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April 2022

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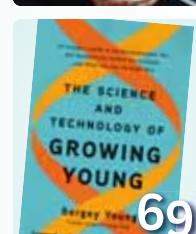
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\* Supplier Internal Study. Data on File. 2017

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

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

**Treatments** for autoimmune disorders vary and often focus on *reducing* immune activity.<sup>2</sup>

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

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

The findings indicate that most readers of **Life Extension® Magazine** are reducing their **autoimmune 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.<sup>1</sup>

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.<sup>5</sup>

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 **autoimmune 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](http://www.autoimmuneregistry.org)) published a comprehensive list of over **150 autoimmune diseases** along with links to published literature and information about possible treatment options.<sup>6</sup>

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.<sup>4</sup>

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

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**.<sup>4</sup>

## 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**.<sup>4</sup>

**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.<sup>8-10</sup>

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.<sup>11-13</sup>

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.<sup>4</sup>

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.<sup>14-16</sup>

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.<sup>17</sup>

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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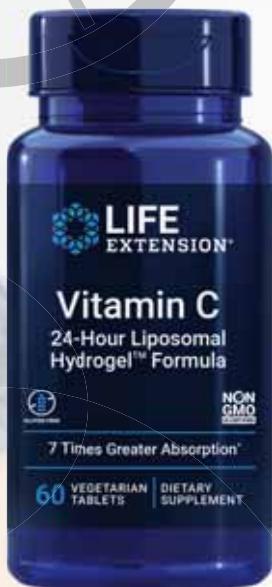


## In this Month's Issue...

**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.



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

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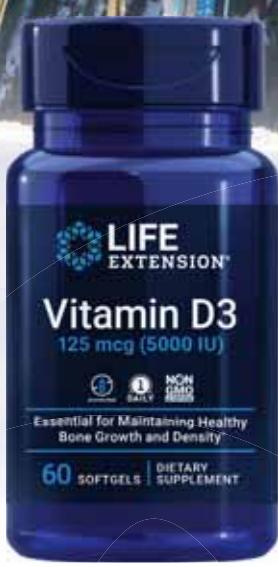
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# In the News



## 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

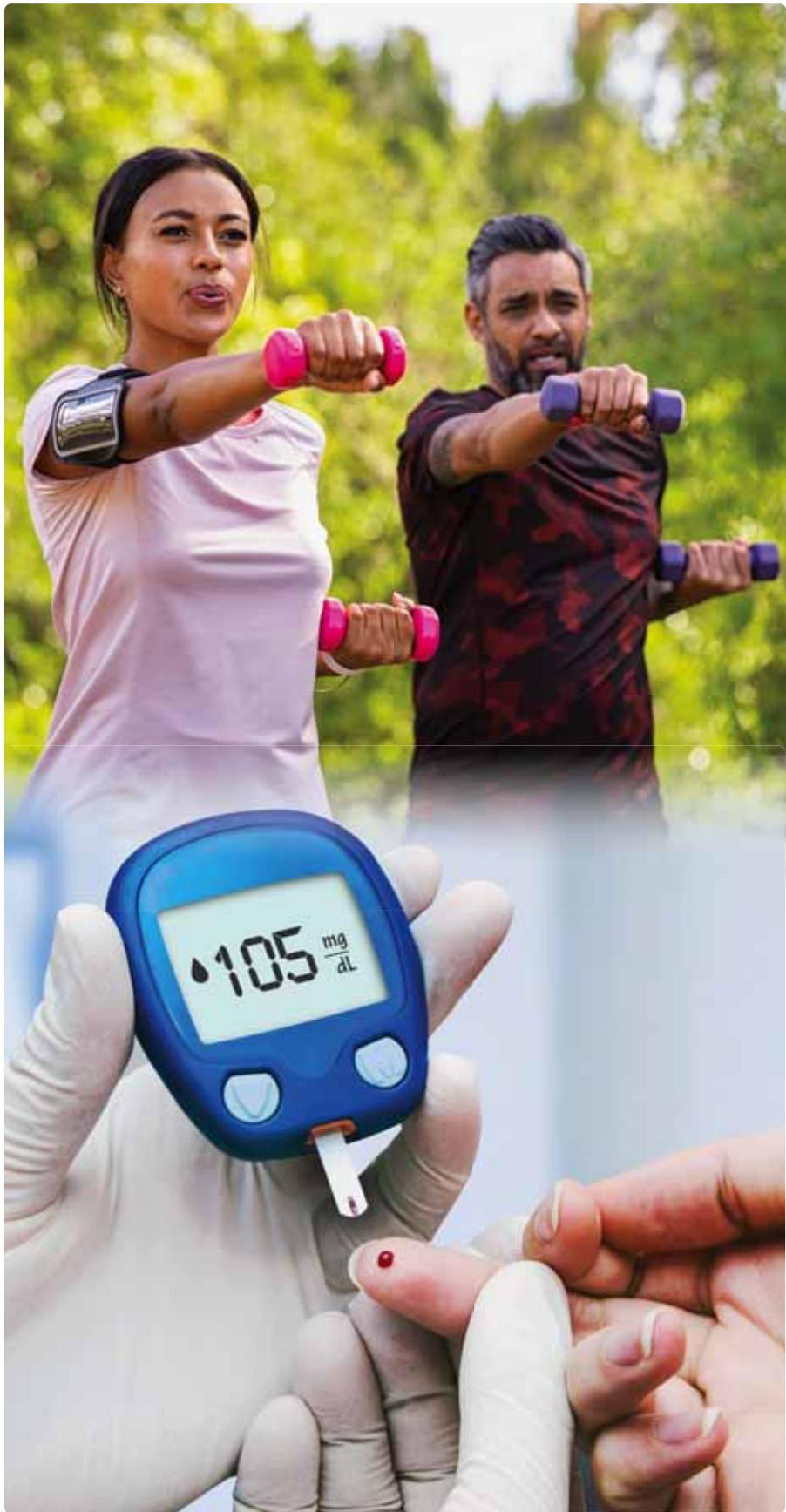
The U.S. Preventive Services Task Force has lowered the age at which overweight and obese people should begin screening for diabetes from 40 to 35, a recommendation statement in *JAMA* urged.\*

