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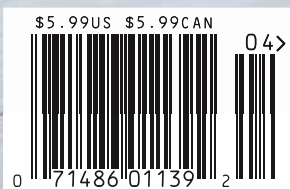
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April 2022

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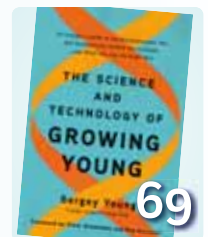
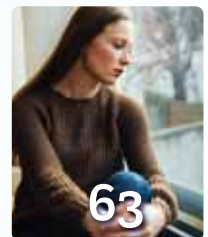
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* *Br J Pharmacol.* 2004 Mar;141(5):825-30.



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Impact of Vitamin D on Autoimmune Risk



WILLIAM FALOON

Autoimmunity occurs when the **immune system** mistakenly targets healthy body tissues.

These misdirected **immune attacks** result in **damage** to normal tissues.

Autoimmune disorders are one of the **largest** classes of illnesses in the United States.

Diseases with a known or suspected **autoimmune** component include:

- **Rheumatoid arthritis**
- **Multiple sclerosis**
- **Type I diabetes**
- **Ulcerative colitis**
- **Lupus**
- **Myasthenia gravis**
- **Psoriasis**
- **Raynaud's**
- **Hashimoto's thyroiditis**
- **Vasculitis**
- **Crohn's disease**
- **Grave's disease**

A recent study found that the prevalence of a common **biomarker** of **autoimmunity** is *increasing* in the United States.¹

Treatments for autoimmune disorders vary and often focus on *reducing* immune activity.²

A side effect of **immune suppression** is *increased* risk of certain **cancers**, along with higher risk of bacterial, fungal, and viral **infections**.³

A landmark placebo-controlled **prevention** trial studied a large group of people for over **five years**.⁴

The findings indicate that most readers of **Life Extension® Magazine** are reducing their **auto-immune disease** risk by **25%-30%**.

This article describes an increase in **autoimmune prevalence** and what can be done to reduce this risk.



Autoimmunity occurs when the **immune system** produces **antibodies** that **attack** the body’s own tissues.

A common method to screen for potential **autoimmunity** is the **antinuclear antibody** blood test or “**ANA**” for short.

In a study published in **June 2020**, researchers found that the prevalence of positive **antinuclear antibody (ANA)** tests is *increasing* in the United States.¹

Groups with the greatest increase in this biomarker of **autoimmune disease** include males, non-Hispanic whites, adults 50 years and older, and adolescents.

This study was the first to evaluate **ANA** changes over time in a large representative sampling of the American population.⁵

The study evaluated over **14,000** people enrolled in the **U.S. National Health and Nutrition Examination Survey (NHANES)**.

The following increases in **ANA** (antinuclear antibodies) prevalence were found:

PERIOD	ANA PREVALENCE
1988-1991	11.0%
1999-2004	11.5%
2011-2012	15.9%



The percentages for the **2011-2012** period correspond to an approximate **41 million** individuals who may be afflicted by quality-of-life-robbing **auto-immune disorders** that shorten overall **longevity**.

The scientists conducting this analysis state that the observed **ANA** increases were not explained by current trends in weight, alcohol, or smoking exposure.

The findings are concerning because they suggest troubling potential *increases* in future **autoimmune disease** cases.

First Comprehensive List of Autoimmune Diseases

In **November 2020**, a nonprofit group called the **Autoimmune Registry** (www.autoimmuneregistry.org) published a comprehensive list of over **150 autoimmune diseases** along with links to published literature and information about possible treatment options.⁶

This group states that between **15-30 million** people in the United States suffer from an **autoimmune disorder**.

The **Autoimmune Registry** emphasizes how **autoimmune diseases** can affect every part of the human body—including skin, blood vessels, nerves, and immune and digestive systems.

Their list includes well-known diseases like **lupus, rheumatoid arthritis, celiac disease, multiple sclerosis, and type I diabetes**.

Dozens of rarer diseases like hemolytic anemia, myasthenia gravis, cytopenia, and vasculitis are also listed.





Human Autoimmune Study

In **November 2021**, findings from a follow-up analysis from a major clinical trial were published.⁴

In this study, subjects were randomized to receive daily **vitamin D** and **fish oil** or **placebo** for five years.⁷

This nationwide, double-blind, placebo-controlled trial enrolled men at least 50 years of age and women at least 55.

Compared to the **placebo** group, those given **vitamin D3** and **omega-3** supplements had a **25%-30% reduced** incidence of **autoimmune disease**.⁴

Impressive Study Size and Design

This **November 2021** published study is not the first to indicate protection against **autoimmune** disorders with **vitamin D** or **omega-3s**.⁴

Vitamin D has been associated with reduced risk of several autoimmune diseases in some observational studies, but a large, randomized, controlled trial has been lacking.⁸⁻¹⁰

Smaller clinical trials with dietary fish oil **omega-3** fatty acids have suggested that supplementation may help decrease the abnormal immune activation against otherwise healthy cells and tissues observed in autoimmunity.¹¹⁻¹³

No prior rigorous studies (i.e., large, randomized controlled trials), however, tested whether **supplementation** lowers risk of developing **autoimmune disease**.

This recent study tested **vitamin D3** and **omega-3 supplements** versus **placebo** for prevention of **autoimmune** diseases in 25,871 Americans for a median of over **five years**.

The daily supplemental dose was **2,000 IU** of **vitamin D3** and **1,000 mg** of **omega-3** fatty acids.

Impact of Longer-Term Vitamin D Supplementation

In this study showing a **25%-30% reduction** in **autoimmune disease** risk, the effect of **vitamin D3** appeared to strengthen after two years of supplementation.⁴

When the first two years of supplementation were excluded, the **vitamin D3** group had a nearly **40% reduced autoimmune** risk at a median of **5.3 years**.

This is an important finding that confirms, for autoimmune disease, what has previously been observed—including in results from this same study cohort—for **cancer**. The effects of vitamin D on reducing cancer incidence and mortality become evident, or more pronounced, after continuous supplementation for one or two years or more.¹⁴⁻¹⁶

One reason for this is that some people in these studies have **preexisting cancers** that are only formally diagnosed one to two years after the study starts. When *longer* term data are analyzed, improved protective effects can be demonstrated.

Be it **nutrient supplementation** or controlling **hypertension** with **medications**, the *earlier* one initiates an effective strategy, the greater the likelihood of a successful outcome.

Serendipitous Benefits of Vitamin D + Omega-3s

According to one survey, the illnesses that people fear most are cancer, dementia, and cardiovascular disease.¹⁷

When stricken with **autoimmune disorders**, people are often bewildered because they gave it little thought before symptoms manifest.

Most readers of this publication **supplement** with **vitamin D** and **omega-3s** to help protect against common age-related maladies.

This in turn may have provided a robust degree of serendipitous protection against a growing trend of **autoimmune** blood indicators.

For longer life,



William Faloon,
Co-Founder, Life Extension

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In this Month's Issue...

Life Extension has long urged supporters to include **walnuts** as part of their regular diet. Favorable data continue to pour in from **human** studies showing remarkable disease risk reductions in those who ingest **walnuts**. The article on page 32 of this month's issue describes some of these new findings.

Reduced mental energy, clarity, focus, and performance are symptoms of **brain fog**. Page 24 introduces an easy method to think more clearly.

Other articles published this month reveal ways to help manage blood **glucose** levels, improve mood, and boost **immune** defenses.

SUSTAINED SUPPORT

24
HOURS
A DAY



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Mary

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

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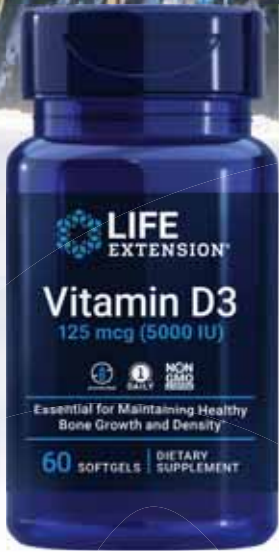


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In the News



Eating More Fish Linked to Benefits for the Brain

People who eat higher amounts of fish have lower vascular brain disease, according to a study published in *Neurology*.^{*} Vascular brain disease, which involves damage to the brain's blood vessels, increases the risk of vascular dementia and stroke.

Researchers analyzed MRI brain scans of 1,623 people 65 and over who had no history of stroke, cardiovascular disease, or dementia. The individuals also filled out dietary questionnaires.

Participants who ate the most fish had fewer signs of blood vessel disease in their brains compared to those who ate it less frequently.

Editor's Note: This association was strongest in people ages 65-69, compared to older individuals in the study.

^{*} *Neurology*. 2021 Nov 30;97(22).

Diabetes Screening Age Lowered from 40 to 35 for Overweight and Obese People

The U.S. Preventive Services Task Force has lowered the age at which overweight and obese people should begin screening for diabetes from 40 to 35, a recommendation statement in *JAMA* urged.*

According to the Task Force, there is a spike in the prevalence of both diabetes and prediabetes around age 35.

Lowering the screening age from 40 to 35 could help identify people with prediabetes and give them time to prevent full-blown diabetes by adopting a healthier diet, exercising more, and losing weight, the Task Force stated.

Editor's Note: "Diabetes is the leading cause of kidney failure and new cases of blindness among adults in the U.S.," the statement noted.

* *JAMA*, 2021;326(8):736-743.





Curcumin for Inflammatory Bowel Disease

Patients with inflammatory bowel disease who received curcumin experienced improvements, compared with those getting a placebo, a meta-analysis published in *Complementary Therapies in Medicine* found.*

Pooled analysis of the participants' data revealed an increase in clinical remission for those taking curcumin, compared to controls. This remained significant among patients aged 40 years and older. In two studies that reported changes in clinical symptoms, improvement was also observed in curcumin-treated participants.

Editor's Note: Additionally, among the six studies in which participants underwent endoscopy, endoscopic remission in participants treated with curcumin significantly increased among those 40 years of age and older.

* *Complement Ther Med.* 2021 Oct 29;63:102787.

Higher Vitamin D Pre-Op Levels Aid Recovery from Hip-Fracture Surgery

A study reported in the *Journal of Bone Metabolism* revealed an association between deficient vitamin D levels and diminished functional recovery with prolonged hospitalization among men and women who underwent surgery for hip fracture.*

The study included 1,029 individuals aged 65 years or older with a hip fracture that required surgery. Measurement of 25-hydroxyvitamin D levels upon hospital admission revealed vitamin D deficiency among 702 patients.

The average length of hospitalization was 27.7 days among patients with vitamin D deficiency compared to 20.9 days among those whose levels were considered sufficient.

Vitamin D deficiency was significantly associated with:

- **1.52** times greater odds of developing postoperative delirium, and
- **2.41** times greater odds of developing a blood clot.

Editor's Note: Patients with vitamin D deficiency were also found to have greater odds of postoperative pneumonia compared to those who had sufficient levels.

* *J Bone Metab.* 2021 Nov;28(4):333-338.





Increased Ergothioneine May Prevent Neurodegeneration

Low levels of the amino acid **ergothioneine** have been associated with cognitive decline and could serve as an early warning sign of cognitive impairment, according to research published in the journal *Free Radical Biology and Medicine*.*

Results of the 496-participant study showed that plasma ergothioneine levels were **lowest** in dementia patients, and only intermediate levels were found in people with cognitive impairment.

In multivariate analyses, lower levels of ergothioneine were *significantly associated* with dementia and cognitive impairment.

