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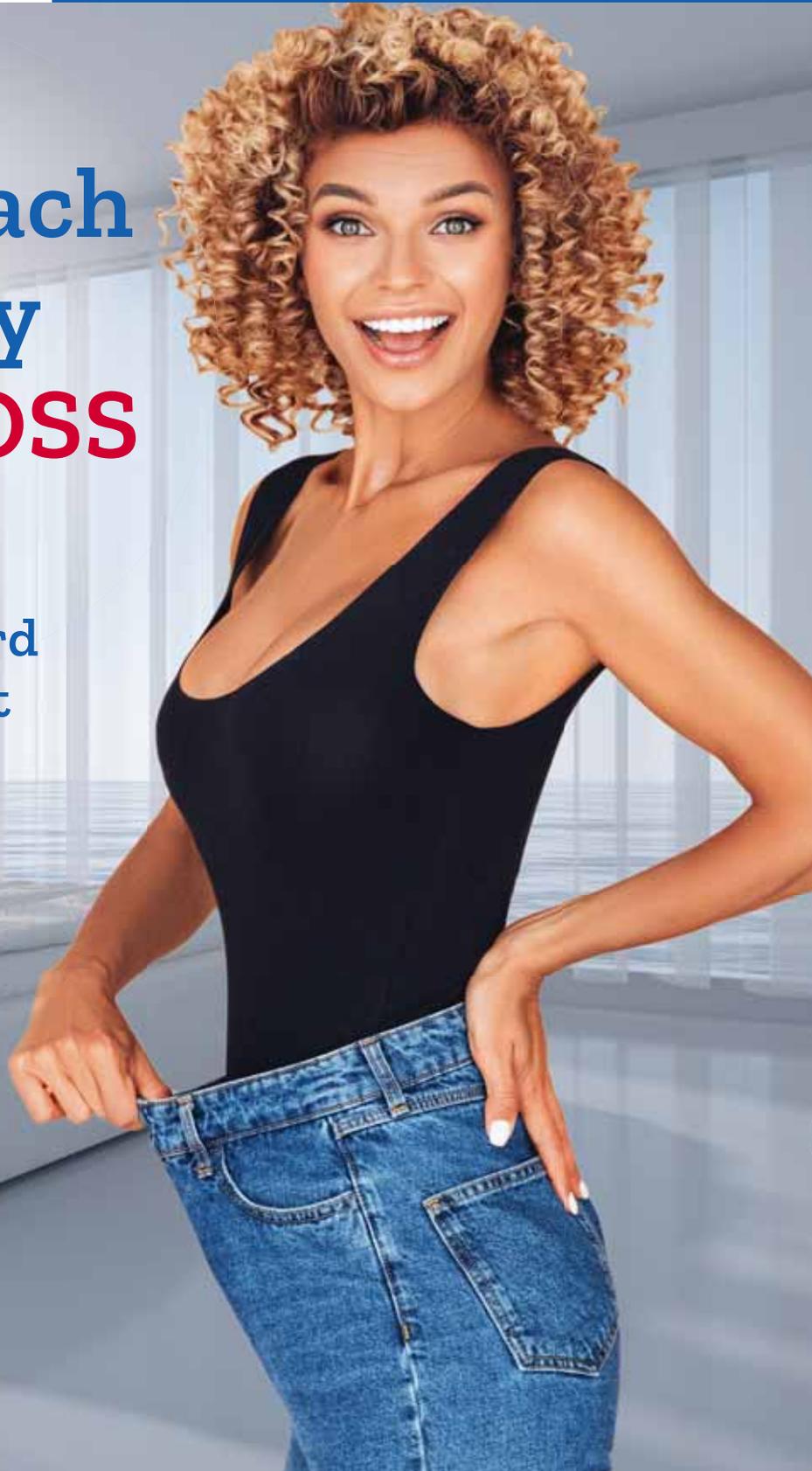
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74 CoQ10 + SELENIUM REDUCE CARDIOVASCULAR DEATH

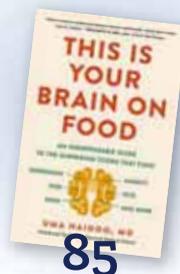
Cardiovascular deaths were *reduced* by **50%** in older adults taking **selenium** and **CoQ10** supplements.

DEPARTMENTS



IN THE NEWS

Vitamins C and E reduce dementia risk; fast-food availability linked to risk of diabetes; resveratrol helps control diabetes; NAD⁺ may improve cognitive function.



AUTHOR INTERVIEW

Psychiatrist, chef, and author of *This is Your Brain on Food*, Uma Naidoo, MD, explains what to eat to improve cognitive function, mood, energy, concentration, and libido, and highlights key supplements.



SUPER FOODS

Apples contain high levels of phytochemicals such as quercetin, flavonoids, and carotenoids, and are tied to a reduced risk of cardiovascular disease, cancer, asthma, and all-cause mortality.



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February 2022

Volume 28 • Number Two

Publisher • LE Publications, Inc.

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Wellness specialists: 800-226-2370 • Email: wellness@LifeExtension.com

Life Extension® Magazine values your opinion and welcomes feedback.

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Letters to the Editor, PO Box 407198, Fort Lauderdale, FL 33340
or email us: LEmagazine@LifeExtension.com

LIFE EXTENSION (ISSN 1524-198X) Vol. 28, No. 2 ©2022 is published monthly except bi-monthly in April by LE Publications, Inc. at 3600 West Commercial Blvd., Fort Lauderdale, FL 33309-3338. LE Publications, Inc. All rights reserved. Published 13 times a year. Subscription rate: \$40 per year in the United States. US \$47 in Canada. US \$60 in other countries. Mail subscriptions or address changes to: LE Publications, Inc., P.O. Box 407198, Fort Lauderdale, FL 33340-7198, USA. Or phone us toll-free at: 1-800-841-5433. Canada Subscriptions: Publications mail agreement number 40028967. Return undeliverable Canadian addresses to PO Box 503, RPO West Beaver Creek, Richmond Hill, ON L4B4R6. You will be sent your first issue within six weeks after LE Publications, Inc. receives your subscription fee. Periodicals Postage paid at Fort Lauderdale, FL and at additional mailing offices. POSTMASTER: Send address changes to Life Extension, P.O. Box 407198, Ft. Lauderdale, Florida 33340-7198, USA. Printed in USA. The articles in this magazine are intended for informational purposes only. They are not intended to replace the attention or advice of a physician or other health-care professional. Anyone who wishes to embark on any dietary, drug, exercise, or other lifestyle change intended to prevent or treat a specific disease or condition should first consult with and seek clearance from a qualified health-care professional. LEGAL NOTICE: Health claims contained in articles and advertisements in this publication have not been approved by the FDA with the exception of FDA-approved, qualified health claims for calcium, antioxidant vitamins, folic acid and EPA and DHA omega-3 fatty acids, and selenium as noted where applicable. *Life Extension® Magazine* does not endorse any of the businesses or the products and/or services that may appear in advertisements for non-Life Extension branded products or services contained in it, except to state that they are advertisers who may have paid Life Extension for placement of an advertisement in this publication. Life Extension disclaims any and all responsibilities or warranties as to the accuracy of information contained in advertisements for non-Life Extension branded products or services. For Canadian customers send change of address information and blocks of undeliverable copies to P.O. Box 1051, Fort Erie, ON L2A 6C7.

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Sleep Loss and Weight Gain



WILLIAM FALOON

Two **trends** are simultaneously **worsening**.

As **sleep deprivation** rates surge **higher**, so do the numbers of **overweight** and **obese** people.

Human research links **sleep loss** with **weight gain**.^{1,2}

Published reports associated **sleep loss** with a **15% decrease in life expectancy**.³⁻⁵

What's stumped everyone are effective **solutions** for chronic **sleep disorders**.

Over the past three years, four studies have been published that reveal a partial solution in the form of a low-cost supplement.⁶⁻⁹

Differing doses of the herb **ashwagandha** have been used by Americans for decades. Its ability to **improve sleep** was recently validated.

A **2019** placebo-controlled study showed that a lower potency ashwagandha extract taken twice a day reduced stress and anxiety, and demonstrated "**significant improvement in sleep quality**."⁶

A more impressive **2020** placebo-controlled study used a new ashwagandha that is more concentrated and taken only once at bedtime.⁸

The results found **improvements** as high as **72%** across a wide spectrum of **sleep measures**.⁸

Those challenged with getting enough quality sleep should consider novel approaches being uncovered in the published scientific literature.

The ability to reduce one's **calorie intake** and **disease risk** in response to **better sleep** makes achieving **restorative** nocturnal rest a **New Year's** priority.

This might happen with the proper use of **ashwagandha** and other approaches that yield ancillary **health benefits**.



Impact of Sleep on Hunger

Most of us who suffer a night of **non-restorative sleep** tend to **eat more** the next day.

Epidemiologic evidence links **sleep loss** with **obesity**.¹⁰

An underlying cause involves changes in **brain activity** that increase our desire for high-calorie foods that cause weight gain.

Other factors linking **weight gain** to **sleep deprivation** are increases in hormones like **ghrelin** that **stimulate hunger**, and decreases in **leptin** that **suppress appetite**.¹¹

One epidemiological study found that older adults **sleeping** less than five hours per night are at approximately **40% greater** risk of becoming **obese** compared to those sleeping seven to eight hours per night.¹²

Sleep-Deprived People Age Faster

Age-related disorders accelerate in response to **insufficient sleep**.

Harvard University Medical School published a report revealing the many health problems associated with **sleep loss** including:⁴

- Hypertension
- Immune impairment
- Cardiovascular disease
- Type II diabetes
- Common colds
- Obesity

The **Harvard** report referred to a study showing those who slept **less than seven hours** a night are nearly **three times more** likely to develop **cold symptoms** compared to those who slept **eight or more hours**.

Those with good sleep “**quality**” were the least likely to contract a **common cold**.^{4,13}

This **Harvard** report described three separate studies suggesting that insufficient sleep may increase mortality (death) risk by **15%**.^{3,4}

The Whitehall II Sleep Study

The world woke up to the importance of **sleep** with the publication of a huge, **multi-decade** study conducted in Britain.

The study found that as people aged and their **sleep duration** shortened, risk of **cardiovascular death** more than doubled.⁵

The **Whitehall II** study has been referred to in numerous articles as demonstrating the **lethal** dangers of **sleep deprivation**. Newly published research supports many of its findings.

Impact of Sleep on Cardiovascular Risks

A recent study published online in the *Journal of Preventive Cardiology* analyzed data from the National Health and Nutrition Examination Survey (NHANES).¹⁴

A total of **17,635** eligible participants were followed for a median of **7.5 years** to determine if they died from a **heart attack, heart failure** or **stroke**—in other words, to determine their cardiovascular mortality.





Researchers divided participants into three groups depending on their average sleep as follows:

- 1) **Less than six hours,**
- 2) **Six to seven hours, and**
- 3) **More than seven hours.**

These people were tracked to ascertain how many in each group died from cardiovascular causes.

Those who slept **less than six hours** a night had a **45% increased** risk of **cardiovascular death** compared to those who slept **six to seven hours** each night.

What confused people about this study is that it showed that those who slept **more than seven hours** each night also had an increased death risk.

We at **Life Extension** received calls about this and explained that this study measured **sleep duration** (number of hours) and **not sleep quality**.

We opined that people with underlying degenerative illnesses tend to require *longer* sleep periods, often because their “**sleep quality**” is impaired.

Measuring “Quality” Sleep

Restorative sleep is a critical aspect of the overall sleep experience yet many people are challenged to obtain **restful sleep**.

Early research focused on **number of hours** slept and not as much on the “**quality**” of sleep architecture.

Sleep **quality** can now be assessed with **monitors** as small as **wristwatches**.

This enables scientists to conduct **clinical trials** that precisely measure a variety of sleep parameters.

Highly Standardized Ashwagandha

Non-restorative sleep is an indicator of poor sleep “quality” that goes beyond mere **number of hours** slept.

Studies published in **2019**, **2020**, and **2021** describe the ability of **ashwagandha extracts** to improve the overall sleep experience.⁶⁻⁹

The results from these studies provide consistent data about **ashwagandha’s** ability to enable a better night’s rest.

A new *highly* concentrated **ashwagandha** extract may have demonstrated more comprehensive enhancements to both sleep **quantity** and **quality**.

In a randomized, double-blind, placebo-controlled trial published in **2020**, 150 people scoring high on **non-restorative** sleep measures were given a new *highly* standardized **ashwagandha extract** at bedtime.⁸

Using a validated **monitor** worn on the wrist like a wristwatch, the following six **sleep measures** were assessed:

- **Onset of sleep** (how long it took to fall asleep)
- **Sleep efficiency** (percentage of time asleep while in bed)
- **Total sleep time** (number of hours slept)
- **Average number of awakenings during the night**
- **Average times waking after sleep onset**
- **Total bedtime**



At the end of the six-week study, the **ashwagandha group** showed a significant *increase* in **total sleep time** compared to **placebo**.⁸

Compared to placebo, the **time to fall asleep** and **waking after sleep onset** in the **ashwagandha** group were significantly reduced.

Sleep efficiency significantly **improved** in the ashwagandha arm of the **2020** published study. This means more time was spent asleep while in bed.⁸

Overall **improvement** in **restorative sleep** was **72%** in the **ashwagandha** arm of this study, indicating a meaningful enhancement of nightly rest.⁸

Quality-of-Life Benefits

The improvements demonstrated by the **wrist monitors** were clinically significant in the 2020 **ashwagandha** sleep study.

A second measure of perceived benefits also yielded intriguing findings.⁸

Questionnaires to evaluate **quality of life** were used at baseline, and six weeks later in both the **placebo** and **ashwagandha extract** groups.

Compared to baseline, the **ashwagandha** group showed **quality-of-life** improvements, which is expected in response to enhanced **sleep quality** and quantity.

Comparing Ashwagandha Sleep Studies

Consistent findings from **human** trials support a role for **standardized ashwagandha** in enabling more restful sleep.

The primary active constituents of ashwagandha are **withanolides**.

Three of the recent sleep studies used two daily **ashwagandha** doses providing up to **30 mg** of **withanolides**.^{6,7,9}

The fourth study used a *higher* concentration **ashwagandha extract** that provided **42 mg** of **withanolides** in one nighttime dose.⁸

What jumped to my attention is that the new *higher* concentrated **ashwagandha (42 mg)** yielded robust results with once nightly dosing, rather than having to take it twice daily like in other studies.

Wrist-monitor data from the *higher* concentrated **ashwagandha (42 mg of withanolides)** taken once nightly indicated better **sleep** improvements.

In This Month's Issue...

Many of you are determined to **shed body fat** to reduce your risk of degenerative illnesses. This might be impossible if you also suffer chronic **sleep deprivation**.

The article on page 34 of this issue describes how highly standardized **ashwagandha + melatonin** can enable more restorative sleep and an improved sense of wellbeing.

While there are no miraculous weight loss pills, a novel formulation described on page 44 enabled **5% weight loss** to occur in obese individuals over a two-month period.

Combining standardized **ashwagandha + melatonin** at bedtime with more sensible eating, regular physical activity, and **5% weight loss** can improve healthy longevity.

I want to thank readers of **Life Extension Magazine®** for their generous support in **2021**.

As we aim to reverse human aging processes, improved **sleep** and reduced **body fat** are side benefits we plan to assess in upcoming clinical trials.

For longer life,



William Faloon, Co-Founder
Life Extension Buyers Club

Associations between Inadequate Sleep and Obesity in United States Adults 1977–2009

A startling **73%** of the U.S. population are defined medically as being **overweight** or **obese**.¹⁵

This means the **excess pounds** they carry increase their risk of degenerative disorders.

A 2014 published study looked at **sleeping habits** and **obesity** incidences starting in **1977**. At the time, Americans did not have 24/7 television and computers and digital entertainment and electronic information. Time spent in front of display screens, especially late at night, was dramatically less back then than it is now.¹⁶

When the study period (**1977 to 2009**) ended, the following figures were observed in the United States:

	1977	2009
Prevalence of Obesity	10.2%	27.7%
Prevalence of Overweight	31.2%	36.9%
Prevalence of Very Short Sleep (<5 hours)	1.7%	2.4%
Prevalence of Short Sleep (5-6 hours)	19.7%	26.7%
Prevalence of Long Sleep	11.6%	7.8%



Analyses of these data showed that relative to **seven to eight hour** sleepers, **very short** sleepers had **30% greater** odds of being **overweight** or were **twice as likely** to be **obese**.

Likewise, **short sleepers** had **20% greater** odds of being overweight or **57% greater** odds of being obese. (**Long sleepers** had **20%** greater odds of being obese, but no greater odds of being overweight.)

These findings are not surprising. Prevalence of very short and short sleep has gradually increased in recent decades. The authors of this study concluded:

“Inadequate sleep was associated with overweight and obesity for each available year.”

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Take **one capsule 30-60 minutes** before bedtime.



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References

1. *Sleep Med.* 2020;72:28-36.



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In the News



Vitamin C and E Supplementation Lowers Risk of Cognitive Decline

Supplementation with vitamins C and E may lower the risk of cognitive decline in people 65 and over, according to a study published in *The Annals of Pharmacotherapy*.*

Researchers analyzed 5,269 men and women who were free of dementia at the start of the study, and followed them for 11 years.

