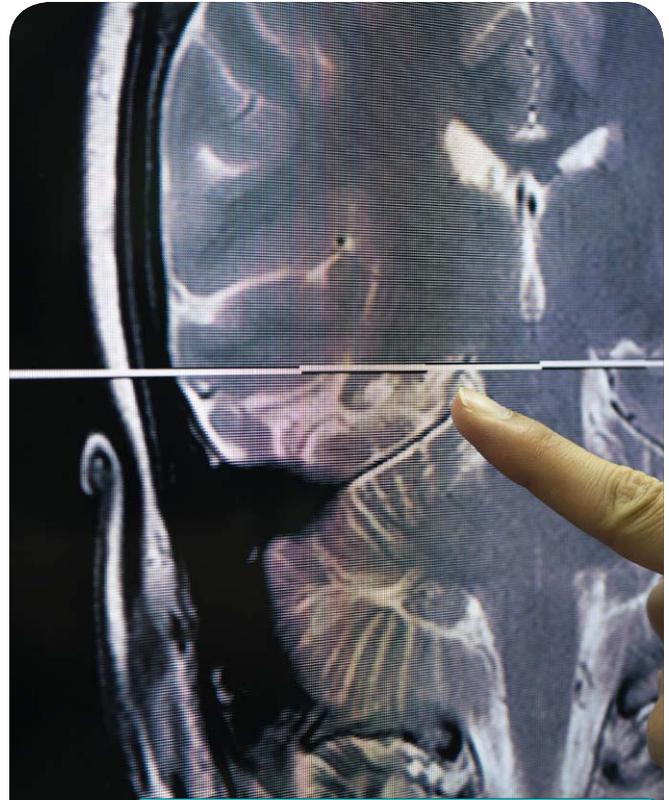
The favorable change in **gene expression** results in reduced production of toxic (*beta-amyloid*) proteins implicated in dementia.

Additionally, folate lowers the high homocysteine levels that often accompany brain aging and dementia. As a result, folic acid supplementation helps preserve cognitive function in adults with mild cognitive impairment.

Slowing the progress of mild cognitive impairment could delay the onset of dementia like Alzheimer's and Parkinson's diseases.

There is no reason for people to be deficient in folic acid as it is a remarkable low-cost nutrient. ●

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

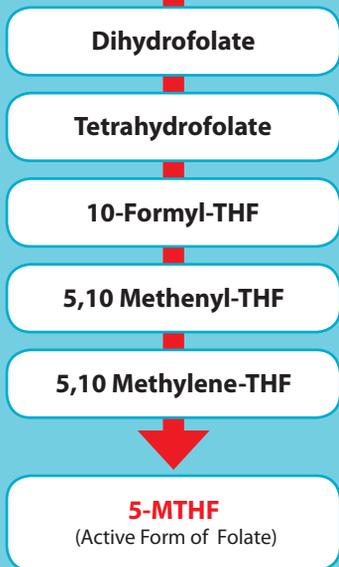


What You Need to Know

Folate Slows Brain Aging

- Mild cognitive impairment is an early indicator of dementia.
- Up to 15% of people over 65 years old with mild cognitive impairment will proceed *each year* to develop dementia, compared with less than 2% of those without mild cognitive impairment.¹⁶
- Studies show that mitigating mild cognitive impairment can ward off dementia, preserving more youthful cognition.
- A groundbreaking human clinical trial has found that supplementation with folic acid successfully improved cognitive function in adults with mild cognitive impairment.
- Deeper findings of the study show that folic acid reduces production of dangerous Alzheimer's-associated proteins, while also lowering toxic homocysteine levels.

Synthetic Folic Acid



5-MTHF: The Best Form of Folate Supplementation

In the body, the **folate** molecule goes through several enzymatic steps to become the active molecule **5-MTHF**.¹⁷⁻¹⁹

In order to make the conversion from folate to the active 5-MTHF, an enzyme called **methylenetetrahydrofolate reductase** or **MTHFR** is necessary—and not everyone has sufficient activity of the gene that codes for this enzyme. It is estimated that between **5%** and **10%** of the population has a gene variant that reduces MTHFR activity by **70%**,²⁰ while nearly **50%** of people of European descent have a genetic variation that decreases MTHFR activity by as much as **35%**.^{18,19,21-24}

Supplementation with 5-MTHF bypasses the enzyme defect and provides the body with exactly the right molecule it needs.

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Cognitex® with Pregnenolone & Brain Shield®

	Retail Price	Your Price
1 bottle	\$62	\$46.50
4 bottles		\$39.75 each

Item #01897 • 90 softgels



* *J Diet Suppl.* 2011 Jun; 8(2):158-68

Caution: Do not take this product if you have breast cancer, prostate cancer, or other hormone-sensitive diseases. If you are taking anti-coagulant or anti-platelet medications, or have a bleeding disorder, consult with your health care provider before taking this product.

Sensoril® is protected under US Patents Nos. 6,153,198 and 6,713,092 and is a registered trademark of Natreon, Inc. Sharp-PS® is a registered trademark of Enzymotec Ltd.



For full product description and to order
Cognitex® with Pregnenolone & Brain Shield®,
call 1-800-544-4440 or
visit www.LifeExtension.com

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



Promote Tear Production From The Inside Out



Everyday factors can lead to dry, itchy, irritated eyes.

Tear Support with MaquiBright® is a unique oral supplement that supports your body's own tear production for continuous, all-day comfort.

The secret is the maqui berry's rich source of **delphinidins**, a source of support for tear-producing glands. When human subjects took just **60 mg** a day of **Maqui berry extract**, there was a **45% increase** in lubricating tear production.^{1,2}



For full product description and to order **Tear Support with MaquiBright®**, call **1-800-544-4440** or visit **www.LifeExtension.com**

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

Item #01918 • 30 vegetarian capsules



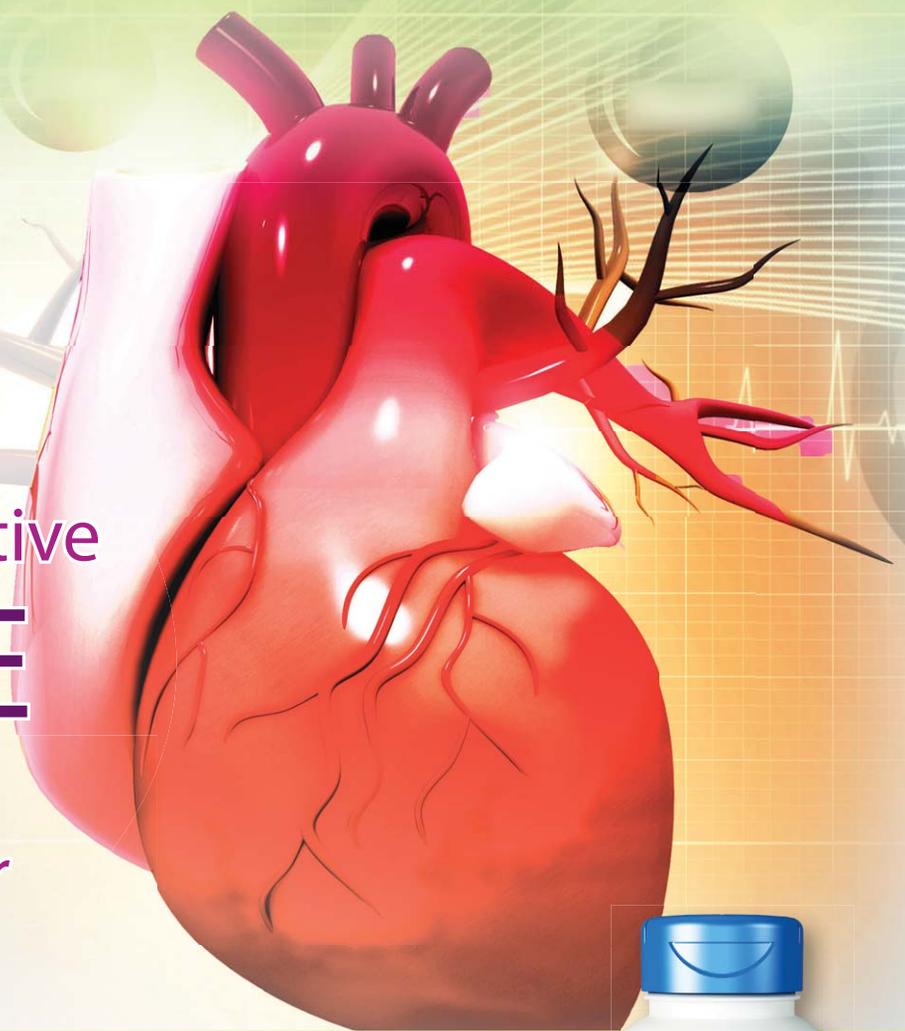
MaquiBright® is a registered trademark of MAQUI NEW LIFE S.A, Chile and ORYZA OIL & FAT CHEMICAL CO., LTD., Japan.

References

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2. *Panminerva Med.* 2014;56(3 Suppl 1):1-6.

Metabolically Active FOLATE

Supports Cardiovascular Health



Folate helps maintain homocysteine levels within the normal range,¹ thereby promoting cardiovascular health.² Folate also supports neurotransmitter synthesis—which in turn helps maintain cognitive abilities.³

However, not everyone has sufficient activity of the **enzyme** required to convert folate to its biologically active form, **5-methyltetrahydrofolate**, or **5-MTHF**.^{4,5}

5-MTHF requires no enzymatic conversion to become metabolically active⁶—providing maximum support for both cardiovascular and cognitive health.

Optimized Folate provides metabolically active **5-MTHF** folate in **1,000 mcg** or **5,000 mcg** strengths.

References

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Optimized Folate (1,000 mcg) Item #01939 • 100 vegetarian tablets

	Retail Price	Your Price
1 bottle	\$15	\$11.25
4 bottles		\$10 each



High Potency Optimized Folate (5,000 mcg) Item #01913 • 30 vegetarian tablets

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



For full product description and to order either of these **Optimized Folate** formulas, call **1-800-544-4440** or visit **www.LifeExtension.com**

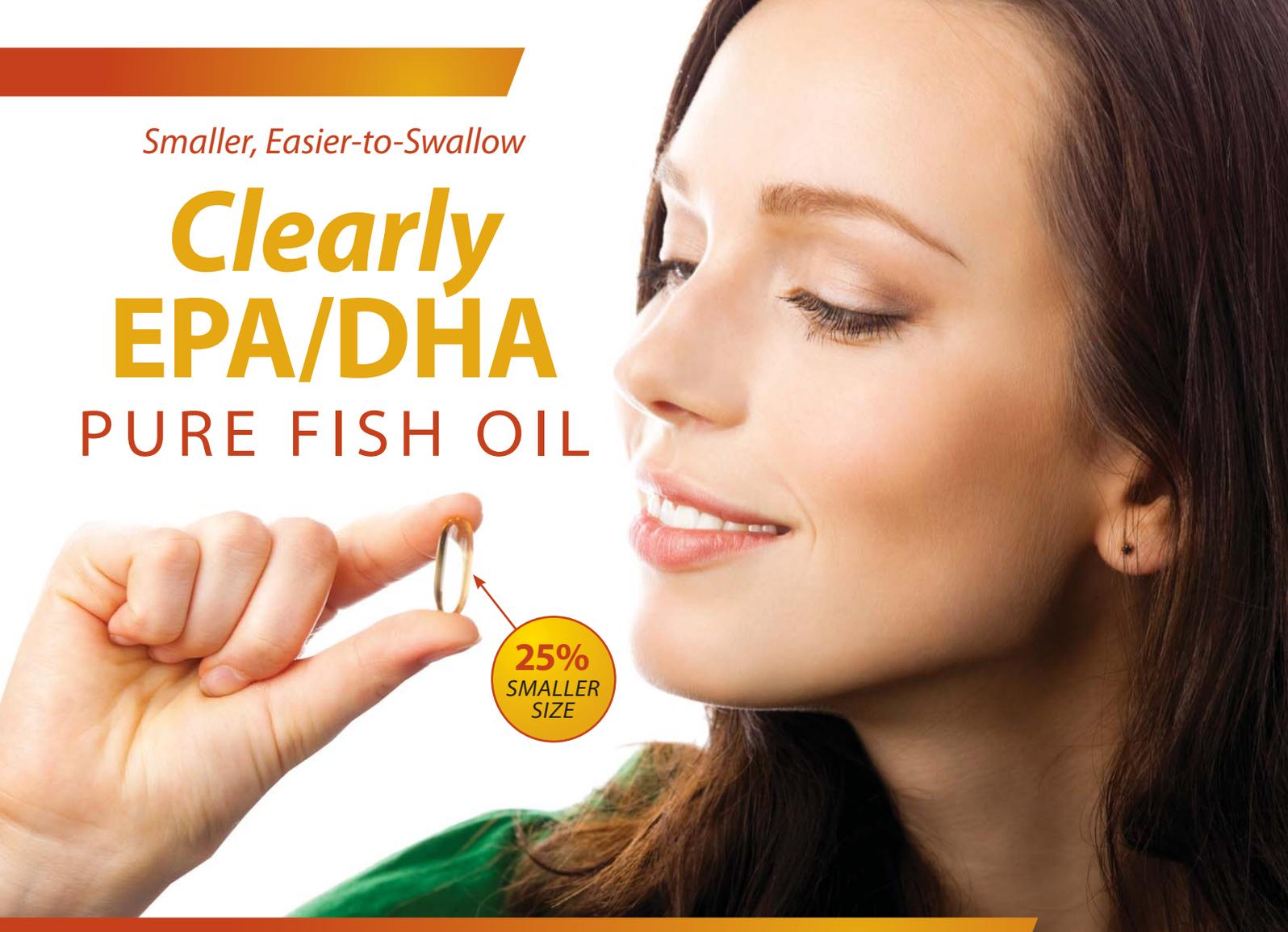
Caution: Do not use this product if treated with methotrexate, fluorouracil, phenytoin, phenobarbital, primidone, or levodopa prior to consultation with your personal physician.