Editor's Note: Additionally, researchers noted that lower ergothioneine levels “were also associated with white matter hyperintensities and brain atrophy markers (reduced global cortical thickness and hippocampal volumes).”

* *Free Radic Biol Med.* 2021 Dec;177: 201-211.



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Anthony

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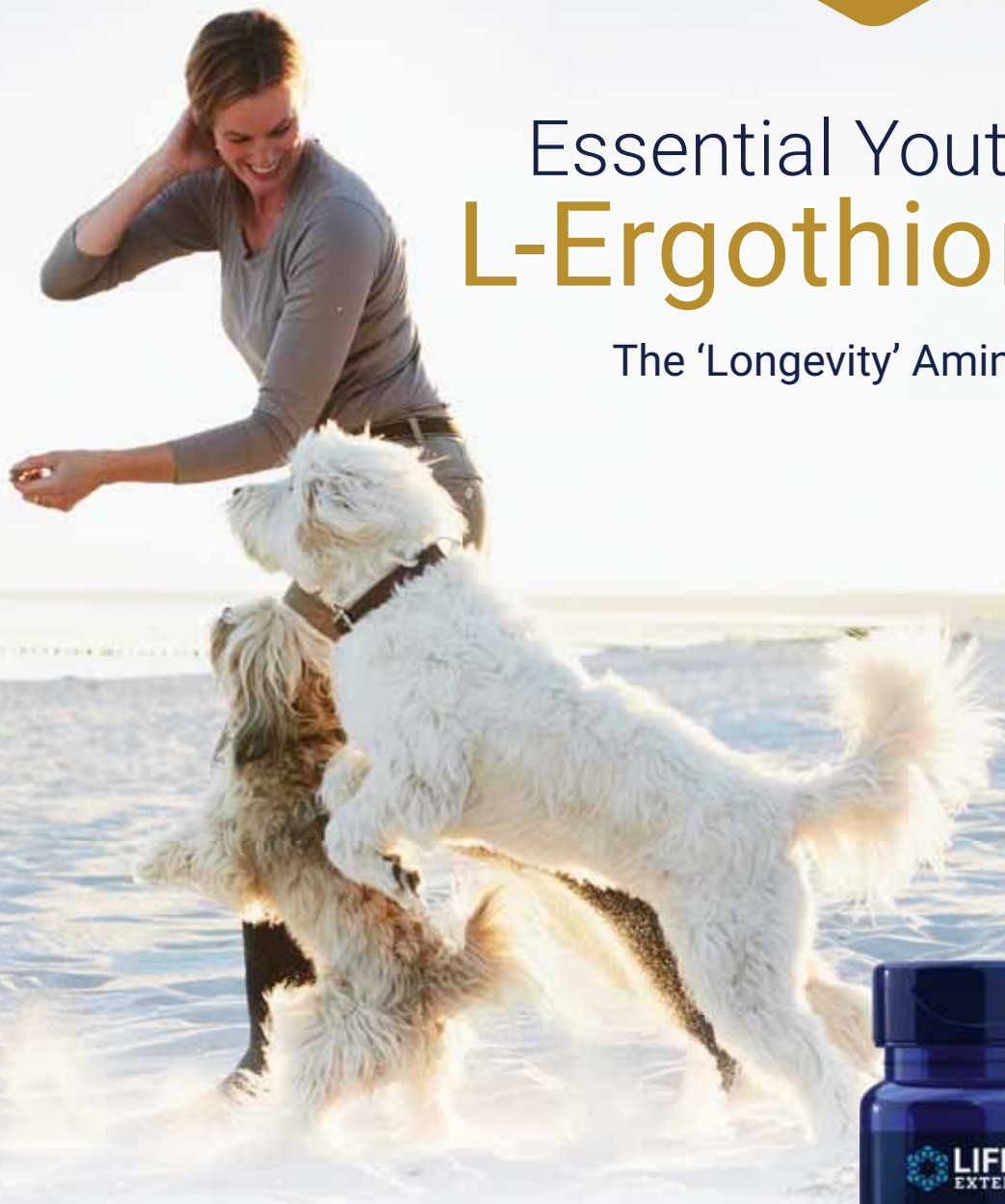
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- Protecting against **mitochondrial DNA** damage¹
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One daily capsule of **Essential Youth** provides **5 mg** of **L-ergothioneine**.

This **5 mg** potency exceeds the **L-ergothioneine** contained in 2 cups of white button mushrooms, depending on growing conditions.^{4,5}

References

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2. *J Diet Suppl.* 2020 Dec 7:1-14.
3. *Free Radic Biol Med.* 2009 Apr 15;46(8):1168-76.
4. *FEBS Lett.* 2018 Oct;592(20):3357-66.
5. *Food Chem.* 2017 Oct 15;233:429-33.



Item #02431 • 30 vegetarian capsules

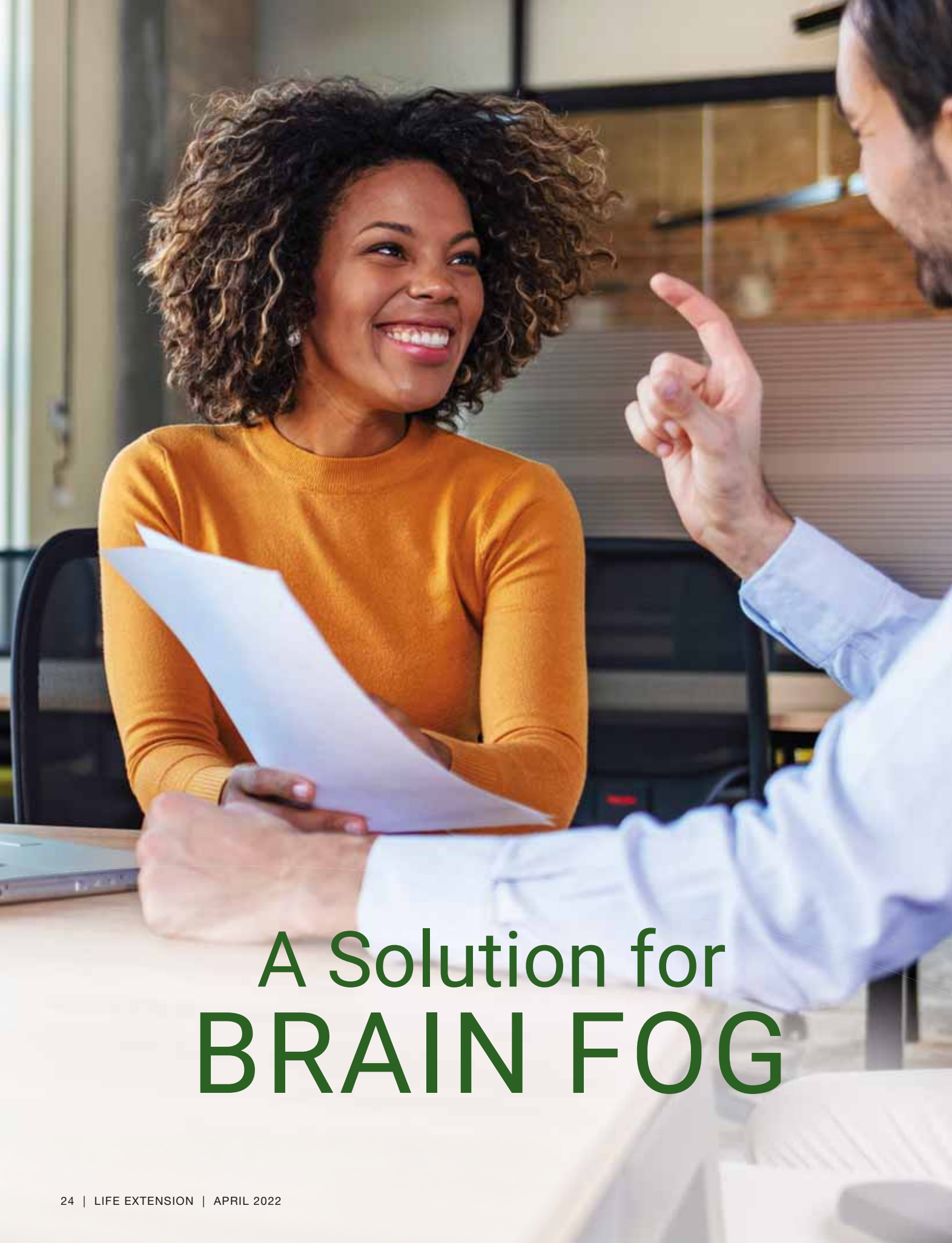
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A Solution for **BRAIN FOG**

BY LISA TANNER



We all have moments when we feel mentally fatigued and find it hard to concentrate. This is often referred to as **brain fog**.

Until recently, it was believed that little could be done about it.

But by studying various medical conditions associated with brain fog, scientists have pinpointed biological alterations in the brain that may cause these feelings of decreased mental energy and sharpness.¹⁻⁷

This research has allowed for the identification of **two** plant-based nutrients that can prevent or potentially even reverse these alterations to bring back mental clarity, energy, and focus.

In clinical studies, **mango leaf extract** containing the compound **mangiferin** improves reaction time, reduces mental fatigue, and boosts attention, performance accuracy, and working memory.^{8,9}

In additional clinical studies, **peppermint oil** significantly *reduces* the development of mental fatigue and *improves* aspects of attention and memory.¹⁰

These two ingredients can help to lift the clouds of brain fog and restore mental energy, clarity, focus, and performance.

What Is Brain Fog?

Brain fog refers to a general feeling of decreased **mental energy** and **focus**. It may be characterized by mental fatigue and clouding, forgetfulness, fuzzy thinking, confusion, and difficulty concentrating.

It's more than an annoyance. It can also decrease **cognitive performance** and hinder the ability to get work done or accomplish goals.

Scientists trying to understand brain fog noted certain medical conditions associated with some of the same mental symptoms.

For example, people with allergies, inflammatory disorders, and dietary sensitivities often complain of brain fog.¹⁻⁷ Over **90%** of patients with **mast cell disorders**, which increase inflammation, report frequent **cognitive impairment** consistent with **brain fog**.²



Even **seasonal allergies** can lead to reduced cognitive performance, including impaired attention, memory problems, and reduced speed of information processing.¹

These observations led scientists to propose that **brain fog** may be caused by several related mechanisms. These include the release of **histamine** (the chemical that causes allergic symptoms), **inflammation**, neurotransmitter **imbalance**, and impairments in neuronal **activity**.¹⁻³

Plant Extracts That Help

When researchers set out to find compounds that could alleviate **brain fog**, they looked for ingredients that met two criteria:

- They had a track record in animal or human studies of improving the **symptoms** of brain fog, like aspects of cognition.
- They targeted the possible **causes** of brain fog, by reducing neuroinflammation, histamine modulation, balancing neurotransmitters, or neuronal activity support.

They found two plant-derived ingredients that were the most promising: **mango leaf extract** and **peppermint oil**.

Mangiferin Boosts Brain Power

Mango leaves, extracts, and teas have long been used in Asian and African countries to treat a range of disorders, including fatigue and exhaustion.

More recently, scientists found that **mango leaf** extracts have **neuroprotective**, anti-inflammatory, and anti-diabetic properties.⁸

Mangiferin is a compound found in mango leaves that is believed to be largely responsible for these effects.

In animal models, mangiferin helps **protect the brain** by reducing oxidative stress and neuroinflammation and by providing neurotransmitter support.¹¹⁻¹³

Animal studies have also found that mangiferin prevents cognitive impairment and memory impairments, symptoms of **brain fog**.¹⁴ In addition, in mice and rat studies, mangiferin was shown to have favorable anti-allergic properties^{15,16} This further suggests benefits against brain fog in those with **allergies**.