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

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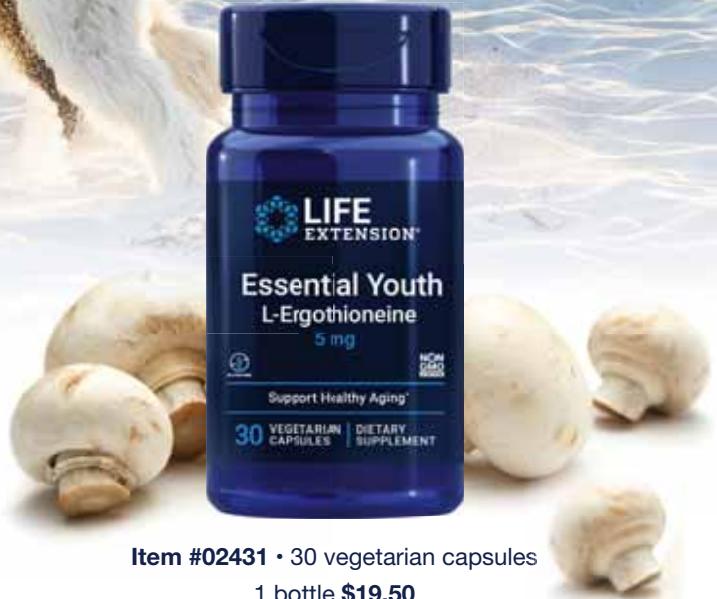
- Protecting against **mitochondrial DNA** damage<sup>1</sup>
- Delaying **telomere** shortening<sup>2</sup>
- Supporting **DNA function** in cells subjected to UV exposure<sup>3</sup>

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.<sup>4,5</sup>

#### References

1. *Cell Death Differ.* 2010 Jul;17(7):1134-40.
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

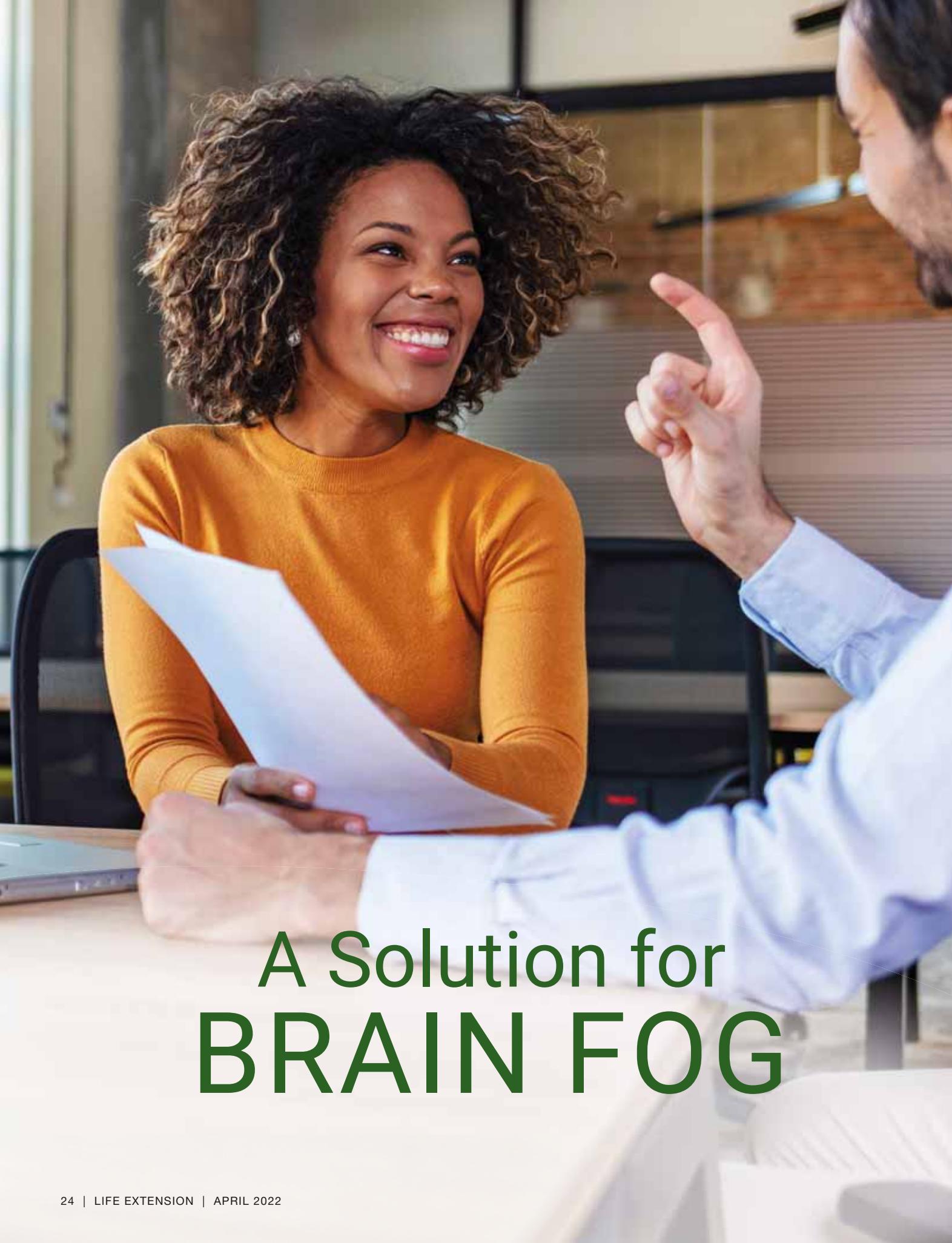
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# A Solution for **BRAIN FOG**



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.<sup>1-7</sup>

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.<sup>8,9</sup>

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

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.<sup>1-7</sup> Over 90% of patients with **mast cell disorders**, which increase inflammation, report frequent **cognitive impairment** consistent with **brain fog**.<sup>2</sup>



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

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**.<sup>1-3</sup>

## 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.<sup>8</sup>

**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.<sup>11-13</sup>

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

## WHAT YOU NEED TO KNOW



## 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.

### 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.<sup>17,18</sup> For example, peppermint teas have been shown to improve **memory** and **mental alertness** in human subjects.<sup>19</sup>