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

Smaller, Easier-to-Swallow

Clearly EPA/DHA PURE FISH OIL



- **Easier-to-swallow** fish oil-only softgel
- **Colorless** omega-3 blend
- **5-star** rating from **International Fish Oil Standards Program**
- **1,500 mg of EPA** and **1,000 mg of DHA** daily dose
- **Smaller** size softgel

For full product description and to order
Clearly EPA/DHA Highly Concentrated Omega-3,
call **1-800-544-4440** or visit **www.LifeExtension.com**

Note: **Super Omega-3** softgels are 25% larger by volume because they provide **olive polyphenols, sesame lignans** and 5-star rated **fish oil**. New **Clearly EPA/DHA** provides same omega-3 potency in easier-to-swallow smaller softgels.

IFOS™ certification mark is a registered trademark of Nutrasource Diagnostics, Inc. If you are taking anticoagulant or antiplatelet medications, or have a bleeding disorder, consult your healthcare provider before taking this product. Supportive but not conclusive research shows that consumption of EPA and DHA omega-3 fatty acids may reduce the risk of coronary heart disease.



**Clearly EPA/DHA
Highly Concentrated Omega-3**
Item #02200 • 120 softgels

	Retail Price	Your Price
1 bottle	\$30	\$22.50
4 bottles		\$20 each

Four smaller softgels provide **1,500 mg of EPA** and **1,000 mg of DHA**.

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

Advanced Technology TO OPTIMIZE B12 ABSORPTION



 **ELIGEN B12™**
(cyanocobalamin/SNAC)
1000 mcg/100 mg tablets

Learn more at www.EligenB12.com

Eligen B12™ helps maintain normal vitamin B12 levels. Eligen® Technology is designed to allow patients to absorb an oral B12 formulation independent of intrinsic factor, a protein required to effectively absorb B12.

Eligen B12™ uses an advanced patented carrier technology to optimize vitamin B12 absorption by chaperoning B12 through the gastric lining directly into the bloodstream within 30 minutes. This enables individuals who are unable to absorb vitamin B12 intestinally to use an oral supplement to help inhibit B12 deficiency.

BENEFITS AT A GLANCE:

- Optimizes B12 absorption, especially among individuals lacking intrinsic factor.
- Helps maintain consistent long-term and predictable healthy B12 blood levels with a single daily dose.
- Helps inhibit B12 deficiency.

ABOUT EMISPHERE

Emisphere is a drug delivery company that utilizes its proprietary Eligen® Technology to develop new oral formulations of therapeutic agents. Emisphere is currently partners with global pharmaceutical companies for the development of new orally delivered therapeutics. For more information, please visit the company's website at www.emisphere.com.

Eligen B12 30 Tablets

Item Number: 53518 Retail: 45.99 Your Price: 34.49

For full product description and to order Eligen B12™, please call 1-800-544-4440 or visit www.LifeExtension.com



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Growing Older and Healthier the CR Way[®]: Wonderful Possibilities!

When I was younger, I was afraid of getting old.

Turning age 70 would be the beginning of the end, it seemed.

Developing a life-threatening disease like cancer or diabetes was a fearsome prospect. And what about quality of life?

Would my joints be achy and swollen from arthritis or my eyesight dimmed so I could no longer see the world around me in all its glorious detail?

Well, it finally happened: I turned 70 a few weeks ago. To celebrate, I went to my doctor for my annual wellness exam to evaluate key markers of my health.

The results* were an extraordinary birthday present:

Blood pressure: 100/60 mmHg

Resting heart rate: 50 beats-per-minute

Total cholesterol: 97 mg/dL

LDL cholesterol: 47 mg/dL

Fasting glucose: 71 mg/dL

* Results from blood work done at CareMount[®] Medical, Mount Kisco, New York, ordered by Dr. Jennifer LaPorta and reported February 2018.

I am delighted that a 70-year-old can have biomarkers that are like those of a healthy school-age child.¹⁻³

My body mass index (BMI) is 20 and I am strong and energetic. I have no aches or pains and I do not take medications. I read without glasses and my distance vision is 20/10—better than it was in my 50s and better than most people of any age.⁴ I am optimistic that I can look forward to a long, healthy life.

Mediocre Results in my 40s

I wasn't always so healthy. Flashback 25 years—I was in my forties and my test results were mediocre: Blood pressure was **140/90 mmHg**. Fasting blood glucose was at risk levels, in the mid-**90s mg/dL**. I was on a trajectory to disease. If I hadn't made significant changes in my approach to health, my life could have gone downhill easily—fast.

"No!" to Age-Related Decline

Having experienced the sadness of losing family loved ones, I knew that in my own life I would not be able to simply accept age-related decline and death. Instead, I made a resolution: to make life extension in good health my life's mission.

And I started to fight—mustering resources and talent to move life-extension science forward faster. The best way to begin was to understand and practice **dietary restriction**, a non-genetic, non-pharmacological intervention known to increase active and healthy lifespan in a variety of species.⁵

Many people think *dietary restriction* is synonymous with *calorie restriction*, but it can also include restriction of specific nutrients such as dietary protein or methionine (an amino acid).

As my **dietary restriction** practice developed, I learned that glucose control could significantly enhance the benefits that I was getting. So I decided to focus on that, because high blood glucose is linked to increased risk for many major diseases such as cancer,⁶ diabetes,⁷ heart disease,⁸ and dementia,⁹ as well as mortality from all causes.¹⁰



Longitudinal Studies?

Some researchers believe that longitudinal studies are required as proof that any form of **dietary restriction** extends life in humans, but one thing is certain: You can measure objectively how well you are doing. Consider these inspiring stories from members of LivingTheCRWay:

- Ev, 81, lives in Hawaii and joined LivingTheCRWay four years ago with challenges. Having had metastatic melanoma twice, and living with high blood glucose in the 90s and blood pressure higher than optimal, his markers now are more like those of a person considerably younger than 81: blood pressure at **88/53 mmHg**, achieved naturally without medication, no recurrence of cancer, and fasting glucose in the 70s.
- Debbie, 60, from Tennessee, is an active woman who lives on a farm. Before she joined LivingTheCRWay, her cholesterol was **216 mg/dL**. Her fasting blood glucose was at prediabetic levels. Since joining the CR Way only a few months ago she has lowered her fasting blood glucose to the **70s**, and her cholesterol readings are perfect—total cholesterol is **146 mg/dL** and LDL is down from **90 mg/dL** to **50 mg/dL**.
- Dave, 60, from Virginia, works hard daily as a professional landscaper. When not working, Dave and his wife, Jenny, like to go on trips and visit with family and friends. As often happens when one reaches 60, Dave's blood glucose had crept up to prediabetic levels. Now, after taking *THE CR WAY TO GREAT GLUCOSE CONTROL* classes, Dave's high fasting glucose has fallen into the **70s** and low **80s mg/dL**.
- Ellen, 65, from Wisconsin, is an RN whose work as a massage therapist is demanding. "I have evolved into better health and dietary habits that are demonstrably improving not just my glucose levels but all aspects of my life. Thank you both and the CR Way for helping me guide my ship in these positive ways."
- Thomas, 68, from Colorado, summed up how members of the LivingTheCRWay community feel: "I have had a good life and I want more of it!"

No one should promise that life extension is guaranteed. We do, though, expect these and many other **CR Way** members to continue to live healthy, active lives, as if they were younger than their chronological ages.



CR Way Secrets to Extraordinary Health

The **CR Way** of living helps people achieve such extraordinary health by showing them how to activate the biochemistry associated with extending life and preventing age-related disease.

Lowering mTOR

Standing originally for **mammalian Target of Rapamycin** (and more recently **mechanistic Target of Rapamycin**), **mTOR** is an enzymatic complex that drives growth in humans and other organisms.¹¹ This is essential in our younger years but can turn dangerous as we age.

You may have heard of **rapamycin**, a drug used to reduce the immune response in organ-transplant patients in the hope that their bodies will not reject their newly transplanted organ.

Rapamycin's downregulation of mTOR prompted researchers to give it the name "mammalian target of rapamycin."

Drugs and nutrients that boost **AMPK** indirectly suppress **mTOR**. Another way of lowering mTOR is to reduce one's calorie intake.

mTOR Activity Accelerates Aging

TORC1 (Target of Rapamycin Complex 1) and **TORC2** (Target of Rapamycin Complex 2) are the two parts of the large mTOR molecule. TORC1 has been studied more than TORC2 and is identified as a master regulator of cell growth and metabolism.¹²

Whether or not you know every nuance associated with mTOR, you must understand that overstimulating it increases risk of cancer and accelerates aging. You should also know that if you overfeed your body with calories, protein, or glucose-raising foods, your cells will go wild. You will store fat and put on weight, and your risk of disease will soar.

We help new participants in *THE CR WAY TO GREAT GLUCOSE CONTROL* to turn down mTOR with diet. It's easy, really: Make your diet **plant-based**, and you are halfway there.

Role of AMPK in Cell Energy Metabolism

AMPK (*adenosine monophosphate-activated protein kinase*) evolved early in the history of living organisms. AMPK fulfills the need to fuel cellular processes when energy (food) supplies become limited.¹³

When you follow the CR Way lifestyle, you manage your **glucose** levels better in ways that activate your **AMPK** beneficially. The metabolic changes that take place are extraordinary, as can be seen on the chart on the next page.

Metabolic Changes in Response to Healthier Eating Patterns

In response to consuming healthy foods that are part of the CR Way program, multiple changes occur throughout your body that slash your risk of degenerative illnesses while helping to decelerate aging itself. Below is a summary of just a few of the benefits we've seen in people who follow our **dietary restriction** program:

- **Blood pressure declines: 100/60 mmHg** is normal for CR Way practitioners, a benefit that may be a result of *increased eNOS* (endothelial nitric oxide synthase) levels.
- **High-sensitivity C-reactive protein (hsCRP) and tumor necrosis factor (TNF)** fall to the low end of the reference range, indicating **reduced inflammation**.
- **Fat synthesis decreases and fat burning increases.** That's probably why body fat percentages are as low as **12%** in CR Way men and **18% to 24%** in CR Way women.

- **Triglyceride** levels **reduce**, running between **45 mg/dL** and **65 mg/dL**.
- **Cholesterol reduction—150 mg/dL** is routine for CR Way members, and even lower can be normal.
- **IGF-1** is stable at moderate levels.

Moderate dietary restriction is a fundamental starting point for CR Way living. We continue to add complementary aging interventions like meditation and friendly support.