WHAT
YOU
NEED
TO
KNOW

More recently, human trials have explored the use of mangiferin-containing extracts in treating symptoms consistent with brain fog.

One study randomized healthy adults into four groups. One group took a mango leaf extract containing **60% mangiferin**, one took **caffeine**, one was given a combination of mangiferin and caffeine, and one received a **placebo**.⁸

The **mango leaf** extract led to a remarkable **47%** improvement in **fatigue** compared to baseline. It also led to an almost **5%** improvement in **reaction time** compared to baseline, which was a significant improvement compared to the placebo group. This was a greater improvement than seen with caffeine alone **or** the combination of caffeine and mangiferin.

Tests of electrical activity in the brain showed that those taking mangiferin had *increased* activity in regions associated with complex cognitive processing, attention, and memory.

In another clinical study, healthy young adults were given either **300 mg** of the mangiferin-containing mango leaf extract or a placebo.⁹ In tests, the extract improved specific areas of cognitive function, including aspects of **attention**, **performance accuracy**, and **working memory**.

These improvements were accompanied by a more **relaxed mood**. This is notable because many people who take caffeine to counter brain fog complain that it *reduces* relaxation and increases nervousness and jitters.

Peppermint Sharpens the Mind

The herb **peppermint** has been traditionally used for its medicinal properties, including as a digestive aid and to promote calming. Its oil contains a high concentration of **monoterpene** compounds, including menthol and menthone.

Studies have shown that plants rich in monoterpenes have cognitive benefits.^{17,18} For example, peppermint teas have been shown to improve **memory** and **mental alertness** in human subjects.¹⁹

Mint species have demonstrated the ability to modulate various **neurotransmitters** in the brain, such as acetylcholine and GABA, which play roles in cognition, mood, and mental alertness.¹⁰

In a clinical trial, researchers randomized healthy adults to receive either **peppermint oil** containing **60% monoterpenes** or a placebo, and tested various aspects of memory, attention, and mood.¹⁰



Banish Brain Fog

- **Brain fog** is a constellation of symptoms that cloud mental function, including reduced mental energy, clarity, focus, and performance.
- Scientists have found clues that inflammation, histamine release, and neurotransmitter imbalances may contribute to brain fog.
- **Mango leaf extract** and **peppermint oil** may help prevent or reverse these potential causes of brain fog.
- Human studies have found that **peppermint oil** and mango leaf extract containing the active compound **mangiferin** each improve aspects of cognition associated with brain fog, including attention, memory, and cognitive performance.
- These two ingredients help combat brain fog and bring back mental focus, attention, energy, and sharpness.



The peppermint oil significantly *reduced* the development of **mental fatigue** and *improved* aspects of **attention** and **working memory**. By contrast, those receiving the **placebo** were severely fatigued within a few hours after the various demanding cognitive tasks.

Peppermint oil and mango leaf extract can help lift brain fog and bring back mental clarity, energy, and focus.

Summary

Brain fog refers to symptoms of reduced mental energy, clarity, focus, and performance.

Research suggests that neuroinflammation, histamine release, and neurotransmitter imbalances can contribute to the development of brain fog symptoms.

Two plant-derived nutrients may help combat brain fog. Preclinical studies show that **mangiferin** from mango leaf extract and **peppermint oil** address the mechanisms thought to contribute to brain fog.

Human studies of mangiferin and peppermint oil show that they improve various aspects of brain fog, reducing **mental fatigue** and improving **attention**, **memory**, and **cognitive performance**.

A combination of these two ingredients may maximize the brain-supporting power of these nutrients and help lift brain fog. ●

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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* *Int Angiol.* 2014 Feb;33(1):20-6.

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- Reduced mental fatigue
- Improved focus and attention, and
- Improved working memory

PEPPERMINT OIL:³

- Reduced mental fatigue
- Improved attention and memory

One softgel provides **fast-acting** benefits within three hours.

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100 vegetarian capsules

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Harvard Study: Eating WALNUTS May EXTEND Your LIFE

BY MICHAEL DOWNEY

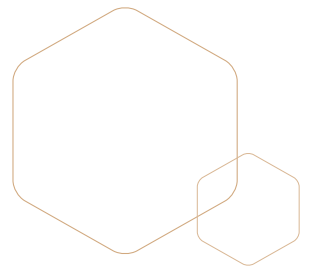
Walnuts provide an array of health benefits.

New evidence suggests that *regular* walnut consumption may contribute to a **longer life**.¹

In a landmark study using data collected over **20 years**, scientists with **Harvard University** discovered a link between eating more walnuts and a lower overall **risk of death** among older adults.

This observational study found that 60-year-old Americans who ate **five or more servings** of **walnuts** per week lived roughly **1.3 years longer** than those who never ate walnuts.¹

They also had a **14%** lower risk of **death from any cause** and a whopping approximate **25%** lower risk of dying from **cardiovascular disease**.



Longer Lifespan

Walnuts contain healthy fats, fiber, vitamins, minerals, and many different compounds with proven health benefits.

Harvard research published in the journal *Nutrients* in **2021** now links walnuts to greater **life expectancy**.¹

Compared to people who never ate walnuts, consuming **five servings** of walnuts per week (with one serving being one ounce) resulted in:¹

- An approximate **1.3-year increase** in **life expectancy**, for 60-year-olds,
- A **14% lower** risk of death from any cause, and
- A **25% lower** risk of dying from cardiovascular disease.

Consumption of just **two to four servings** of walnuts per week also had clear benefits, resulting in:¹

- About a **one-year increase in lifespan**, for 60-year-olds,
- A **13% lower** risk of death from any cause, and
- An approximate **14% lower** risk of death from cardiovascular disease.

The study authors noted that even if your diet needs improvement, eating just **half an ounce** (a half-serving) of walnuts daily could lower the risk of death from any cause by **12%**.

Twenty Years of Study Data

The team from the **Harvard T.H. Chan School of Public Health** analyzed data from **67,014 women** enrolled in the Nurses' Health Study and **26,326 men** in the Health Professionals Follow-up Study. Participants had an average age of just over **63** years.¹

All subjects had completed a survey on walnut consumption and were relatively healthy at the start of the average **20-year** follow-up period. Their diets were checked every four years. This allowed scientists to identify associations between varying levels of **walnut intake** and **life expectancy**.

It's important to note that the researchers found an approximate **1.3-year increase in life expectancy** associated with *higher* walnut consumption—among subjects who had *already* reached the age of **60**.¹

“Even a few handfuls of walnuts per week may help promote longevity,” noted lead investigator Yanping Li, PhD, “especially among those whose diet quality isn't great to begin with.”²



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Nutritional Powerhouse

Walnuts contain nutrients that play an important role in a healthy diet. One ounce contains **4 grams of protein**, **2 grams of fiber**, and **45 mg** of the mineral **magnesium**.³

They also contain **ALA (alpha-linolenic acid)**, an **omega-3 fatty acid** found in plants.³

ALA may improve **blood lipids (fats)**⁴⁻⁶ as well as the function of **endothelial cells** that line the arteries.⁷⁻⁹

Walnut consumption has also been associated with reduced **oxidative stress**.^{10,11}

These nutritional contents may help explain walnuts' contribution to healthy aging and longevity.

Walnuts' powerful effects on lifespan and risk of death may result from their ability to help inhibit many conditions that can shorten **lifespan**. These conditions range from high blood pressure and obesity to diabetes and cancer.

Heart Protection

Walnuts are believed to reduce the risk of **cardiovascular disease**.¹²

One possible reason is that walnut consumption is linked to a *reduction* in **blood pressure**, even among those with existing hypertension.¹³

The Benefits of Walnuts

- Harvard researchers analyzed 20 years of data on over 93,000 older men and women and found that those who ate a **one ounce** serving of **walnuts** five times a week lived roughly **1.3 years longer** than those who didn't eat walnuts.
- Those who ate **five** weekly servings of walnuts had a **14% lower risk of death from any cause** and a **25% lower risk of dying from cardiovascular disease**.
- Other studies suggest that walnut consumption may help protect against heart disease, control type II diabetes, and potentially help lower the risk of Alzheimer's disease and several types of cancer.



High blood pressure is a key risk factor for heart disease and stroke.

High **cholesterol** levels can also result in the development of vascular disease.

Preclinical data suggest that walnuts may *reduce* the production of **lipids** and *improve* blood lipid levels.¹⁴

In a randomized controlled trial, a diet enhanced with **1.5 ounces** of walnuts daily significantly reduced **fasting** levels of multiple atherogenic lipids and lipoproteins, including total cholesterol, non-HDL cholesterol, LDL-cholesterol, triglycerides, and apoB (apolipoprotein B).¹⁵

Another clinical trial of healthy adults between 63 and 79 years old showed that eating about **two ounces** of walnuts daily for two years:¹⁶

- Reduced total cholesterol, LDL and IDL (Intermediate Density Lipoprotein),
- Reduced total **LDL** particles number by **4.3%**, and
- Reduced total small **LDL** particles number (a *more dangerous* form of LDL) by **6.1%**.

Help Controlling Diabetes

Type II diabetes is dangerous for its potential long-term complications, including cardiovascular disease, chronic kidney disease, nerve damage, vision problems, and cognitive impairment.^{17,18}

Accumulating evidence suggests that walnuts and their components may help **lower blood sugar** and reduce the long-term health risks associated with diabetes.¹⁹

A human trial found that consumption of walnut oil daily for three months *lowered* blood sugar levels in diabetes patients by about **8%**. This held true for both the **fasting glucose** level and the **three-month** (HbA1c) blood glucose level.²⁰

A flavonoid in walnuts called **myricetin** has been linked to **antidiabetic** effects due to its ability to enhance the activity of an insulin receptor.²¹

Anti-Cancer Activity

Limited evidence suggests that walnut consumption may lower the risk of certain **cancers**.

In one lab study, **walnuts' peptide fractions** inhibited the growth of **breast cancer** cells by about **63%** and **colon cancer** cells by about **51%**.²²

Animal studies have found that feeding walnuts to mice inhibits the **development** of tumors and decreases tumor **growth** rate and **size**.²³

One analysis compared the estimated lifelong consumption of walnuts, peanuts, and almonds of **breast cancer** patients with people free from breast cancer. Compared to those with no consumption, those with *high* consumption had a **two to three times lower risk** of breast cancer.²⁴

Brain Health

Lab and animal studies show that compounds present in walnuts *reduce oxidative damage and inflammation in brain cells*.²⁵ In a mouse model of Alzheimer's disease, walnuts reduced oxidative damage to **lipids** and **proteins**.²⁶

In an animal model of **Alzheimer's disease**, mice were fed **walnuts** for about 10 months, a significant portion of their lifetimes. Compared to mice given no walnuts, they showed improvements in **memory**, **learning ability**, and more.²⁷

Additional research suggests that walnuts may also lower the risk or progression of other brain disorders, including **Parkinson's disease**, **stroke**, and **depression**.²⁸

Adding a handful of walnuts to your daily diet appears to be a simple way to improve overall health and possibly even extend your lifespan.

Summary

A recent, large study by Harvard University scientists found that 60-year-olds, eating **five weekly servings of walnuts**, had an approximate **1.3-year increase** in lifespan.

There was also a **14% lower** risk of death from any cause and a **25% lower** risk of dying from cardiovascular disease.

Some longevity benefits were found even with fewer weekly servings of walnuts.