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.<sup>10</sup>

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.<sup>10</sup>



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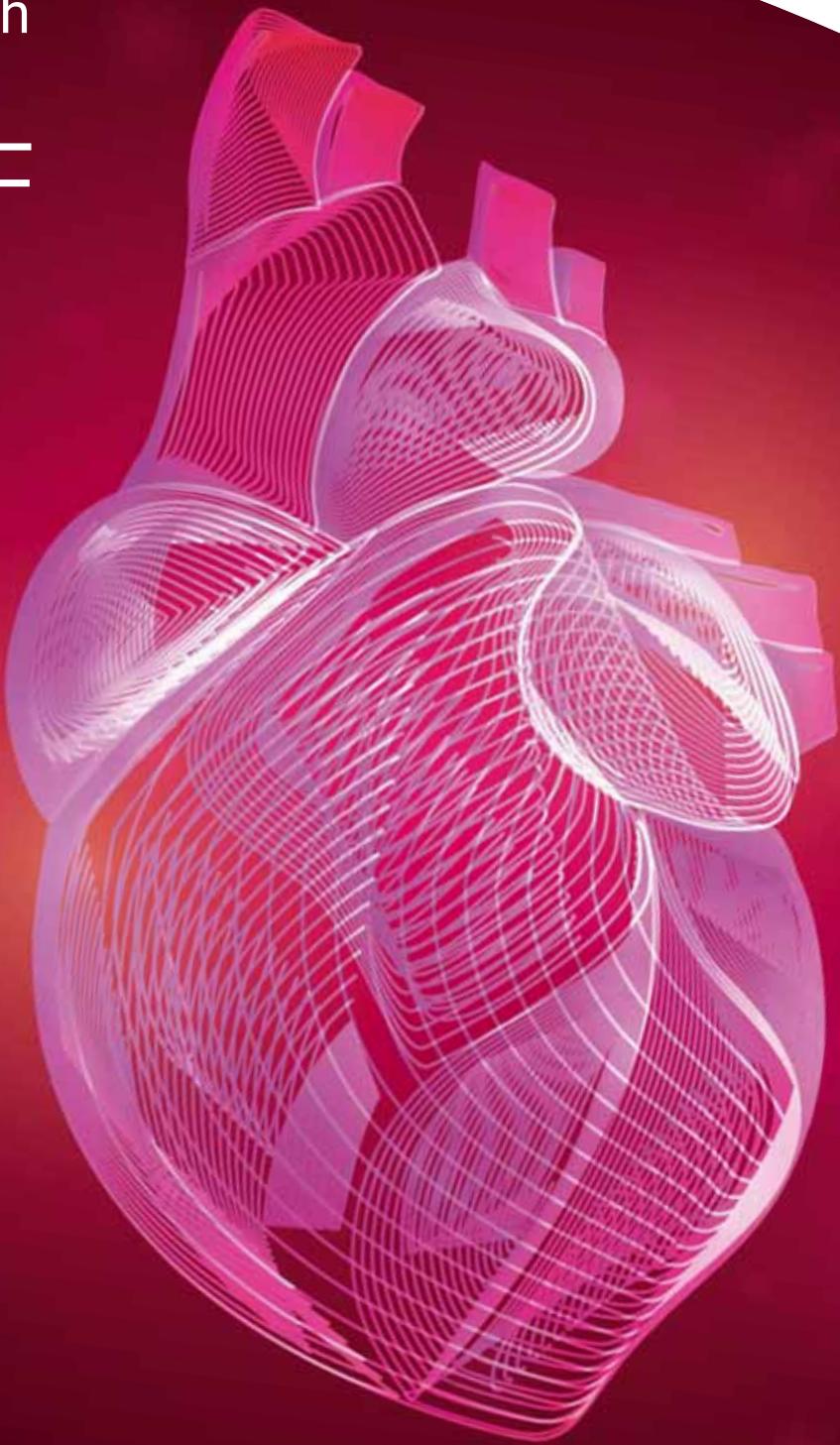
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\* *Int Angiol.* 2014 Feb;33(1):20-6.

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- Sharpened thinking
- Reduced mental fatigue
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#### References

1. *J Ethnopharmacol.* 2020 Oct 5;260:112996.
2. *Nutrients.* 2020 Jul 23;12(8).
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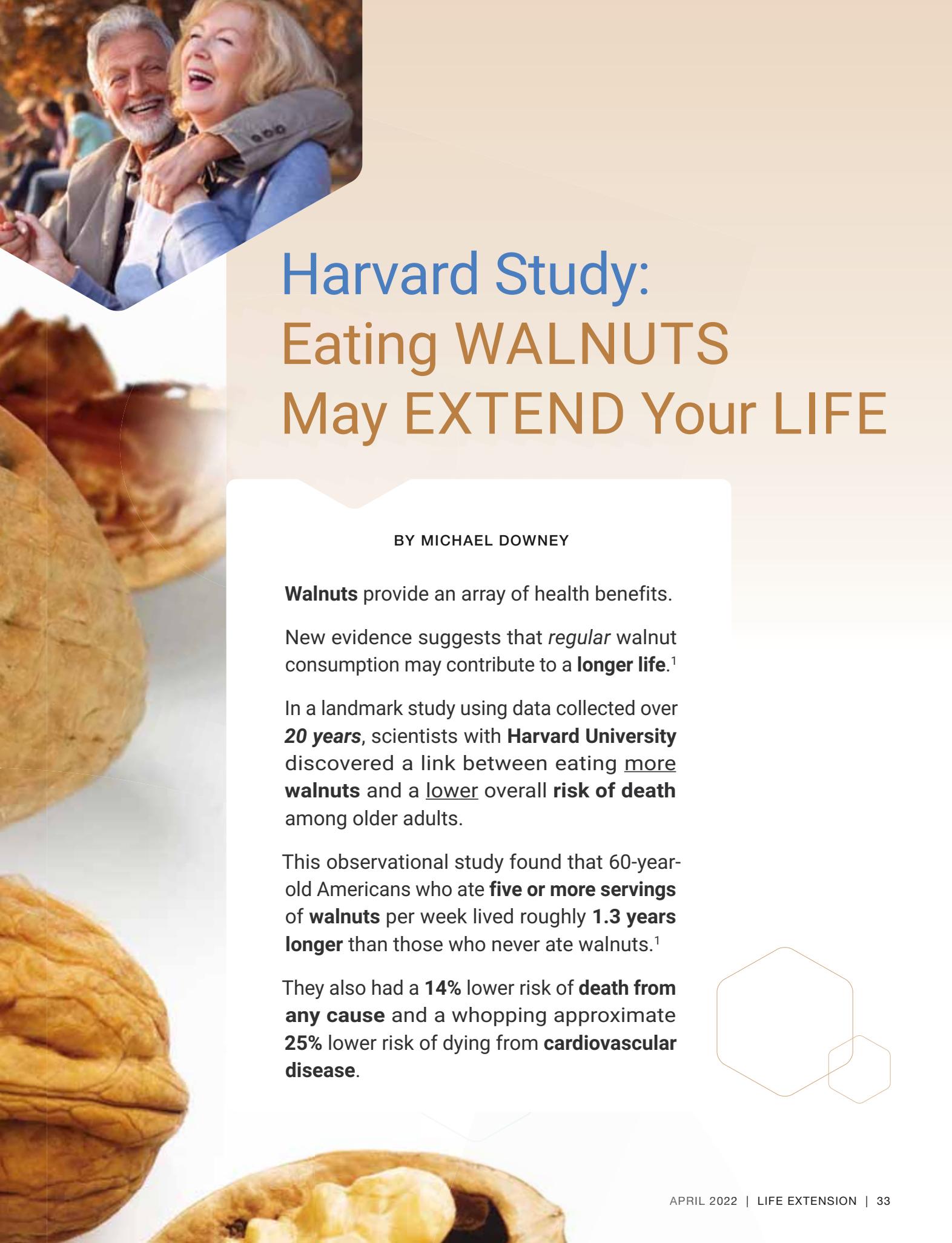