Begin with Glucose Control

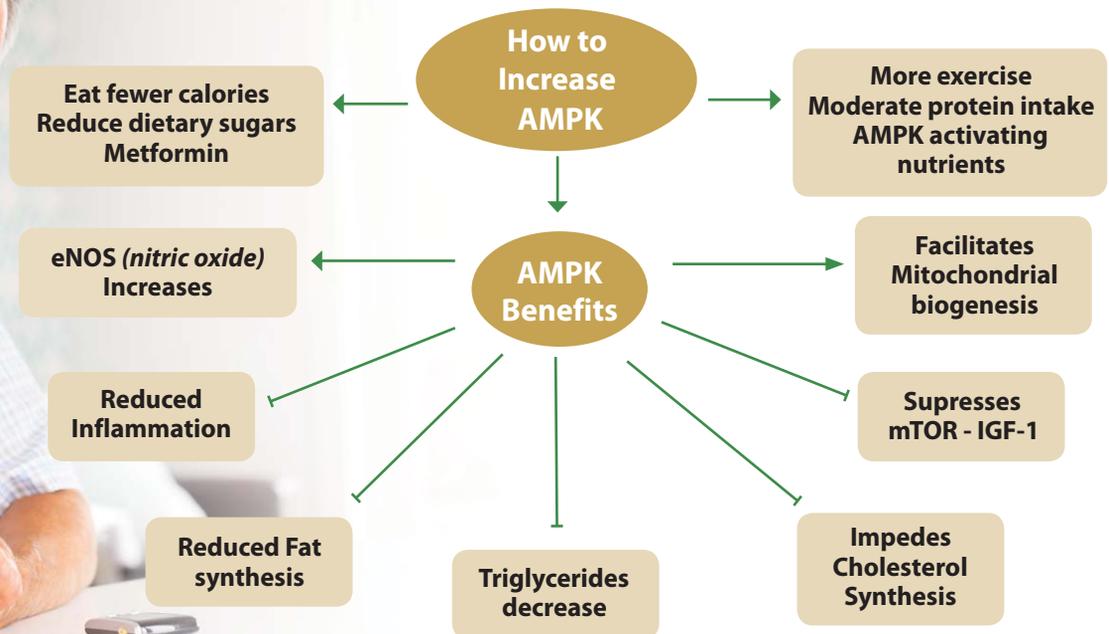
Many successful CR Way members begin with *THE CR WAY TO GREAT GLUCOSE CONTROL* and for good reason: About 84.1 million Americans¹⁴ and millions more worldwide¹⁵ have **fasting glucose** levels at dangerous prediabetes levels—**100 mg/dL** or above. If you are one of them and you don't do anything about it, your likelihood of developing type II diabetes, as well as other diseases, will soar.¹⁵

Hundreds of people have used the CR Way three-month online course—with live teleconferences—to reduce their glucose to healthy levels and improve their prospects for a long, disease-free life.

Features of *THE CR WAY TO GREAT GLUCOSE CONTROL* course

- A five-part e-book, updated with delicious recipes, food suggestions, and ideas for improving your body's microbiomes
- Weekly participation in the CR Way Support Group, where participants discuss successes and challenges of glucose control and other CR Way practices and get real, practical solutions for day-to-day issues
- Instructional videos, describing key steps for great glucose control
- Six live 30-minute classes by teleconference
- Personalized guidance: Glucose control experts Paul McGlothlin and Meredith Averil teach the classes—live!
- Recordings and transcripts of the teleconference classes
- A Great Glucose Control Library on LivingTheCRWay.com where recordings of classes and all instruction materials are available 24/7 for your use

Multiple Benefits of Boosting AMPK



Growing Older: Wonderful Possibilities

Twenty-five years ago we decided to create **The CR Way**.

It has now blossomed into a community where people make striving for great health fundamental to their way of life. Imagine the potential that offers: As you begin to feel terrific, you enjoy life more. You function well and can take better advantage of life's possibilities. And you have like-minded people supporting you in your efforts.

With your newfound energy and verve, you could choose to go back to school and learn a new skill, or simply apply your new vigor to the career you already love. With the return of your youthful health, retirement becomes optional rather than necessary.

You'll again enjoy your life as you once did, and not have to worry about draining your savings because you need expensive medications. This is what LivingTheCRWay offers.

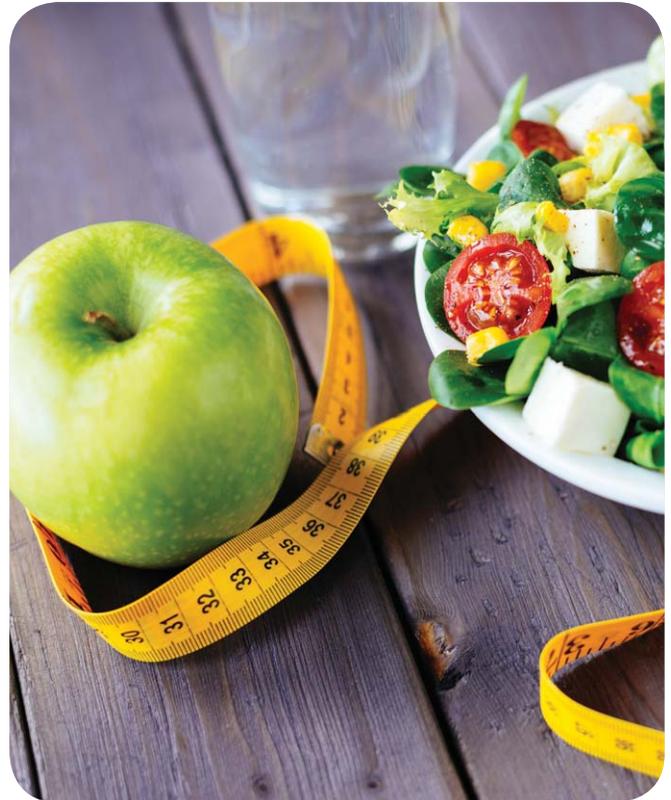
The starter three-month *CR WAY TO GREAT GLUCOSE CONTROL* program retails for \$350. We invite you as a *Life Extension Magazine*® reader to take advantage of the collegial pricing of **\$330**. This special price is only available through **September 14, 2018**. ●

Enroll today in an upcoming CR Way to Great Glucose Control class.

To order CR Way to Great Glucose Control, call Life Extension at 1-800-544-4440. Item #34144.

Paul McGlothlin and Meredith Averill have discovered how to bridge the gap between the scientific research into low-calorie diets and how to practically apply that research. Their work brings real results and longevity benefits to CR Way practitioners. 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.

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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Sweet DREAMS

Choose the Melatonin That's Right For You

Healthy sleep is one of the best ways to feel revitalized and maintain optimal health.

While many people find melatonin helps improve sleep, others take it nightly for its **immune** protecting effects.

Individual doses range from **300 mcg** to **10 mg** taken 30-60 minutes before going to sleep.

Caution: Consult your health care provider before taking this product if you are being treated for a medical condition (especially autoimmune or depressive disorders). Use caution if combining with alcohol. This product is not intended for children, pregnant or lactating women, or women trying to become pregnant. Do not attempt to drive or operate heavy machinery after taking this product.

ChromeMate®, a patented, biologically active oxygen-coordinated niacin-bound chromium complex, is a registered trademark of Interhealth Nutritionals Inc. MicroActive® Melatonin is a registered trademark of Bioactives LLC.

For occasional sleeplessness.



Melatonin Timed Release 300 mcg
100 vegetarian tablets
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Your Price: \$9
Item # 01787



Melatonin 3 mg
60 vegetarian capsules
Retail: \$8
Your Price: \$6
Item # 00330



Melatonin 500 mcg
200 vegetarian capsules
Retail: \$18
Your Price: \$13.50
Item# 01083



Melatonin 3 mg
60 vegetarian lozenges
Retail: \$8
Your Price: \$6
Item# 00332



Melatonin Timed Release 750 mcg
60 vegetarian tablets
Retail: \$8
Your Price: \$6
Item # 01788



Melatonin Timed Release 3 mg
60 vegetarian tablets
Retail: \$12
Your Price: \$9
Item # 01786



Melatonin 1 mg
60 capsules
Retail: \$5
Your Price: \$3.75
Item# 00329



Enhanced Sleep with Melatonin
30 capsules
Retail \$22
Your Price \$16.50
Item# 01551



Melatonin 10 mg
60 vegetarian capsules
Retail: \$28
Your Price: \$21
Item# 00331



Enhanced Sleep without Melatonin
30 capsules
Retail: \$22
Your price: \$16.50
Item# 01511



Melatonin 300 mcg
100 vegetarian capsules
Retail: \$7
Your Price: \$5.25
Item# 01668



Melatonin IR/XR
60 capsules
Retail: \$12
Your Price: \$9
Item# 02201



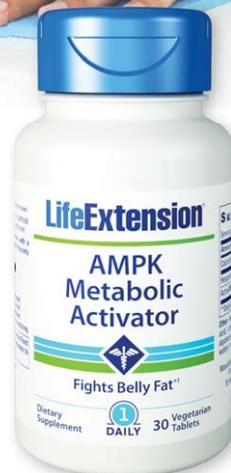
For full product description and to order any of these premium-grade Melatonin supplements, call 1-800-544-4440 or visit www.LifeExtension.com

Fight Systemic Aging



The plant compounds in **AMPK Metabolic Activator** help boost AMPK, a cell enzyme that mitigates mechanisms of aging and promotes vascular function while helping reduce belly fat.

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



1
DAILY

	Retail Price	Your Price
1 bottle	\$38	\$28.50
4 bottles		\$24 each

Item #02207 • 30 vegetarian tablets



ActivAMP® is a registered trademark of Gencor.

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

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EUROPEAN MILK THISTLE

Ultimate Protection For Your Liver

Milk thistle extract—rich in *silymarin*—is a powerful weapon to support liver health. Scientific studies demonstrate silymarin's ability to provide potent protection for your liver.^{1,2}

Life Extension®'s European Milk Thistle contains standardized, top-grade potencies of *silymarin*, *silybin*, *isosilybin A*, and *isosilybin B*, providing a full spectrum of liver-supportive compounds. This unique formula includes *phosphatidylcholine*, a nutrient that promotes better absorption of milk thistle extract.³

The *silymarin* contained in **European Milk Thistle** is absorbed nearly **5 times** better than silymarin alone, and its bioavailability to the liver is **10 times** better.

**European Milk Thistle
Advanced Phospholipid Delivery**
Item #01922 • 60 Softgels

	Retail Price	Your Price
1 bottle	\$28	\$21
4 bottles		\$18.75 each

References

1. *Mol Nutr Food Res.* 2009 Apr;53(4):460-6.
2. *Environ Toxicol.* 2007 Oct;22(5):472-9.
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For full product description and to order
European Milk Thistle Advanced Phospholipid Delivery,
call **1-800-544-4440** or visit **www.LifeExtension.com**

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NEXT-GENERATION

Glucose-Insulin MANAGEMENT

Glycemic Guard™ contains **maqui-berry** and **clove extract**.

These **plant extracts** help maintain healthy *after-meal* blood **glucose** levels and **insulin** response, and promote healthy HbA1c levels.

ITEM # 02122 • 30 vegetarian capsules • Retail price \$42 • Your price \$31.50 • 4 bottles \$28 each

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

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DHEA

FOR ALL NEEDS

DHEA is one of the most important hormones in your body. It supports immune function, mood, sex drive, and lean muscle mass.

DHEA levels markedly decline with age.

Because everyone's needs are different, **Life Extension®** offers DHEA in different encapsulated potencies, along with a dissolve-in-the mouth tablet.

DHEA 15 mg capsules

	Retail Price	Your Price
1 bottle	\$14	\$10.50
4 bottles		\$9 each

Item #00454 • 100 capsules



DHEA 25 mg capsules

	Retail Price	Your Price
1 bottle	\$16	\$12
4 bottles		\$11 each

Item #00335 • 100 capsules



DHEA 25 mg tablets

	Retail Price	Your Price
1 bottle	\$14	\$10.50
4 bottles		\$8.81 each

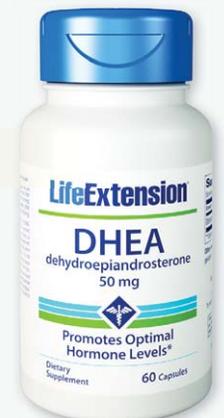
Item #00607 • 100 dissolve-in-mouth tablets



DHEA 50 mg capsules

	Retail Price	Your Price
1 bottle	\$19	\$14.25
4 bottles		\$12.75 each

Item #00882 • 60 capsules



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

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.



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

Metformin

Reduces Diabetic Risk by
Improving Gut Health

BY STACY GRANT

The gut **microbiome** consists of trillions of microorganisms that inhabit the human gastrointestinal tract.

Having an **imbalanced gut microbiome** is associated with cancer, vascular disease, allergies, neurodegenerative disorders, and depression.¹⁻³

In **2017**, researchers at **Johns Hopkins Bloomberg School of Public Health** announced a series of discoveries linking disturbances in the microbiome to **diabetes**.⁴

Fortunately, they also found a solution.



Metformin is the most widely prescribed drug to treat **type II diabetes**.

Since **1995**, Life Extension® has recommended metformin to nondiabetics as a possible way to slow **biological aging**.

Metformin's primary beneficial mechanism is to increase cellular AMPK.

As people age, **AMPK activity declines** and sets the stage for a host of degenerative illnesses.