Other studies suggest that regular **walnut** consumption may protect against hypertension, high cholesterol, diabetes, cancer, and Alzheimer's disease. ●

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

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BOOST DEFENSES





Against Colds, Flu, and Allergens

BY MICHAEL DOWNEY

Millions of Americans suffer from **colds, flu,** and seasonal **allergies** every year.

Medications only target the *symptoms* but don't address the underlying causes.

Scientists have discovered two unique ingredients—a dried **yeast fermentate** + a **probiotic**—that help prevent these symptoms *and* reduce their severity and duration if they do occur.

Clinical studies show that supplementation with a dried **yeast fermentate** resulted in:^{1,2}

- Increases in **secretory IgA** levels, an antibody that provides mucosal immune defense against viruses and bacteria, and
- Increases in **natural killer cell** activity that destroys infected cells.

In a clinical study, the use of the **probiotic *L. rhamnosus* CRL1505** resulted in:³

- **47%** higher levels of secretory **IgA levels,**
- **55%** fewer cold and flu occurrences, and
- **46%** fewer cases of fever.

Together, these ingredients work in multiple ways to enhance **immune defenses** and dramatically reduce the number of cold, flu and allergy occurrences.

More Than a Nuisance

Seasonal **allergies** affect about **30%** of American adults.⁴ They have also been associated with more serious conditions, including asthma, and sinus and ear infections.^{5,6}

American adults also average **two to three colds** annually.⁷ They can strike any time of year, and the nasal congestion that comes with them may cause worrisome **secondary bacterial infections**.⁸

Influenza causes **thousands** of U.S. deaths in a typical year.⁹ Those over 65 are most at risk for severe disease and complications.¹⁰

Preventing and Limiting Symptoms

Medications can provide temporary relief for cold, allergy, and flu symptoms, but they do nothing to *prevent* them.

Side effects of these drugs can include drowsiness, constipation, headache, rapid heartbeat, and sleep problems.¹¹ Certain allergy drugs, known as **anticholinergics**, have been linked to an increased risk of Alzheimer's disease.¹²

Scientists have identified two ingredients that help **prevent** cold and flu episodes.^{3,13,14}

These ingredients are:

- A dried **yeast fermentate**, and
- A probiotic strain called ***Lactobacillus rhamnosus* CRL1505**.

Each of these ingredients boosts activity of **immunoglobulin A (IgA)**, an antibody that provides immune defense against **viruses** and **bacteria**.^{1,3}

Additionally, supplementation with dried yeast fermentate offers relief for people with allergies.¹³

The Discovery of Yeast's Immune Benefits

The immune benefits of **yeast fermentate** were discovered purely by accident.

A company in Cedar Rapids, Iowa was producing a specialized **yeast** culture when it became clear that its factory workers—exposed daily to the yeast through inhalation—were using far fewer sick days than the office workers.

Scientists investigated and found that, compared to the office staff, factory personnel had significantly *higher* levels of the antibody **secretory IgA**. Secretory IgA is known to block pathogens from penetrating mucosal surfaces.¹⁵





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They also had increased activity of **natural killer cells**, which can destroy cells infected by **viruses**.¹⁶

The company went on to develop the dried fermentate using a proprietary fermentation process and **baker's yeast**. Six placebo-controlled **clinical trials** have since validated its ability to protect against colds, flu, and allergies.^{1,2,13,14,17,18}

Yeast's Allergy Defense

Scientists conducted a pilot study on 25 healthy individuals, giving them either a **placebo** or **500 mg** of dried **yeast fermentate** daily for five weeks at the start of allergy season.¹

Several in the **yeast** group saw clear improvements. About **a quarter of those who received the yeast** reported a **complete absence** of allergy symptoms, which returned within two weeks after they stopped taking the yeast fermentate.¹

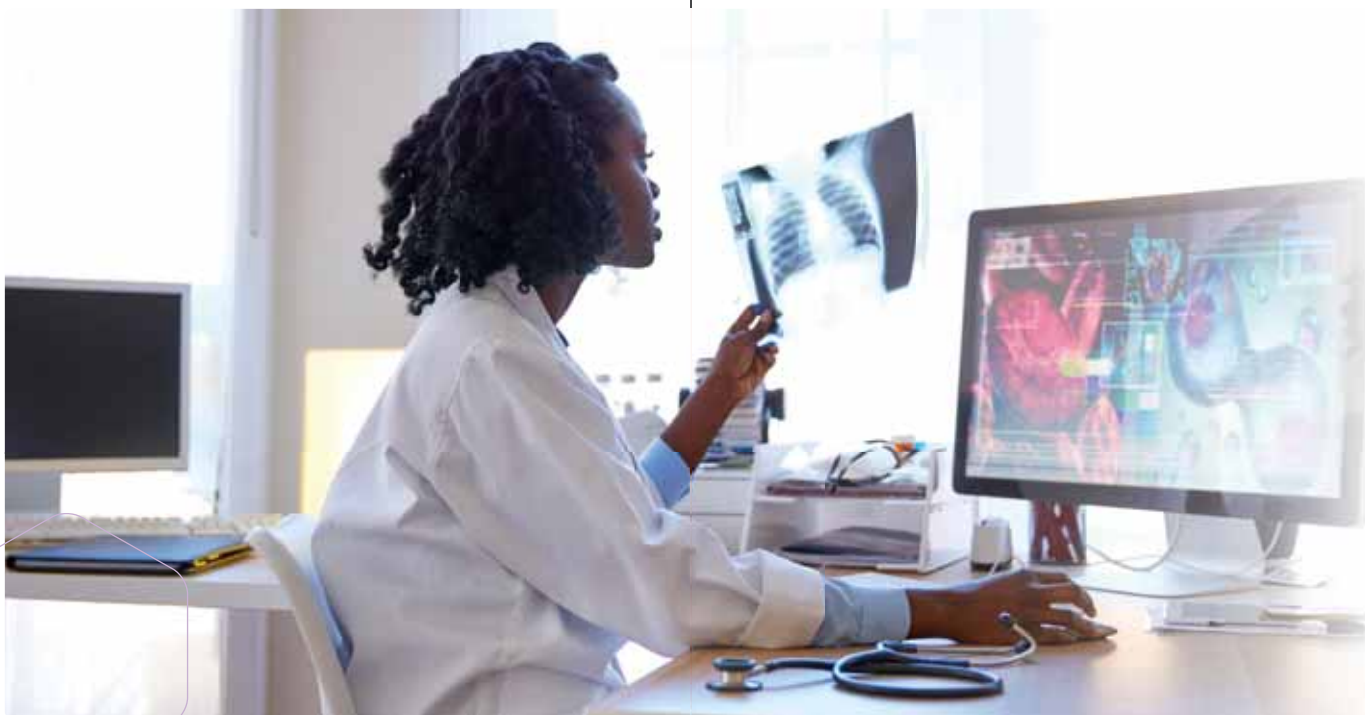
Seasonal allergies did *not* change in the **placebo** group.

Researchers then conducted a clinical study of people with a history of seasonal allergies and hay fever. Participants took either a placebo or **500 mg** of dried **yeast fermentate** once daily.¹³

The first half of the 12-week study took place during the year's highest pollen-count period. Compared to the placebo group, those taking yeast had a median of **43% fewer days** with **nasal congestion**, along with decreased *severity* of runny nose and nasal congestion.¹³

Protect Against Allergies, Colds, and Flu

- In a human study, taking **500 mg** of dried **yeast fermentate** daily decreased seasonal **allergy** symptoms, leading to **43%** fewer days with nasal congestion. The same dose also reduced **cold** or **flu**-like symptoms.
- The probiotic strain ***Lactobacillus rhamnosus* CRL1505** decreased the frequency, severity, and duration of **cold** and **flu** symptoms in a clinical trial. Over six months, it led to **49%** fewer infections, **55%** fewer cases of cold and flu, and **46%** fewer cases of fever.
- Combining these two ingredients is a safe and effective way to reduce the misery caused by colds, flu, and allergies, all year long.



Yeast Fermentate's Cold and Flu Protection

Scientists conducted two clinical studies to test the yeast fermentate's effect on **cold** and **flu-like** symptoms.

In one, they gave a daily dose of **500 mg** of the **dried yeast fermentate** to 116 individuals with a mean age of 37. The trial was conducted from January through March, peak cold and flu season.

At the end of 12 weeks, compared to the placebo group, the yeast-treated group had experienced a **13% reduction** in cold or flu-like symptoms. These included headache, fever, general aches and pains, fatigue, nasal stuffiness, sore throat, cough, and chills.¹⁷

The other study was virtually identical, except that the participants were an average age of 44. The yeast-treated group had an **11% reduction** in the incidence of cold or flu-like symptoms and a **17% reduction** in the *duration* of symptoms.¹⁴

How Yeast Fermentate Works

Allergy symptoms affect the eyes, nose, throat, lungs, or skin. They are chiefly caused by antibodies called **immunoglobulin E (IgE)**, which trigger the body's release of chemicals such as **histamine** that cause these reactions.

In the pilot study that first showed **yeast fermentate's** ability to relieve allergy symptoms, blood levels of **IgE** *increased* among placebo recipients as allergy season went into full swing, indicating heightened allergic responses.¹

In those taking the yeast, **IgE** levels increased only slightly, indicating far less of an allergic reaction. This demonstrated that **yeast fermentate** decreases allergic tendencies by **stabilizing IgE** levels.¹

Scientists also investigated yeast's ability to help prevent **colds** and **flu**.

When given a single **500 mg** dose of dried yeast fermentate, volunteers had significantly *increased* levels of markers of activity of **natural killer cells** within just *two hours*.² These immune cells specifically target and kill cells infected by viruses, such as those that cause colds and flu.

When healthy subjects were given **500 mg** of yeast fermentate daily for eight weeks, they also had a significant increase in **secretory IgA**, an antibody that defends against viruses and bacteria.¹

A Probiotic's Cold and Flu Protection

The probiotic strain ***Lactobacillus rhamnosus* CRL1505** was originally isolated from goat's milk by scientists in northwestern Argentina.¹⁹

Because it was shown to decrease **respiratory infections** in children, the Argentine government has been safely providing *L. rhamnosus* CRL1505 to over **300,000** schoolchildren annually since 2008.^{3,19-21}

Preclinical studies show that this probiotic may help fight the viruses and bacteria that cause the common cold, influenza, bronchitis, and pneumonia.^{20,22}

A team of nutritionists, pediatricians, and immunologists designed a randomized, controlled trial. They enlisted 298 healthy children between ages two and five, a group particularly susceptible to respiratory infections.³

Five days a week, the treatment group was given **100 million CFU** (colony-forming units) of *L. rhamnosus* CRL1505 in a yogurt drink. The placebo group received a yogurt drink without the addition of the beneficial probiotic bacteria *L. rhamnosus* CRL1505.

A common misconception is that all yogurt is a good source of probiotics. In fact, it is only when the exact beneficial bacterial strain is present in the correct amounts that these healthy microorganisms can reliably convey their benefit.