Compared to non-supplementers, those who supplemented with vitamin C and/or vitamin E had a **38% lower** adjusted risk of **all-cause dementia** and a **40%** lower risk of **Alzheimer's disease**.

They also had a **23%** lower risk of developing cognitive impairment without dementia.

Editor's Note: The study authors concluded, "This study supports a protective role of vitamin E and C supplements in the risk for Alzheimer's disease and all-cause dementia. In addition, these supplements may contribute to a reduced risk of CIND [cognitive impairment, not dementia]. Overall, these findings indicate additional support for the use of antioxidants as a preventive strategy against cognitive decline."

* *Ann Pharmacother.* 2017 Feb;51(2):118-124.

Fast-food Restaurant Availability Linked to Type II Diabetes

A nationwide study found that living in a neighborhood with a higher availability of fast-food restaurants could increase the risk of developing type II diabetes.*

Researchers analyzed data from more than four million veterans seen at 1,200 health facilities around the country who were followed for an average of 5.5 years.

They examined the relationship between the “built food environment” and its connection to chronic disease. The *built food environment* indicates the physical buildings in a community in which people can make decisions about food, such as fast-food restaurants, grocery stores, and other food options.

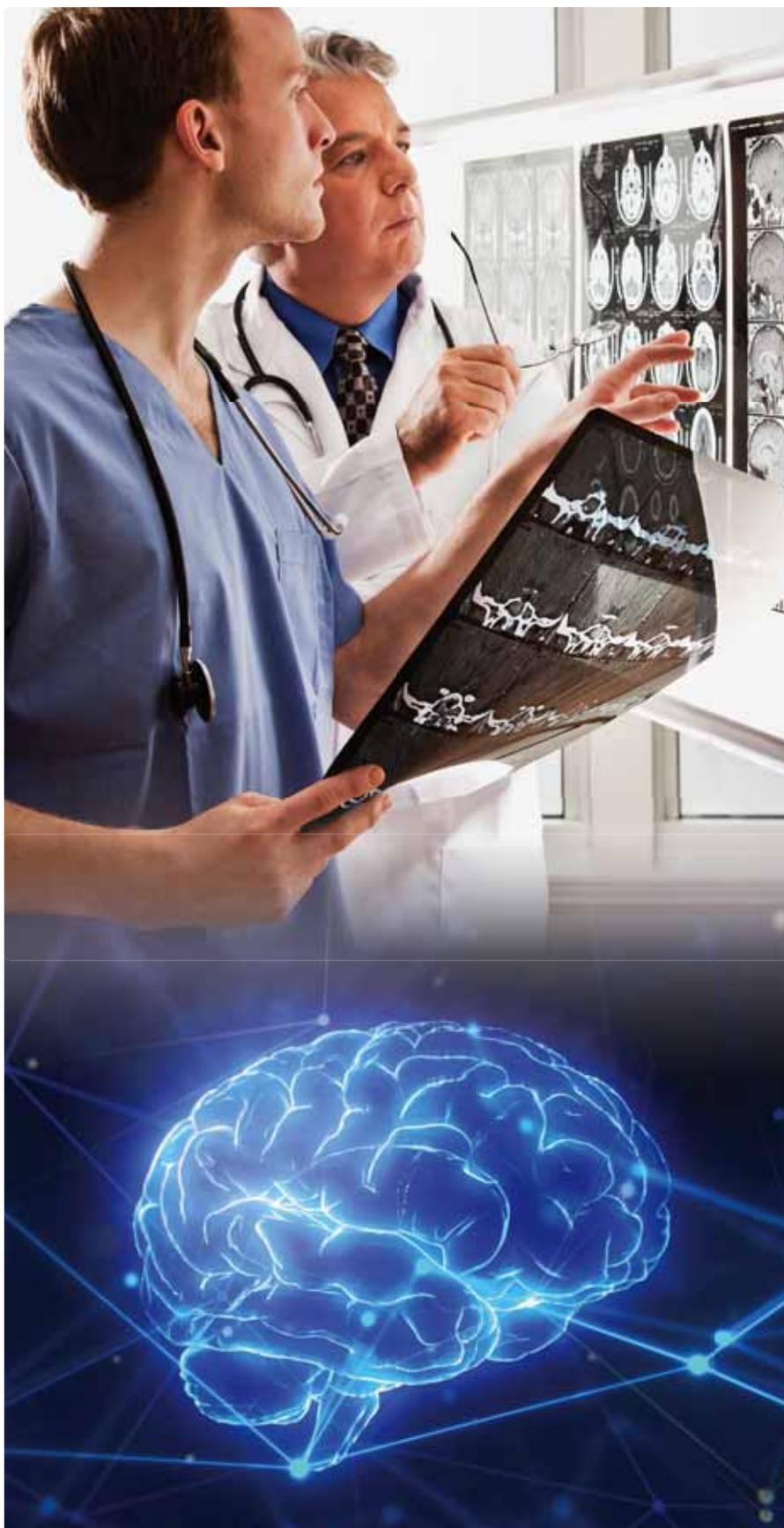
The researchers found that there was a link between the built food environment and the likelihood of developing chronic diseases like heart disease, type II diabetes, and certain types of cancers.

This association has been examined previously on a small scale. This was the first nationwide study—using data from people living in **98%** of the US census tracts across the country—to confirm the connection.

Editor’s Note: The researchers concluded, “The more we learn about the relationship between the food environment and chronic diseases like type II diabetes, the more policymakers can act by improving the mix of healthy food options sold in restaurants and food outlets, or by creating better zoning laws that promote optimal food options for residents.”

* *JAMA Network Open*, 2021; 4(10): e2130789.





NAD⁺ Boosts Cognitive Function in Animal Study

The *Journal of Neuroinflammation* reported that **nicotinamide adenine dinucleotide (NAD⁺)** improved **cognitive function** and inhibited neuroinflammation in an animal model of **chronic cerebral hypoperfusion**, an underlying cause of vascular dementia.*

In this study, rats with reduced **circulation** to their **brains** were given daily injections of NAD⁺ for eight weeks. Researchers found that the NAD⁺ improved **cognitive function** and inhibited *neuroinflammation*.

The relevance of this study is that normal aged humans suffer significant cerebral **circulatory deficits**.

Maintaining more youthful **NAD⁺** levels might circumvent some of the pathologies associated with deficient **brain** blood flow (hypoperfusion).

Editor's Note: NAD⁺ treatment alleviated CCH-induced neuronal death, microglial activation, and pro-inflammatory factor expressions in the cerebral cortex and hippocampus, the authors stated.

* *J Neuroinflammation*. 2021 Sept 16; 18(1):207.

Resveratrol Helps Modulate Glycemic Control in Diabetics

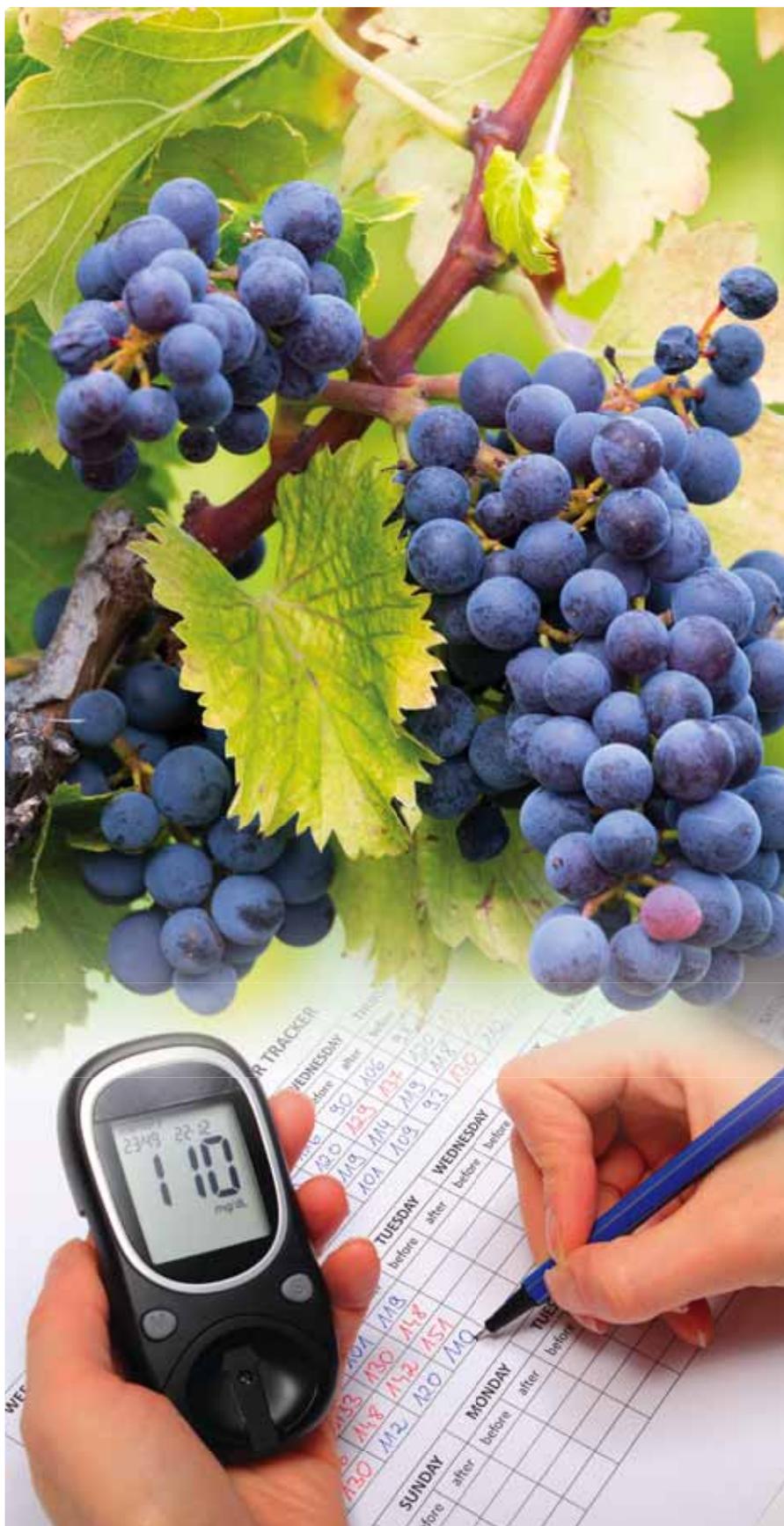
Supplementing with resveratrol was found to be associated with improvements in diabetics' glycemic control, according to findings from a meta-analysis of clinical trials published in *Medicina Clinica (Barcelona)*.*

The trials compared resveratrol to a placebo with or without concurrent antidiabetic medications or other drug treatment.

Resveratrol doses of **500 mg** or more were associated with lower fasting blood glucose, fasting serum insulin, insulin resistance, total cholesterol, LDL cholesterol, and diastolic blood pressure, compared to a placebo.

Editor's Note: Resveratrol was associated with a greater reduction in hemoglobin A1c (a marker of long-term glucose control) compared to a placebo in trials of three months duration.

* *Med Clin (Barc)*. 2021 Oct 16;S0025-7753(21)00472-3.





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1. Akay Internal Study. Liposomal hydrogel vitamin C pharmacokinetics. Data on file. 2021.

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CURCUMIN FOR BRAIN HEALTH



BY DEEP SHUKLA, PHD

Curcumin is best known for its anti-inflammatory and anti-cancer properties.

Interestingly, research has identified added benefits for curcumin, specifically for the **brain**.

In animal and human studies, curcumin has been shown to:¹⁻⁵

- Form new neurons in the **hippocampus**.
- Improve **performance** on memory tests.
- Reduce **neuroinflammation**.
- Protect against **memory loss**.

It is challenging to derive these full benefits because curcumin is **poorly absorbed**.⁴

Scientists have found that combining curcumin with fenugreek **galactomannan** increases its **bioavailability** (absorbability) by up to **45.5 times greater** compared to regular curcumin.⁶

Increasing Curcumin Bioavailability

Curcumin is the main active ingredient in the spice **turmeric**.

It has potential benefits in combating a range of conditions such as diabetes, arthritis, cancer, and cardiovascular disorders.^{7,8}

But curcumin itself has poor **bioavailability**. Only a small fraction of the amount consumed is *absorbed* into the bloodstream. And most of it is metabolized in the body into *other compounds* or eliminated from the body.⁹⁻¹¹

Curcumin's use for **brain** disorders is also hindered by its limited ability to cross the **blood-brain barrier**.

Scientists have discovered a way around these problems.

They found that supplementation with curcumin combined with **galactomannans** from the herb fenugreek resulted in levels of **free curcuminoids** in the blood up to **45.5 times greater** compared to standard curcumin alone.⁶

This **curcumin-galactomannan** complex is able to easily cross the blood-brain barrier to deliver more curcuminoids than unformulated curcumin.^{6,12}

A **2021** animal study shows that this **curcumin-galactomannan** complex delivered more curcuminoids to the brain's *hippocampus* than unformulated curcumin.¹²

The **hippocampus** is a region of the brain that has a major role in learning and memory.



Two **human** studies confirm the brain benefits of this novel **curcumin-galactomannan** complex.

In one, this formulation was effective at reducing **stress, anxiety, and fatigue**.¹³

In a **2020** human study, oral intake of **500 mg** of the **curcumin-galactomannan** complex twice daily resulted in positive changes in **brain activity** levels and improved performance in **audio-visual** and **memory** tests.⁴

Electroencephalogram (EEG) results verified the **curcumin-fenugreek** complex's penetration of the **blood-brain barrier**, providing brain benefits previously unavailable.

Preventing Cognitive Decline

Neurodegeneration is characterized by the progressive damage and loss of function of neurons that occurs with aging and neurodegenerative diseases.

Some of the common mechanisms underlying these diseases include:

- Chronic **inflammation**, which can damage brain cells,¹⁴
- **Oxidative stress**, which leads to cell damage and death,^{15,16} and
- Accumulation of **misfolded proteins**, which are toxic to neurons.¹⁶

Curcumin targets *all* these problems.

Preclinical research shows that curcumin can **reduce neuroinflammation**.^{2,3}

Other work in preclinical models shows that curcumin could protect the brain against **oxidative stress** by activating the protein **Nrf2**,^{17,18} which is involved in increasing antioxidant levels in the brain.¹⁹

Curcumin also activates antioxidant enzymes such as **superoxide dismutase (SOD)** and **glutathione peroxidase**¹⁷ and directly neutralizes free radicals.²⁰

Studies in rats show that curcumin can **reverse memory loss** caused by aging.^{12,21}

Besides its antioxidant and anti-inflammatory effects, curcumin spurs the **formation of new neurons** in a brain region called the **hippocampus**.⁵

A population-level study of elderly Asian individuals showed that regular curcumin intake in the form of curried food was associated with protection against **cognitive decline**.²²

WHAT
YOU
NEED
TO
KNOW



Protecting the Brain with Curcumin

- Curcumin is an active compound in turmeric, the spice. It has potent anti-inflammatory, antioxidant, and anti-cancer properties.
- By reducing inflammation, oxidative stress, and the buildup of toxic proteins, curcumin may prevent cognitive decline.
- Lab and animal research shows this compound may also reduce damage from strokes, prevent Parkinson's disease, relieve symptoms of multiple sclerosis, and ease diabetic neuropathy.
- Combining curcumin with a fiber called galactomannans makes it up to 45.5 times more bioavailable than standard curcumin. It can also more easily pass through the blood-brain barrier, enabling it to exert its neuroprotective effects.

Fighting Parkinson's Disease

Parkinson's disease is a common neurodegenerative disorder that leads to tremors, muscular rigidity, slowness of movement, and difficulty maintaining balance.²³

These symptoms are caused by the loss of **dopamine** neurons in a brain region called the **substantia nigra**, which plays an important role in movement and motivated behaviors.²⁴

While the underlying cause of Parkinson's disease is not clearly understood, both **mitochondrial dysfunction** and **oxidative stress** have emerged as major contributors to the neurodegeneration seen in Parkinson's disease.²⁵

Curcumin *alleviates* both oxidative stress and mitochondrial damage in animal models of Parkinson's.^{26,27}

In human patients with Parkinson's disease, low levels of the antioxidant **glutathione** are observed in dopamine neurons from the substantia nigra. Curcumin activates antioxidant enzymes to *prevent* the depletion of **glutathione**.²⁸

Parkinson's also involves the formation of clumps of the misfolded protein **alpha-synuclein**.²⁹ These protein aggregates have toxic effects on dopamine neurons.

Preclinical studies show that curcumin can inhibit the accumulation of **alpha-synuclein** and prevent the death of dopamine neurons.^{30,31} This may help slow the development of Parkinson's disease.

Relieving Multiple Sclerosis Symptoms

Multiple sclerosis is an autoimmune disorder that afflicts over **2.5 million** people worldwide.³² Severe cases can lead to vision loss, paralysis, and impaired brain function.

Multiple sclerosis occurs when the immune system causes **neuroinflammation** in the central nervous system and interruption of the blood-brain barrier.³³

This inflammation damages the protective **myelin sheath** that covers nerve fibers. The resulting harm to neurons hinders their ability to communicate.