New studies have uncovered another benefit to metformin: It boosts a beneficial intestinal bacterium called *Akkermansia muciniphila*.⁴

Studies show that this bacterium has specific actions that combat diabetes and obesity.

This study from **Johns Hopkins** sheds new light on metformin's role as a microbiome-modifying, anti-diabetic drug.

Akkermansia Improves Metabolic Health

Gut health hinges on having a healthy balance of the right kinds of bacteria.

Akkermansia muciniphila is one of the good guys, and its specialty seems to lie in beneficially affecting metabolic health.⁵

Until 2016, little was known about the organism's role in human metabolism.⁵⁻⁹ That changed with publication of a French study.⁵

In a 12-week dietary intervention, the Sorbonne's researchers studied 49 overweight and obese adults. Subjects undertook six weeks of a calorie-restricted diet followed by six weeks of a diet aimed at weight stabilization.

The study showed that subjects with the highest baseline abundance of *Akkermansia muciniphila* in their stool had the best parameters associated with metabolic health, including:

- The lowest fasting glucose,
- The lowest waist-to-hip ratios (a measure of central obesity),
- The lowest mean diameter of fat cells, and
- The best metabolic status, as indicated by lower plasma-triglyceride levels and better body-fat distribution.⁵

Having an abundance of *Akkermansia* also predicted greater improvements following the calorie-restriction phase of the study. For example, the subjects with higher baseline *Akkermansia*

levels had greater improvements in markers of insulin resistance, blood lipids, and body fat composition after the intervention, compared with those having lower abundance of the organism.⁵ They also showed less liver-cell damage, a common outcome of excessive liver fat associated with **non-alcoholic fatty liver disease (NAFLD)**.

As an added benefit, having plenty of *Akkermansia muciniphila* was associated with having an abundance of other microbial species with known benefits to metabolic health.⁵

In addition to confirming *Akkermansia muciniphila*'s role in metabolic health, this study also suggests that interventions that boost *Akkermansia* are likely to be useful in counteracting obesity, diabetes, and their deadly cardiovascular consequences.

And it turns out that an unanticipated yet potent way to boost *Akkermansia* is a drug that's already well-known for its glucose-lowering, anti-diabetic benefits: **metformin**.

Metformin's Akkermansia-Boosting Effects

Metformin is a derivative of the French lilac (*Galega officinalis*) with an ever-expanding list of benefits and an excellent safety record.¹⁰⁻¹²

It has been used for more than 50 years to treat type II diabetes.¹³

More recently, reports have indicated that metformin's metabolic benefits might involve alterations to the gut microbiome. Intrigued, researchers at the Johns Hopkins Bloomberg School of Public Health teamed up with colleagues in Colombia to develop a deeper understanding of metformin's impact on the microbiome.⁴

The study involved 28 individuals with diabetes and 84 others without diabetes that were matched to the diabetic subjects by sex, age, and body mass index (BMI). Half of the diabetic subjects were taking metformin, while the other half were not.⁴

What the researchers found was remarkable. Compared with subjects who did not have diabetes, the diabetic subjects taking metformin had higher abundance of *Akkermansia muciniphila*, while diabetics not taking metformin lacked this increase.⁴

There may be no citizen of the gut microbiome community better suited to protecting us against diabetes—the combination of diabetes and obesity—than *Akkermansia* because of its ability to improve insulin resistance, blood lipids, and body-fat composition.



As an added benefit, the diabetics given metformin also had higher levels of bacteria known for their ability to produce essential *short-chain fatty acids* (such as butyrate).⁴ Short chain fatty acids are increasingly being recognized for their anti-inflammatory properties in the intestine and elsewhere in the body.^{14,15}

In sharp contrast, diabetics not taking metformin showed a higher abundance of bacteria in the Clostridiaceae family, which have been associated with higher levels of gut and system-wide inflammation.^{4,16,17}

These beneficial shifts in the diabetic gut microbiome are precisely what one would desire in an antidiabetic therapy: reduction in bacteria associated with inflammation (which promotes insulin resistance and therefore diabetes), and increases in bacteria known to protect gut integrity and soothe inflammation.

Metformin's Metabolic Effects

Another study out in late **2016** vividly demonstrates the important health benefits of metformin as a gut microbiome-modulating drug.¹⁸

It found that metformin's ability to improve the gut microbiome can **reverse** a condition known to cause everything from digestive issues and hormone imbalances, to skin issues and food allergies, to autoimmune diseases and depression.

The condition is called **leaky gut**, and it occurs when the otherwise-tight intestinal wall becomes permeable, allowing things like toxins, bacteria, and undigested food to "leak" out of the intestines and travel throughout the

body through the bloodstream. The immune system targets them as imposters and attacks them. This leads not only to the effects listed above, but to a body-wide state of low-grade inflammation.^{18,19}

Two primary underlying causes of a leaky gut include a high-fat diet and an unbalanced (dysbiotic) gut microbiome, and it can lead to a cascade of events that have a harmful impact on blood sugar and insulin resistance.²⁰

The chief culprit in this scenario is a ubiquitous, highly-toxic family of compounds called lipopolysaccharides, or endotoxins. When lipopolysaccharides are released into the circulation, they cause a profound **inflammatory response**, even when present in amounts as miniscule as *one-trillionth of a gram*.²¹

One of the most devastating results of lipopolysaccharide-induced chronic inflammation is the development of insulin resistance. This occurs when damaged cells lose the ability to respond to insulin signaling, leading to high blood-sugar levels that damage tissues.¹⁹

While it is virtually impossible to avoid these dangerous endotoxins, studies have shown that modulating the composition of the gut microbiome can limit how much of them are absorbed into the circulation—which has beneficial effects on metabolic health.

Metformin Reverses Leaky Gut

Another **2016** study found that **metformin's** ability to modulate a dysbiotic gut microbiome has a profound impact on leaky gut and its consequences.

For this study, scientists fed mice a high-fat diet for 18 weeks to induce insulin resistance.¹⁸

They then treated the mice with either metformin alone, or metformin following injections of lipopolysaccharides to produce high-grade inflammation.

The results showed that **metformin** treatment:

- **Reversed** gut leakiness induced by a high-fat diet,
- **Lowered** the resulting elevated circulating lipopolysaccharide levels, and
- **Increased** the abundance of beneficial *Lactobacillus* and *Akkermansia* in the gut microbiome.

This study shows that metformin exerts favorable changes on a dysbiotic gut microbiome—a benefit that results in a sharp decrease in pro-inflammatory compounds associated with diabetes and obesity. It also offers additional insights into why metformin is such a potent actor in fighting these disorders.

This study highlights the importance of microbiome composition in metabolic health and strengthens the case for *Akkermansia muciniphila* as a chief guardian of gut balance.

Summary

Metformin is a multitargeted drug with broad-spectrum metabolic benefits in diabetes, the deadly combination of diabetes and obesity.

New studies show that some of metformin's metabolic benefits stem from its impact on the gut microbiome.

These studies show that metformin boosts the amount of *Akkermansia muciniphila*. People with higher levels of *Akkermansia*

have better metabolic health, lower blood sugar, and healthier body-fat distributions than those with lower levels.

By inducing these beneficial gut microbiome changes, metformin reduces gut leakiness and lowers levels of circulating toxins that induce inflammation throughout the body—effects that help to reduce inflammation-related insulin resistance and elevated blood-sugar levels.

Probiotics are one important means of supporting good gut microbiome balance and overall health. Metformin may be considered along with probiotics as a beneficial, gut microbiome-modulating intervention that can promote intestinal as well as metabolic health. ●

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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STEPHANIE CARTER'S WORLD OF HEALTH

This baby boomer fuses her passion for health and fitness with entrepreneurial drive

BY KYLE RODERICK

Stephanie Carter is the co-founder of Wallaroo Hat Company, which manufactures sun hats, scarves and turbans that provide maximum protection from harmful ultraviolet rays.

But she's more than an entrepreneur whose headwear protects people around the world. An attorney and mother of three grown children who lives with her husband in Boulder, Colorado, Carter is also an avid amateur athlete. Lending her products and company name to health campaigns that raise awareness of potentially deadly skin cancers and the steps we can take to prevent them, Carter's professional life is balanced with daily mind/body fitness training.

Life Extension® quizzed her about her passion for health, wellness, and protecting the skin, the largest organ of the body.

LE: How do you define health?

SC: Health is a mind/body condition that we can support and protect through diet and lifestyle-related behaviors. The basis of my health is my meditation practice, which I do for 20 minutes every morning as soon as I wake up. Sometimes it can be challenging to make time for meditation, but the clarity, stress management and strength that it provides makes it worth the effort. I do an India mantra-based meditation, also known as Vedic meditation.



STEPHANIE CARTER



LE: In addition to being a meditator, you're also an avid amateur athlete. Were you a very sporty girl?

SC: Growing up in Boulder, Colorado, with three older brothers, I was playing sports all year round. We were all on ski teams when we were young. I skied most every winter weekend throughout my youth. In high school, I was a runner and I also did bike racing.

LE: What are your favorite forms of physical exercise?

SC: I love being outside, so I hike several times a week early in the morning. After I've done my morning meditation, I go sunrise hiking on Mount Sanitas with a group of friends who live nearby. We meet at 6 a.m. and power up the steep backside of the mountain, and although the trail is only 3.1 miles roundtrip, it's quite a workout as the climb involves 1,343 feet of elevation gain. We can usually get up to the top in about 45 minutes.

Between climbing in the fresh air, taking in the view with friends and seeing the beauty of the morning light, it's totally energizing.

LE: Do you stretch before you hike?

SC: I don't really have the time to do much stretching so early in the morning, but because I do yoga several times a week, I am limber enough to get moving in the dark!

LE: Tell us about your yoga practice.

SC: Vinyasa flow-style yoga is an integral part of my life, and I first got into it when I was a law student at University of Denver law school. I started to do heated flow yoga classes to release stress and relax my body after long hours of reading, writing and sitting at a desk. Law school felt very stressful, particularly during the second year. Yoga came to my rescue because it helps get you out of your head so that you concentrate on breathing and downshift into mental calm.

From my experience, regularly practicing yoga enhances energy levels and endurance.

I deepened my yoga practice by taking some teacher training courses in India and in Boulder to learn more about the technique behind the poses and to learn their Sanskrit and English names. I do Vinyasa yoga anywhere from three to four times a week at Yoga Pod and CORE Power Yoga, which are two fine studios in Boulder.

LE: With so many fitness-oriented citizens, Boulder is also well known for its supportive yoga and meditation community.

SC: Yes, it's true. I was an original investor in Boulder's Hanuman Yoga Festival, which in 2018 is celebrating its seventh year. I am also an owner of the festival, which happens every June in Boulder for four days. The festival is a great cross-cultural gathering uniting people of all ages and walks of life. Along with seminars taught by renowned female and male yogis who are teaching everything from Kundalini yoga to Vinyasa flow yoga, the program features musical performances.

LE: What other forms of exercise do you love to do?

SC: In the winter, I ski since it's second nature for me. I'm on a tennis team for which I train individually with a pro on some mornings before I go to the office. Besides attending group practices in the evenings and on weekends, I also play in tournaments. I enjoy doing stand-up paddleboarding because it's a low impact exercise that requires coordinating your mind and body to balance. You are constantly using your strength and endurance to paddle or just stand up straight on the board. While it's

an excellent core workout, your feet, legs, back, shoulders, arms and neck must work together, so really, your whole body benefits.

Every year, I travel with a group of women friends to Baja California, Mexico, to do stand-up paddleboarding and sea kayaking. We go to the Sea of Cortez and visit beautiful islands such as Isla Carmen and Isla Danzante in the Loreto Bay National Marine Park, a protected marine area that's home to dolphins, sea turtles, manta rays, sea lions, and whales. We camp, paddle, and snorkel around these islands. You can unplug from your daily life and electronic devices as there is zero cell phone reception there.

LE: What are your biggest health challenges?

SC: I've been getting migraine headaches since I was in college at New York University, where I earned my undergraduate degree in French and Spanish. Although they tend to be triggered by hormonal fluctuations, the migraines are also aggravated by alcohol, especially beer, and caffeine. I find that if I get eight hours of sleep, and stay very well hydrated, I'm far less likely to develop a migraine. A few years ago, my acupuncturist suggested I stop eating gluten to see if that might improve the situation. After eliminating gluten from my diet, my headache symptoms reduced in severity. Although I occasionally get migraines with bad occipital pain behind the eyes, they're not as bad as they used to be. I take *Ginkgo biloba* for enhanced blood circulation to the brain.

LE: Given that you're so physically active, do you get any regular body work?

SC: I get a deep tissue massage every other week for muscle mobility, relaxation, and mental health, because it's therapeutic for me. It's also important to get a massage to stimulate blood and lymph flow, which helps to flush toxins out of your system.