After six months, compared to the placebo group, the children in the probiotic group had experienced:³

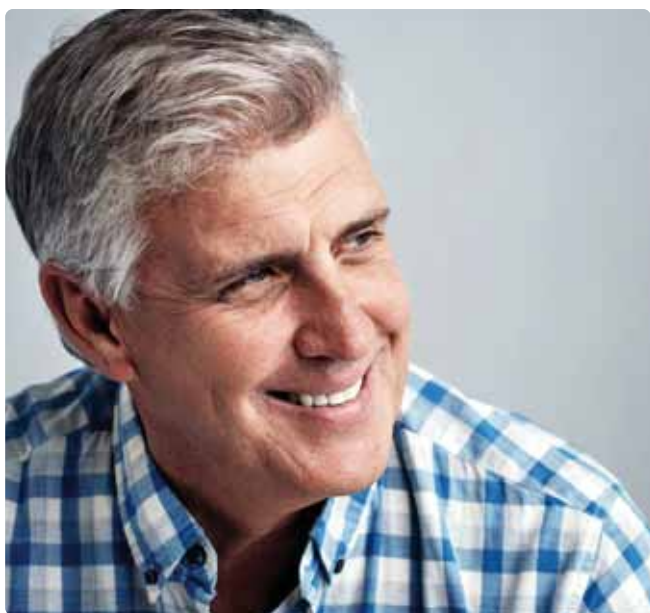
- **49% fewer** infections,
- **55% fewer** cases of cold or flu,
- **46% fewer** cases of fever,
- **47% increase** in levels of secretory IgA, and
- **33% less** antibiotic use.

The treatment group also had **61% fewer** cases of **tonsillitis** and **pharyngitis** (an infection in the back of the throat).³

How the Probiotic Works

Antibodies known as **IgA** constitute an important element of the immune system. Secreted from **mucous membranes** including the nose, mouth, and lungs, IgA can bind to respiratory viruses and block them from invading cells, infecting us, and causing colds, flus, and other respiratory infections.





The trial that used the *L. rhamnosus* CRL1505 in schoolchildren found that this probiotic significantly increases levels of secretory IgA,³ suggesting that this is one way the probiotic enhances immune protection against cold and flu viruses.

Taken together, this probiotic and the dried yeast fermentate can provide optimal protection against colds, flu, and allergies, any time of year.

Summary

Human studies have shown that a **yeast fermentate** safely reduces the occurrence, severity, and duration of allergy, cold, and flu-like symptoms.

The probiotic ***Lactobacillus rhamnosus* CRL1505** also provided protection against colds and flu in a high-risk population, including by supporting secretory IgA levels.

These two ingredients work in multiple ways to boost **immune** defenses against viruses and bacteria, enhancing antibodies and natural killer cell activity and providing an anti-allergy effect. ●

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

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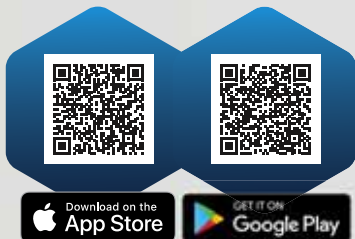
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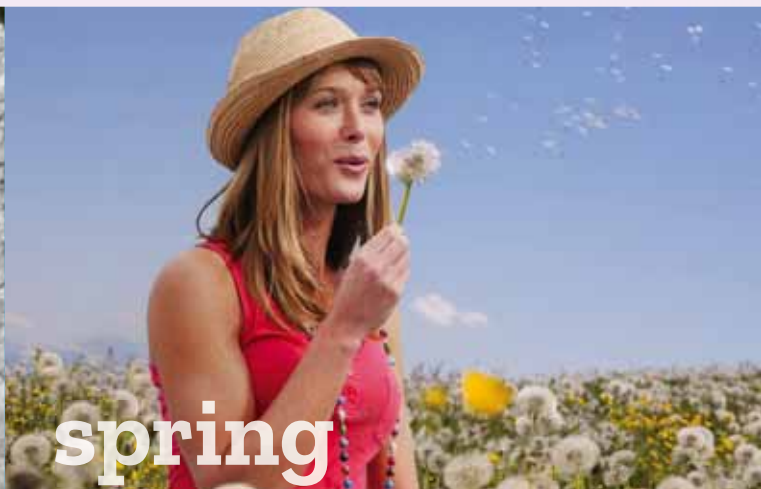
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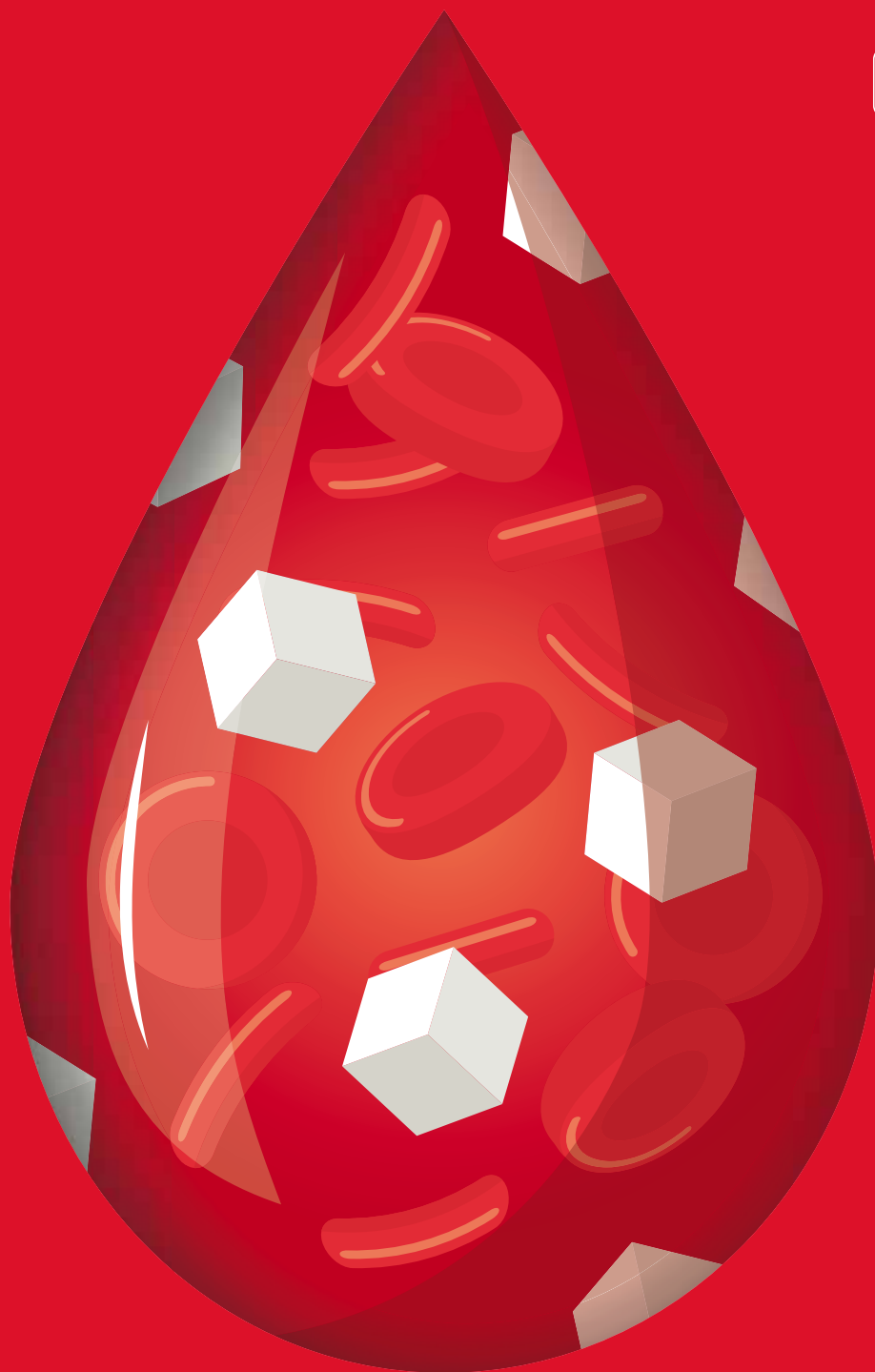


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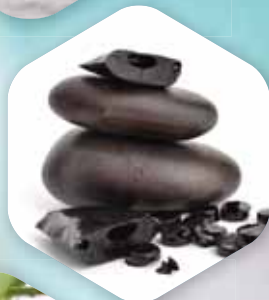
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Restore Healthier GLUCOSE LEVELS



BY MICHAEL DOWNEY



With age, a sedentary lifestyle, or a diet high in saturated fat or refined carbohydrates and simple sugars, our cells become **insulin resistant**.

This causes **blood glucose** levels to *remain high*.

Chronically elevated **fasting blood glucose** is a serious danger.

It can lead to long-term consequences such as heart disease and stroke, dementia, cancer, accelerated aging, and premature death.¹⁻⁸

Life Extension believes everyone should strive for optimal glucose control, regardless of whether or not they are diabetic.

This means taking action to improve your glycemic control if your fasting glucose is over **85 mg/dL** or your **HbA1C** is higher than **5.0%**.

Doctors generally prescribe glucose-lowering drugs *only* to people who have been diagnosed as diabetic. That leaves **millions** of Americans at risk.

Scientists have found several nutrients that can safely promote healthy **blood sugar** levels and **insulin sensitivity**.

The Risks of Elevated Glucose

Insulin resistance occurs when the body's cells no longer respond efficiently to the hormone insulin. As a result, cells cannot easily take up **glucose** from the blood and blood **sugar** levels rise.

Insulin resistance becomes more common as we age. It usually develops without symptoms, allowing blood **glucose** levels to creep to dangerously **high** levels over time.

Insulin resistance is considered a causative factor of **metabolic syndrome**. This condition is defined as the presence of at least three of the following:⁹

- High fasting blood sugar,
- Abdominal obesity,
- High blood pressure,
- Low HDL (“good”) cholesterol, and
- High triglycerides.

Epidemic Health Crisis

The results from a nutritional survey in the United States found that, by 2016, over **half** of adults age 60 and over had **metabolic syndrome**.¹⁰ These people have a *higher* risk of cardiovascular disease, type II diabetes, non-alcoholic fatty liver disease and liver cancer, chronic kidney disease, gout, sleep apnea, cataracts, retinopathy, and other eye pathologies, and **premature death**.¹¹⁻¹³

Many people with **metabolic syndrome** have elevated blood sugar levels but their glucose numbers are below the threshold for a diagnosis of **diabetes**.

Silent Diabetes

Prediabetes is the term to describe higher than normal blood sugar that is lower than the diabetic threshold.¹⁴ It has been estimated that more than **470 million** people worldwide will be prediabetic by 2030.^{14,15}

Up to **70%** of people with prediabetes will eventually develop diabetes, according to an expert panel of the American Diabetes Association.^{14,15}

Diet and other lifestyle interventions can help reduce the risk of progressing to diabetes.¹⁶ But in *anyone* with high blood sugar, **lasting damage** can occur on a daily basis.

To meet this challenge, scientists identified several nutrients that work in different ways to **lower blood glucose** levels:

- Cinnamon,
- Chromium,
- Amla,
- Shilajit, and
- Iodine-rich seaweed.

Cinnamon Reduces Glucose

Cinnamon has been used to help manage conditions including obesity, metabolic syndrome, and diabetes.

Scientists identified a purified, water-soluble, **cinnamon extract** that demonstrates **glucose-lowering** properties.¹⁷⁻¹⁹

In **human trials**, oral supplementation with a water-soluble cinnamon extract was shown to:²⁰⁻²³

- Lower fasting blood **glucose**,
- Enhance insulin sensitivity,
- Decrease systolic blood pressure,
- Reduce total and **LDL** (“bad”) cholesterol, and
- Improve lean mass body composition.