Curcumin has been shown, in animal models, to *lower* levels of pro-inflammatory proteins and aid in **myelin repair**. This *reduced* the severity of multiple sclerosis symptoms.³³⁻³⁵



Easing Diabetic Nerve Pain

Neuropathic pain is caused by damage to the nerves that relay pain signals from the muscles and skin to the spinal cord and brain. It often affects patients with **diabetes**.³⁶

Studies in mice show that curcumin can *reduce* diabetes-related **hyperalgesia** (increased sensitivity to pain).^{37,38}

Various inflammatory cytokines, such as **nuclear factor-kappa B (NF-kB)** and **TNF-alpha**, are responsible for the pain associated with diabetic neuropathy.³⁹ Curcumin *reduces* levels of these pro-inflammatory cytokines to relieve hyperalgesia.³⁸

In a rat model of diabetic neuropathy, curcumin reduced the **oxidative stress** that contributes to the dysfunction of neurons.⁴⁰

Reducing Damage from Strokes

There are two major types of **strokes**: **ischemic** and **hemorrhagic**.

Ischemic strokes account for almost **90%** of all strokes. They are caused by a blood clot or obstruction in an artery. The disruption in blood flow to the brain leads to oxygen deprivation, brain cell death, and damage to the blood-brain barrier.⁴¹

Animal studies show that curcumin reduces the size of the ischemic injury and prevents behavioral impairment. Curcumin exerts these **neuroprotective** effects by:

- Preventing damage to the blood-brain barrier,⁴²
- Inhibiting cell death,⁴³
- Counteracting oxidative stress,⁴⁴ and
- Reducing the inflammatory response.⁴⁵

The other main kind of stroke is caused by **intracerebral hemorrhage**, in which there is a bursting or leaking of a blood vessel. One of its major complications is a **cerebral edema**, when fluid builds up around the brain. The increased pressure and lower cerebral blood flow can damage brain cells.

Curcumin alleviates edema and reduces behavioral impairments in animal models of intracerebral hemorrhage. It does this by modulating the expression of proteins called **aquaporins** that reduce brain water content.⁴⁶



Traumatic **brain injuries** caused by external mechanical force also result in inflammation, cerebral edema, blood-brain barrier damage, and oxidative stress.^{47,48} Rodent models show that curcumin can reduce the **brain damage** caused by trauma by countering these adverse effects.⁴⁹⁻⁵¹

Summary

Most **neurodegenerative** diseases share common features, including the accumulation of toxic proteins, inflammation, and oxidative stress.

Curcumin helps reduce or prevent all of these.

Studies have shown that it may help reduce or slow the development of a wide variety of brain disorders.

A **curcumin-galactomannan complex** is highly **absorbable** and easily crosses the blood-brain barrier. •

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

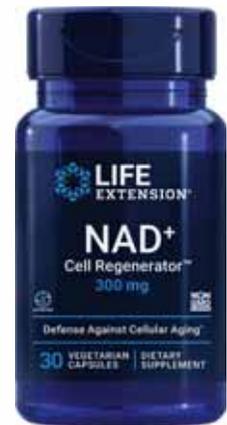
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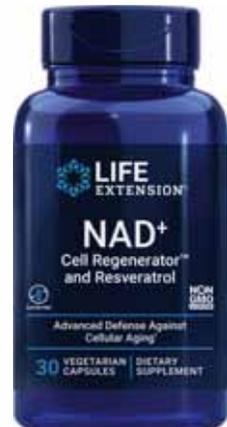
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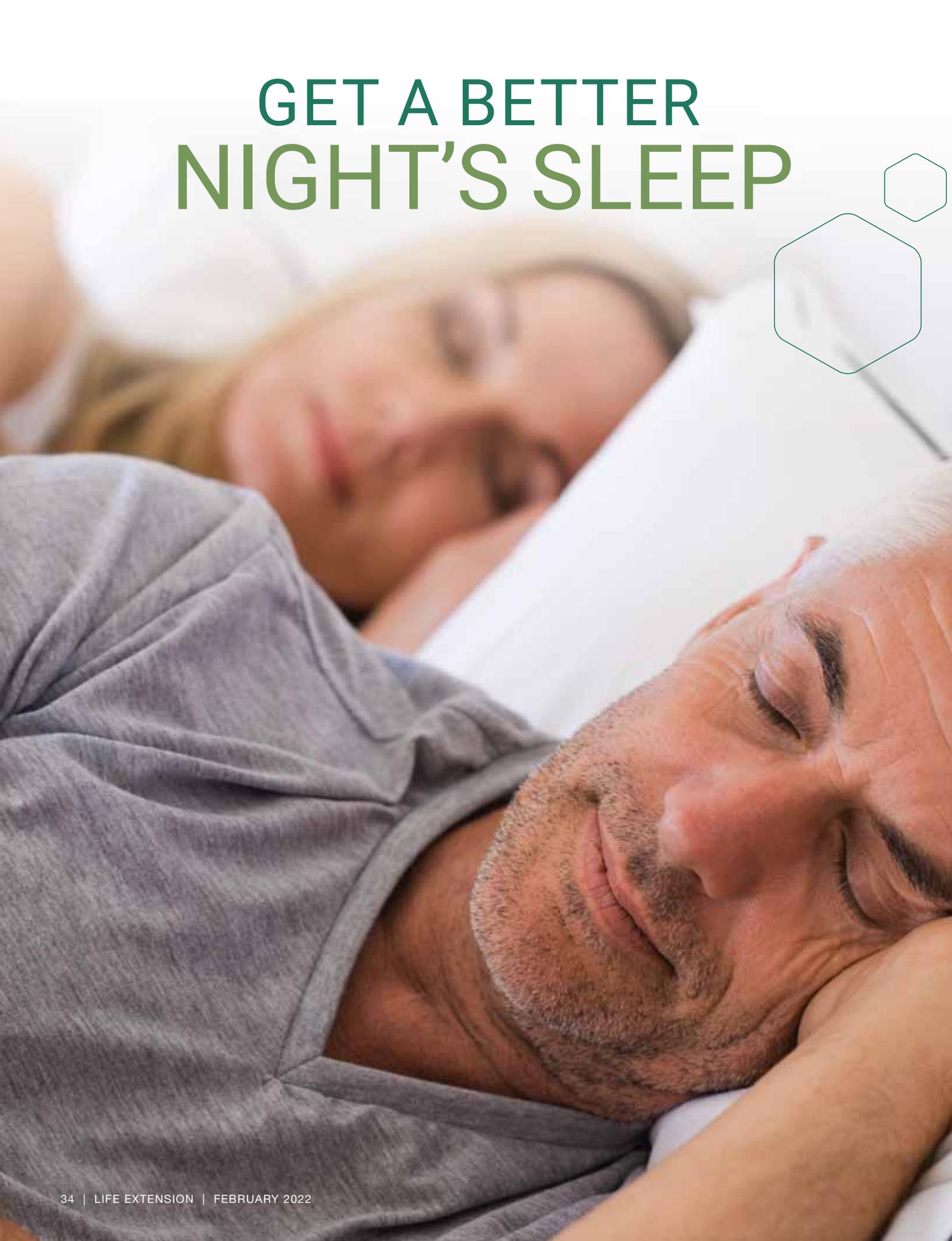
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GET A BETTER NIGHT'S SLEEP





BY MICHAEL DOWNEY

Lack of sleep doesn't just make you feel exhausted all the time. It's **dangerous**.

Insufficient sleep is linked to increased risk of diabetes, high blood pressure, heart attacks, cancer, accelerated aging, and premature death.^{1,2}

Many people resort to **prescription drugs**,³ putting them at risk of side effects and dependence.

More than **8%** of *older* Americans resort to sleep medications—even though national guidelines warn against the use of prescription sleep medicine by people over **65**.^{3,4}

There is an alternative.

In a clinical study, an extract of the herb **ashwagandha** resulted in an average **72% increase in restorative sleep** within six weeks.⁵

Working in a complementary way, **melatonin**, when properly dosed, has been shown to help some people **fall asleep faster** and stay asleep throughout the night.^{6,7}

Taking these two ingredients together can help ensure a night of longer, better sleep.

Health Risks of Inadequate Sleep

The Centers for Disease Control and Prevention (CDC) and others recommend that adults get **seven or more hours** of sleep a night.^{8,9}

More than **one in three adults** get suboptimal sleep on a regular basis.¹ Studies show that frequently getting too little sleep may increase the risk of:¹⁰⁻¹³

- Obesity,
- Depression,
- Dementia,
- Heart disease,
- Type II diabetes,
- Some cancers, and
- Other chronic health issues.

For every **one-hour reduction** in sleep per night, there is about a **6% increase** in the risk of **death from any cause**.²



Sleep problems worsen with **age**.¹⁴ Changes in hormones as we grow older have been linked to insomnia and poor sleep quality.¹⁵⁻¹⁷ Some medications prescribed to older adults can also disrupt sleep.¹⁸

About **nine million** people in the U.S. rely on sleep **medications**.¹⁹ But they come with side effects like memory problems and dizziness, potential for physical dependence, a “hangover effect” that leads to poor mental performance the day after use, and other risks.²⁰⁻²⁴

Both the U.S. Food and Drug Administration (FDA) and drug manufacturers themselves advise that these medications are for **short-term use only**. It should also be noted that the risks of sleep medications are greater for older adults.⁴

Balancing and Regulating Sleep Patterns

Scientists have been investigating **safer** ways to help people fall asleep more quickly and improve their sleep quality.

Two hormones that regulate and balance the cycles of wakefulness and sleep are **cortisol** and **melatonin**.

Cortisol is often thought of as the stress hormone, known for driving the body’s fight-or-flight response. It also helps to control the **wake-sleep cycle**.

Normally, cortisol levels rise as we approach the *end* of our sleep cycle, reaching their highest point around **9 AM** to enhance wakefulness. Then, to pave the way for sleep, cortisol levels decline during the day, bottoming out around **midnight**.²⁵

In a world of chronic stress, this cortisol rhythm is often thrown out of balance and can interfere with sleep. Poor sleep can result in even higher cortisol levels, setting up a vicious circle.²⁵

Melatonin is known as the sleep hormone. It activates receptors in the brain that regulate sleep *and* the body’s **circadian** (daily) rhythm.²⁶

Melatonin production declines with age, contributing to some of the sleep problems seen with advanced age.^{27,28}

Cortisol and **melatonin** both work to regulate sleep and wakefulness.

Scientists have identified **ashwagandha** and **melatonin** as two ingredients that can regulate and **balance** hormones to promote more restful sleep.



WHAT
YOU
NEED
TO
KNOW

Ashwagandha Promotes Calm

Ashwagandha is an herb that has been used in traditional Indian medicine for thousands of years.²⁹ Extracts of its roots and leaves contain a mix of beneficial compounds, including **withanolide glycosides**.³⁰

Ashwagandha root powder has been shown to *lower* **cortisol** levels. It also reduces the **anxiety** and **stress** that *increase* cortisol production.³¹

Researchers have documented these **anxiety-reducing** properties.^{29,32}

In one study of adults with self-reported **high stress**, an extract of ashwagandha (standardized to **35%** withanolide glycosides) led to a significant reduction in scores on stress-assessment scales. The use of this extract was also associated with **reduced** levels of **cortisol** in the morning.³³

Another way that **ashwagandha** reduces stress is by *activating* nerve-cell receptors for a calming neurotransmitter called **GABA**.³⁴

Fall Asleep Faster, Stay Asleep Longer

- Lack of sleep is a serious health threat, increasing the risk of many chronic illnesses and premature death.
- About nine million Americans take prescription drugs to get to sleep. They come with potentially dangerous side effects and can lead to dependency.
- An extract of the herb ashwagandha standardized to **35%** withanolide glycosides helps lower anxiety and stress and reduces levels of the stress hormone cortisol. In a clinical trial, it led to a **72%** increase in restorative sleep.
- Maintaining higher nighttime levels of the “sleep hormone” melatonin promotes faster sleep onset and higher-quality sleep. Combining immediate-release and extended-release forms can allow people to stay asleep all night.
- A blend of ashwagandha and melatonin can rebalance nighttime cortisol and melatonin levels, providing a longer, more restorative sleep.

Clinically Validated Results

To validate **ashwagandha's** effects on sleep, scientists tested a standardized **35% withanolide glycoside** extract.

Every evening for six weeks, 75 volunteers were given a **placebo** and 75 were given **120 mg of ashwagandha** extract.

Those in the ashwagandha group had significantly improved **quality of sleep**, including a:⁵

- **72% increase** in **restorative sleep**, measured by a standard, weekly sleep questionnaire,
- Significant **improvement** in **sleep efficiency** (total sleeping time as a percentage of total time spent in bed),
- **27% decrease** in **sleep onset latency** (time needed to fall asleep), and
- **15% decrease** in **wake after sleep onset** (time spent awake after first falling asleep).

No adverse effects related to ashwagandha were reported.

Maintaining All-Night Melatonin Levels

Melatonin is produced by the pineal gland in response to darkness, and it helps control the body's **sleep-wake cycles**.³⁵

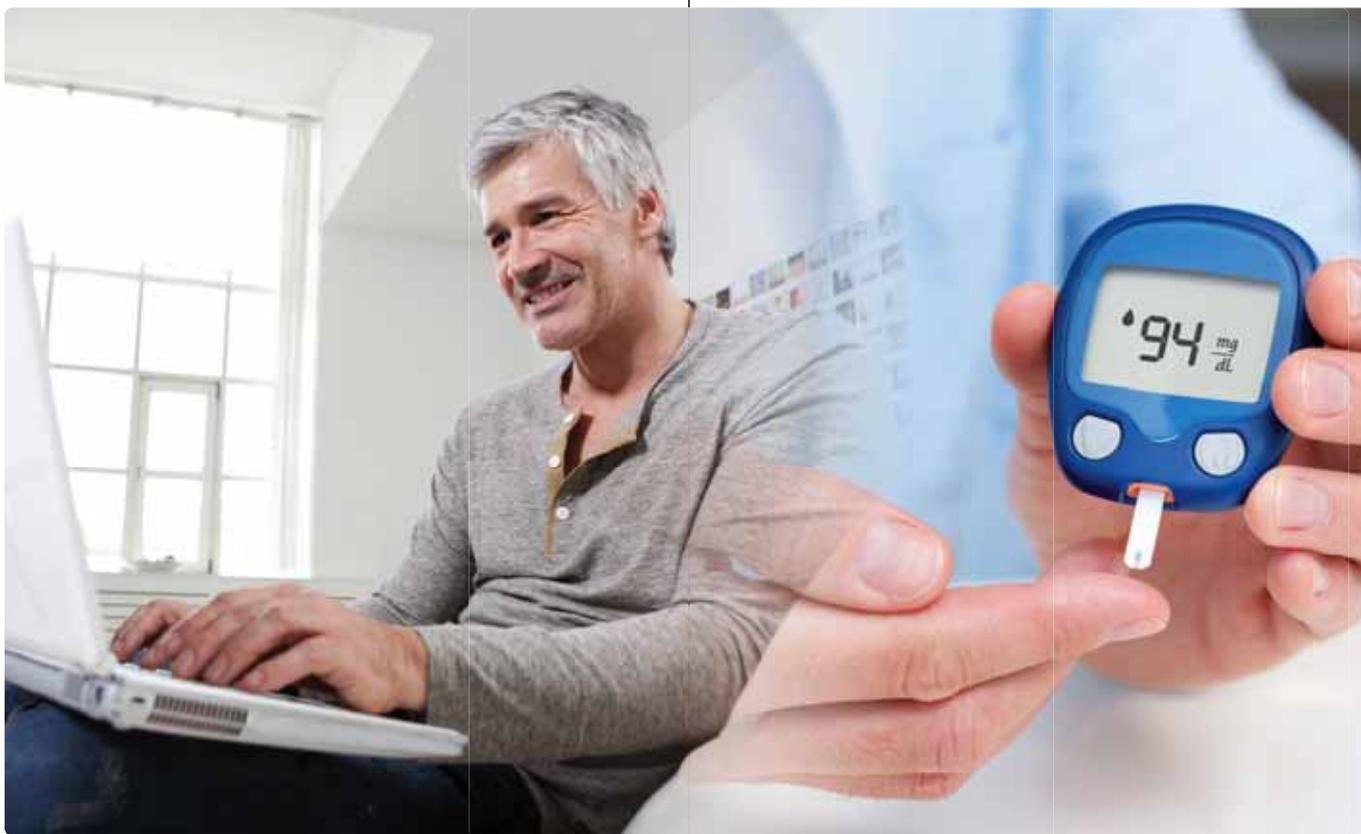
Levels of melatonin *fall* with age. This can result in **impaired sleep** and contributes to some of the consequences of disordered sleep, such as accelerated cognitive decline, cardiovascular disease, and metabolic disorders.²⁷

Many of these effects are believed to be related to melatonin's impact on specific brain cells and regions of the brain involved in controlling our day-night cycles.^{27,36}

Chronic conditions, such as elevated blood sugar, can also suppress normal melatonin production, which may account for poor sleep among diabetics.³⁷

Boosting melatonin has been shown to help normalize sleep-wake patterns and enhance **high-quality sleep**.^{38,39}

Human studies have shown that raising melatonin levels via supplementation can improve **sleep patterns, quality, and duration**.^{6,7}





Increasing **melatonin** levels results in significant **improvements** in:^{6,7,40}

- **Sleep efficiency** (total sleeping time as a percentage of total time spent in bed),
- **Sleep onset latency** (time needed to fall asleep), and
- **Awake after sleep onset** (time spent awake after first falling asleep).