LE: You're involved in raising awareness of melanoma and various skin cancers. Why is it so important to be informed about these particular health issues?

SC: Because protecting your skin and seeing a dermatologist for a full body exam starting in childhood can possibly save your life, or the lives of your friends and family. Most people diagnosed with melanoma are Caucasian men older than 50. Almost one million people in the U.S. have the disease.

It needs to be said that melanoma is not just a skin cancer. In fact, it can develop anywhere on the body: eyes, scalp, nails, feet, mouth, etc.

According to the melanoma.org website: "In 2018, over 178,000 Americans are expected to be diagnosed with melanoma. Of these, approximately 91,000 will be diagnosed with invasive (Stage I, II, III or IV) melanoma and another 87,000 will be diagnosed with melanoma in situ (Stage 0)." Many people are unaware that melanoma is the top cause of cancer death in women ages 25 to 30, and the second most common cause of cancer death in women ages 30 to 35.

Stephanie's Supplements

Carter consumes a morning smoothie drink that's mixed with **8 grams** of dietary fiber and **15 grams** of soy or whey protein. This powder also contains Vitamin A, Vitamin B complex, Vitamin C, Vitamin D, Vitamin E, Vitamin K, and Riboflavin. "I take probiotics and antioxidants in varying dosages, plus calcium and magnesium citrate supplement and vitamin C complex, a fish oil supplement and glucosamine and chondroitin sulfate in order to help with joint soreness. It's good for nourishing cartilage."



LE: U.S. government figures state that the incidence of people under 30 with melanoma is rising faster than any other age group and has risen by **50%** in women since 1980, while about 500 American children are diagnosed with the disease each year. Tell me about how you and your company partners are educating the public about melanoma and skin cancer prevention.

SC: My business, The Wallaroo Hat Company, was founded in 1999, mainly to provide people with stylish hats that will provide maximum sun protection and protection from ultraviolet radiation. We partner with the Melanoma Research Foundation (www.melanoma.org), which is based in Washington, D.C., in addition to other nonprofit community organizations devoted to skin cancer prevention. The Melanoma Research Foundation sponsors running races at Universal Studios every year, and we donate to their silent auction. Recently we made a line of turbans and scarves that we donated to the American Cancer Society, and we also donate products to the University of Virginia where they do skin-cancer screenings.

LE: So what type of hat do you recommend people wear? Is there a minimum brim width?

SC: A wide-brimmed (3-inch or greater) hat covers places where it is difficult to apply sunscreen, such as the scalp and tops of the ears, plus the back of the neck. A tightly woven hat will shade your face and protect the delicate internal structures of the eyes from ultraviolet UVA and UVB rays while also preventing you from squinting in the sun. Wide-brimmed hats and sunscreen provide ideal



protection. Baseball caps are not recommended as they offer relatively little protection for the nose, cheeks, tops of the ears, etc.

LE: Is there some kind of internationally recognized and certified rating system?

SC: Wear a hat that has at least a three-inch brim and is certified UPF 50+ by the Skin Cancer Foundation. UPF is a concept that was standardized in Australia in 1999, and while the initials stand for Ultraviolet Protection Factor, the number indicates what percentage of the sun's ultraviolet rays can penetrate a fabric. This means that a hat or garment with a UPF of 50 allows just 1/50th of the sun's UV radiation to reach the skin.

LE: What creates the UPF? Is the fabric embedded with chemicals?

SC: UPF is determined by the density of the weave of the fabric and it is this density that creates the UV protection. There are no chemicals involved in UPF. While wearing a hat is your #1 defense against damaging ultraviolet rays, it's also important to wear sunglasses and sunscreen, even while driving, because light reflects off sidewalks, snow and roads. And while car windows and glass filter out the kind of radiation known as UVB rays, it allows UVA rays to penetrate. It's a sunny world. Wear a hat! ●

Stephanie Carter's Wallaroo Hat Company can be accessed online at <https://wallarohats.com>

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Dr. Sandra Kaufmann

The Science of Slowing Aging

BY GARY GREENBERG



SANDRA KAUFMANN, M.D.

Sandra Kaufmann, M.D., is Chief of Pediatric Anesthesiology at Joe DiMaggio Children's Hospital in Hollywood, Fla.

The 49-year-old married mother of two is also an athlete who enjoys running, swimming, and rock climbing. When she hit her mid-40s, Kaufmann decided she didn't want to succumb to the ravages of time and began exploring ways to fight back against what has always been the inevitable decline of aging.

Armed with years of higher education that not only included her medical degrees but also a masters in ecology and evolutionary biology with an emphasis on cellular plasticity under changing environmental conditions, she scrutinized thousands of scientific studies on hundreds of potentially anti-aging substances.

The results are detailed in her new book, *The Kaufmann Protocol: Why We Age and How to Stop It*, available in e-book form from Amazon.com. In it, she describes the mechanisms of aging on a cellular level and the best substances to retard its progress.

Life Extension[®] caught up with Dr. Kaufmann a few days before she headed off on an expedition to the base camp of Mount Everest.

LE: It seems ironic that a children's doctor should become an expert in aging.

SK: I appreciate the irony but, on the other hand, spending so much time with kids serves to remind me that the clock is always ticking.

LE: How is your book different from the many other anti-aging books and programs on the market?

SK: My book is not about diet and exercise, and has little mention of carbohydrates or ketones. It doesn't include anything about colonic cleansing or any other fad or exotic treatment to prevent aging. My book is based solely on how to maintain cellular health. We are made of cells, and we age because our cells age. You have to change your perspective from organs to cells, from "what does my skin look like?" to "what are my skin cells doing?" You have to look inside the cells, which is what I have done.

LE: What are the mechanics of aging?

SK: Aging consists of seven categories of things that happen to your cells. No. 1: Changes to DNA, including epigenetic modification and telomere length. No. 2: Disruptions in energy production due to mitochondria failure. No. 3: Problems with metabolic pathways, especially the sirtuins, AMPK, and mTOR pathways. No. 4: Quality control problems that affect DNA and protein repair. No. 5: Inflammatory issues due to a faulty immune system. No. 6: Not fulfilling the needs of specific cells. No. 7: Incomplete waste management.

To defeat aging, or decelerate the process, you have to take into consideration each of the seven categories.

LE: Are any of those seven categories more important than others?

SK: They are all interrelated and dependent on each other. The ratio of what's important may change over time. For example, when you are young, you have less DNA damage, so the DNA repair mechanisms are less active. As you get older, you have more DNA damage and less capacity to fix it, so that category becomes extraordinarily important. I separated the categories to explain the process. But in practice they are so interrelated it's virtually impossible to separate them.

LE: What's the basis of the Kaufmann Protocol?

SK: For every anti-aging agent I've identified, I've created a numerical system that rates it on a 0 to 3 scale for each of the seven categories of cell aging in the order I've already listed. For example, resveratrol and its more bioavailable cousin, pterostilbene, hits every category, carrying a Kaufmann Rating score of 2.3.3.3.2.2 for a total of 15. Carnosine, a dipeptide, has a Kaufmann Rating of 0.3.0.0.0.0.3 for six points.

LE: How does epigenetic modification come into play?

SK: Epigenetics is genetic control on top of your DNA. Every cell carries the same information, but the information you needed as a neonate you may not need as an adult. As the needs change, the methylation pattern of the DNA changes, blocking your body from transcribing that information. It's a control mechanism. You also have epigenetic drift, which is how the environment affects the methylation patterns. Chronic inflammation from things like chemical pollu-

tion, alcohol, smoking and UV light causes a negative methylation drift that can lead to aging and cancer. There are also beneficial epigenetic modifiers, such as sulforaphane, resveratrol and curcumin. So you can affect your genes positively by eating good things.

LE: How about telomeres?

SK: Telomeres are the ends of DNA that don't code for anything but act as protective caps. Every time a cell divides, you lose a length of telomeres, on average 50 to 70 base pairs a year. When you lose too much length, the cells can no longer divide. They become senescent, which is the equivalent of a grumpy old man sitting in the corner being obnoxious by spewing out evil cytokines and interleukins and making everything systemically inflamed.

LE: So how do you protect DNA?

SK: The best agents I've found are sulforaphanes, which you find in broccoli and other cruciferous vegetables; the medicinal plant astragalus; and the diabetes drug metformin.

LE: Why do you include a prescription diabetes drug in your protocol?

SK: I tried to include only things that anyone can easily buy, but metformin was too good to pass up. I call it the Clark Kent of the drug world because it looks old and stodgy but is actually Superman. It is an epigenetic modifier that induces genome-wide methylation and stimulates telomere length. It activates endogenous antioxidants to protect mitochondria from oxidative stress. It's an anti-inflammatory, boosts the formation of new nerve cells and, of course, reduces blood glucose. It is amazing in almost every category. One study

said that metformin has saved more people from cancer than anything else. That's because it lowers both sugar and inflammation, two risk factors for cancer. It also promotes better gut bacteria. It's cheap as dirt and the only common side effect seems to be a bit of indigestion in some people. I think everybody should be taking it whether they have diabetes or not.

LE: What are metabolic pathways and how do they influence aging?

SK: The discovery of metabolic pathways came about from scientists trying to figure out why a calorie-restricted diet increased longevity in organisms pretty much across the board. When the body thinks it is starving, it triggers innumerable processes including turning metabolic pathways on and off. There are many pathways, and new ones being discovered all the time, but the big three are gene/protein combinations called AMPK, sirtuins and mTOR. AMPK is called the body's "metabolic master switch," and it maintains energy homeostasis by regulating the energy flow. There are seven members of the sirtuin family, and they sense the environment and alter the metabolism to promote survival. In part, they accomplish this by activating AMPK. The sirtuin family is dependent on the coenzyme NAD⁺ (nicotinamide adenine dinucleotide), which our bodies produce less of as we age. mTOR (mammalian or mechanistic target of rapamycin regulates growth and development, which is great when you are young. But as you age, excess mTOR activity contributes to inflammation and its numerous problems.

LE: Moving on to mitochondria... why do you call these little power stations "a necessary evil?"

SK: A long, long time ago, mitochondria were their own energy-efficient little cells that became engulfed by bigger cells and, eventually, semi-autonomous organelles within those cells. They're a victim of history because they evolved when oxygen was very rare, and now it's not rare. So mitochondria find themselves extremely vulnerable to free radicals. Mitochondria use oxygen, but get destroyed by it. The more they work, the more they damage themselves. It's kind of sad. Mitochondria make their own endogenous antioxidants, but over time can't make enough. Fortunately, there are several things that can help them out: astaxanthin, curcumin, quercetin, resveratrol or pterostilbene, and nicotinamide. When too many mitochondria are damaged, energy production drops, which affects all of the other categories and is why old people tend to feel tired a lot.

LE: Why is waste management so important?

SK: When you combine excess glucose and oxidative stress, you get advanced glycation end products, known by the wonderful acronym AGEs. AGEs age you because glucose is sticky and gums up the works of everything it latches onto, including DNA and proteins, eventually causing structural failure and dysfunction. It's why our arteries stiffen and skin sags. But several agents can either strip away AGEs or inhibit their formation. Some of the best are carnosine, curcumin, pyridoxamine (a form of vitamin B6), rosmarinic acid and our old friend metformin.

LE: You include 14 anti-aging "molecular agents" in your book. Do people have to take them all?

SK: The more the merrier. Although they may overlap to some degree, the biology is very complex and they sometimes work on different elements of the same problem. To start out, I recommend five agents that can be bought by anyone and touch all of the bases. I call them The Panacea. They all excel at supporting mitochondria, so the regime should give you an energy boost.

Resveratrol and pterostilbene score in every category but do especially well with metabolic pathways and DNA and protein repair. Astaxanthin is a super antioxidant that scavenges free radicals and acts as an anti-inflammatory. NAD (in the form of nicotinamide riboside) is a multitasker that is essential in activating the sirtuin pathways and is also vital in DNA repair. Curcumin, a molecule found in the spice turmeric, is another powerful antioxidant that is also an epigenetic modifier. Carnosine is one of my favorites because of its ability to block AGEs formation. It acts like the body's janitor in cleaning up the waste. Along with these agents, I also recommend that everyone take a good multivitamin because people suffer from micronutrient deficiencies and we don't want to starve our cells from the raw materials they need. Traditionally, we treat diseases. My protocol is designed to avoid diseases. I think this is the way the world will be going eventually. ●

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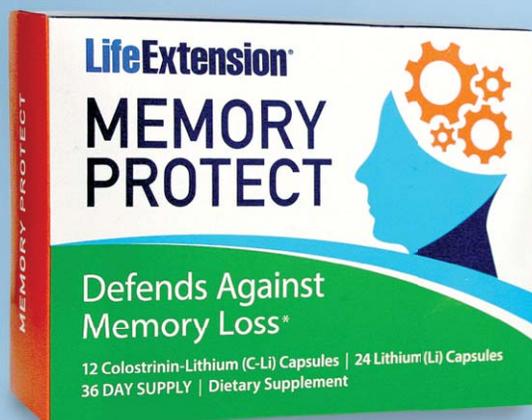
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VEGETABLES FROM AN ITALIAN GARDEN

Italian cuisine is usually not thought of as health food, associated as it is with pizza, pasta, lasagna, and rich, creamy deserts. But the fact is that vegetables are what make up the backbone of dishes in Italy, largely due to the immense richness of that country's harvest.