WHAT
YOU
NEED
TO
KNOW

Natural Ways to Control Glucose

- With age, **insulin resistance** and elevated **glucose** levels become more common. These conditions often lead to metabolic syndrome and prediabetes, increasing risk for heart disease, dementia, stroke, and premature death.
- **Cinnamon** increases the body's ability to take up glucose from the blood and transport it to cells, *reducing* blood glucose and increasing insulin sensitivity.
- **Chromium, amla, and shilajit** all support healthy cellular glucose metabolism.
- Iodine-rich **brown seaweed** blocks the conversion of starches into glucose and increases insulin sensitivity, thereby promoting glucose uptake by cells, further reducing blood glucose levels.
- Together, these nutrients can help maintain healthy glucose levels and prevent the damage elevated levels can do.

Cinnamon has been shown to impact these metabolic parameters in more than one way.

In one preclinical model, a water-soluble cinnamon extract increased production of **glucose transport molecules** known as **GLUT4**, which enable cells to take up glucose from blood plasma in the presence of insulin.²⁴

Without effective GLUT4 transporters, blood glucose can steadily rise, eventually damaging tissues through a process known as **glycation**, and also by inducing insulin resistance.^{25,26}

Preclinical data indicate that cinnamon activates and also increases the production of **metabolic sensors** called **PPARs**,²⁷ mirroring a key mechanism of some antidiabetic drugs.²⁸ Increased expression of PPARs helps *promote insulin sensitivity*, thereby improving glucose uptake.²⁹

Chromium Fights High Glucose

More than 60 years ago, scientists established that having **low** levels of the mineral **chromium** contributes to high blood sugar.³⁰

Studies show that chromium deficiency is associated with **insulin resistance** and **diabetes**.^{31,32}

One study found that chromium deficiency is common in people with **prediabetes**.^{33,34}

In **type II diabetics**, chromium supplementation has been found to significantly:³¹

- Improve blood sugar levels,
- Lower HbA1c,
- Raise HDL cholesterol, and
- Lower triglycerides.

Chromium is believed to work by improving **intracellular signaling systems** that are critical to cells' ability to detect and respond to elevated glucose levels in the blood. It does this by activating glucose-transporting **GLUT4** molecules.³⁵



Amla and Shilajit Optimize Chromium Benefits

Two organic compounds have been identified that deliver **free-radical scavenging** activity *and* provide **glucose-lowering** effects: **amla** and **shilajit**.

Amla is an herb also known as Indian gooseberry. It has been shown to **lower blood glucose** in diabetic animals and humans.^{36,37}

Shilajit is a Himalayan nutrient that has been used for centuries. It is rich in **fulvic acid**, an organic compound that is thought to account for the many medicinal and biological properties of shilajit. It has been used in the management of diabetes and many gastrointestinal conditions like diarrhea, gastritis, ulcers, and more.³⁸⁻⁴⁰

Combining **chromium** with **amla** and **shilajit** promotes removal of glucose from the bloodstream *and* efficient use of glucose within cells.

In a study of type II diabetics, supplementation with a **chromium, amla, and shilajit complex**, in addition to current medication, compared to placebo, resulted in:⁴¹

- Better after-meal glucose control,
- Decreases in C-reactive protein (marker of inflammation), and
- Reductions in LDL levels.

Brown Seaweed Stops Conversion of Carbs to Sugars

Another way to improve **glucose control** is to limit the amount of glucose the body has to process in the first place.

Brown seaweed blunts the conversion of starches into glucose in the gastrointestinal tract by blocking two enzymes needed for this conversion, **alpha-amylase** and **alpha-glucosidase**.^{42,43} As a result, less glucose is absorbed into the bloodstream.

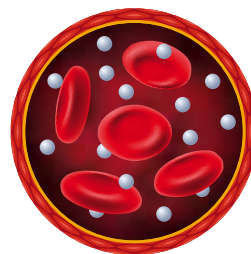
Brown seaweed is also rich in **iodine**, and animal studies show that oral iodine reduces glucose.^{44,45}

In clinical trials, **brown seaweed** extracts:⁴⁶⁻⁴⁸

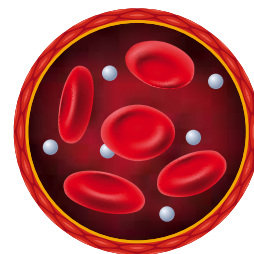
- Lowered **fasting glucose** levels,
- *Reduced* insulin levels and *increased* insulin sensitivity (when taken before eating carbohydrate-rich bread),
- Lowered A1c readings, and
- Improved after-meal **cognitive function**.



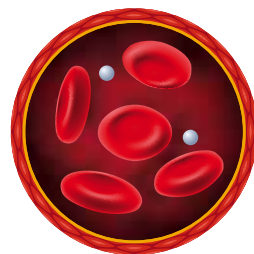
GLUCOSE LEVELS



HYPERGLYCEMIA



NORMAL



HYPOGLYCEMIA

Seaweed, cinnamon, chromium, amla, and shilajit all help support healthy glucose levels, warding off the damage elevated blood sugar can do.

Summary

Aging is associated with increased **insulin resistance** and elevated **glucose** levels and with greater risk of diabetes, heart disease, stroke, cancer, and premature death.

The nutrients **cinnamon**, **chromium**, **amla**, **shilajit**, and **seaweed** help the body transport and burn glucose, block the conversion of carbohydrates into glucose, and work in other ways to **reduce blood glucose** levels and optimize energy production.

These innovative compounds can help people maintain healthy blood glucose levels well into older age. •

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

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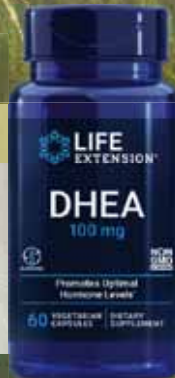
DHEA 25 mg

Item #00335 • 100 capsules
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4 bottles \$11 each



DHEA 100 mg

Item #01689 • 60 vegetarian capsules
1 bottle **\$18**
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DHEA 50 mg

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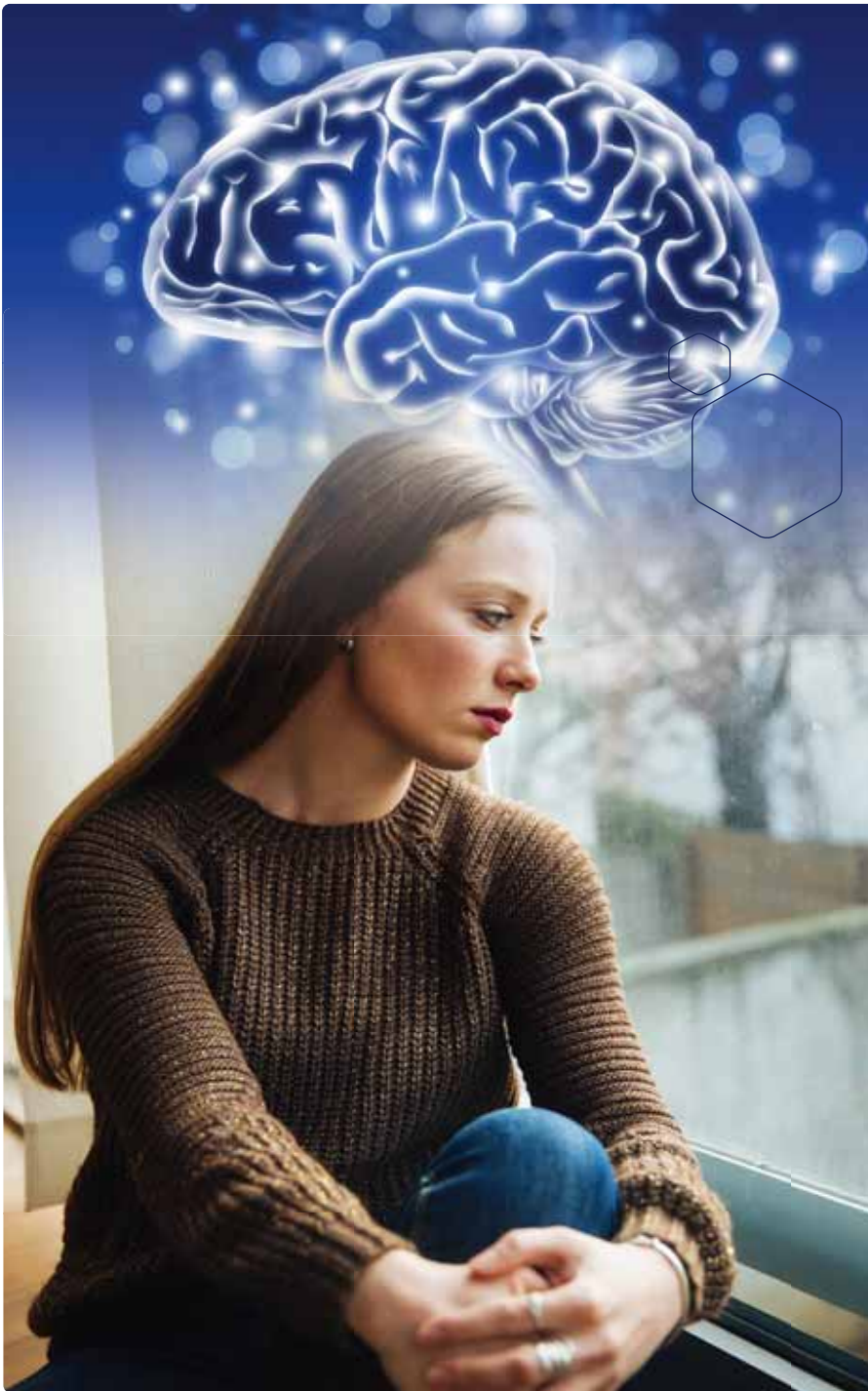
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This supplement should be taken in conjunction with a healthy diet and regular exercise program. Individual results are not guaranteed, and results may vary.

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What is Tryptophan?

BY CHANCELLOR FALOON



Tryptophan is an amino acid the body uses for many purposes, notably to create the neurotransmitter **serotonin**.

As a nutritional supplement, it is known primarily for its ability to improve **mood** and **sleep**.¹

Because we can't supplement with serotonin itself, we must rely on **serotonin precursors** such as **tryptophan** to increase serotonin in the brain.

Tryptophan is categorized as an **essential amino acid** because we don't produce it on our own. It *must* be obtained through diet or direct oral intake.²

A meta-analysis found that **tryptophan** plasma levels were *decreased* in patients with **major depressive disorder** compared to controls.³

Depression and poor sleep quality are typically connected. A genetic variation related to tryptophan has been identified as possibly playing an important role in the relationship between these conditions.⁴ When tryptophan was given to patients with this genetic variation, they showed significantly **improved sleep-quality** scores.

A placebo-controlled clinical study found that supplemental tryptophan intake increased positive **social interactions** with people.⁵ In a randomized crossover study, a diet high in tryptophan improved **mood**.⁶

Additionally, **vitamin B6** assists in the conversion of tryptophan into 5-hydroxytryptophan (**5-HTP**), which is converted into **serotonin** in the brain.⁷

Supplemental **vitamin B3** may reduce premature conversion of tryptophan in the bloodstream, making more tryptophan available to cross the blood-brain barrier where it converts to **serotonin**.⁷

In a trial in young adults, taking **100 mg** of tryptophan with vitamin B3 and vitamin B6 twice daily between meals for seven days led to a significant improvement in mood in young adults with subclinical **depression**.⁸

In summary, clinical research shows that increasing **tryptophan** intake can improve sleep and boost mood.

It is best to consume supplemental tryptophan separately from protein and amino acids. •

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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FLORASSIST® GI provides a 7-strain blend of **probiotics** in a **dual encapsulation** formula to deliver beneficial bacteria and **phages** where you need them the most.