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# Harvard Study: Eating WALNUTS May EXTEND Your LIFE

BY MICHAEL DOWNEY

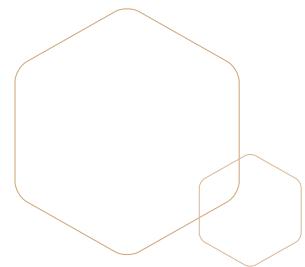
**Walnuts** provide an array of health benefits.

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

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.<sup>1</sup>

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**.<sup>1</sup>

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

- 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:<sup>1</sup>

- 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**.<sup>1</sup>

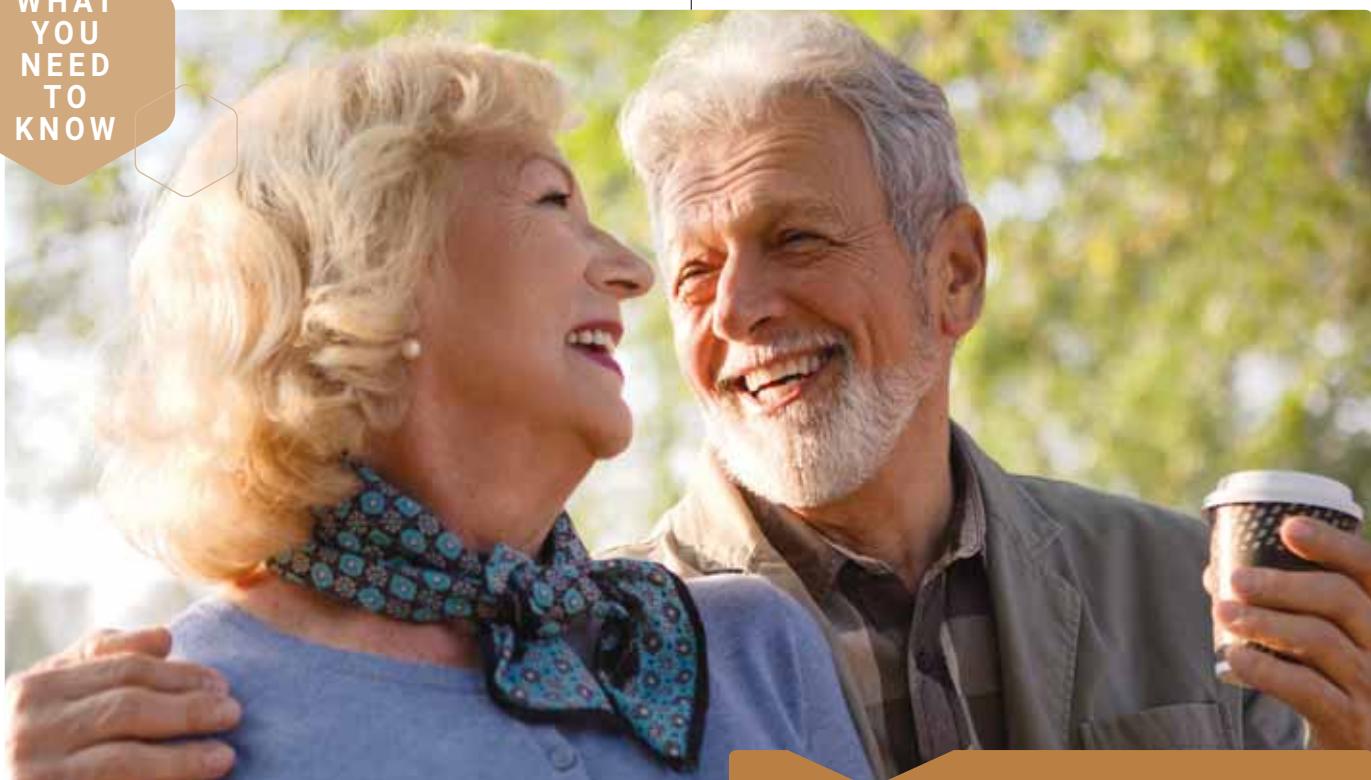
All subjects had completed a survey on walnut consumption and were relatively healthy at the start of the average **20-year** follow-up period. Their diets were checked every four years. This allowed scientists to identify associations between varying levels of **walnut intake** and **life expectancy**.

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**.<sup>1</sup>

"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."<sup>2</sup>



## WHAT YOU NEED TO KNOW



### 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**.<sup>3</sup>

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

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

Walnut consumption has also been associated with reduced **oxidative stress**.<sup>10,11</sup>

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.