Vegetables From an Italian Garden is a cookbook that focuses on that fact. Compiled from a number of Italian cookbooks going back to 1950, the editors note that "Markets all over the country are stocked with spectacular and colorful displays of tomatoes, bell peppers, globe artichokes, broccoli, fennel bulbs, asparagus, chicory, carrots, eggplants—whatever is in season."

Accordingly, recipes in the cookbook are arranged into four categories featuring the vegetables that flourish in each season of the year. And it's worth noting that many of these meals hew closely to the Mediterranean diet, famed for its associations with heart health and longevity.

We've selected a sampling of four recipes from among the many in *Vegetables From an Italian Garden* that are healthy as well as delicious.

—Garry Messick



Cannellini Bean and Spinach Salad With Mustard

(Insalata di Cannellini e Spinaci Alla Senape)

Preparation time: 5 min. • Cooking time: 20 min. • Serves 4

- 2 tablespoons Dijon mustard
- 3 tablespoons red wine vinegar
- scant ½ cup olive oil
- 6 shallots, finely chopped
- 1 ¾ pounds canned cannellini beans, drained and rinsed
- 2 tablespoons chopped thyme
- 2 tablespoons chopped parsley
- 5 ⅓ cups chopped spinach
- salt and pepper

Combine the mustard and vinegar in a bowl and set aside. Reserve 2 tablespoons of the olive oil and heat the remainder in a wide pan. Add the shallots and cook over low heat, stirring occasionally, for 5 minutes, until softened and translucent. Stir in the cannellini beans and add the mustard-flavored vinegar and reserved olive oil. Season with salt and pepper and add the thyme, parsley, and spinach. Cook, stirring continuously, until the spinach has wilted, then remove from the heat. Serve immediately.

Artichokes With Olive Oil and Garlic

(Carciofi in Casseruola all'Aglio e Olio)

Preparation time: 30 min. • Cooking time: 40 min. • Serves 4

- juice of 1 lemon, strained
- 8 globe artichokes
- olive oil
- 2 cloves garlic, peeled
- salt and pepper

Fill a bowl halfway with water and stir in the lemon juice. Trim the artichoke stems, remove any coarse leaves and the chokes, and cut off the tips of the remaining leaves, then add the artichokes immediately to the acidulated water to prevent discoloration. Drain and pack them tightly into a tall, narrow, pan. Pour in water to come halfway up the artichokes, measuring how much you add. Then add half as much olive oil and garlic, and season with salt and pepper. (The liquid should come three-quarters of the way up the artichokes.) Cover and cook over low heat for about 40 minutes, until the artichokes are tender and almost all the water has been absorbed. Remove from the heat and serve immediately.



Lettuce, Avocado, and Pepper Salad

(Insalata di Lattuga, Avocado e peperoni)

Preparation Time: 15 min. • Serves 4

- 1 large lettuce heart
- 1 ripe avocado
- juice of ½ lemon, strained
- 5 tablespoons olive oil
- 2 teaspoons strong mustard
- 1 small red bell pepper, seeded and julienned
- salt

Separate the lettuce leaves. Peel and halve the avocado, remove and discard the pit, and thinly slice the flesh. Sprinkle the slices with lemon juice to prevent discoloration. Whisk together the olive oil, mustard, and a pinch of salt in a bowl. Put the lettuce leaves, bell pepper, and avocado slices on a serving dish, pour over the dressing, and serve.



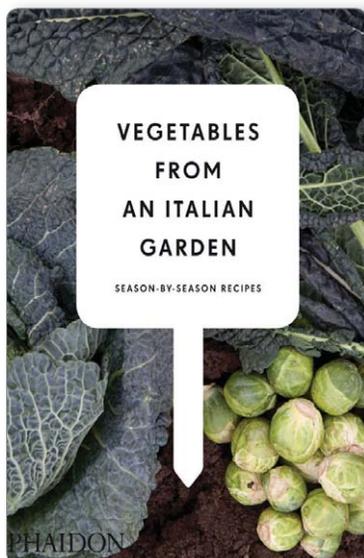
Molise Celery

(Sedano alla Molisana)

Preparation time: 15 min. • Cooking time: 15 min. • Serves 4

- 2 tablespoons olive oil, plus extra for brushing
- 1 head celery, trimmed and sliced
- 8 scallions, thinly sliced
- 1 scant cup pitted black olives
- 3 tablespoons bread crumbs
- salt and pepper

Preheat the oven to 400° F. Brush an ovenproof dish with olive oil. Bring a pan of salted water to a boil. Add the celery and cook for 10 minutes, then drain, turn into a bowl, and let cool slightly. Meanwhile, heat the oil and 1 tablespoon of water in a pan, add the scallions, and cook over low heat for 5 minutes, until softened, then season with salt and pepper. Put the celery into the prepared dish, top with the scallions and olives, sprinkle with the bread crumbs, and bake for 15 minutes.



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BY GARRY MESSICK

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The researchers suggested that substituting chia seeds in this manner could allow athletes to reduce their sugar intake.

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Albumin/globulin ratio • Bilirubin

Electrolytes and Minerals:

Sodium • Potassium • Chloride
Calcium • Phosphorus • Iron

Blood Sugar:

Glucose

Kidney Function:

Uric acid • BUN (blood urea nitrogen)
Creatinine • BUN/creatinine ratio
eGFR (estimated glomerular filtration rate)

Complete Blood Count:

Red blood cell count • Hemoglobin
Hematocrit • MCV (mean corpuscular volume)
MCH (mean corpuscular hemoglobin)
MCHC (mean corpuscular hemoglobin concentration)
RDW (red blood cell distribution)
White blood cell count
Immune Cell Differentiation Count
Platelet count

○ **NEUROTRANSMITTER BASIC PANEL** (LC100058)**

Serotonin, Dopamine, Epinephrine, Norepinephrine, GABA, Glutamate, Glycine, Histamine, and PEA. Alternations in these nine neurotransmitters play a significant role in contributing to symptoms such as cognitive disorders, depression, anxiety, diminished drive, fatigue and sleep difficulties, cravings, addictions, pain and more! Not available in NY.

\$199

○ **FOOD SAFE ALLERGY TEST – BASIC** (LCM73001)**

This test measures delayed (IgG) food allergies for 95 common foods.

\$198

○ **TOXIC METALS PANEL (FECAL) ** (LC100076)**

The results of fecal elemental analysis can help you identify and eliminate dietary exposure to toxic metals, while also assessing the body's natural excretion of metals. The panel tests Antimony, Arsenic, Beryllium, Bismuth, Cadmium, Copper, Lead, Mercury, Nickel, Platinum, Thallium, Tungsten, and Uranium.

\$170

○ **FOOD SAFE ALLERGY TEST – COMBO** (LCM73003)**

This test measures delayed (IgG) food allergies to all 190 foods found in our Basic and Extended panels.

\$375

GENETIC TESTING

○ **DNA GENETIC CANCER RISK PROFILE** (LC100057)**

With only a saliva sample, you can identify your risk for 25 hereditary cancers by analyzing 98 genes from your DNA including the well-known BRCA1, BRCA2, TP53, and APC. Not available in NY and RI.

\$265

○ **APOE GENETIC TEST FOR ALZHEIMER'S AND CARDIAC RISK ** (LC100059)**

Apolipoprotein E (ApoE) is an important regulator of cholesterol and triglycerides levels in your blood and supports lipid transport and injury repair in your brain. Genetically, E4 is the strongest risk factor for developing Late Onset Alzheimer's disease. According to the National Institute of Health, inheriting a single copy of ApoE4 increases the risk of Alzheimer's disease by about three-fold. Inheriting two copies increases the risk by about 12-fold. In fact, almost 40% of AD patients have inherited an E4 allele.

\$149

○ **PATHWAY FIT®- DNA WEIGHT MANAGEMENT (LC100067) ****

Your DNA holds the blueprint to how your body responds to both food and exercise! This panel looks at 40+ genetic traits.

\$299

○ **PAIN MEDICATION DNA INSIGHT® PROFILE (LC100069) ****

This profile helps you understand your body's likely response to pain relief for 13 commonly prescribed pain medications.

\$299

○ **MENTAL HEALTH DNA INSIGHT® PROFILE (LC100068) ****

The Mental Health DNA Insight® profile helps you understand your body's likely response to 50+ psychiatric medications.

\$299



BLOOD TEST PANELS

	YOUR PRICE		YOUR PRICE
<p>MALE LIFE EXTENSION PANEL (LC322582) CBC/Chemistry Profile • DHEA-S • PSA (prostate-specific antigen) Homocysteine • C-Reactive Protein (high-sensitivity) • Apolipoprotein B (ApoB) Free Testosterone • Total Testosterone • Estradiol • TSH for thyroid function • Vitamin D (25-hydroxyvitamin D) • Hemoglobin A1c</p>	\$269	<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>MALE ELITE PANEL (LC100016)* CBC/Chemistry Profile • Free and Total Testosterone • Total Estrogens Estradiol • DHEA-S • Progesterone • Pregnenolone • DHT • FSH • LH • TSH Free T3 • Free T4 • Reverse T3 • Free and Total PSA • IGF-1 • SHBG • HbA1c Vitamin D 25-OH • hs-CRP, ferritin • Homocysteine • Hemoglobin A1c Apolipoprotein B (ApoB)</p>	\$575	<p>WEIGHT LOSS PANEL-COMPREHENSIVE (LC100028) CBC/Chemistry Profile • DHEA-S • Free and Total Testosterone • Estradiol Progesterone • Cortisol, TSH • Free T3 • Free T4 • Reverse T3 • Insulin Hemoglobin A1c • Vitamin D 25-hydroxy • C-reactive protein (high sensitivity) Ferritin</p>	\$275
<p>MALE COMPREHENSIVE HORMONE PANEL (LC100010)* CBC/Chemistry Profile • DHEA-S, Estradiol • DHT • PSA Pregnenolone • Total and Free Testosterone • SHBG • TSH • Free T3 This panel now includes Free T4 and Cortisol with no increase in price!</p>	\$299	<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>MALE BASIC HORMONE PANEL (LC100012) DHEA-S • Estradiol • Total and Free Testosterone • PSA</p>	\$75	<p>ADRENAL STRESS PROFILE – SALIVA (LC100070) ** Check your red flags of adrenal imbalance. This panel contains Cortisol (x4), DHEA, SigA.</p>	\$159
<p>FEMALE LIFE EXTENSION PANEL (LC322535) CBC/Chemistry Profile • DHEA-S • Estradiol • Homocysteine C-Reactive Protein (high-sensitivity) • Progesterone • Free Testosterone Total Testosterone • TSH for thyroid function • Apolipoprotein B (ApoB) Vitamin D (25-hydroxyvitamin D) • Hemoglobin A1c</p>	\$269	<p>SIBO HOME BREATH KIT (LACTULOSE) (LC100063) ** SIBO stands for small intestinal bacterial overgrowth. Research shows that up to 70% or more of those diagnosed with IBS have SIBO.</p>	\$249
<p>FEMALE ELITE PANEL (LC100017)* CBC/Chemistry Profile • Free and total Testosterone • Total Estrogens Estradiol • Estrone • DHEA-S • Progesterone Pregnenolone • Apolipoprotein B (ApoB) DHT • FSH • LH • TSH • Free T3 • Free T4 • Reverse T3 • IGF-1 • SHBG • HbA1c Vitamin D 25-OH • hs-CRP • Ferritin • Homocysteine • Hemoglobin A1c</p>	\$575	<p>COMPREHENSIVE THYROID PANEL (LC100018) TSH, Total T4, Free T4, Free T3, Reverse T3, Thyroglobulin Antibody (ATA), Thyroid Peroxidase Antibody (TPO)</p>	\$199
<p>FEMALE COMPREHENSIVE HORMONE PANEL (LC100011)* CBC/Chemistry Profile • DHEA-S, Estradiol • Total Estrogens Progesterone • Pregnenolone • Total and Free Testosterone • SHBG TSH • Free T3 This panel now includes Free T4 and Cortisol with no increase in price!</p>	\$299	<p>THYROID PANEL WITH REVERSE T3 (LC100044) TSH, Total T4, Free T4, Free T3, Reverse T3</p>	\$120
<p>FEMALE BASIC HORMONE PANEL (LC100013) DHEA-S • Estradiol • Total and Free Testosterone • Progesterone</p>	\$75	<p>OMEGA-3 INDEX COMPLETE ** (LC100066) Beneficial for everyone taking omega-3/fish oil! You want to target a range of 8%-12% for optimal health.</p>	\$99

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.