Dual-Encapsulation Delivery



Item #02125 • 30 liquid vegetarian capsules
1 bottle \$24.75 • 4 bottles \$22.50 each



For full product description and to order **FLORASSIST® GI with Phage Technology**, call **1-800-544-4440** or visit www.LifeExtension.com

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"Massage aids muscle recovery and speeds recovery times..."

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"A daily foot massage lowers blood pressure and lowers triglyceride levels..."

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TWO FORMS OF TRYPTOPHAN

"I have been able to fall asleep easily and I feel so much better when I wake up."

Janet

VERIFIED CUSTOMER REVIEW

PROMOTE SLEEP AND REDUCE STRESS

Tryptophan is the precursor of serotonin in the brain, a neurotransmitter associated with:¹⁻⁴

- **Enhanced mood**
- **Improved sleep**
- **Reduced stress**

Life Extension offers two forms of tryptophan:

- **Optimized Tryptophan Plus**
Three capsules daily provide **1,000 mg** of L-Tryptophan plus Niacin, L-Lysine, Hops, and Rosemary for enhanced neurotransmitter support.
- **L-Tryptophan**
One capsule provides **500 mg** of pure L-Tryptophan.



Item #01721

90 vegetarian capsules

1 bottle **\$24** • 4 bottles \$21.75 each



Item #01722

90 vegetarian capsules

1 bottle **\$24.75** • 4 bottles \$22.50 each



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

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CAUTION: Serotonin syndrome is characterized by high levels of serotonin and symptoms like confusion, sweating, agitation, nausea, involuntary muscle contractions, and racing heartbeat. Do not take L-tryptophan if you experience these symptoms. Because tryptophan may have numerous drug interactions (most commonly, MAOIs and SSRIs) consult your healthcare provider before taking this product if you are taking prescription medications. Do not use before driving or operating heavy machinery.

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Broccoli

THE TREE OF LIFE

Just one daily **Optimized Broccoli and Cruciferous Blend** tablet provides cell-protective compounds found in fresh vegetables.

For maximum absorption each **enteric coated** tablet contains two layers:

- **Myrosinase** to release **sulforaphane** in the small intestine, in one layer, and
- **DIM** (3, 3-diindolymethane) to promote healthy estrogen balance, and
- **Glucoraphanin** from broccoli, watercress, cabbage and rosemary (sulforaphane precursors), in the other layer.

"Even though I have a good diet, I feel this product has given me a little extra energy."

Carol

VERIFIED CUSTOMER REVIEW



Item #02368 • 30 enteric coated vegetarian tablets

1 bottle **\$28.50** • 4 bottles \$26.50 each

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

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The Science and Technology of Growing Young

BY SERGEY YOUNG



Can you imagine living to 100, 150, or even 200 years of age... and beyond? Better yet, enjoying those extra years while staying healthy, vigorous, and mentally adept?

In *The Science and Technology of Growing Young*, Sergey Young explains why this radical concept is not only possible, but inevitable.

It starts with the idea that **aging** itself is not an inescapable *process*, but a *curable condition*.

Unlike other longevity books that are viewed through the lens of a scientist or medical doctor, *The Science and Technology of Growing Young* was written by an investor-author with his finger on the pulse of dozens of companies on the cutting edge of longevity science.

In his latest book, Young shares his firsthand knowledge of these remarkable breakthroughs.

He identifies the **Near Horizon of Longevity**—those developments that will allow us to live to 150 (some of which are already in use, like gene editing and organ regeneration).

He also introduces the **Far Horizon of Longevity**—the future of age-reversal (including digital avatars and AI-brain integration) that could allow us to experience age 200 and beyond.

In addition to revealing the latest scientific discoveries and technological breakthroughs gathered from leading health entrepreneurs, scientists, doctors, and inventors, *The Science and Technology of Growing Young* provides practical advice for ways to live better right now for increased longevity.

Young believes that following these steps will help people live long enough to be able to take advantage of the latest technologies when they become available.

The following brief excerpts from *The Science and Technology of Growing Young* provide insight into Sergey Young's innovative thinking on achieving practical longevity.

—LAURIE MATHENA

TECHNOLOGICAL ADVANCEMENTS DRIVING THE LONGEVITY REVOLUTION

Scientists now understand far better than ever before the relationship between genes and aging.

And while our genes do not significantly change from birth to death, our epigenome—the system of chemical modifications around our genes that determine how our genes are expressed—does.

The date on your birth certificate, it turns out, is but a single way to determine age. The biological age of your epigenome, many longevity scientists now believe, is far more important.

Best of all, however, science is beginning to offer ways to alter both your genome and epigenome for a healthier, longer life.

New technologies like CRISPR-Cas9 and other gene-editing tools are empowering doctors with the extraordinary ability to actually insert, delete, or alter an individual's genes.

In the not-terribly-distant future, we will be able to remove or suppress genes responsible for diseases and insert or amplify genes responsible for long life and health.

GENE EDITING IN PRACTICE

The hereditary trait that causes sickle-cell anemia affects tens of millions worldwide, including as many as **30%** of sub-Saharan Africans, and up to three million African Americans.

The bone marrow of those with sickle-cell anemia produces abnormally shaped red blood cells that are unable to carry oxygen to the body. This often leads to fatigue, frequent infections, and sudden and excruciating bouts of pain.

Sickle-cell anemia also leads to premature death.

Victoria Gray was just three months old the first time she endured a sickle-cell attack. By the time she was 34 years old, the condition had already gotten so bad that she could no longer walk or feed herself.

Then one day, doctors at the Sarah Cannon Research Institute (SCRI) in Nashville, Tennessee, threw Gray a lifeline: she became the first patient to be treated with a new treatment called CRISPR-Cas9, a new form of genetic engineering.

Using this new technology, doctors at the SCRI removed bone marrow from Gray's body and altered the genes of her cells. The procedure effectively "edited" the defect, the way you might go through the lines of a book and correct typos or alter words.

Doctors then reintroduced billions of these enhanced cells back into her body to see if they would start doing their job properly.

One year after the treatment, Gray appeared to be doing marvelously.

While SCRI researchers hoped that at least **20%** of Gray's red blood cell system would be positively affected by the procedure, when they checked nine months later, the vast majority of bone marrow cells and hemoglobin proteins found in Gray's body appeared to be functioning effectively.

More importantly, her pain attacks and hospital visits had ceased completely!

While it is still too early to declare this procedure a cure for sickle-cell anemia, it has at least for the moment completely rehabilitated the life of Victoria Gray.

In laboratories around the world, gene editing is being used to tackle

Huntington's disease, Lyme disease, congenital blindness, and many more conditions.

When perfected, gene editing technology will have the ability to correct **89%** of the known hereditary human diseases.

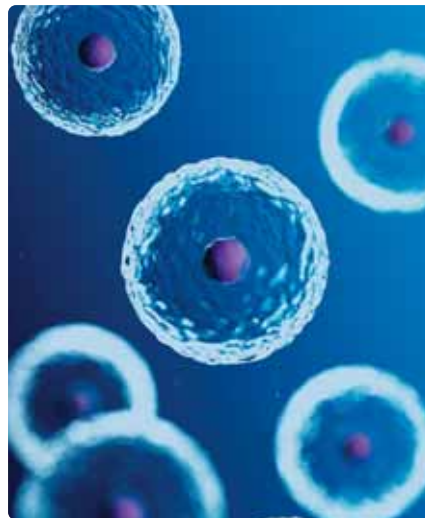
The FDA has stated that it expects to approve 10 to 20 new gene and cell therapies per year by the year 2025. This will drive the cost of gene therapy down and make it available for a wide range of health conditions.

CART-CELL THERAPY

Gene therapy works by effectively providing cells with genes that produce necessary proteins in patients whose own genes cannot produce them.

This process is already being applied to a few rare diseases, but it will soon become a common and incredibly effective medical approach.

Probably the most revolutionary area of gene therapy today is CAR T-cell therapy—a cancer treatment method by which scientists modify a patient's own immune-system T cells to fight the specific type of cancer they have.



These T cells are equipped in a lab with the antigen receptors they need to latch on to and kill cancer cells, based on the specific characteristics of the cancer cells. The T cells are then reintroduced to the body, where they destroy the cancer cells and then remain on watch for the cancer to return.

CAR T-cell therapy may very well end the scourge of cancer, which takes an estimated 10 million lives per year.

EXAMPLE

Emily Whitehead was the first pediatric patient to receive CAR T-cell therapy, when she was just seven years old. Emily was in hospice care—her last stand in a severe battle against leukemia.

Within a few days of receiving her highly experimental CAR T-cell therapy, the treatment started to work.

After a few weeks, she was in such strong remission that she was no longer considered terminal. Best of all, the CAR T cells remain on duty inside Emily to this day, remembering and watching for her cancer to come back, for the rest of Emily's life.

Hundreds more like her are alive today after receiving CAR T-cell therapy. It is as close to a “cure” for cancer as we have today, with up to **80%** of those receiving the treatment surviving.

IMPORTANCE OF EARLY DIAGNOSTICS

Early and accurate detection of diseases is the key to addressing the prevention of the “premature death” dimension of longevity.

Of the nearly 60 million lives lost around the globe each year, more than

30 million are attributed to conditions that are reversible if caught early.

We live in a world of “reactive medicine.” Most people do not have advanced batteries of diagnostic tests unless they're experiencing problems.

But not for long.

Soon, health care will move from being “reactive” to being “proactive.”

The key to this shift will be low-cost, ubiquitous, connected devices that constantly monitor your health.

Very soon, wearable, portable, and embeddable devices will radically reduce premature death from diseases like cancer and cardiovascular disease, and in doing so, add years, if not decades, to global life expectancy.

They will constantly monitor your heart rate, your respiration, your temperature, your skin secretions, the contents of your urine and feces, free-floating DNA in your blood that may indicate cancer or other disease, and even the organic contents of your breath.

EXAMPLE

After it was discovered that dogs can use their highly sensitive noses to detect cancer, UK firm Owlstone produced a handheld diagnostic mask that measures volatile organic compounds (VOCs) transferred from your blood to your breath.

This “breath biopsy” can diagnose inflammation, infectious disease, cardiovascular disease, metabolic conditions, and eight different types of cancer.

In a 2016 study of 2,500 smokers and nonsmokers, the Owlstone breath biopsy accurately identified 42 people with lung cancer. Of those subjects, **90%** had a curable, early stage of the disease.

SENOLYTIC LONGEVITY PILLS

Dr. Judith Campisi and others have pioneered a new class of potential longevity pills called senolytics, which target and destroy zombie senescent cells.

Cellular senescence is the natural process whereby cells reach their capacity for division and finally take themselves out of service. When senescence proceeds smoothly, expired cells are absorbed by the body and their useful contents recycled.

When they reach the end of their natural life cycle, they sometimes stick around in a kind of “zombie state” instead of being reabsorbed. They become inflamed and begin sending chemical signals to adjacent cells to also become zombies.

High levels of zombie cells in the body are linked to heart disease, diabetes, dementia, osteoporosis, kidney disease, liver failure, and lung conditions.

In studies by Campisi and other researchers, senolytic molecules like dasatinib and quercetin successfully destroyed these zombie cells in mice, subsequently curing or preventing age-related conditions in the lungs, cardiovascular system, bones, and kidneys.

The mice given these senolytics also lived **36%** longer than mice that were not.

In 2019, the Mayo Clinic's resident senescent cell expert Dr. James Kirkland released the results of the first clinical trial exploring the use of senolytics to treat age-related diseases in humans.

In a small, short study of just 14 patients with pulmonary fibrosis, dasatinib and quercetin improved the condition of the subjects in just three weeks.