Maintaining Melatonin All Night Long

Many people take melatonin before bedtime.

Researchers have now developed a way to maintain melatonin levels all night long to enable a longer and more restorative sleep.

Scientists developed a **dual-action** form of melatonin containing:

- **0.5 mg** of **immediate-release** melatonin, and
- **1.0 mg** of **extended-release** melatonin.

This melatonin combination allows an initial elevation in melatonin levels and then delivers melatonin throughout a period of approximately **seven hours**.

The *immediate-release* melatonin can help people get to sleep faster and experience more restful and regenerative sleep. The *extended-release* melatonin can support a full night of uninterrupted sleep.

A placebo-controlled study of elderly subjects who complained of **insomnia** confirmed that taking an extended-release form of melatonin improved sleep quality.⁶

Taking this dual-action **melatonin** along with an extract of **ashwagandha** standardized to **35%** withanolide glycosides in the evening can support a **longer**, more **restorative sleep** that promotes overall health.

Summary

Sleep problems often worsen with age.

Ashwagandha helps reduce elevated **cortisol** levels that can impair sleep and has been shown in a clinical trial to result in an average **72% increase** in restorative sleep.

Melatonin helps reset the body's sleep-wake cycles and promotes more effective, restful sleep. A dual-action formulation that combines *immediate-release* and *extended-release* melatonin can help people get to sleep faster *and* stay asleep throughout the night.

Taking **ashwagandha** extract standardized to **35%** withanolide glycosides and dual-action melatonin **30 to 60** minutes before bedtime promotes the hormonal balance that allows more restorative, more refreshing sleep. •

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

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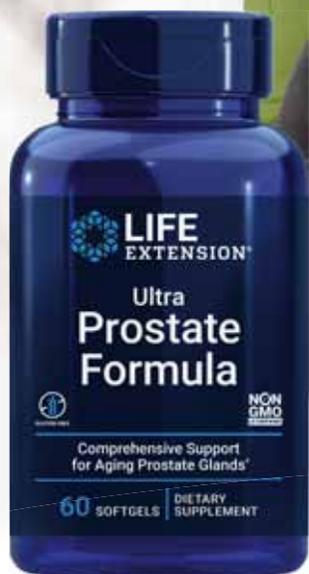
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1 bottle \$25.65 • 4 bottles \$23.63 each

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For full product description and to order Ultra Prostate Formula, 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.

PreticX™
IN A TASTY
STRAWBERRY
CHEWABLE



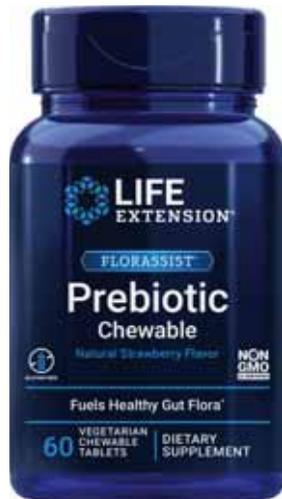
RESTORE YOUTHFUL GUT BALANCE

With Strawberry Flavored
FLORASSIST® Prebiotic Chewable

SUPER SALE PRICE

Item #02203 • 60 vegetarian chewable tablets

1 bottle **\$13.50** • 4 bottles \$11.70 each



- With age, our **bifidobacteria** levels decline to as little as **5%**, creating gut imbalance.¹
- *Increasing bifidobacteria levels enhances digestion and carbohydrate metabolism.*
- *Strawberry flavored FLORASSIST® Prebiotic Chewable helps restore healthy bifidobacteria levels in as little as 14 days using XOS prebiotic.²*
- **1,000 mg of XOS** (xylooligosaccharides) per prebiotic chewable.

References

1. *Front Microbiol.* 2016;7:1204.
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PreticX™ is a trademark of AIDP, Inc.

For full product description and to order **FLORASSIST® Prebiotic Chewable**, 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.

GET READY FOR BED



Deep, Peaceful Sleep



Rest & Renew combines two compounds that have been shown to help support restful sleep.

Ashwagandha: In a human trial, **Rest & Renew's** proprietary, standardized ashwagandha resulted in an average **72% increase** in **restorative sleep**.¹

Melatonin: **Rest & Renew** combines **0.5 mg** of *immediate-release* and **1.5 mg** of extended-release melatonin for about **seven hours** of sleep support.

Take **one capsule 30-60 minutes** before bedtime.

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

SUPER SALE PRICE

Item #02502 • 30 vegetarian capsules
1 bottle **\$12.15** • 4 bottles \$10.80 each

Shoden® is a registered trademark of Arjuna Natural Pvt. Ltd. MicroActive® Melatonin is a registered trademark of Bioactives LLC.

References

1. *Sleep Med.* 2020;72:28-36.



CAUTION: Do not consume alcohol, drive or operate heavy machinery after taking this product.



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



CURB Hunger and Burn More Fat



BY MARSHA MCCULLOCH, MS, RD

Many people want to **lose weight** to look and feel better.^{1,2}

Shedding extra pounds also supports **healthier aging**.

Excess body weight is associated with an increased risk of **heart disease, type II diabetes**, and several types of **cancer**.

Sleep apnea, osteoarthritis, and high blood pressure are directly related to surplus body mass.^{3,4}

Research shows that losing as little as **5%** of body weight can provide health benefits.⁵

The wrong kind of **dieting** causes biological changes that can make it challenging to lose weight, including an *increase* in **hunger hormones**.⁶

But it doesn't have to be so difficult.

Researchers have identified a blend of extracts from **lemon verbena** leaf and **hibiscus** flower that can reduce **hunger signals** and promote **satiety** (a feeling of fullness).⁷⁻¹⁰

Two clinical trials have shown that these extracts can almost **double the amount of weight loss** compared to a **placebo**, when used in conjunction with a healthy diet and exercise.^{7,8}

To improve compliance and support healthy weight loss, a lifestyle app has been developed that further facilitates losing weight with these extracts. Over **85%** of the app users taking the supplement reduced their body weight, losing an average of **12.6 pounds** in three months.¹¹

Why Weight Loss Is So Hard

Shedding pounds is rarely easy.

Dieting causes changes in metabolism and appetite-related hormones that can make it harder to lose weight and keep it off.⁶

For example, weight loss leads to a rise in circulating **ghrelin**, a hunger hormone that *increases appetite*.¹²

Weight loss also causes the body to secrete *less glucagon-like peptide-1 (GLP-1)*, a hormone that increases satiety.

Furthermore, a decrease in body weight reduces resting energy expenditure, or what we commonly refer to as metabolic rate.⁶

Lemon Verbena and Hibiscus

Hibiscus is known for a bright red herbal tea made from its flower.

Lemon verbena is an herb beloved for its lemony aroma and flavor.

Both plants are rich in **polyphenols** that can help promote weight loss—without the unwanted side effects of drugs.^{7,13,14}

In a preclinical cell study, **hibiscus extract** was shown to significantly *inhibit* the creation of new **fat** cells. It also reduced the accumulation of **triglycerides** in fat cells.¹⁵

When excess triglycerides build up in fat cells, it leads to **oxidative stress**. That can trigger the **inflammation** that promotes diseases associated with **obesity**.¹⁶

In the cell study, **hibiscus** extract led to a **30%** reduction in the generation of damaging **reactive oxygen species**.¹⁵

Preclinical research has shown that **lemon verbena** extract can decrease **triglyceride** accumulation in fat cells.¹⁷

Triglycerides are the most common type of **fat** in your body. They come from foods like butter, oils, other fats and glucose-boosting foods (starches) and sugary beverages.

Triglycerides not needed for energy production circulate in the blood and are **stored** in our cells as **fat**.

Curbing Appetite

A blend of **lemon verbena leaf** and **hibiscus flower** extracts was tested in a rigorous, placebo-controlled trial of 47 overweight and obese women.⁷



All subjects were advised to ingest approximately **2,200**-calories a day. They were also encouraged to walk at least half an hour daily during the two-month study.

Roughly half the participants took **500 mg** of the **plant extracts** 20 to 30 minutes before breakfast every day. The other half were given a **placebo**.

Those taking the **lemon verbena-hibiscus** combination had a **56.4%** decrease in feelings of hunger, on average. They also experienced a significant increase in the satiety-promoting hormone **GLP-1**, accompanied by an increase in food intake-related satisfaction.

Decreased appetite may have been one factor that led to greater weight loss. In two months, the treatment group lost **7.7 pounds**, while the placebo group lost only **4.6 pounds**.

If this does not sound like much weight, it represents the real-world challenges people face when attempting to shed excess body weight.

Controlling Calorie Intake

In another trial, scientists gave 33 overweight and obese men and women **500 mg** of **lemon verbena-hibiscus extract** or a **placebo** daily before breakfast.⁹

After 60 days, both groups returned to the lab and were fed a standardized breakfast. A few hours later, they were served a buffet-style lunch.

The group taking the extracts ate almost **10%** fewer calories at lunch than the **placebo** group did and reported a significant improvement in **satiety**.

After taking the **lemon verbena-hibiscus** extract, the men and women had a **12%** increase in **GLP-1** after breakfast and a **22%** increase after lunch, promoting a feeling of fullness.

Trimmer Waistlines

Shedding pounds promotes **metabolic health**.¹⁸

In a placebo-controlled clinical trial of overweight or obese **women**, scientists tested whether **500 mg** of **lemon verbena-hibiscus extract** could increase weight loss.⁸

All the women were instructed to walk at least 30 minutes daily and encouraged to consume **2,200** calories a day.



Herbal Appetite Control for Weight Loss

- Losing as little as **5%** of body weight can reduce the risk of many chronic diseases, including heart disease and type II diabetes.
- Difficulty controlling **appetite** is a major obstacle for people trying to lose weight.
- Extracts from a blend of **lemon verbena** leaf and **hibiscus** flower can increase satiety hormones to help curb appetite.
- Clinical trials of a combination of lemon verbena and hibiscus extracts have shown that it can reduce body weight by **5%** within two months and trim the waistline by more than **2.5 inches**.
- These extracts work best when combined with a healthy diet and regular exercise. Studies have shown that a **digital app** can help keep weight loss efforts on track and promote a healthier lifestyle.

After two months of taking the **plant extracts**,⁸ **overweight** participants with an average **body mass index (BMI)** of **27 kg/m²**:

- Lost over **eight pounds**, or **5.4%** of their starting weight,
- Decreased their body mass index (BMI) by **1.5 points**,
- Trimmed their waistline by **2.7 inches**,
- Reduced their percentage of body fat by **1.3%**,
- Lowered their **systolic** blood pressure (top number) by **20.6 mmHg**, and
- Decreased their resting heart rate by **8.5 beats per minute**.

These changes were all significantly better than the changes in subjects given a **placebo**.

Most notably, the extract group lost about **twice as much weight** and almost **four times as many inches** from their waistline as the placebo group.

Obese participants (average BMI of **34 kg/m²**) taking the extracts lost over **10 pounds**, or **5.3%** of their body weight.

They also lowered their heart rate by **eight beats per minute** and reduced systolic **blood pressure** by **18.4 mmHg**.

A reduction in heart rate is significant because an elevated resting heart rate is one of the predictors of both **cardiovascular and all-cause mortality**.

LIFESTYLE TIPS FOR ACHIEVING HEALTHY WEIGHT

Life Extension has long recommended the Mediterranean diet for maintaining healthy weight, heart health and longevity. (See ***Life Extension Magazine***[®] December 2021).

In addition, the American Heart Association recommends moderate, regular exercise.²¹ This should include, **150-300 minutes** a week of heart-pumping exercise, muscle strengthening two days a week, and reduced sitting.



Summary

A combination of **lemon verbena** and **hibiscus** extracts has been shown to promote fat burning and shift appetite hormones in ways that make it easier to eat less and lose weight.

Controlled clinical trials of overweight adults have found that taking **500 mg** of combined lemon verbena-hibiscus extracts for two months can produce an average of **5% reduction** in body weight.

Modest, sustainable weight loss like this can go a long way toward reducing the risk of common cardiovascular and metabolic diseases. •

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

Boost Motivation with a Mobile App



As our phones become increasingly integrated into our lives, many people are relying on mobile apps to improve their health. There are apps with exercise programs, sleep-tracking programs, and now an app that was especially designed to improve weight loss in conjunction with the **lemon verbena-hibiscus** extract.

Mobile **apps** can support a more comprehensive approach to weight loss, which could help with managing weight over the long term.^{19,20}

In a 90-day real-world study, 397 volunteers took **500 mg** of a **lemon verbena-hibiscus extract** blend daily, administered in a yogurt drink.¹¹

They also used a custom **app** designed to help them develop a healthier lifestyle.

The interactive app:¹¹

- Gradually introduced healthy behavior changes,
- Provided reminders to take the extract blend,
- Encouraged water, vegetable, and fruit intake,
- Tracked exercise, food, and water intake,
- Helped track weight changes, and
- Provided motivational messages and incentives.

In those completing the study, the app boosted **adherence** to the extracts by more than **five times** compared with typical dietary supplements.¹¹

The participants' lifestyle improved, too. They **doubled** their water intake and fruit and vegetable consumption. And they increased their **exercise** by **33%** over baseline.

These changes paid off.

Over **85%** of the users reduced their body weight, losing an average of **12.6 pounds** in three months.¹¹

(A similar **app** is available at no charge to **lemon verbena-hibiscus extract** users.)

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HEALTHY BONES = HEALTHY HEART



THREE WAYS TO GET VITAMIN



SUPER K

SUPER K is the best-selling **vitamin K** formula for bone and heart health. It costs only **23 cents** a day and provides in one softgel:

Vitamin K1 (converts to K2 in some people)	1,500 mcg
Vitamin K2 (MK-4) (for bone & vascular health)	1,000 mcg
Vitamin K2 (MK-7) (long-acting protection)	100 mcg

SUPER K ELITE

Super K Elite provides 2 additional forms of vitamin K and even **higher** potencies of K1, MK4, and MK7. **Super K Elite** costs **54 cents** a day and provides in one softgel:

Vitamin K1 (converts to K2 in some people)	2,000 mcg
Vitamin K2 (MK-4) (for bone & vascular health)	1,500 mcg
Vitamin K2 (MK-7) (long-acting protection)	181 mcg
Vitamin K2 (MK-9) (added cardiovascular support)	43 mcg
Vitamin K2 (MK-6) (added cardiovascular support)	11 mcg

MEGA VITAMIN K2

Japanese physicians use **high-dose vitamin K2** for those with challenges in maintaining healthy bone density. **Mega Vitamin K2** costs **86 cents** a day and provides in one daily capsule:

Vitamin K2 (MK-4) (for bone & vascular health)	45,000 mcg
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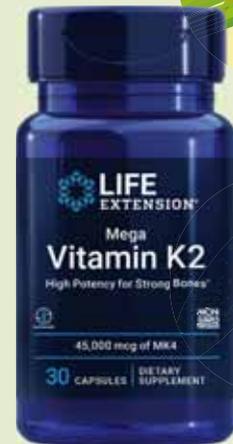
SUPER SALE PRICE

SUPER K Item #02334 • 90 softgels
1 bottle **\$20.25** • 4 bottles \$18.23 each



SUPER SALE PRICE

SUPER K ELITE Item #02335 • 30 softgels
1 bottle **\$16.20** • 4 bottles \$14.40 each



SUPER SALE PRICE

MEGA VITAMIN K2 Item #02417 • 30 capsules
1 bottle **\$25.65** • 4 bottles \$23.40 each

For full product description and to order these **VITAMIN K** formulas call **1-800-544-4440** or visit www.LifeExtension.com

CAUTION: If you are taking a vitamin K antagonist (e.g. warfarin), consult your healthcare practitioner before taking this product.



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.

FORESIGHT FOR YOUR EYESIGHT

MacuGuard® Ocular Support provides:

- > Lutein, *trans*-zeaxanthin, and meso-zeaxanthin help maintain structural integrity of the macula and retina.¹⁻⁵
- > Cyanidin-3-glucoside assists with night vision.⁶⁻⁸
- > Saffron has been shown to help support vision as demonstrated by doctors' eye exams.¹
- > Alpha-carotene further helps support macular density.¹



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

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MacuGuard® Ocular Support with Saffron + Astaxanthin
SUPER SALE PRICE

Item #01993 • 60 softgels

1 bottle **\$29.70** • 4 bottles \$27 each

MacuGuard® Ocular Support with Saffron
SUPER SALE PRICE

Item #01992 • 60 softgels

1 bottle **\$16.88** • 4 bottles \$15.75 each

(Each bottle lasts for two months.)

MacuGuard® Ocular Support is available with or without astaxanthin.

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

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.



Increase **AMPK** to Better Manage Body Weight

Most people today consume excess calories.

This results in **mTOR** constantly running at high gear, which is a factor in unwanted **fat storage**.