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.

Amino Acids

Arginine & 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
 Endothelial Defense™ with Pomegranate Complete and CORDIART™
 Endothelial Defense™ with GliSODin®
 Optimal BP Management
 NitroVasc with CORDIART™
 Pomegranate Complete
 Pomegranate Fruit Extract
 Triple Action Blood Pressure AM/PM Venoflow™

Bone Health

Bone Restore
 Bone Restore-Sugar Free
 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
 Cognitex® Basics
 Cognitex® with Brain Shield®
 Cognitex® with Pregnenolone & Brain Shield®
 Cognizin® CDP-Choline Caps
 DMAE Bitartrate (dimethylaminoethanol)
 Dopa-Mind™
 Focus Tea™
 Ginkgo Biloba Certified Extract™
 Huperzine A
 Lecithin Granules
 Memory Protect
 Migra-Eeze™
 Neuro-Mag® Magnesium L-Threonate
 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

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 PQQ
 Mitochondrial Energy Optimizer with PQQ
 NAD+ Cell Regenerator™
 Optimized NAD+ Cell Regenerator™ with Resveratrol
 PQQ Caps
 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® Clearly EPA/DHA
 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® Provinal® Purified Omega-7
 OMEGA FOUNDATIONS® Vegetarian DHA
 Organic Golden Flax Seed

Food

California Estate Extra Virgin Olive Oil
 Kenyan Green Tea Crystal
 Kenyan Purple Tea Crystal
 Rainforest Blend Decaf Ground Coffee
 Rainforest Blend Ground Coffee
 Rainforest Blend Ground Natural Mocha Flavor
 Rainforest Blend Natural Vanilla Flavor
 Rainforest Blend Whole Bean Coffee
 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
 Super Ubiquinol CoQ10
 Super Ubiquinol CoQ10 with PQQ
 Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™
 Super-Absorbable CoQ10 Ubiquinone with *d*-Limonene
 TMG Powder
 TMG Liquid Capsules

Hormone Balance

DHEA (Dehydroepiandrosterone)
 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®
 Boswellia
 ComfortMax™
 Cytokine Suppress™ with EGCG
 Serrafazyme
 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® Elite
 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
 GEROPROTECT® Ageless Cell™
 GEROPROTECT® Longevity A.I.™

Grapeseed Extract
 Mediterranean Whole Food Blend
 Mega Green Tea Extract (decaffeinated)
 Mega Green Tea Extract (lightly caffeinated)
 Optimized Fucoidan with Maritech® 926
 Optimized Resveratrol
 Pycnogenol® French Maritime
 Pine Bark Extract
 Resveratrol
 RNA (Ribonucleic Acid)
 Super R-Lipoic Acid
 X-R Shield

Men's Health

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

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

Advanced Cortisol Balance
 Enhanced Stress Relief
 5 HTP
 L-Theanine
 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
 Hair, Skin & Nail Rejuvenation Formula W/VERISOL®
 Hair Suppress Formula
 Life Extension Toothpaste
 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® Nasal
 FLORASSIST® Oral Hygiene
 FLORASSIST® Prebiotic
 FLORASSIST® Throat Health
 Jarro-Dophilus® for Women
 Theralac® Probiotics
 TruFlora® Probiotics

Skin Care

Adult Blemish Lotion
 Advanced Anti-Glycation Peptide Serum
 Advanced Growth Factor Serum
 Advanced Hyaluronic Acid 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-Aging Rejuvenating Scalp Serum
 Anti-Glycation Serum with Blueberry & Pomegranate Extracts
 Antioxidant Facial Mist Hydrator
 Collagen Boosting Peptide Serum
 Cucumber Hydra Peptide Eye Cream
 DNA Support Cream
 Environmental Support Serum
 Essential Plant Lipids Serum
 Eye Lift Cream
 Face Rejuvenating Anti-Oxidant Cream
 Healing Formula
 Hyaluronic Facial Moisturizer
 Hyaluronic Oil-Free Facial Moisturizer
 Hydrating Anti-Oxidant Facial Mist
 Hydroderm
 Lifting & Tightening Complex
 Melatonin Advanced Peptide Cream
 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 Ceramides
 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
 Vitamin K Cream
 Youth Serum

Sleep

Bioactive Milk Peptides
 Enhanced Sleep with Melatonin
 Enhanced Sleep without Melatonin
 Fast-Acting Liquid Melatonin
 Glycine
 L-Tryptophan
 Melatonin
 Melatonin IR/XR
 Optimized Tryptophan Plus
 Quiet Sleep Melatonin

Sports Performance

Creatine Capsules
 Plant Protein Complete & Amino Acid Complex
 Tart Cherry with CherryPure®
 Wellness Code™ Whey Protein Concentrate (Chocolate and Vanilla Flavor)
 Wellness Code™ Advanced Whey Protein Isolate (Vanilla Flavor)
 Wellness Code™ 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
 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
 Super Vitamin E
 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 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 CLA Blend with Sesame Lignans
 Waist-Line Control™

Women's Health

Enhanced Sex for Women 50+
 Breast Health Formula
 Femmenessence MacaPause®
 Estrogen for Women
 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			
01974	ACETYL-L-CARNITINE ARGINATE • 90 veg. caps	38.00	28.50	26.00			
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			
01807	ADVANCED APPETITE SUPPRESS • 60 veg. caps	38.00	28.50	25.50			
02012	ADVANCED CORTISOL BALANCE • 30 veg. caps	45.00	33.75	30.00			
01828	ADVANCED LIPID CONTROL • 60 veg. caps	30.00	22.50	20.25			
00681	AHCC® • 500 mg, 30 caps	61.98	46.49				
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 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			
02138	ARTHROMAX® ELITE • 30 veg. tablets	30.00	22.50	20.00			
01404	ARTHRO-IMMUNE JOINT SUPPORT • 60 veg. caps	32.00	24.00	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							
01945	B-COMPLEX (Bio-Active Complete) • 60 veg. caps	12.00	9.00	8.00			
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 (Enhanced) • 60 veg. caps	29.00	21.75	19.50			
00664	BETA-CAROTENE • 25,000 IU, 100 softgels	11.75	8.81				
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	25.99				
00102	BIOTIN • 600 mcg, 100 caps	7.50	5.63	4.88			
SUBTOTAL OF COLUMN 1							

ITEM No.	PRODUCT	YOUR PRICE				QTY	Total
		Retail Each \$	1 Unit Each	4 Unit Each	10 Unit Each		
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			
01008	BLAST™ • 600 grams of powder	26.97	20.23				
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			
02123	BONE RESTORE • Chocolate, Sugar-Free • 60 chewable tabs	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			
00984	BP MANAGEMENT (Optimal) • 60 tablets	44.00	33.00	30.00			
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							
01963	CALCIUM CITRATE W/VITAMIN D • 200 veg. caps	18.00	13.50	12.50			
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			
02018	CARNITINE (Optimized) • 60 veg. caps	30.00	22.50	20.00			
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	37.50	37.50				
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			
00818	CLA BLEND W/SESAME LIGNANS (Super) • 120 softgels	36.00	27.00	24.75	19.75		
SUBTOTAL OF COLUMN 2							

ITEM No.	PRODUCT	Retail Each \$	YOUR PRICE			QTY	Total
			1 Unit Each	4 Unit Each	10 Unit Each		
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		
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			
02202	COMFORTMAX™ • 30 day supply	44.00	33.00	29.00			
01945	COMPLETE B-COMPLEX (BioActive) • 60 veg. caps	12.00	9.00	8.00			
02298	COMPREHENSIVE NUTRIENT PACKS ADVANCED • 30 packs	90.00	67.50	61.50			
01949	COQ10 W/d-LIMONENE (Super-Absorbable) • 50 mg, 60 softgels	25.00	18.75	16.50	15.00		
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/PQQ (Super Ubiquinol) • 100 mg, 30 softgels	50.00	37.50	30.00	27.00		
01437	COQ10 W/ENH MITOCHONDRIAL SUPPORT™ (Super Ubiquinol) • 100 mg, 30 softgels	33.00	24.75	22.00			
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			
00467	CURCUMIN® (Super Bio) • 400 mg, 30 veg. caps	20.00	15.00	14.00			
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							
80105	ADULT BLEMISH LOTION • 1 fl. oz	74.50	55.88	49.17			
80157	ADVANCED ANTI-GLYCATION PEPTIDE SERUM • 1 fl. oz	53.00	39.75	34.50			
80165	ADVANCED GROWTH FACTOR SERUM • 1 fl. oz	65.00	48.75	42.75			
80170	ADVANCED HYALURONIC ACID SERUM • 1 fl. oz	45.00	33.75	29.25			
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 fl. oz	65.00	48.75	42.75			
80140	ADVANCED UNDER EYE SERUM W/STEM CELLS • .33 fl. 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 fl. 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 fl. oz	46.00	34.50	29.25			
80134	ANTI-GLYCATION SERUM W/BLEUBERRY & POMEGRANATE EXTRACTS • 1 fl. oz	33.00	24.75	23.51			
80133	ANTIOXIDANT FACIAL MIST HYDRATOR • 2 fl. oz	32.00	24.00	22.80			
80156	COLLAGEN BOOSTING PEPTIDE 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		
80169	CUCUMBER HYDRA PEPTIDE EYE CREAM • .5 oz	38.00	28.50	26.00			
80141	DNA SUPPORT CREAM • 1 oz	49.00	36.75	31.50			
80167	ENVIRONMENTAL SUPPORT SERUM • 1 fl. oz	59.00	44.25	39.00			
80108	ESSENTIAL PLANT LIPIDS SERUM • 1 fl. 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			
80137	HEALING FORMULA ALL-IN-ONE CREAM • 1 oz	53.00	39.75	34.07			
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 fl. oz	39.95	29.96	28.50			
80103	LIFTING & TIGHTENING COMPLEX • 1 oz	74.50	55.88	49.17			
80168	MELATONIN ADVANCED PEPTIDE CREAM • 1 oz	38.00	28.50	26.00			
80114	MILD FACIAL CLEANSER • 8 fl. oz	59.00	44.25	38.94			
80159	MULTI STEM CELL SKIN TIGHTENING COMPLEX • 1 fl. 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 fl. oz	46.00	34.50	29.25			
80166	SKIN FIRMING COMPLEX • 1 fl. oz (2 units \$34.50)	53.00	39.75				
80112	SKIN LIGHTENING SERUM • 1/2 fl. oz	85.00	63.75	56.10			
80130	SKIN STEM CELL SERUM • 1 fl. 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 each \$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 fl. 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 fl. 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			
80102	VITAMIN K CREAM • 1 oz	79.50	59.63	52.47			
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			

SUBTOTAL OF COLUMN 4

ITEM No.	PRODUCT	YOUR PRICE				QTY	Total
		Retail Each \$	1 Unit Each	4 Unit Each	10 Unit Each		
30747	DIGEST RC® • 30 caps	19.95	14.96				
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			
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			
02270	DNA PROTECTION FORMULA • 30 veg. caps	20.00	15.00	13.50			
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			
02200	EPA/DHA (Clearly) • 120 softgels	30.00	22.50	20.00			
01937	EPA/DHA (Mega) • 120 softgels	20.00	15.00	13.50			
02033	ESOPHACOOL™ • 60 chewable tablets	12.00	9.00	8.00			
01737	ESOPHAGEAL GUARDIAN (Berry flavor) • 60 chewable tablets	36.00	27.00	24.00			
01894	ESTROGEN FOR WOMEN • 30 veg. tabs	30.00	22.50	20.00			
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							
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/PHASE 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			
02208	FLORASSIST® NASAL • 30 veg. caps	36.00	27.00	24.00			
02203	FLORASSIST® PREBIOTIC • Strawberry flavor, 60 chewable tabs	20.00	15.00	13.00			
01920	FLORASSIST® THROAT HEALTH • 30 lozenges	20.00	15.00	13.50			
02212	FOCUS TEA™ • Spearmint flavor, 14 stick packs	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			
SUBTOTAL OF COLUMN 5							