Another Kirkland study, released later that year, showed that senolytic drugs indeed reduce the number of senescent cells in humans.

LONGEVITY SUPPLEMENTS

Berkeley biochemist Bruce Ames created a list of nutrients that he theorizes are needed for the body's most important undertakings. When there are enough of these nutrients in the body to go around, they are used to protect the body from aging.

But when there is a shortage, the body prioritizes immediate survival and reproduction over repair of damaged cells.

Of the 41 nutrients on his list, Ames thinks **vitamin D, omega-3, magnesium, quinone, and carotenoids**—are critical.

Quercetin and its senolytic sister **fisetin** are also both naturally occurring fruit flavonoids that are available over the counter as supplements.

Many supplements are probably good for longevity. I, myself, take **40 to 50** supplements per day.

PRACTICAL STEPS FOR LONGEVITY

First, early diagnosis is critical for the prevention of disease and age-related decline. This recommendation is not number one on my list by accident. I recommend that you get yourself checked regularly, and as comprehensively as possible, within your means.

At a minimum, you should have a complete annual physical exam that includes blood count and metabolic blood chemistry panels, a thyroid panel, and testing to reveal potential deficiencies in nutrients such as vitamin D, vitamin B, iron, and magnesium. If you are sexually active, you should also be checked for STDs.

Second, eat early, and less often.

Awareness of the relationship between caloric restriction (CR) and longevity goes back to the 1930s, when Cornell animal husbandry professor Clive McCay discovered that rats who were underfed by **30%** to **50%** not only became healthier than their normally fed littermates but they also lived **33%** longer.

These experiments have been successfully repeated in one form or another in worms, mice, rats, rhesus monkeys, and humans.

Caloric restriction predictably reduces common health problems like diabetes, cancer, heart disease, and cognitive decline. It reduces the likelihood of obesity and insulin resistance. It preserves immune system function.

And, in animal subjects, at least, it results in as much as an **80%** increase in lifespan.

LIVING TO 100

Living to at least age 100 is within reach for most people on the planet today.

In the United States, **50%** currently make it past 83 years old and **25%** past 90. In Japan, **51%** of girls and **27%** of boys born today are expected to reach 90.

Going forward, these numbers will only improve for anyone who follows a longevity-optimized lifestyle. The middle-aged today can still add 10 to 15 years of extra life, while for those in their twenties, adding up to an additional quarter century should be a piece of (sugar-free, low-carb) cake!

If you would like to stay alive longer, then my advice to you is to stay as healthy as possible for as long as possible, until you are able to take advantage of the next horizon of innovation. •

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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Sergey Young is a longevity investor and visionary with a mission to extend the healthy lifespan of one million people.

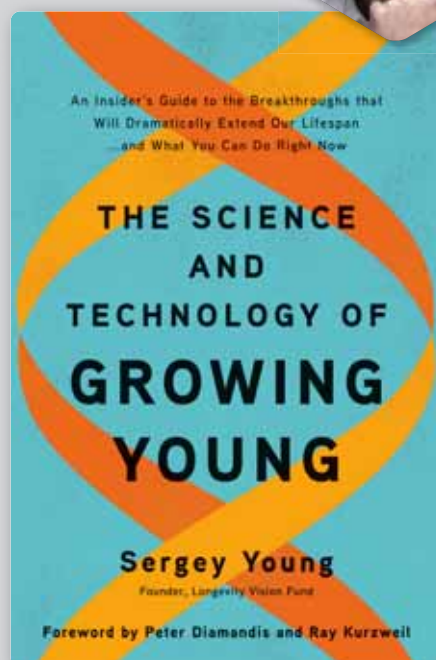
He is founder of the \$100 million Longevity Vision Fund, one of the few funds specializing exclusively in longevity and helping to accelerate longevity breakthroughs. He is also Development Sponsor of Age Reversal XPRIZE, a global initiative designed to cure aging and age-related diseases.

To order a copy of *The Science and Technology of Growing Young*, call 1-800-544-4440 or visit www.LifeExtension.com

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The **Gummy Science™ Youthful Collagen** formula provides clinically studied^{1,2} doses with daily intake of 4 tasty **chewable gummies**.

No added sugars.



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For full product description
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Youthful Collagen**, call
1-800-544-4440 or visit
www.LifeExtension.com

References:

1. *Skin Pharmacol Physiol.* 2014;27(1):47-55.
2. *Skin Pharmacol Physiol.* 2014;27(3):113-9.

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SUPPORTS
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HEALTH

ASTAXANTHIN is a carotenoid that benefits the brain, heart, skin, and immune system. Research suggests that astaxanthin can play a role in promoting cardiovascular health.¹

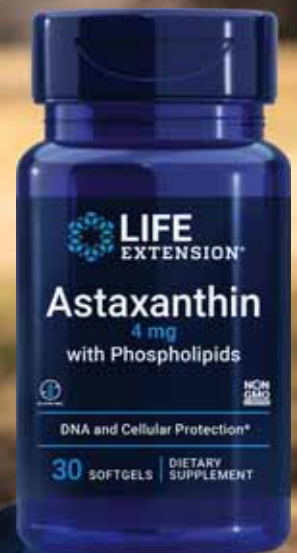
Found naturally in seafood and algae, as little as **50%** of **astaxanthin** is normally **absorbed** in the bloodstream.^{2,3}

Life Extension® combines **4 mg** of **astaxanthin** with a blend of four different **phospholipids**, which has been shown to enhance carotenoid **absorption** by **several-fold**.⁴

References

1. *Nutrients*. 2020 Jun; 12(6): 1896.
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3. *Eur J Pharm Sci*. 2003 Jul;19(4):299-304.
4. *Int J Pharm*. 2011 June 30; 412(1-2):99-105.

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Item #01923 • 30 softgels
1 bottle \$12

4 bottles \$10.50 each



Macadamia Nuts

BY LAURIE MATHENA



References

1. *Lipids Health Dis.* 2014 Oct 1;13:154.
2. *J Nutr.* 2008 Apr;138(4):761-7.
3. *Clin Exp Pharmacol Physiol.* 2004 Dec;31 Suppl 2:S37-8.
4. *PLoS One.* 2014;9(7):e103376.

Macadamia nuts have the hardest shell of all nuts, taking **300 pounds** per square inch to break open. It's worth the effort, though, because cracking open their shell exposes one of the healthiest nuts on the planet.

These nuts are high in **monounsaturated fat**, which is a healthy fat that has been associated with improved heart health, and lower risk of fatal heart attacks, strokes, and all-cause mortality.¹

In one study, when people with slightly high cholesterol ate a macadamia-rich diet, they experienced lower total and LDL cholesterol levels, compared to the average American diet.²

They contain a specific monounsaturated fatty acid called *palmitoleic acid*, that could potentially aid in fat metabolism and reduce stored body fat.

This could explain why studies have shown that, despite their high fat content, macadamia nuts have been found to aid in weight loss when eaten in moderate amounts.³

Because they are low in carbohydrates and sugar, macadamia nuts are considered a low-glycemic food. In fact, eating tree nuts like macadamia nuts has been associated with **improved** glycemic control in people with type II diabetes.⁴

Macadamia nuts are calorie dense, with **one cup** containing nearly **1,000 calories**. A standard serving size is far less than that—just **one ounce**, or **10-12 nuts**—and contains **200 calories**.

Be aware that some macadamia nuts contain added oil, salt, or sugar. For the greatest health benefit, be sure to choose brands that contain only the nuts, without extra ingredients.

ACTIVE LIFESTYLE & FITNESS

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- 02147 Wellness Bar—Cookie Dough
- 02246 Wellness Code® Advanced Whey Protein Isolate Vanilla
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- 02261 Wellness Code® Whey Protein Concentrate Chocolate
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- 01671 D,L-Phenylalanine Capsules
- 01624 L-Arginine Caps
- 01532 L-Carnitine
- 00345 L-Glutamine
- 00141 L-Glutamine Powder
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- 01827 Taurine
- 00133 Taurine Powder
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- 02497 Endothelial Defense™ Pomegranate Plus
- 02320 NitroVasc™ Boost
- 00984 Optimal BP Management
- 01953 Pomegranate Complete
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- 02024 Triple Action Blood Pressure AM/PM
- 02102 Venoflow™

BONE HEALTH

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- 02123 Bone Restore Chewable Tablet
- 02416 Bone Restore Elite with Super Potent K2
- 01727 Bone Restore with Vitamin K2
- 01725 Bone Strength Collagen Formula
- 00313 Bone-Up™
- 01963 Calcium Citrate with Vitamin D
- 01506 Dr. Strum's Intensive Bone Formula
- 02417 Mega Vitamin K2
- 01476 Strontium Caps

BRAIN HEALTH

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- 01974 Acetyl-L-Carnitine Arginate
- 02419 B12 Elite
- 02510 Brain Fog Relief
- 01659 CDP Choline
- 02321 Cognitex® Basics
- 02396 Cognitex® Elite
- 02397 Cognitex® Elite Pregnenolone
- 01540 DMAE Bitartrate
- 02006 Dopa-Mind™
- 02413 Dopamine Advantage
- 02212 Focus Tea™
- 01658 Ginkgo Biloba Certified Extract™
- 01527 Huperzine A
- 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

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

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- 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
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- 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

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- 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

- 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
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- 02169 Rainforest Blend Ground Coffee
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- 00438 Stevia™ Organic Liquid Sweetener
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GLUCOSE MANAGEMENT

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- 01949 Super-Absorbable CoQ10 Ubiquinone with *d*-Limonene • 50 mg, 60 softgels
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- 01929 Super Ubiquinol CoQ10
- 01427 Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 50 mg, 30 softgels
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- 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

- 024115 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 Boswella
- 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
- 02431 Essential Youth - L-Ergothioneine
- 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™
- 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 Instensive 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
- 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

DUAL-ACTION
JOINT SUPPORT

Get Moving!

Joint Mobility is a patent-pending blend
of tamarind and turmeric extracts.



A placebo-controlled **clinical trial*** shows these **plant extracts** help:

- Support you to walk farther and faster
- Promote knee flexibility and range of motion
- Reduce occasional knee discomfort
- Inhibit inflammation to support continued joint health

Item #02424 • 60 vegetarian capsules

Each capsule provides **200 mg**
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1 bottle **\$18.75** • 4 bottles \$17 each

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

*Int J Med Sci. 2019;16(6):845-53.

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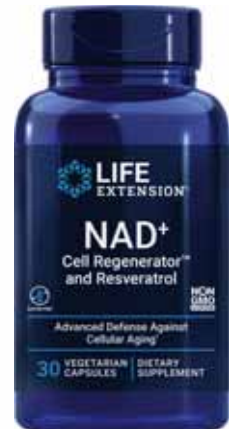
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Multiple Benefits of **NAD⁺**

- Energy production
- DNA support
- Gene expression (Sirtuin 1-7)
- Immune cell signalling



Item #02344
300 mg • 30 veg. caps.
1 bottle*



Item #02348
30 veg. caps.
1 bottle*

For those already taking resveratrol, **NAD⁺ Cell Regenerator™** provides **300 mg** of **nicotinamide riboside chloride**.

Optimized NAD⁺ Cell Regenerator™ combines **300 mg** of **nicotinamide riboside chloride** with **resveratrol** and other plant extracts.

For full product description, pricing and to order **NAD⁺ Cell Regenerator™**, call **1-800-544-4440** or visit www.LifeExtension.com

* For pricing available to readers of this magazine, call **1-800-544-4440** or visit LifeExtension.com/NAD

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