Studies show that increasing AMPK activity turns down excess **mTOR**.¹

Reduce Cell Fat Storage

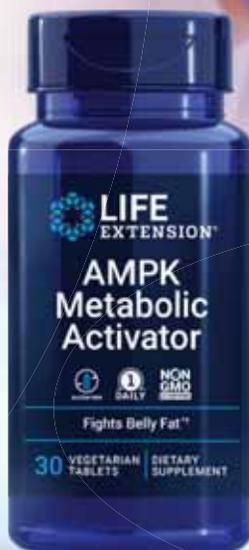
Scientific studies show that increasing AMPK activity can encourage cells to store less fat and burn it as energy.^{2,3}

AMPK Metabolic Activator was formulated based on data showing reduced belly fat in response to just one of its ingredients (*Gynostemma pentaphyllum*).³

This ***Gynostemma pentaphyllum* + hesperidin** formula is designed to support healthy **AMPK** cellular activation.

References

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2. *Nutr J*. 2016;15:6.
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SUPER SALE PRICE

Item #02207 • 30 vegetarian tablets

1 bottle **\$25.65** • 4 bottles \$21.60 each



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

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

Actiponin® is a trademark of TG Biotech Co., Ltd.

NEW APPROACH TO

Healthy Weight Loss



Super Sale Price

Item #02504
30 veg. caps

1 bottle \$20.25

4 bottles **\$18 each**



Eat Right, Choose Wisely and Sleep Well

When it comes to losing weight, we tend to think of eating salads, skipping dessert, or going for a run. While those are great, we're forgetting something important—**sleep**.

As it turns out, not getting enough sleep can put a damper on your weight loss plans.

Good food choices (nutrient-dense foods) and healthy habits (daily exercise) are other pieces of the puzzle.

Two new **nutrient** formulas plus an optional **Body Trim App** provide additional support.

Lose weight. Feel full. Stay trim.

Human studies show that **lemon verbena** leaf and **hibiscus flower** extracts promote satiety and encourage **weight loss**...in just 8 weeks.[†]

In one clinical trial, participants taking this plant extract duo reduced their body weight by an average of **5.4%**—while losing **2.7 inches** from their waistlines.¹

Another clinical trial resulted in an average **50.4%** increase in feelings of satiety.²

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

Metabolaïd® is a registered trademark of MONTELOEDER, S.L.

References: 1. *Sci Rep.* 2019 Feb 28;9(1):2999. 2. *Food Funct.* 2018 Jun 20;9(6):3173-84.

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.



To download the Body Trim app, scan the QR code or visit the Apple and Android stores



Super Sale Price

Item #02502
30 veg. caps

1 bottle \$12.15

4 bottles **\$10.80 each**



FREE Weight Management App

Hit your healthy weight goals with help from Life Extension's FREE **Body Trim app**.

- Get daily healthy weight tips
- Track your weight, activity, intake of fruits & vegetables and water
- In a 3-month clinical study, **88%** of participants were still using the app when the study concluded,

For full product description and to order Rest & Renew and Body Trim and Appetite Control, call 1-800-544-4440 or visit www.LifeExtension.com

Deep, Peaceful Sleep

Rest & Renew combines two compounds that have been shown to help support restful sleep:

- 1. Ashwagandha:** In a human trial, Rest & Renew's proprietary **ashwagandha** extract resulted in an average **72% increase** in **restorative sleep**.¹
- 2. Melatonin:** Rest & Renew combines **0.5 mg** of *immediate-release* and **1.5 mg** of extended-release **melatonin** for about seven hours of sleep support.

Take one capsule 30-60 minutes before bedtime.

Shoden® is a registered trademark of Arjuna Natural Pvt. Ltd. MicroActive® Melatonin is a registered trademark of Bioactives LLC.

References: 1. *Sleep Med.* 2020;72:28-36.

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.





Boost Testosterone Levels *without* Drugs

BY CARL RITTER

Testosterone levels drop as men get older. This begins *much* earlier than most realize.

As early as **age 30**, testosterone levels start falling at a rate of about **1% per year**.^{1,2}

Decreased libido and **erectile dysfunction** are well-known symptoms associated with low testosterone levels.³ But this hormone deficit affects more than the reproductive system.

Low levels of testosterone are also associated with depression, obesity, diabetes, heart disease, osteoporosis, muscle wasting, and more.⁴⁻⁸

Studies also show that *low* testosterone levels in aging men are associated with an *increased* risk of **death from any cause**.⁹

Three **plant-based nutrients** have been identified that support the body's ability to produce testosterone, significantly **raising levels**.

In one clinical study, a proprietary blend of **pomegranate** and **cacao** extracts was shown to increase **free testosterone** by as much as **48%** in aging males.¹⁰

In cell and animal studies, **luteolin**, a flavonoid found in fruit and vegetables, has been shown to *inhibit* the **aromatase** enzyme.^{11,12} This enzyme converts testosterone into **estrogen**.

These nutrients can help support more youthful **testosterone** balance in aging men.

Importance of Testosterone

Testosterone is a hormone produced primarily in the testes of men and in the ovaries of women. A small amount is also made in the adrenal glands of men and women.¹³⁻¹⁵

This sex hormone is critical to the development of the male reproductive system. But testosterone levels also impact metabolism, energy, muscle strength and mass, inflammation, cognition, mood, and more.¹⁶

Low levels of testosterone become increasingly common and more severe as men age.¹⁷⁻²⁰

Not only does this rob men of energy, virility, and the youthful feeling of general well-being, but it is also associated with age-related chronic conditions, including **heart disease** and **diabetes**.⁹

In one meta-analysis, *low* testosterone levels were associated with an **increased risk of death** due to **cardiovascular disease** or *any cause*.⁹

“Free” and “Bound” Testosterone

Testosterone circulates in the blood bound to circulating plasma proteins, most importantly **sex hormone binding globulin** (SHBG) and albumin.^{13,21}

Only about **2%** of circulating testosterone is *non*-protein bound, or **free**.²² This **free testosterone** is the **biologically active** form.

For testosterone to exert its effects, **free testosterone** must *bind* to **receptors** in target tissues.

Total testosterone is the measure of *all* circulating testosterone, including that which is *bound* to carrier

proteins like **sex hormone binding globulin** (SHBG). In this “bound” form, testosterone is *not* available for the body to use.

Both **total testosterone** and **free testosterone** drop significantly with advancing age.

What’s more, being **overweight** or **obese** has been associated with increases in the levels of an enzyme called **aromatase**. This enzyme converts testosterone into **estrogen**, one of the primary sex hormones in women.^{23,24}

As a result, overweight men, especially those with a high amount of **abdominal fat**, are at *higher* risk for *low* **testosterone** levels.

Pomegranate and Cacao Raise Testosterone

Scientists have been searching for ways to safely elevate testosterone levels without drugs.

In one study, researchers found that in healthy adult men and women, intake of **pomegranate fruit juice** for just **two weeks** increased salivary testosterone levels by **23%-27%**. Measures of mood and well-being were also improved.²⁵

These findings inspired scientists to screen hundreds of other plant extracts and nutrients for the ability to raise testosterone levels.

In a study using testes cells from mice, they confirmed that **pomegranate** extract raised testosterone production. They also discovered that **cacao seed** extract—from the same beans used to make cocoa





WHAT
YOU
NEED
TO
KNOW

Boost Testosterone for Better Health

and chocolate—significantly increased testosterone production.²⁶

When combined, the **pomegranate** and **cacao seed** extracts had an impressive impact on testosterone production in an animal model.

In a study on rats, this **pomegranate-cacao** combination boosted **total testosterone** levels by over **72%** after just six weeks.²⁷

Results from Human Studies

In a clinical trial, the **pomegranate** and **cacao** extracts were tested in men ranging from 36 to 55 years of age.¹⁰ They were randomized to receive either a combination of both extracts or a **placebo**.

After eight weeks, **free testosterone** levels were elevated by over **48%** compared to baseline in men receiving **400 mg** of the **pomegranate-cacao** blend.

Notably, **free testosterone** increased by a *greater* percentage than **total testosterone**.

That wasn't all. In those taking pomegranate and cacao extract, overall **well-being** improved. Measures of **stress** dropped by **26%**. Hand grip **strength** increased by almost **25%**, compared to baseline.

- Levels of the male sex hormone **testosterone** drop steadily after around age 30.
- **Low testosterone** is associated with erectile dysfunction, loss of virility, and serious chronic health issues including heart disease, obesity, depression, and more.
- Scientists have found that a proprietary blend of pomegranate and cacao extracts stimulate production and increase blood levels of testosterone.
- In a clinical trial, this combination increased biologically active **free testosterone** by as much as **48%** and led to reduced stress, increased hand grip strength, and other health improvements.
- **Luteolin**, a flavonoid found in several fruits and vegetables, was shown in cell and animal studies to support testosterone production and reduce its conversion into estrogen.



The study also measured what’s known as the **Aging Males’ Symptoms** scale, which includes:²⁸

- Joint pain and muscle aches,
- Excessive sweating,
- Sleep problems and exhaustion,
- Anxiety and irritability,
- Depression and feeling burned out, and
- Decrease in libido and other sexual problems.

Measures of these symptoms were reduced by **19%** in those who took the **pomegranate-cacao** combination.

A similar study was performed in healthy **younger** men, aged 21 to 35.²⁹ Even in this age group, pomegranate and cacao increased **free testosterone** by **25%**. Hand grip strength and the circumference of the upper arm increased as well.

Luteolin Supports Testosterone Production

Luteolin is a flavonoid found in several herbs, fruits, and vegetables, including celery, broccoli, parsley, and thyme.

Preclinical studies have shown that luteolin may support healthy **testosterone** levels by at least two different ways:

- **Increasing StAR protein:** The **steroidogenic acute regulatory (StAR) protein** is an enzyme that is *required* for testosterone production to occur.³⁰
- **Inhibition of aromatase:** Luteolin has also been found to inhibit **aromatase**—the enzyme that converts testosterone into estrogen—in cell culture and animal models.^{11,12}

Scientists combined **luteolin** with **pomegranate** and **cacao** extracts to help support healthy **free testosterone** levels.

Summary

Testosterone is the primary male sex hormone. It plays important roles in reproductive function and impacts many other aspects of health.

Beginning around age **30**, levels of testosterone in men begin to *decline*.

Low testosterone is associated with loss of energy, erectile dysfunction, and increased risk for heart disease, obesity, diabetes, osteoporosis, muscle wasting, and other health conditions.

Scientists have discovered that a proprietary blend of **pomegranate** and **cacao seed** extracts can raise blood levels of free testosterone in men.^{10,29}

In one study **free testosterone** was increased by as much as **48%** in aging males taking this proprietary blend.¹⁰

The increases in free testosterone also correlated with improvements in levels of **stress, strength, mood,** and more.

Evidence from cell and animal studies suggests that **luteolin** may also support testosterone levels by increasing production and preventing its breakdown to estrogen.

The combination **pomegranate/cacao** with added **luteolin** may offer a solution to the age-related decreases in testosterone levels seen in men. •

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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† This product is intended to support testosterone levels but does not contain testosterone. Tesnor® is a trademark of Laila Nutra and Gencor.



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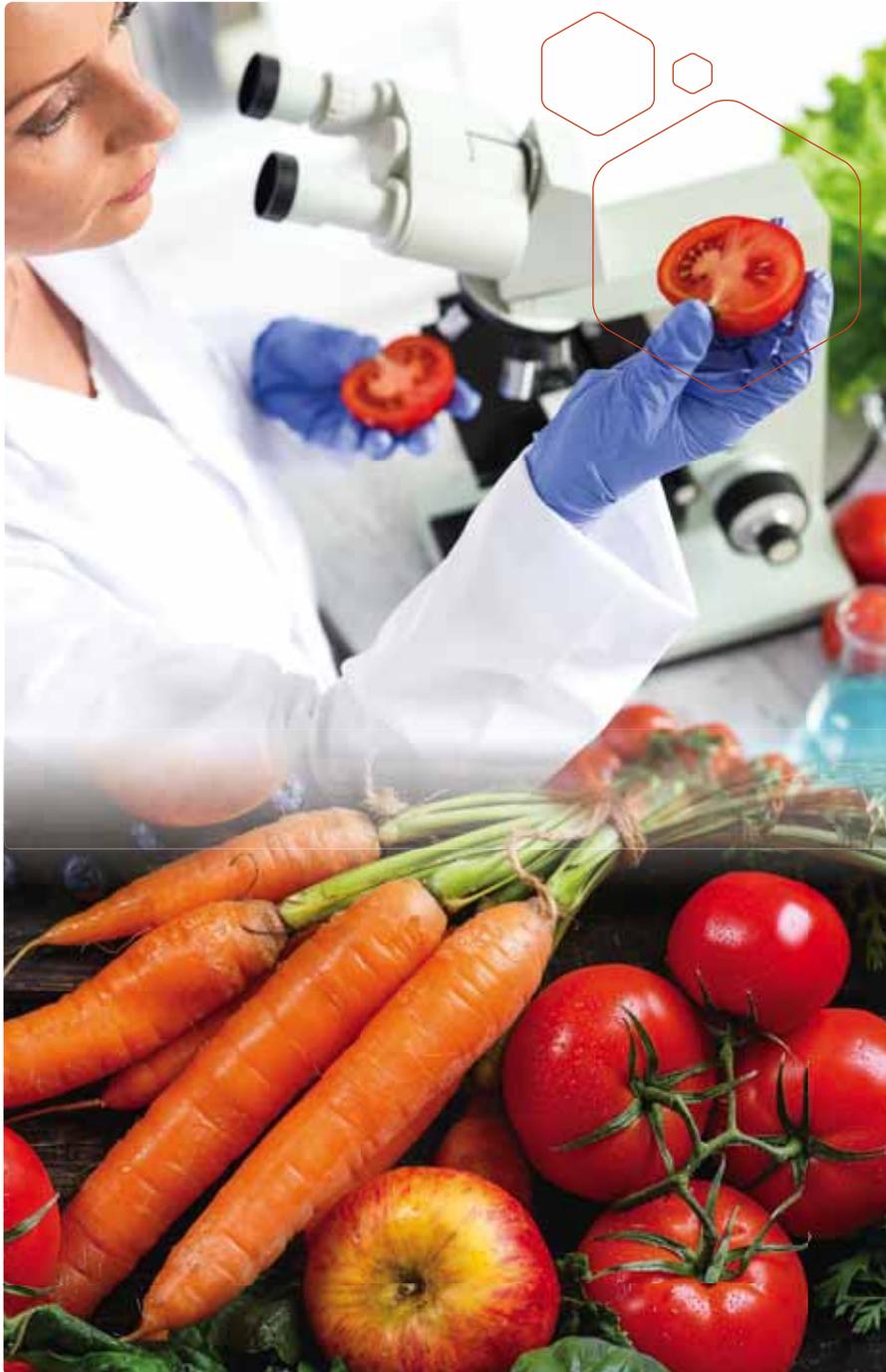


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New Studies Corroborate LYCOPENE BENEFITS

BY LAURIE MATHENA



If you've ever wondered what makes a tomato red or a grapefruit pink, the answer is a carotenoid called **lycopene**.

In the body lycopene promotes blood vessel function, supports normal insulin sensitivity, and helps maintain healthy blood pressure levels.

But lycopene is *best* known for its role in helping **reduce the risk of prostate cancer**.

Because of its multi-targeted health benefits, lycopene has been described as an important nutrient for longevity.¹

In just the past year alone, new studies have added to lycopene's list of health benefits:

- **Lycopene protects against obesity and diabetes.**² After evaluating about 200 articles, researchers concluded that lycopene exhibits anti-diabetes and anti-obesity activities in multiple organs. They concluded that lycopene consumption could help lower the risk of obesity and diabetes.

- **Lycopene inhibits prostate cancer.**³ A review summarized numerous original and review articles, evaluating the many ways that lycopene helped to prevent or suppress cancer. The authors concluded that lycopene suppressed the progression and proliferation of **prostate cancer** cells and induced apoptosis of these malignant cells in *in-vivo* and *in-vitro* conditions. It also modulated the signaling pathways and their proteins, potentially preventing and aiding in the treatment of prostate cancer.
- **Lycopene intake reduces all-cause mortality.**⁴ In a review of studies, researchers determined that dietary lycopene or serum lycopene was associated with reduced all-cause mortality, prostate cancer, stroke, cardiovascular disease, metabolic syndrome, and male infertility.

- **Lycopene could help protect against peripheral neuropathy.**⁵ In an animal study, oral administration of lycopene helped ameliorate central and peripheral nerve injuries caused by a platinum-based chemotherapeutic drug called oxaliplatin.

One drawback is that it isn't easily available in adequate amounts through diet alone.