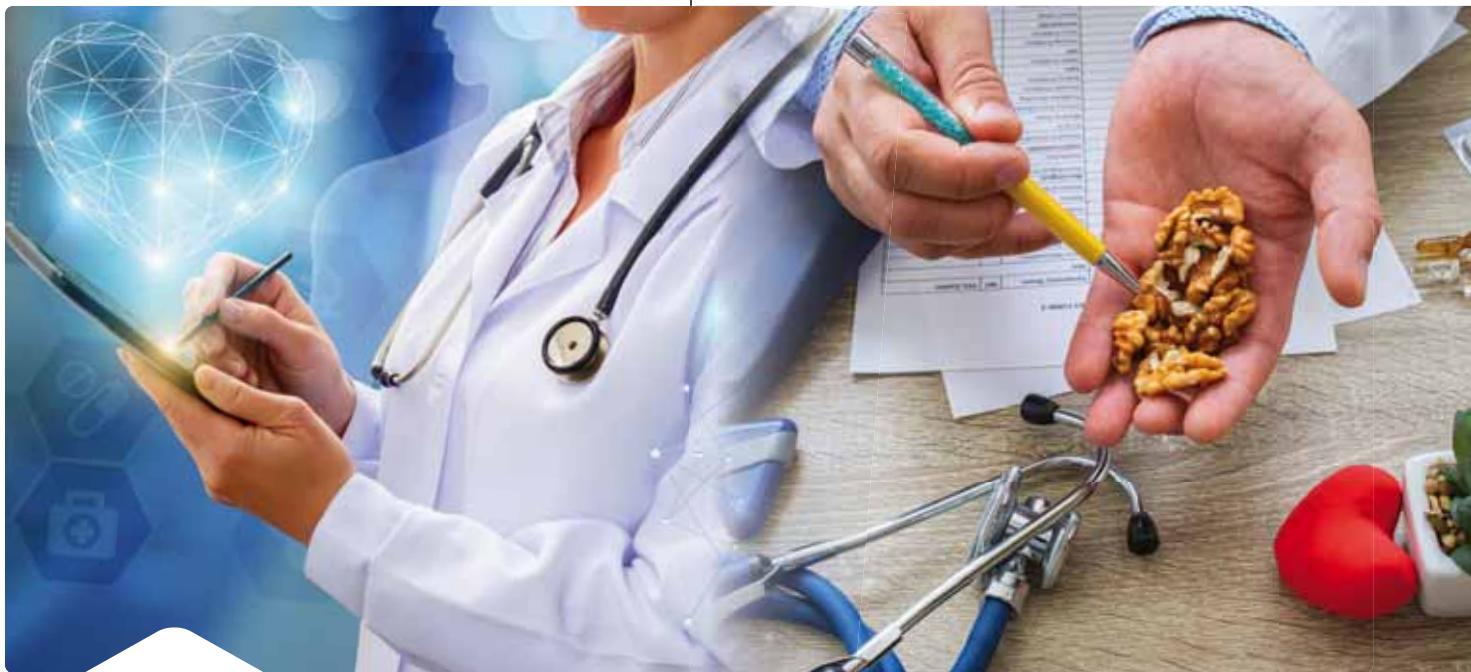
### Heart Protection

**Walnuts** are believed to reduce the risk of **cardiovascular disease**.<sup>12</sup>

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

### 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.<sup>14</sup>

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).<sup>15</sup>

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

- 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.<sup>17,18</sup>

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

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.<sup>20</sup>

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

### 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%**.<sup>22</sup>

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

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.<sup>24</sup>

## Brain Health

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

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.<sup>27</sup>

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

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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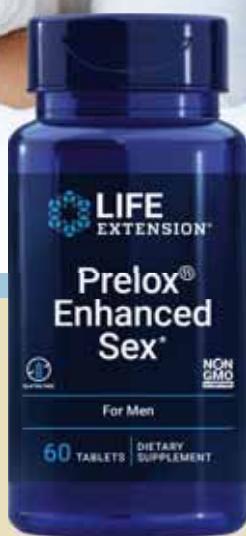
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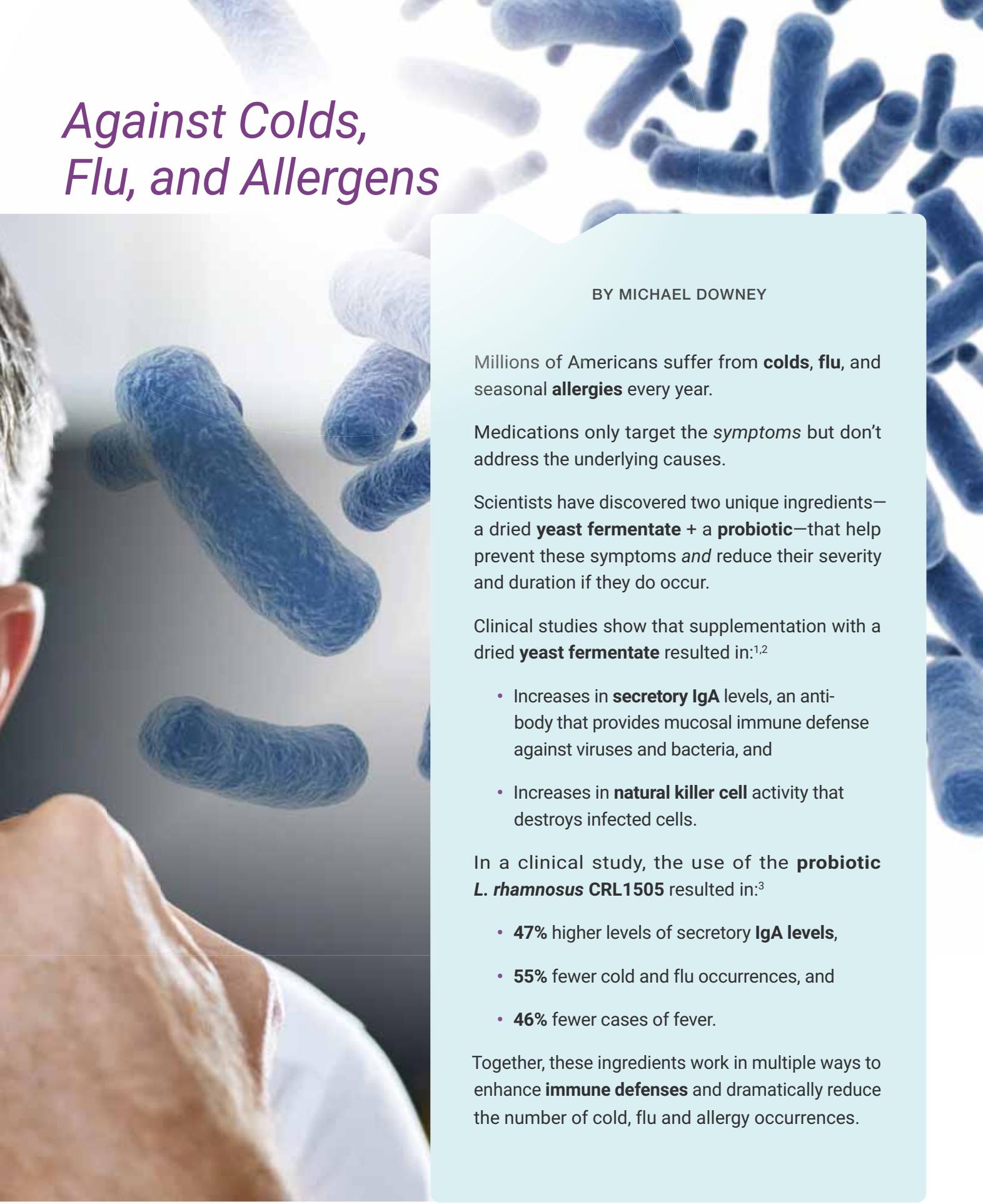
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# BOOST DEFENSES