ITEM No.	PRODUCT	YOUR PRICE				QTY	Total
		Retail Each \$	1 Unit Each	4 Unit Each	10 Unit Each		
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			
02218	GLA WITH SESAME LIGNANS (Mega) • 30 softgels	22.00	16.50	15.00			
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	22.00	16.50	15.00			
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			
02211	GRAPE SEED EXTRACT 100 mg, 60 veg. caps	35.00	26.25	23.00			
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				
02222	HAIR, SKIN & NAILS REJUVENATION FORM W/VERISOL® 120 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			
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 • 300 mg, 2 fl. oz	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	28.55	21.41				
00789	KYOLIC® RESERVE • 600 mg, 120 caps	30.15	22.61				
SUBTOTAL OF COLUMN 6							

ITEM No.	PRODUCT	YOUR PRICE				QTY	Total
		Retail Each \$	1 Unit Each	4 Unit Each	10 Unit Each		
01681	LACTOFERRIN • 60 caps	44.00	33.00	30.00			
00020	LECITHIN • 16 oz granules	18.00	13.50	12.00			
02255	LIFE EXTENSION MIX™ • 240 tablets	74.00	55.50	48.00	42.00		
02257	LIFE EXTENSION MIX™ W/EXTRA NIACIN • 240 tablets	74.00	55.50	48.00	42.00		
02254	LIFE EXTENSION MIX™ • 360 caps	78.00	58.50	50.00	44.00		
02256	LIFE EXTENSION MIX™ POWDER • 12.70 oz	72.00	54.00	46.00	40.00		
02265	LIFE EXTENSION MIX™ • 240 tablets W/o copper	74.00	55.50	48.00	42.00		
02264	LIFE EXTENSION MIX™ • 360 caps W/o copper	78.00	58.50	50.00	44.00		
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	13.00	9.75	8.50			
02107	(EXTEND-RELEASE) MAGNESIUM • 60 veg. caps	13.00	9.75	8.75			
02209	MALE VASCULAR SEXUAL SUPPORT • 30 veg. caps	24.00	18.00	16.00			
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	7.00	5.25	4.50			
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			
02234	MELATONIN (Fast-Acting Liquid) • 2 fl. oz (Citrus-Vanilla)	12.00	9.00	8.25			
02201	MELATONIN IR/XR • 60 caps	12.00	9.00	7.50			
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/PQQ • 30 caps	40.00	30.00	27.00			
01868	MITOCHONDRIAL ENERGY OPTIMIZER W/PQQ • 120 caps	68.00	51.00	45.00			
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			

SUBTOTAL OF COLUMN 7

ITEM No.	PRODUCT	YOUR PRICE				QTY	Total
		Retail Each \$	1 Unit Each	4 Unit Each	10 Unit Each		
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	24.00	call for pricing				
02144	NAD+ CELL REGENERATOR™ NICOTINAMIDE RIBOSIDE 250 mg, 30 veg. caps	48.00	call for pricing				
02148	NAD+ CELL REGENERATOR™ W/RESVERATROL (Optimized) 30 veg. caps	54.00	call for pricing				
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		
02092	ONCE-DAILY HEALTH BOOSTER • 30 softgels	30.00	22.50	20.00			
02091	ONCE-DAILY HEALTH BOOSTER • 60 softgels	54.00	40.50	38.00			
02213	ONE-PER-DAY • 60 tablets	23.00	17.25	16.00			
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	38.00	28.50	26.00			
00577	POTASSIUM IODIDE • 130 mg, 14 tabs	6.95	5.21	3.94			
01500	PQQ CAPS • 10 mg, 30 veg. caps	18.00	13.50	11.00	10.00		
01647	PQQ CAPS • 20 mg, 30 veg. caps	32.00	24.00	18.00	17.00		
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® ENHANCED SEX FOR MEN • 60 tablets	52.00	39.00	36.00			

SUBTOTAL OF COLUMN 8

ITEM No.	PRODUCT	YOUR PRICE				QTY	Total
		Retail Each \$	1 Unit Each	4 Unit Each	10 Unit Each		
00525	PROBOOST™ THYMIC PROTEIN A • 30 packets	66.60	49.95				
01441	PROGESTA-CARE® • 4 oz cream	36.39	27.29	25.72			
02029	PROSTATE FORMULA (Ultra) • 60 softgels	38.00	28.50	26.25	24.00		
01909	PROSTAPOLLEN™ (Triple strength) • 30 softgels	28.00	21.00	18.75			
02261	PROTEIN CONCENTRATE (Whey) Chocolate • 640 gram	30.00	22.50	19.95			
02260	PROTEIN CONCENTRATE (Whey) Vanilla • 500 grams	30.00	22.50	19.95			
02246	PROTEIN ISOLATE (Advanced Whey) Vanilla • 454 grams	30.00	22.50	19.50			
02243	PROTEIN ISOLATE (Whey) Chocolate • 437 grams	30.00	22.50	19.50			
02242	PROTEIN ISOLATE (Whey) Vanilla • 403 grams	30.00	22.50	19.50			
02127	PROTEIN (PLANT) COMPLETE & AMINO ACID COMPLEX • 15.87 oz	34.00	25.50	23.00			
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			
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			
02169	RAINFOREST BLEND GROUND COFFEE • 12 oz. bag	13.00	9.75				
02173	RAINFOREST BLEND GROUND COFFEE Natural Mocha • 12 oz. bag	15.00	11.25				
02172	RAINFOREST BLEND GROUND COFFEE Natural Vanilla • 12 oz. bag	15.00	11.25				
02171	RAINFOREST BLEND WHOLE BEAN COFFEE 12 oz. bag	13.00	9.75				
02170	RAINFOREST BLEND DECAFFEINATED ROAST GROUND COFFEE 12 oz. bag	14.00	10.50				
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 fl. 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			
02210	RESVERATROL • 100 mg, 60 veg. caps	32.00	24.00	21.00			
02230	RESVERATROL (Optimized) • 60 veg. caps	45.00	33.75	30.00			
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			
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			
S							
01432	SAFFRON W/SATIAREAL® (Optimized) • 60 veg. caps	36.00	27.00	24.00			
02175	SAME (S-Adenosyl-Methionine) 200 mg, 30 enteric coated tablets	25.00	18.75	16.50			
02176	SAME (S-Adenosyl-Methionine) 400 mg, 30 enteric coated tablets	36.00	27.00	24.00			
SUBTOTAL OF COLUMN 9							

ITEM No.	PRODUCT	YOUR PRICE				QTY	Total
		Retail Each \$	1 Unit Each	4 Unit Each	10 Unit Each		
02174	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			
01626	SEX FOR WOMEN 50+ (Enhanced) • 90 veg. caps	59.00	44.25	34.00			
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			
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 oz	50.00	37.50	33.00			
02131	SKIN CARE COLLECTION NIGHT CREAM • 1.65 oz	39.00	29.25	27.00			
02096	SKIN RESTORING CERAMIDES 30 liquid veg. caps	25.00	18.75	17.25			
01444	SLEEP (Quiet) • 60 veg. caps	13.00	9.75	7.50			
01445	SLEEP MELATONIN (Quiet) • 5 mg, 60 veg. caps	18.00	13.50	12.00			
01551	SLEEP W/ MELATONIN (Enhanced) • 30 caps	22.00	16.50	15.00			
01511	SLEEP W/O MELATONIN (Enhanced) • 30 caps	22.00	16.50	15.00			
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				
00987	STRESS RELIEF (Enhanced) • 30 veg. caps	28.00	21.00	18.00			
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			
02205	TEA CRYSTALS (Kenyan Green) • 14 stick packs	12.00	9.00	8.00			
02206	TEA CRYSTALS (Kenyan Purple) • 14 stick packs	18.00	13.50	12.00			
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	TOOTHPASTE • 4 oz tube (Mint)	9.50	7.13	6.50			
SUBTOTAL OF COLUMN 10							

ITEM No.	PRODUCT	Retail Each \$	YOUR PRICE			QTY	Total
			1 Unit Each	4 Unit Each	10 Unit Each		
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			
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	TRUFLORA® 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			
02216	TWO-PER-DAY • 60 tablets	12.00	9.00	7.50			
02215	TWO-PER-DAY • 120 tablets	23.00	17.25	15.50			
02217	TWO-PER-DAY • 60 caps	13.00	9.75	8.50			
02214	TWO-PER-DAY • 120 caps	24.00	18.00	16.00			
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)	14.00	10.50	9.50			
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	30.00	22.50	20.00			
00084	VITAMIN C POWDER (Buffered) • 454 grams	28.00	21.00	19.00			
01736	VITAMIN C-MAGNESIUM CRYSTALS (Effervescent) • 180 grams	20.00	15.00	13.50			
02232	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			
02244	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 (Super) • 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				
SUBTOTAL OF COLUMN 11							

RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS

ITEM No.	PRODUCT	Retail Each \$	YOUR PRICE			QTY	Total
			1 Unit Each	4 Unit Each	10 Unit Each		
Z							
01813	ZINC HIGH POTENCY • 50 mg, 90 veg. caps	9.00	6.75	6.00			
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			
*01254	ZYFLAMEND™ WHOLE BODY • 120 liquid veg. caps	72.95	54.71				
BOOKS							
33998	THE RIGHT TO TRY by Darcy Olsen • 2016	26.99	20.24				
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				
DPT05	DISEASE PREVENTION AND TREATMENT, FIFTH EDITION (Hardcover) • 2014	69.95	39.95	36.00			
33865	THE RESTORATION OF THE HUMAN BODY [IN 7 PARTS] by Sergey A. Dzugan, 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				
34132	TWO'S COMPANY: FIFTY YEAR ROMANCE by Suzanne Somers • 2017	26.00	19.50				
33867	THE COMPLETE MEDITERRANEAN DIET by Michael Ozner, MD • 2014	19.95	9.99				
SUBTOTAL OF COLUMN 12							

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LifeExtension®

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SUBTOTAL COLUMN 1

SUBTOTAL COLUMN 2

SUBTOTAL COLUMN 3

SUBTOTAL COLUMN 4

SUBTOTAL COLUMN 5

SUBTOTAL COLUMN 6

SUBTOTAL COLUMN 7

SUBTOTAL COLUMN 8

SUBTOTAL COLUMN 9

SUBTOTAL COLUMN 10

SUBTOTAL COLUMN 11

SUBTOTAL COLUMN 12

ORDER TOTALS

SUBTOTAL OF COLUMNS 1 - 12

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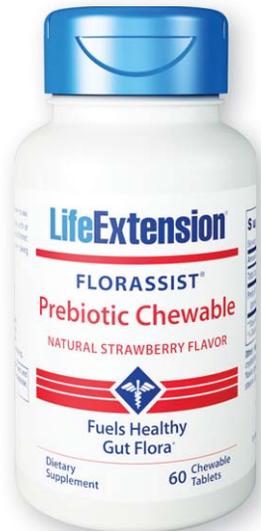
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STRAWBERRY
CHEWABLE**



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- **1,000 mg** of **XOS** (xylooligosaccharides) per prebiotic chewable.

	Retail Price	Your Price
1 bottle	\$20	\$15
4 bottles		\$13 each

Item #02203 • 60 Chewable Tablets

References

1. *Front Microbiol.* 2016;7:1204.
2. *Korean J Nutr.* 2007;40(2):154-61.

For full product description and to order **FLORASSIST® Prebiotic Chewable**, call **1-800-544-4440** or visit **www.LifeExtension.com**

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Magazine



7 SEPSIS: IS THERE NOW A CURE?

Each year about **250,000** Americans die from **sepsis**. Intravenous treatment with **vitamin C**, **hydrocortisone**, and **vitamin B1** reduces **sepsis mortality** by a striking **87%**.



36 BOOST COQ10'S PROTECTIVE EFFECTS

Coronary risks are reduced in people with higher levels of **CoQ10** and **pyridoxal 5'-phosphate**. Most readers of this magazine obtain this **bioactive** form of vitamin B6 in their nutrient formulas.



56 CALORIE RESTRICTION UPDATE

Case histories of people following dietary restriction programs reveal remarkable systemic benefits, including optimizing blood glucose, lipids, and blood pressure.



26 EXTINGUISH FIRES OF CHRONIC INFLAMMATION

Chronic inflammation underlies major disorders of aging. Readers of *Life Extension Magazine*® take steps to reduce their inflammatory burden. **Gamma-linolenic acid** further *suppresses* inflammation via unique mechanisms.



46 NEW ROLE OF FOLATE PROTECTS BRAIN CELLS

By improving gene expression, **folate** *rebalances* **markers of brain aging** and potentially inhibits **beta-amyloid** plaque involved in Alzheimer's dementia.



67 METFORMIN IMPROVES GUT HEALTH

Research shows that **metformin** *boosts* cellular **AMPK** and *increases* a unique gut bacterium that *rebalances* the **gut microbiome**.