Fortunately, it's easy to supplement with lycopene to derive the myriad benefits detailed in studies published in **2020-2021** that corroborate findings dating back to the **1980s**. •

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

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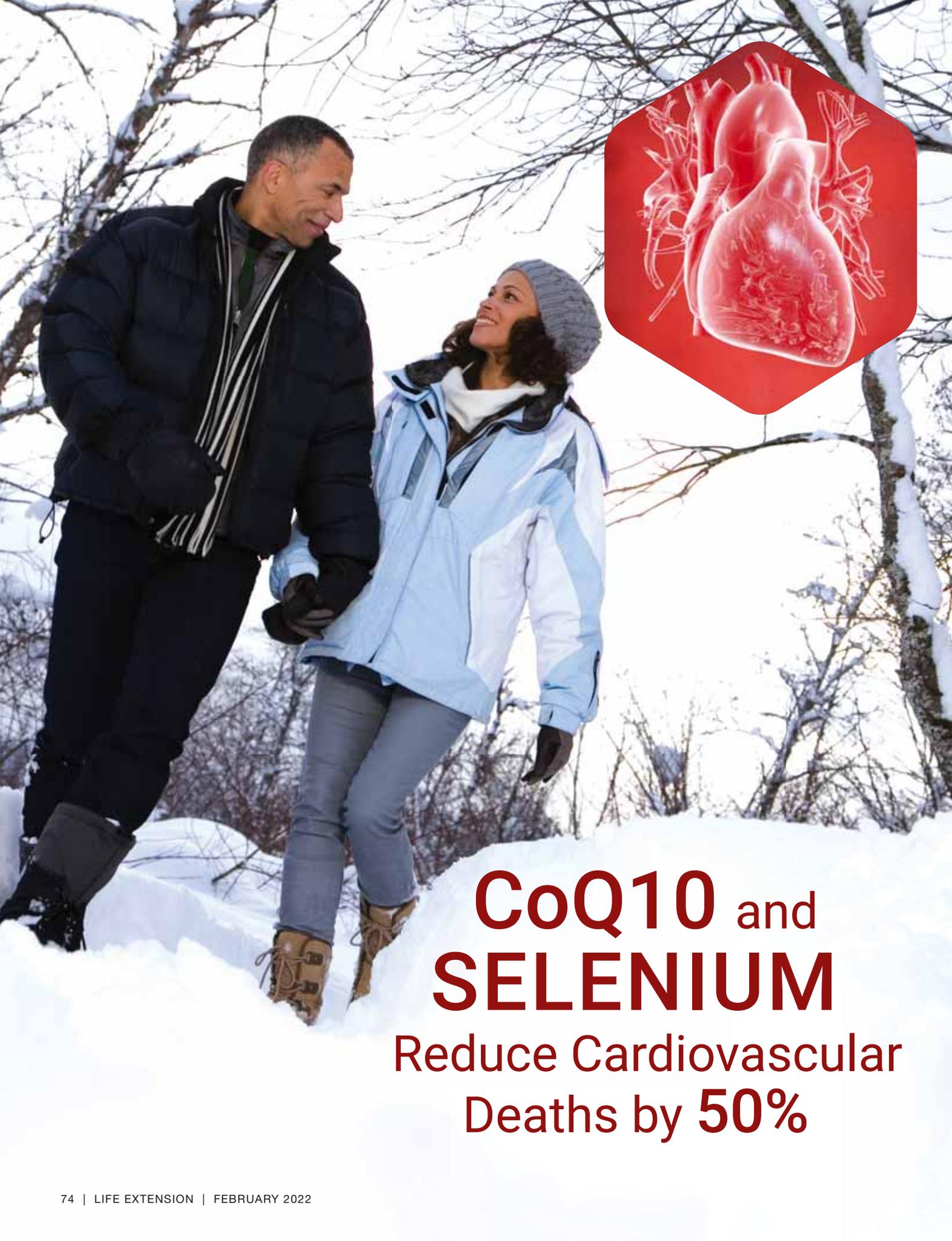
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CoQ10 and
SELENIUM
Reduce Cardiovascular
Deaths by **50%**



BY RANDY WHITMORE

A landmark clinical trial found that **death** due to **cardiovascular causes** was reduced by **more than half** in older people who took **selenium** and **coenzyme Q10 (CoQ10)** for a period of four years.

This protection was found a full **five years** after the selenium and CoQ10 supplementation had stopped. This means the benefit continued long *after* supplementation ended.¹

A follow-up analysis from the same trial demonstrated that the **life-saving** protection continued for **over a decade** after the supplement period concluded.^{2,3}

Follow up studies show benefits in those with existing **heart disease** and **diabetes**.²⁻¹²

These results add powerful evidence to the link between **selenium** and **coenzyme Q10** and heart health.

Reductions in Cardiovascular Death

In the initial study, researchers from Sweden chose healthy adults between the ages of 70 and 88 years old. Subjects were randomized to receive either a combination of **200 mg of coenzyme Q10** and **200 mcg of selenium** daily or a **placebo** for four years.

During the follow-up period of more than five years after the end of the nutrient intervention, **12.6%** of those who had received the **placebo** suffered a **cardiovascular death**. But only **5.9%** of those in the **selenium + CoQ10** group did—**less than half** the mortality rate.¹

Results from two subsequent additional follow-ups have been remarkable.

Ten years after the supplementation ended, the risk of death due to cardiovascular disease was **still 49% lower** in those who had received the nutrients.³ This result was true even for subjects who had existing heart disease.

After **12 years**, the benefit continued; the risk of death was **41% lower** in those who had received selenium and CoQ10.²

The benefits remained consistent when focusing only on subjects who had existing heart disease, diabetes, or high blood pressure.

Improved Markers of Health

Slashing the rate of **cardiovascular mortality** is impressive enough.

But in the last few years, several in-depth analyses of the original trial have determined that **selenium** and **CoQ10** also improved several markers of cardiovascular and general health, including:

- **Quality of life.** In those given selenium *and* CoQ10, measures of mental and physical **quality of life** were maintained better than in those who took the placebo.¹²
- **Hospitalization.** Subjects who received the two **nutrients** spent a remarkable **246 fewer days**, on average, in the hospital than **placebo** recipients.¹²
- **Heart function.** Those receiving the selenium and CoQ10 had significantly better **cardiac function** (measured by an echocardiogram) than placebo recipients.¹
- **Fibrosis.** Fibrosis, the development of rigid, scarred tissue, is a common element of many chronic diseases, including in the heart. Those receiving the supplementation had a **reduction** in fibrosis for biomarkers compared to those taking a placebo.⁶



WHAT YOU NEED TO KNOW



- **Oxidative Stress and Inflammation.** Oxidative stress and chronic inflammation are significant contributors to many forms of age-related disease. In this study, several markers of oxidative stress and chronic inflammation were *decreased* in those taking the nutrients.^{9-11,13}
- **Clot Formation.** *D-dimers* are protein fragments produced by blood clots. Elevated levels in the blood correlate with cardiovascular disease. Taking selenium and CoQ10 was found to *prevent* an increase in D-dimers.⁷
- **Glycation.** Blood sugar can attach to proteins, lipids, or DNA and damage them. This process is known as **glycation**, and it is a contributor to most chronic diseases. **Fructosamine**, a compound found in blood that is a marker of glycation, is associated with risk of cardiovascular disease.¹⁴⁻¹⁹ Fructosamine was *reduced* in those receiving the combination of nutrients.⁵
- **Cardiovascular and Pulmonary Risk.** High levels of the protein **NT-proBNP** in the blood is a marker of **heart failure**. It can also be an indicator of coronary and valvular heart disease, pulmonary hypertension, pulmonary embolism, and stroke risk.²⁰⁻²² Selenium and CoQ10 intake was associated with reduction in **NT-proBNP** levels.¹

These results clearly show that taking selenium and CoQ10 did more than reduce death from cardiovascular causes. It also improved many measures of heart and overall health.

A Combination that Cuts Cardiovascular Death

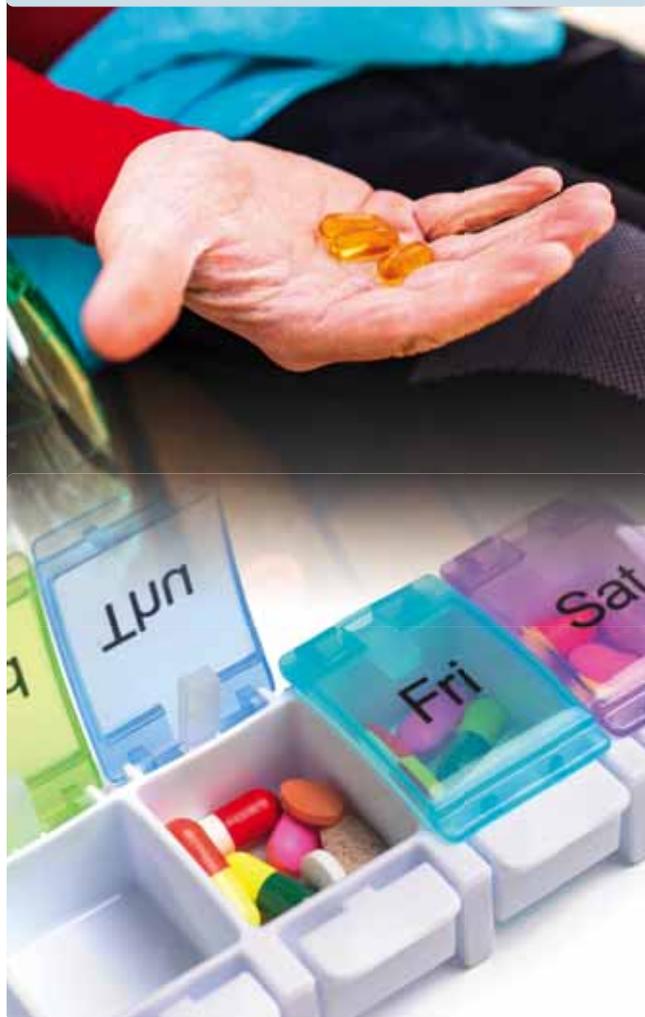
- **Selenium and coenzyme Q10 (CoQ10)** are nutrients that prevent damaging oxidative stress. Coenzyme Q10 plays a vital role in mitochondrial health to maintain cellular energy.
- A landmark study in Sweden showed that older individuals who took **200 mg of coenzyme Q10 and 200 mcg of selenium** daily for four years had dramatically lower cardiovascular-related deaths compared to those who received a placebo, by **more than half!**
- A follow-up showed that the group taking the nutrients still had lower rates of death **12 years** after the supplement intervention ended.
- Several sub-studies have shown that the four-year combination of CoQ10 and selenium also improved quality of life, heart function, and biomarkers of heart and blood vessel health.

Statin Drugs Deplete CoQ10

Many people take **statin** drugs to lower cholesterol and reduce risk of cardiovascular disease.

But that comes with a problem: Statin drugs can deplete **coenzyme Q10** levels.^{29,30} That's because the *enzyme* that statins inhibit is the *same enzyme* that produces a compound required to make new CoQ10 in the body.

Since low CoQ10 production may *raise* the risk of heart disease, those taking statins should be particularly concerned with their blood levels of CoQ10.



How Selenium and CoQ10 Help the Heart

On their own, **selenium** and **coenzyme Q10** each helps protect the heart.

Several studies have shown that there is a link between cardiovascular disease and *lower* blood levels of both nutrients.²³⁻²⁷

Selenium and CoQ10 are involved in the body's defenses against **oxidative stress**, a major contributor to cardiovascular disease. And CoQ10 is crucial for the proper function of the cell's powerhouses, the mitochondria.²⁸

Selenium is important for different *enzymes*, including **glutathione peroxidase** and **thioredoxin reductase**. These are both critical parts of the body's built-in antioxidant system that shields against oxidative damage.⁵

Selenium and CoQ10 may represent a powerful duo for the prevention of heart disease and reduction in cardiovascular deaths.

Summary

A clinical trial showed that a combination of **selenium** and **coenzyme Q10**, taken for four years, reduced **cardiovascular death** in a group of older adults, even five years past the end of the intervention.

Beyond that, 12 years of follow-up have now demonstrated that the protection against cardiovascular death and disease continued for **over a decade** after the supplementation period ended.

Analyses show that selenium and CoQ10 not only reduced mortality, but also reduced hospitalizations for heart disease, improved quality of life, boosted heart function, decreased inflammation, and improved other markers of cardiovascular and general 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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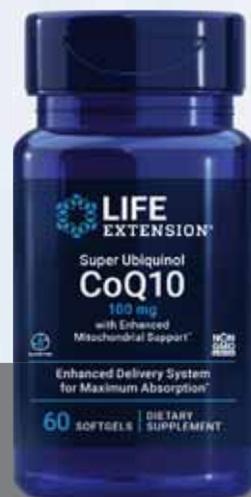
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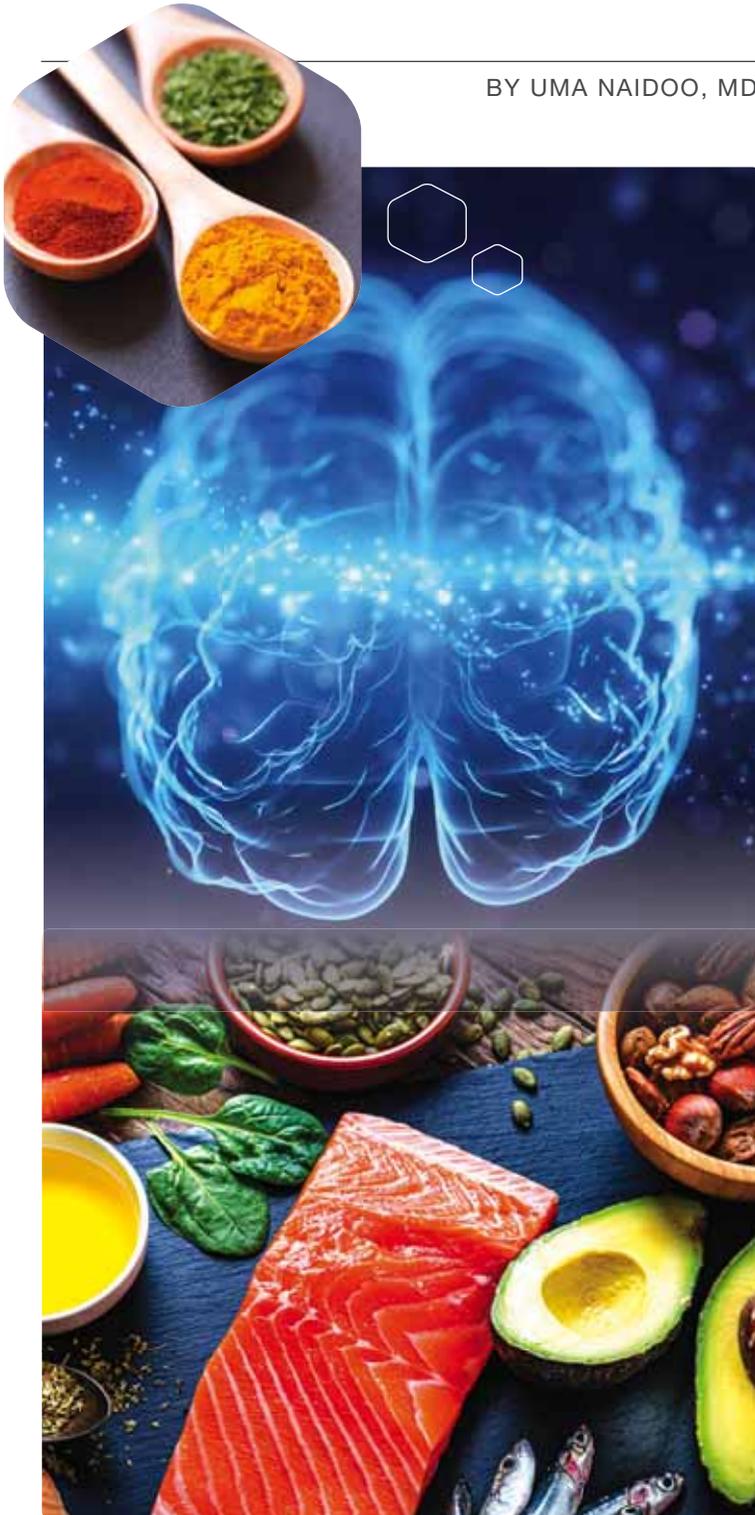
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This is Your Brain on Food

An Indispensable Guide to the Surprising Foods that Fight Depression, Anxiety, PTSD, OCD, ADHD, and More

BY UMA NAIDOO, MD



Food has a profound effect on **mental health**. It impacts your risk of depression, brain fog, and Alzheimer's, and plays a role in libido, sleep, OCD, and much more.

In *This is Your Brain on Food*, board-certified psychiatrist, nutrition specialist, and professionally trained chef Uma Naidoo reveals cutting-edge research on the direct connection between the gut and the brain.

Naidoo says that because many doctors overlook this connection, they are missing a key component to successful treatment and recovery.

"Until we solve nutritional problems, no amount of medication and psychotherapy is going to be able to stem the tide of mental issues in our society," said Naidoo.

In this book, Naidoo explains how you can use diet to achieve well-being in every aspect of your mental health. She offers practical advice on what to eat (and what not to eat) to improve your cognitive function, mood, energy, concentration, libido, and more.

She also highlights key nutrients and supplements that help build the foundation of healthy brain function.

In this interview with *Life Extension* Dr. Naidoo explains the critical gut/brain connection, and offers practical tips to help with depression, memory, sleep problems, and more.

—LAURIE MATHENA

LE: How does food influence your brain?

Dr. Naidoo: Food influences your brain directly and indirectly. When food is broken down by the microbiota into fermented and digested materials, its components directly influence neurotransmitters such as serotonin, dopamine, and GABA, which travel to the brain and change the way you think and feel.

When food is broken down, its constituent parts can also pass through the gut wall into the bloodstream, and certain metabolites can act on the brain that way as well.