# 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:<sup>1,2</sup>

- 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:<sup>3</sup>

- **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.<sup>4</sup> They have also been associated with more serious conditions, including asthma, and sinus and ear infections.<sup>5,6</sup>

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

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

## 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.<sup>11</sup> Certain allergy drugs, known as **anticholinergics**, have been linked to an increased risk of Alzheimer's disease.<sup>12</sup>

Scientists have identified two ingredients that help prevent cold and flu episodes.<sup>3,13,14</sup>

These ingredients are:

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

Each of these ingredients boosts activity of **immuno-globulin A (IgA)**, an antibody that provides immune defense against **viruses** and **bacteria**.<sup>1,3</sup>

Additionally, supplementation with dried yeast fermentate offers relief for people with allergies.<sup>13</sup>

## 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.<sup>15</sup>





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

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.<sup>1,2,13,14,17,18</sup>

### 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.<sup>1</sup>

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.<sup>1</sup>

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.<sup>13</sup>

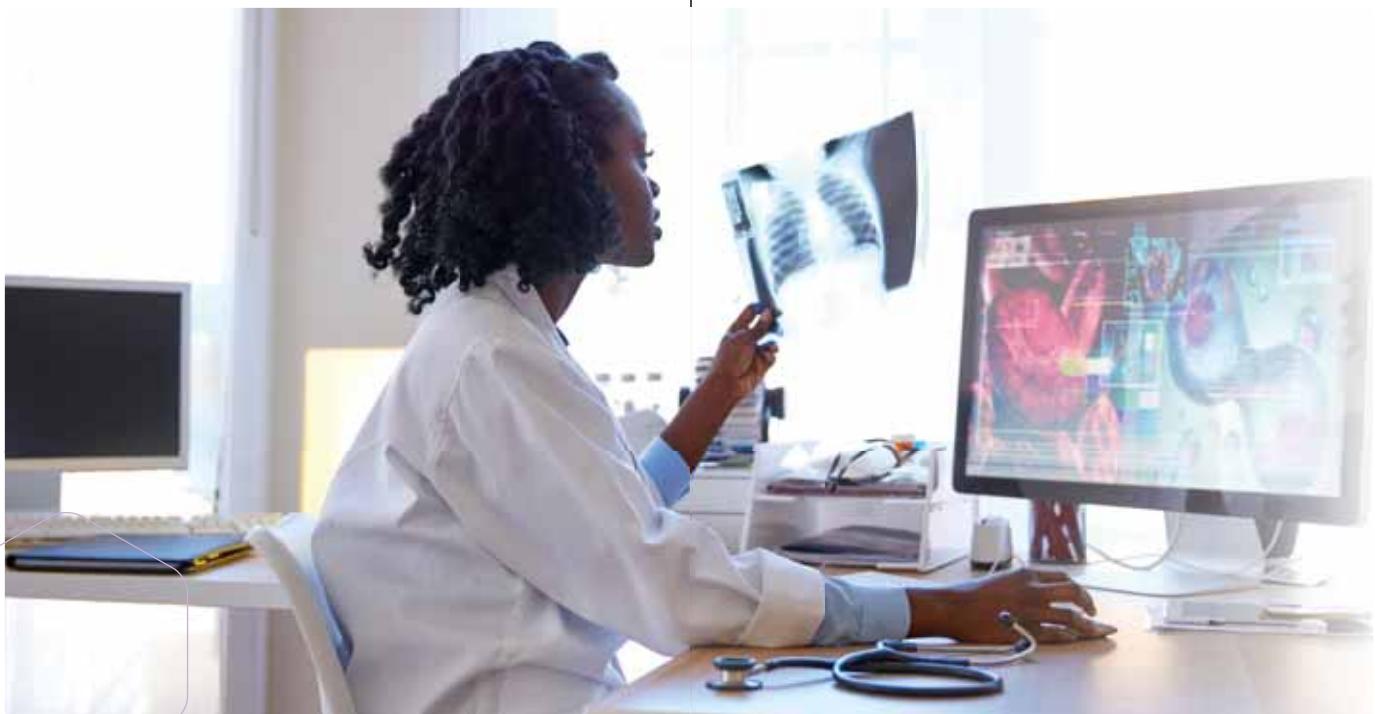
The first half of the 12-week study took place during the year's highest pollen-count period. Compared to the placebo group, those taking yeast had a median of **43% fewer days** with **nasal congestion**, along with decreased severity of runny nose and nasal congestion.<sup>13</sup>

## Probiotics

WHAT  
YOU  
NEED  
TO  
KNOW

### 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.<sup>17</sup>

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.<sup>14</sup>

## 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.<sup>1</sup>

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.<sup>1</sup>

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*.<sup>2</sup> 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.<sup>1</sup>

## 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.<sup>19</sup>

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.<sup>3,19-21</sup>

Preclinical studies show that this probiotic may help fight the viruses and bacteria that cause the common cold, influenza, bronchitis, and pneumonia.<sup>20,22</sup>