Food's most profound effect on the brain is through its impact on your gut bacteria. Some foods promote the growth of helpful bacteria, while others inhibit this growth.

Because of that effect, food is some of the most potent mental health medicine available, with dietary interventions sometimes achieving similar results to specifically engineered pharmaceuticals, at a fraction of the price and with few, if any, side effects.

On the other hand, food can also make you sad—certain food groups and eating patterns can have a negative effect on your gut microbiome and your mental health.

The idea of using food as medicine for mental health is central to nutritional psychiatry, and in my opinion, it's crucial to finding meaningful, lasting solutions to mental health problems.

Until we solve nutritional problems, no amount of medication and psychotherapy is going to be able to stem the tide of mental issues in our society.

LE: How can something as basic and natural as eating be as potent as a drug that cost millions of dollars to develop and test?

Dr. Naidoo: The primary reason gut bacteria have such a profound effect on mental health is that they are responsible for making many of the brain chemicals.

If normal gut bacteria are not present, production of neurotransmitters such as dopamine, serotonin,

glutamate, and gamma-aminobutyric acid (GABA)—all critically important for the regulation of mood, memory, and attention—is impacted.

Many psychiatric disorders are rooted in deficits and imbalances of these chemicals, and many psychiatric drugs are tasked with manipulating their levels.

Therefore, if your gut bacteria are intimately involved with producing these vital chemicals, it stands to reason that when your gut bacteria are altered, you risk doing damage to this complex web of body and brain function.

That's a lot of responsibility for a group of microscopic organisms!

LE: Does this mean that your diet can impact your risk of depression?

Dr. Naidoo: When discussing depression and the gut with my patients, I often use the phrase “blue bowel,” a lighthearted name for the very serious relationship between depression and your gut.

Food changes the types of bacteria present in your gut microbiome. Your gut bacteria may become less diverse as a result of your diet, which may cause the bad bacteria to outgrow the good bacteria, triggering a cascade of negative health effects.

Studies in humans appear to confirm this hypothesis. In 2019, psychiatrist Stephanie Cheung and her colleagues summarized findings from six studies that looked at gut health in patients with depression.

They reported that patients with major depressive disorder had at least 50 types of bacterial species in their gut microbiome that were different from those of control subjects without major depressive disorder.





Recent research suggests that bacterial species associated with higher quality-of-life indicators are depleted in depressed subjects, while bacteria that cause inflammation are often found in higher numbers in people suffering from depression.

This tells us that inflammation and depression are closely linked.

LE: If you're suffering from gut-induced depression, how do you reset your gut microbiome to help achieve a healthy mental state?

Dr. Naidoo: The key is to increase probiotics and prebiotics in your diet. Probiotics are live bacteria that convey health benefits when eaten. Probiotic-rich foods contain beneficial bacteria that help your body and brain.

In 2010, Michael Messaoudi and his colleagues studied 55 healthy men and women who were randomly assigned to receive either a daily probiotic formula or a placebo for 30 days.

Compared to the placebo group, those in the probiotic group reported less depression, and urinary levels of cortisol (the body's main stress hormone) were lower, indicating that their brains were less depressed and less stressed.

Why was this the case? Certain species of gut bacteria have the ability to boost levels of brain chemicals such as gamma-aminobutyric acid, which may speed relief from depression and other mental health conditions.

Magnesium is also important for proper brain function. Countless studies have suggested that depression is related to magnesium deficiency. Several case studies, in which patients were treated with **125-300 mg** of magnesium, have demonstrated rapid recovery from major depression, often in less than a week.

LE: Another issue people struggle with as they get older is memory. Why is the typical Western diet so bad for memory?

Dr. Naidoo: High-fat and high-glycemic-index (high-GI) foods can alter brain pathways necessary for learning and memory, with neurons in the hippocampus and prefrontal cortex especially affected.

The hippocampus is the part of the brain most involved in forming relational memories.

High-fat and high-GI diets can affect the hippocampus in a variety of ways. First, the Western diet can hamper the expression of critical growth factors like brain-derived neurotrophic factor and other hormones that promote healthy function in the hippocampus.

Second, poor diets can affect insulin signaling and insulin sensitivity in the body's tissues. It's unclear exactly what insulin's role is in the

hippocampus, but studies have indicated that it likely impacts memory.

One recent study showed that high saturated fat intake in male rats interfered with insulin signaling in the hippocampus, which led to interference with hippocampal function and corresponding relational memory abilities.

Third, a diet high in saturated fat and refined sugar in male rats showed increased oxidative stress, which damages brain cells and reduces the efficacy of cell-to-cell communication in the hippocampus.

Dietary components such as saturated fat may also exacerbate inflammation in the brain, which has been linked to cognitive decline in aging and risk of developing Alzheimer's disease.

Inflammation disrupts many of the chemical pathways instrumental in memory formation, such as those that rely on dopamine and glutamate. The nerves themselves become sluggish and information travels far more slowly.

LE: Besides cutting out high-fat and high-GI foods, what nutrients can someone take to improve memory?

Dr. Naidoo: Curcumin has antioxidant, anti-inflammatory, and neurotrophic activities. In fact, one recent review of 32 animal and laboratory studies showed that it can reverse some brain damage caused by Alzheimer's.

A 2019 review of curcumin studies also showed improvement in attention, overall cognition, and memory.

Another is saffron. In 2010, Shahin Akhondzadeh and his colleagues tested whether saffron could impact cognition. They administered either **15 mg** capsules of saffron or a placebo twice daily to people with mild to moderate Alzheimer's disease.

After 16 weeks, saffron produced a significantly better outcome on cognitive function than placebo.

LE: Many of our readers struggle with getting adequate sleep. How can you eat for better sleep?

Dr. Naidoo: The best recipe for sleep often lines up with a healthy diet. For example, in 2014, Ryoko Katagiri and her colleagues reported that women who ate more noodles and sweets and less vegetables and fish had worse sleep than those with healthier diets.

Broadly speaking, I recommend you follow a healthy, whole-foods diet like the Mediterranean eating pattern, and make sure to include or exclude certain foods based on how they affect your sleep.

LE: What is one specific nutrient that's been proven to help improve sleep?

Dr. Naidoo: You can add improved sleep to the long list of benefits of omega-3 polyunsaturated fatty acids. A number of studies in animals demonstrate that omega-3s decrease inflammation and normalize sleep, and that they protect the brain from memory impairment in sleep-deprived mice.

There are also an increasing number of studies that demonstrate the beneficial effects of omega-3s on human sleep.

For instance, in 2018 Leila Jahangard and her colleagues conducted a study on 50 depressed patients. Compared to those on a placebo, the participants who received omega-3s improved their depression, anxiety, and emotional control, and over time they improved their sleep as well.

LE: What are some ways to help clear up brain fog?

Dr. Naidoo: "Brain fog" occurs when you cannot think clearly, when you cannot concentrate or multitask, or when you lose short-term and long-term memory.

In 2015, Theoharis Theoharides and his colleagues showed that luteolin, a type of flavonoid, has numerous neuroprotective properties that decrease brain fog. As an antioxidant and anti-inflammatory agent, this substance prevents toxic destruction of nerve cells in the brain.

In 2018, Lucy Harper and her colleague Justine Bold showed that gluten can cause brain fog. After consuming gluten, some people find themselves thinking less clearly and wanting to sleep all day. If you are suffering from brain fog, cut out gluten to see if you improve. It may turn out that you have celiac disease or non-celiac gluten sensitivity.

Phosphatidylserine (PS) is required for healthy nerve cell membranes and coverings, and its protective effects can prevent brain fog. In 2010, Akito Kato-Kataoka explained that six months of soybean-derived PS improved memory function in elderly Japanese adults.

LE: What are your thoughts on taking drugs to treat mental health issues?

Dr. Naidoo: Modern mental health medications can be a godsend to patients who struggle with a variety of disorders, and I don't want to downplay their importance as a therapy in many circumstances.

But what sometimes gets lost in discussions about mental health is a simple truth: the food you eat can

have just as profound an effect on your brain as the drugs you take.

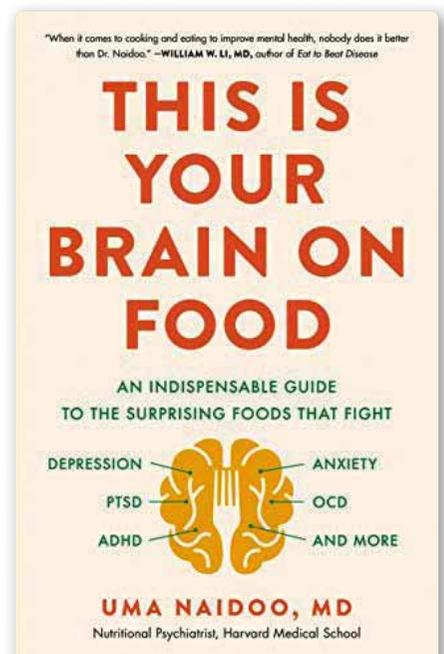
It's important to work with a mental health professional to develop the right mix of psychotherapy and antidepressant medication when necessary. But no matter what, the food you eat will be an important part of the puzzle. •

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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Apples

BY LAURIE MATHENA



When it comes to superfoods, it doesn't get much more nutrient-dense, tasty, portable, or versatile than apples.

Eating just *one* apple per day has been associated with a lower risk of dying from **cardiovascular disease, cancer, or all-cause mortality**.¹

But eating **more** could be even better.

According to a study published in the *American Journal of Clinical Nutrition*, eating **two apples** per day reduced LDL cholesterol and triglyceride levels in people with slightly elevated levels.²

Higher apple consumption has been tied to a lower risk of numerous types of cancer,³ along with a lower risk of cardiovascular disease, asthma, and type II diabetes.⁴

A review of human, culture, and animal studies has also demonstrated that frequent apple consumption has beneficial effects on lipid metabolism, vascular function, and inflammation.⁵

This could be due in part to their high level of phytochemicals such as quercetin, flavonoids, and carotenoids.⁴

These studies prove the truth of the popular adage: An apple a day really can keep the doctor away. •

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- 00020 Lecithin
- 02101 Memory Protect

- 00709 Migra-Eeze™
- 01603 Neuro-Mag® Magnesium L-Threonate Caps
- 02032 Neuro-Mag® Magnesium L-Threonate Powder
- 00888 Optimized Ashwagandha
- 01676 PS (Phosphatidylserine) Caps
- 02406 Quick Brain Nootropic
- 01327 Vinpocetine

CHOLESTEROL MANAGEMENT

- 01828 Advanced Lipid Control
- 01359 Cho-Less™
- 01910 CHOL-Support™
- 01030 Red Yeast Rice
- 01304 Theaflavins Standardized Extract
- 00372 Vitamin B3 Niacin Capsules

DIGESTION SUPPORT

- 53348 Betaine HCl
- 02412 Bloat Relief
- 30747 Digest RC®
- 07136 Effervescent Vitamin C - Magnesium Crystals
- 02021 Enhanced Super Digestive Enzymes
- 02022 Enhanced Super Digestive Enzymes and Probiotics
- 02033 EsophaCool™
- 01737 Esophageal Guardian
- 01706 Extraordinary Enzymes
- 02100 Gastro-Ease™
- 01122 Ginger Force™
- 00605 Regimint
- 01386 TruFiber®

ENERGY MANAGEMENT

- 01628 Adrenal Energy Formula • 60 veg capsules
- 01630 Adrenal Energy Formula • 120 veg capsules
- 00972 D-Ribose Powder
- 01473 D-Ribose Tablets
- 01900 Energy Renew
- 01544 Forskolin
- 01805 Ginseng Energy Boost
- 00668 Metabolic Advantage Thyroid Formula™
- 01869 Mitochondrial Basics with PQQ
- 01868 Mitochondrial Energy Optimizer with PQQ
- 01904 NAD+ Cell Regenerator™ • 100 mg, 30 veg capsules
- 02344 NAD+ Cell Regenerator™ 300 mg, 30 veg capsules
- 02348 NAD+ Cell Regenerator™ and Resveratrol
- 01500 PQQ Caps • 10 mg, 30 vegetarian capsules
- 01647 PQQ Caps • 20 mg, 30 vegetarian capsules
- 00889 Rhodiola Extract
- 02003 Triple Action Thyroid

EYE HEALTH

- 01923 Astaxanthin with Phospholipids
- 00893 Brite Eyes III
- 02323 Digital Eye Support
- 01514 Eye Pressure Support with Mirtogenol®
- 01992 MacuGuard® Ocular Support with Saffron
- 01993 MacuGuard® Ocular Support with Saffron & Astaxanthin
- 01873 Standardized European Bilberry Extract
- 01918 Tear Support with MaquiBright®

FISH OIL & OMEGAS

- 02311 Clearly EPA/DHA Fish Oil
- 01937 Mega EPA/DHA
- 02218 Mega GLA Sesame Lignans
- 01983 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract • 60 softgels
- 01988 Super Omega-3 Plus EPA/DHA Fish Oil, Sesame Lignans, Olive Extract, Krill & Astaxanthin
- 01982 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract • 120 softgels

- 01985 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract • 60 enteric coated softgels
- 01984 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract • 120 enteric coated softgels
- 01986 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract • 240 softgels
- 01812 Provinal® Purified Omega-7
- 01640 Vegetarian DHA

FOOD

- 02008 California Estate Extra Virgin Olive Oil
- 02170 Rainforest Blend Decaf Ground Coffee
- 02169 Rainforest Blend Ground Coffee
- 02171 Rainforest Blend Whole Bean Coffee
- 00438 Stevia™ Organic Liquid Sweetener
- 00432 Stevia™ Sweetener

GLUCOSE MANAGEMENT

- 01503 CinSulin® with InSea²® and Crominex® 3+
- 01620 CoffeeGenic® Green Coffee Extract
- 02122 Glycemic Guard™
- 00925 Mega Benfotiamine
- 01803 Tri Sugar Shield®

HEART HEALTH

- 01066 Aspirin (Enteric Coated)
- 01842 BioActive Folate & Vitamin B12 Caps
- 01700 Cardio Peak™
- 02121 Homocysteine Resist
- 02018 Optimized Carnitine
- 01949 Super-Absorbable CoQ10 Ubiquinone with *d*-Limonene • 50 mg, 60 softgels
- 01951 Super-Absorbable CoQ10 Ubiquinone with *d*-Limonene • 100 mg, 60 softgels
- 01929 Super Ubiquinol CoQ10
- 01427 Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 50 mg, 30 softgels
- 01425 Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 50 mg, 100 softgels
- 01437 Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 100 mg, 30 softgels
- 01426 Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 100 mg, 60 softgels
- 01431 Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 200 mg, 30 softgels
- 01733 Super Ubiquinol CoQ10 with PQQ
- 01859 TMG Liquid Capsules
- 00349 TMG Powder

HORMONE BALANCE

- 00454 DHEA • 15 mg, 100 capsules
- 00335 DHEA • 25 mg, 100 capsules
- 00882 DHEA • 50 mg, 60 capsules
- 00607 DHEA • 25 mg, 100 vegetarian dissolve in mouth tablets
- 01689 DHEA • 100 mg, 60 veg capsules
- 02368 Optimized Broccoli and Cruciferous Blend
- 00302 Pregnenolone • 50 mg, 100 capsules
- 00700 Pregnenolone • 100 mg, 100 capsules
- 01468 Triple Action Cruciferous Vegetable Extract
- 01469 Triple Action Cruciferous Vegetable Extract and Resveratrol

IMMUNE SUPPORT

- 02411 5 Day Elderberry Immune
- 00681 AHCC®
- 02302 Bio-Quercetin®
- 02410 Black Elderberry + Vitamin C
- 01961 Enhanced Zinc Lozenges
- 01704 Immune Modulator with Tinofend®
- 02425 Immune Packs with Vitamin C & D, Zinc and Probiotic

- 02005 Immune Senescence Protection Formula™
- 00316 Kyolic® Garlic Formula 102
- 00789 Kyolic® Reserve
- 01681 Lactoferrin (Apolactoferrin) Caps
- 02426 Mushroom Immune with Beta Glucans
- 01903 NK Cell Activator™
- 01394 Optimized Garlic
- 01309 Optimized Quercetin
- 01811 Peony Immune
- 00525 ProBoost Thymic Protein A
- 01708 Reishi Extract Mushroom Complex
- 01906 Standardized Cistanche
- 13685 Ten Mushroom Formula®
- 01097 Ultra Soy Extract
- 01561 Zinc Lozenges

INFLAMMATION MANAGEMENT

- 01639 5-LOX Inhibitor with AprèsFlex®
- 02324 Advanced Curcumin Elite™
Turmeric Extract, Ginger & Turmerones
- 01709 Black Cumin Seed Oil
- 02310 Black Cumin Seed Oil and Curcumin Elite™
- 00202 Boswellia
- 02467 Curcumin Elite™ Turmeric Extract • 30 veg capsules
- 02407 Curcumin Elite™ Turmeric Extract • 60 veg capsules
- 01804 Cytokine Suppress® with EGCG
- 02223 Pro-Resolving Mediators
- 00318 Serrafazyme
- 01203 Specially-Coated Bromelain
- 00407 Super Bio-Curcumin® Turmeric Extract
- 01254 Zyflamend™ Whole Body