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.<sup>3</sup>

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:<sup>3</sup>

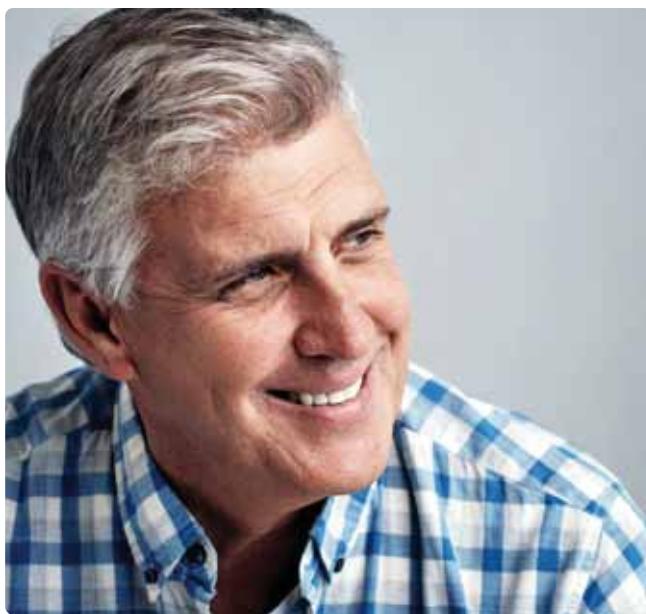
- **49% fewer** infections,
- **55% fewer** cases of cold or flu,
- **46% fewer** cases of fever,
- **47% increase** in levels of secretory IgA, and
- **33% less** antibiotic use.

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

## 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,<sup>3</sup> 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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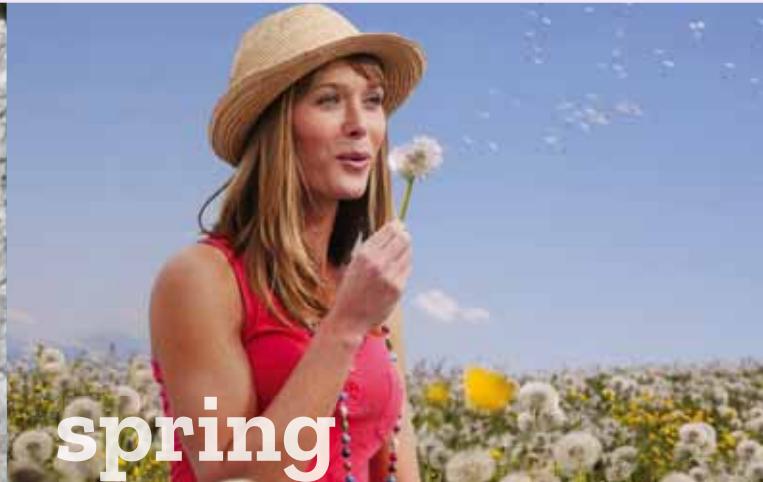
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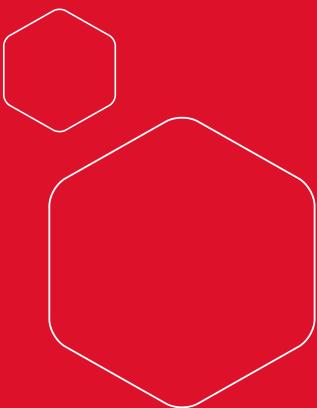


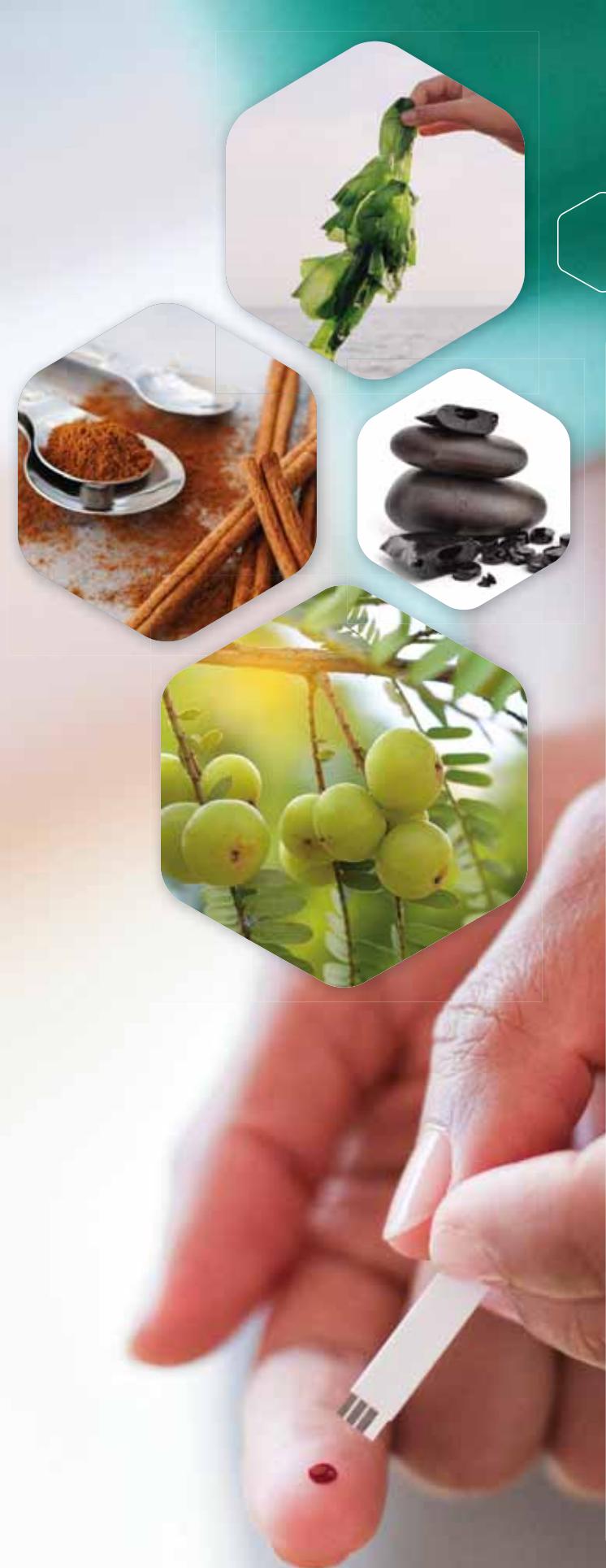
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# Restore Healthier GLUCOSE LEVELS