JOINT SUPPORT

- 02404 Arthro-Immune Joint Support
- 02238 ArthroMax® Advanced NT2 Collagen™ & AprèsFlex®
- 01617 ArthroMax® with Theaflavins & AprèsFlex®
- 02138 ArthroMax® Elite
- 00965 Fast-Acting Joint Formula
- 02430 Fast Acting Relief
- 00522 Glucosamine/Chondroitin Capsules
- 02420 Glucosamine Sulfate
- 02424 Joint Mobility
- 01600 Krill Healthy Joint Formula
- 01050 Krill Oil
- 00451 MSM (Methylsulfonylmethane)
- 02231 NT2 Collagen™

KIDNEY & BLADDER SUPPORT

- 00862 Cran-Max® Cranberry Whole Fruit Concentrate
- 01424 Optimized Cran-Max® with Ellirose™
- 01921 Uric Acid Control
- 01209 Water-Soluble Pumpkin Seed Extract

LIVER HEALTH & DETOXIFICATION

- 01922 Advanced Milk Thistle • 60 softgels
- 01925 Advanced Milk Thistle • 120 softgels
- 02240 Anti-Alcohol Complex
- 01651 Calcium D-Glucarate
- 01571 Chlorophyllin
- 01522 Milk Thistle • 60 veg capsules
- 02402 FLORASSIST® Liver Restore™
- 01541 Glutathione, Cysteine & C
- 01393 HepatoPro
- 01608 Liver Efficiency Formula
- 01534 N-Acetyl-L-Cysteine
- 00342 PectaSol-C® Modified Citrus Pectin Powder
- 01080 PectaSol-C® Modified Citrus Pectin Capsules
- 01884 Silymarin
- 02361 SOD Booster

LONGEVITY & WELLNESS

- 00457 Alpha-Lipoic Acid
- 01625 AppleWise
- 02414 Bio-Fisetin
- 01214 Blueberry Extract
- 01438 Blueberry Extract and Pomegranate
- 02270 DNA Protection Formula
- 02405 Endocannabinoid System Booster
- 02119 GEROPROTECT® Ageless Cell™
- 02415 GEROPROTECT® Autophagy Renew
- 02133 GEROPROTECT® Longevity A.I.™
- 02401 GEROPROTECT® Stem Cell
- 02211 Grapeseed Extract
- 00954 Mega Green Tea Extract (decaffeinated)
- 00953 Mega Green Tea Extract (lightly caffeinated)
- 01513 Optimized Fucoidan with Maritech® 926
- 02230 Optimized Resveratrol
- 01637 Pycnogenol® French Maritime Pine Bark Extract
- 02210 Resveratrol
- 00070 RNA (Ribonucleic Acid)
- 02301 Senolytic Activator®
- 01208 Super R-Lipoic Acid
- 01919 X-R Shield

MEN'S HEALTH

- 02209 Male Vascular Sexual Support
- 00455 Mega Lycopene Extract
- 02306 Men's Bladder Control
- 01789 PalmettoGuard® Saw Palmetto and Beta-Sitosterol
- 01790 PalmettoGuard® Saw Palmetto/Nettle Root Formula and Beta-Sitosterol
- 01837 Pomi-T®
- 01373 Prelox® Enhanced Sex for Men
- 01940 Super MiraForte with Standardized Lignans
- 02500 Testosterone Elite
- 01909 Triple Strength ProstaPollen™
- 02029 Ultra Prostate Formula

MINERALS

- 01661 Boron
- 02107 Extend-Release Magnesium
- 01677 Iron Protein Plus
- 02403 Lithium
- 01459 Magnesium Caps
- 01682 Magnesium (Citrate)
- 01328 Only Trace Minerals
- 01504 Optimized Chromium with Crominex® 3+
- 02309 Potassium with Extend-Release Magnesium
- 01740 Sea-Iodine™
- 01879 Se-Methyl L-Selenocysteine
- 01778 Super Selenium Complex
- 00213 Vanadyl Sulfate
- 01813 Zinc Caps

MISCELLANEOUS

- 00577 Potassium Iodide
- 00657 Solarshield® Sunglasses

MOOD & STRESS MANAGEMENT

- 02312 Cortisol-Stress Balance
- 00987 Enhanced Stress Relief
- 01074 5 HTP
- 01683 L-Theanine
- 02175 SAMe (S-Adenosyl-Methionine)
200 mg, 30 enteric coated vegetarian tablets
- 02176 SAMe (S-Adenosyl-Methionine)
400 mg, 30 enteric coated vegetarian tablets
- 02174 SAMe (S-Adenosyl-Methionine)
400 mg, 60 enteric coated vegetarian tablets
- 02429 Theanine XR™ Stress Relief

MULTIVITAMINS

- 02199 Children's Formula Life Extension Mix™
- 02498 Comprehensive Nutrient Packs ADVANCED
- 02354 Life Extension Mix™ Capsules
- 02364 Life Extension Mix™ Capsules without Copper
- 02356 Life Extension Mix™ Powder
- 02355 Life Extension Mix™ Tablets
- 02357 Life Extension Mix™ Tablets with Extra Niacin
- 02365 Life Extension Mix™ Tablets without Copper
- 02292 Once-Daily Health Booster • 30 softgels
- 02291 Once-Daily Health Booster • 60 softgels
- 02313 One-Per-Day Tablets
- 02428 Plant-Based Multivitamin
- 02317 Two-Per-Day Capsules • 60 capsules
- 02314 Two-Per-Day Capsules • 120 capsules
- 02316 Two-Per-Day Tablets • 60 tablets
- 02315 Two-Per-Day Tablets • 120 tablets

NERVE & COMFORT SUPPORT

- 02202 ComfortMAX™
- 02303 Discomfort Relief

PERSONAL CARE

- 01006 Biosil™ • 5 mg, 30 veg capsules
- 01007 Biosil™ • 1 fl oz
- 00321 Dr. Proctor's Advanced Hair Formula
- 00320 Dr. Proctor's Shampoo
- 02322 Hair, Skin & Nails Collagen Plus Formula
- 01278 Life Extension Toothpaste
- 00408 Venotone
- 00409 Xyliwhite Mouthwash
- 02304 Youthful Collagen
- 02252 Youthful Legs

PET CARE

- 01932 Cat Mix
- 01931 Dog Mix

PROBIOTICS

- 01622 Bifido GI Balance
- 01825 FLORASSIST® Balance
- 02421 FLORASSIST® Daily Bowel Regularity
- 02125 FLORASSIST® GI with Phage Technology
- 01821 FLORASSIST® Heart Health
- 02250 FLORASSIST® Mood Improve
- 02208 FLORASSIST® Immune & Nasal Defense
- 02120 FLORASSIST® Oral Hygiene
- 02203 FLORASSIST® Prebiotic
- 01920 FLORASSIST® Throat Health
- 02400 FLORASSIST® Winter Immune Support
- 52142 Jarro-Dophilus® for Women
- 00056 Jarro-Dophilus EPS® • 60 veg capsules
- 21201 Jarro-Dophilus EPS® • 120 veg capsules
- 01038 Theralac® Probiotics
- 01389 TruFlora® Probiotics

SKIN CARE

- 80157 Advanced Anti-Glycation Peptide Serum
- 80165 Advanced Growth Factor Serum
- 80170 Advanced Hyaluronic Acid Serum
- 80154 Advanced Lightening Cream
- 80155 Advanced Peptide Hand Therapy
- 80175 Advanced Probiotic-Fermented Eye Serum
- 80177 Advanced Retinol Serum
- 80152 Advanced Triple Peptide Serum
- 80140 Advanced Under Eye Serum with Stem Cells
- 80137 All-Purpose Soothing Relief Cream
- 80139 Amber Self MicroDermAbrasion
- 80118 Anti-Aging Mask
- 80151 Anti-Aging Rejuvenating Face Cream

- 80153 Anti-Aging Rejuvenating Scalp Serum
- 80179 Brightening Peptide Serum
- 80176 Collagen Boosting Peptide Cream
- 80156 Collagen Boosting Peptide Serum
- 02408 Collagen Peptides for Skin & Joints
- 80180 CoQ10 and Stem Cell Rejuvenation Cream
- 80169 Cucumber Hydra Peptide Eye Cream
- 02423 Daily Skin Defense
- 80141 DNA Support Cream
- 80163 Eye Lift Cream
- 80123 Face Rejuvenating Anti-Oxidant Cream
- 80109 Hyaluronic Facial Moisturizer
- 80110 Hyaluronic Oil-Free Facial Moisturizer
- 80138 Hydrating Anti-Oxidant Facial Mist
- 00661 Hydroderm
- 55495 Intensive Moisturizing Cream
- 80103 Lifting & Tightening Complex
- 80168 Melatonin Advanced Peptide Cream
- 80114 Mild Facial Cleanser
- 80172 Multi Stem Cell Hydration Cream
- 80159 Multi Stem Cell Skin Tightening Complex
- 80122 Neck Rejuvenating Anti-Oxidant Cream
- 80174 Purifying Facial Mask
- 80150 Renewing Eye Cream
- 80142 Resveratrol Anti-Oxidant Serum
- 01938 Shade Factor™
- 02129 Skin Care Collection Anti-Aging Serum
- 02130 Skin Care Collection Day Cream
- 02131 Skin Care Collection Night Cream
- 80166 Skin Firming Complex
- 02096 Skin Restoring Ceramides
- 80130 Skin Stem Cell Serum
- 80164 Skin Tone Equalizer
- 80143 Stem Cell Cream with Alpine Rose
- 80148 Tightening & Firming Neck Cream
- 80161 Triple-Action Vitamin C Cream
- 80162 Ultimate MicroDermabrasion
- 80173 Ultimate Peptide Serum
- 80178 Ultimate Telomere Cream
- 80160 Ultra Eyelash Booster
- 80101 Ultra Wrinkle Relaxer
- 80113 Under Eye Refining Serum
- 80104 Under Eye Rescue Cream
- 80171 Vitamin C Lip Rejuvenator
- 80129 Vitamin C Serum
- 80136 Vitamin D Lotion
- 80102 Vitamin K Cream

SLEEP

- 01512 Bioactive Milk Peptides
- 02300 Circadian Sleep
- 01551 Enhanced Sleep with Melatonin
- 01511 Enhanced Sleep without Melatonin
- 02234 Fast-Acting Liquid Melatonin
- 01669 Glycine
- 02308 Herbal Sleep PM
- 01722 L-Tryptophan
- 01668 Melatonin • 300 mcg, 100 veg capsules
- 01083 Melatonin • 500 mcg, 200 veg capsules
- 00329 Melatonin • 1 mg, 60 capsules
- 00330 Melatonin • 3 mg, 60 veg capsules
- 00331 Melatonin • 10 mg, 60 veg capsules
- 00332 Melatonin • 3 mg, 60 veg lozenges
- 02201 Melatonin IR/XR
- 01787 Melatonin 6 Hour Timed Release
300 mcg, 100 veg tablets
- 01788 Melatonin 6 Hour Timed Release
750 mcg, 60 veg tablets

- 01786 Melatonin 6 Hour Timed Release 3 mg, 60 veg tablets
- 01721 Optimized Tryptophan Plus
- 01444 Quiet Sleep
- 01445 Quiet Sleep Melatonin
- 02502 Rest & Renew

VITAMINS

- 01533 Ascorbyl Palmitate
- 00920 Benfotiamine with Thiamine
- 00664 Beta-Carotene
- 01945 BioActive Complete B-Complex
- 00102 Biotin
- 00084 Buffered Vitamin C Powder
- 02229 Fast-C® and Bio-Quercetin Phytosome
- 02075 Gamma E Mixed Tocopherol Enhanced with
Sesame Lignans
- 02070 Gamma E Mixed Tocopherol & Tocotrienols
- 01913 High Potency Optimized Folate
- 01674 Inositol Caps
- 02244 Liquid Vitamin D3 • 50 mcg (2000 IU)
- 02232 Liquid Vitamin D3 (Mint) • 50 mcg (2000 IU)
- 01936 Low-Dose Vitamin K2
- 00065 MK-7
- 00373 No Flush Niacin
- 01939 Optimized Folate (L-Methylfolate)
- 01217 Pyridoxal 5'-Phosphate Caps
- 01400 Super Absorbable Tocotrienols
- 02334 Super K
- 02335 Super K Elite
- 01863 Super Vitamin E
- 02422 Vegan Vitamin D3
- 02028 Vitamin B5 (Pantothenic Acid)
- 01535 Vitamin B6
- 00361 Vitamin B12 Methylcobalamin
- 01536 Vitamin B12 Methylcobalamin • 1 mg, 60 veg lozenges
- 01537 Vitamin B12 Methylcobalamin • 5 mg, 60 veg lozenges
- 02228 Vitamin C and Bio-Quercetin Phytosome • 60 veg tablets
- 02227 Vitamin C and Bio-Quercetin Phytosome • 250 veg tablets
- 01753 Vitamin D3 • 25 mcg (1000 IU), 90 softgels
- 01751 Vitamin D3 • 25 mcg (1000 IU), 250 softgels
- 01713 Vitamin D3 • 125 mcg (5000 IU), 60 softgels
- 01718 Vitamin D3 • 175 mcg (7000 IU), 60 softgels
- 01758 Vitamin D3 with Sea-Iodine™
- 02040 Vitamins D and K with Sea-Iodine™

WEIGHT MANAGEMENT & BODY COMPOSITION

- 02479 7-Keto® DHEA Metabolite • 100 mg, 60 veg capsules
- 01509 Advanced Anti-Adipocyte Formula
- 01807 Advanced Appetite Suppress
- 02207 AMPK Metabolic Activator
- 02504 Body Trim and Appetite Control
- 02478 DHEA Complete
- 01738 Garcinia HCA
- 01908 Mediterranean Trim with Sinetrol™ -XPur
- 01432 Optimized Saffron
- 00818 Super CLA Blend with Sesame Lignans

WOMEN'S HEALTH

- 01942 Breast Health Formula
- 01626 Enhanced Sex for Women 50+
- 01894 Estrogen for Women
- 01064 Femmenessence MacaPause®
- 02204 Menopause 731™
- 02319 Prenatal Advantage
- 01441 Progesta-Care®
- 01649 Super-Absorbable Soy Isoflavones

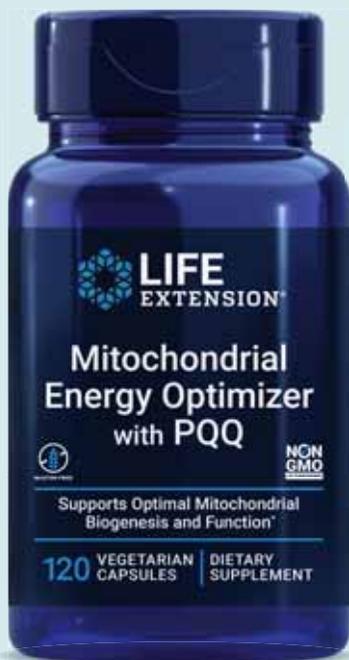
PROTECT & ENERGIZE

Your Aging Cells

1,000 mg
CARNOSINE

800 mg
TAURINE

150 mg
BENFOTIAMINE



150 mg
R-LIPOIC ACID

100 mg
PYRIDOXAL

10 mg PQQ—
PYRROLOQUINOLINE
QUINONE

SUPER SALE PRICE

Mitochondrial Energy Optimizer with PQQ

Item #01868 | 120 vegetarian capsules

1 bottle **\$45.90** | 4 bottles \$40.50 each

When **sugar** binds to **proteins** in your body, toxic **glycation** reactions destroy healthy cell **structures**.

Carnosine, **benfotiamine**, and **pyridoxal-5-phosphate** are powerful anti-**glycation** nutrients.

PQQ and **R-lipoic acid** promote healthy cell energizing **mitochondria** function.

Mitochondrial Energy Optimizer provides a spectrum of nutrients at a fraction of the cost of buying them individually.

For full product description and to order **Mitochondrial Energy Optimizer with PQQ**, call 1-800-544-4440 or visit www.LifeExtension.com

Bio-Enhanced® is a registered trademark of Geronova Research, Inc. Lyc-O-Mato® is a registered trademark of Lycored, Corp.



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.

**HIGHLY
PURIFIED**

FISH OIL



SUPER OMEGA-3 PLUS

EPA/DHA Fish Oil, Sesame Lignans,
Olive Extract, Krill & Astaxanthin
(2,520 mg of EPA + DHA in four softgels)

SUPER SALE PRICE

Item #01988 • 120 softgels
1 bottle **\$30.38** • 4 bottles \$28.35 each



SUPER OMEGA-3*

EPA/DHA Fish Oil,
Sesame Lignans & Olive Extract
(2,400 mg of EPA + DHA in four softgels)

SUPER SALE PRICE

Item #01982 • 120 softgels
1 bottle **\$21.60** • 4 bottles \$18.90 each

For full product description and to order **Super Omega-3**, or **Super Omega-3 Plus**,
call **1-800-544-4440** or visit www.LifeExtension.com

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

* Highest Independent 5-star rating, International Fish Oil Society For Over Nine Years. IFOS™ certification mark is a registered trademark of Nutrasource Diagnostics, Inc.

These products have been tested to the quality and purity standards of the IFOS™ program conducted at Nutrasource Diagnostics, Inc.

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.



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