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.<sup>1-8</sup>

**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:<sup>9</sup>

- 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**.<sup>10</sup> 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**.<sup>11-13</sup>

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.<sup>14</sup> It has been estimated that more than **470 million** people worldwide will be prediabetic by 2030.<sup>14,15</sup>

Up to **70%** of people with prediabetes will eventually develop diabetes, according to an expert panel of the American Diabetes Association.<sup>14,15</sup>

Diet and other lifestyle interventions can help reduce the risk of progressing to diabetes.<sup>16</sup> 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.<sup>17-19</sup>

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

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





## 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.<sup>24</sup>

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

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

## Chromium Fights High Glucose

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

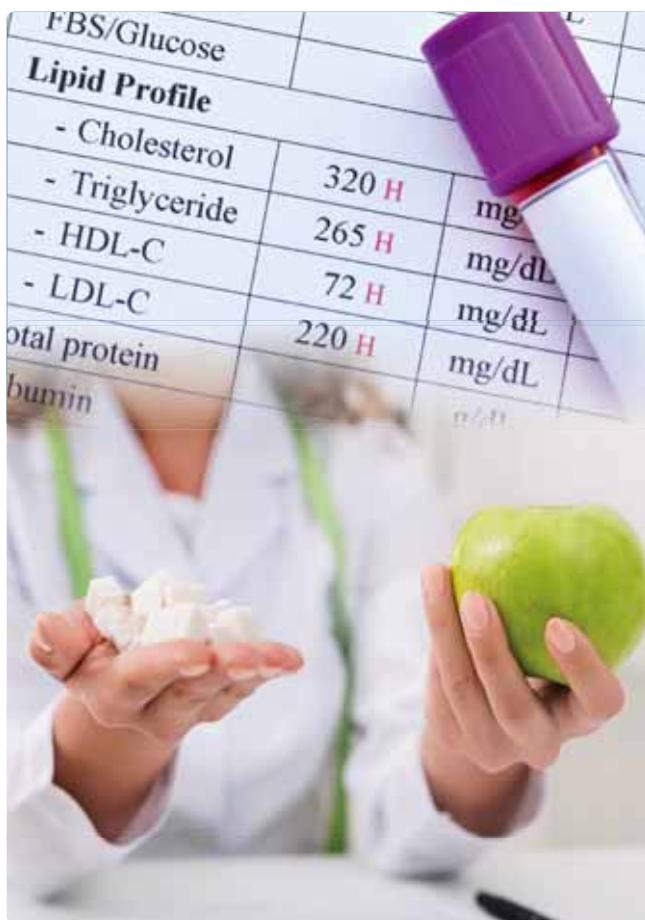
Studies show that chromium deficiency is associated with **insulin resistance** and **diabetes**.<sup>31,32</sup>

One study found that chromium deficiency is common in people with **prediabetes**.<sup>33,34</sup>

In **type II diabetics**, chromium supplementation has been found to significantly:<sup>31</sup>

- 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.<sup>35</sup>



## 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.<sup>36,37</sup>

**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.<sup>38-40</sup>

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:<sup>41</sup>

- 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

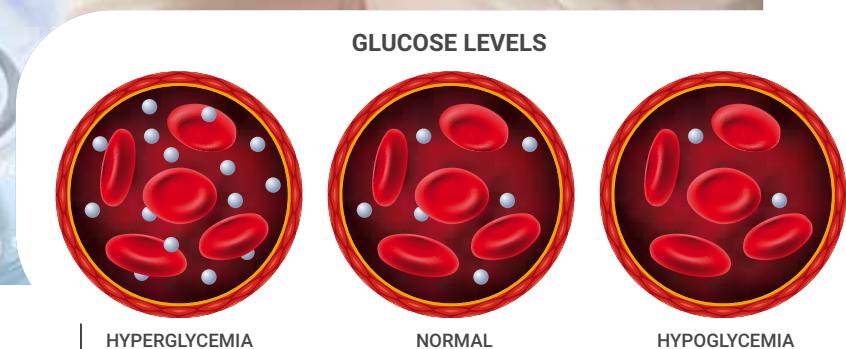
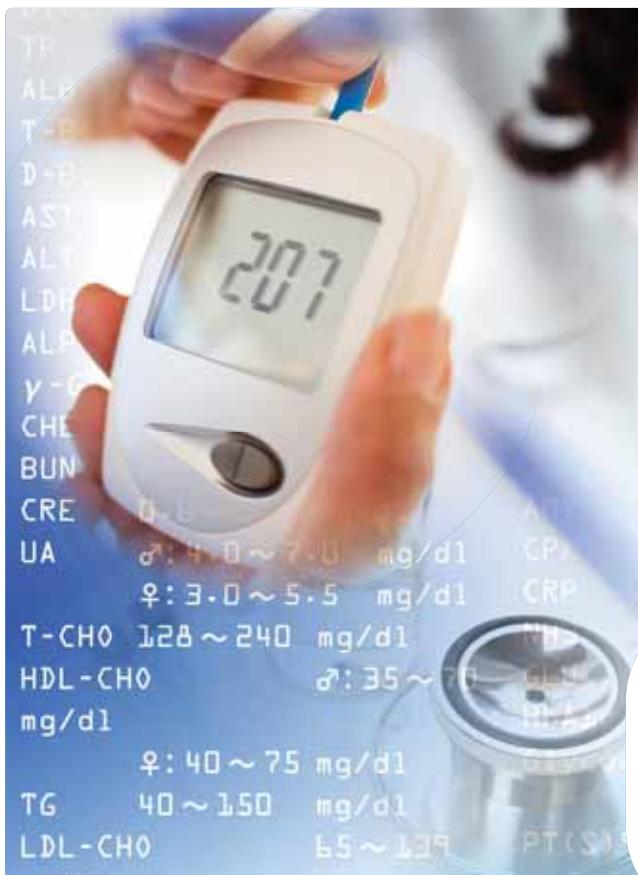
Another way to improve **glucose control** is to limit the amount of glucose the body has to process in the first place.

**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**.<sup>42,43</sup> 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.<sup>44,45</sup>

In clinical trials, **brown seaweed** extracts:<sup>46-48</sup>

- 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**.



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**, **amlia**, **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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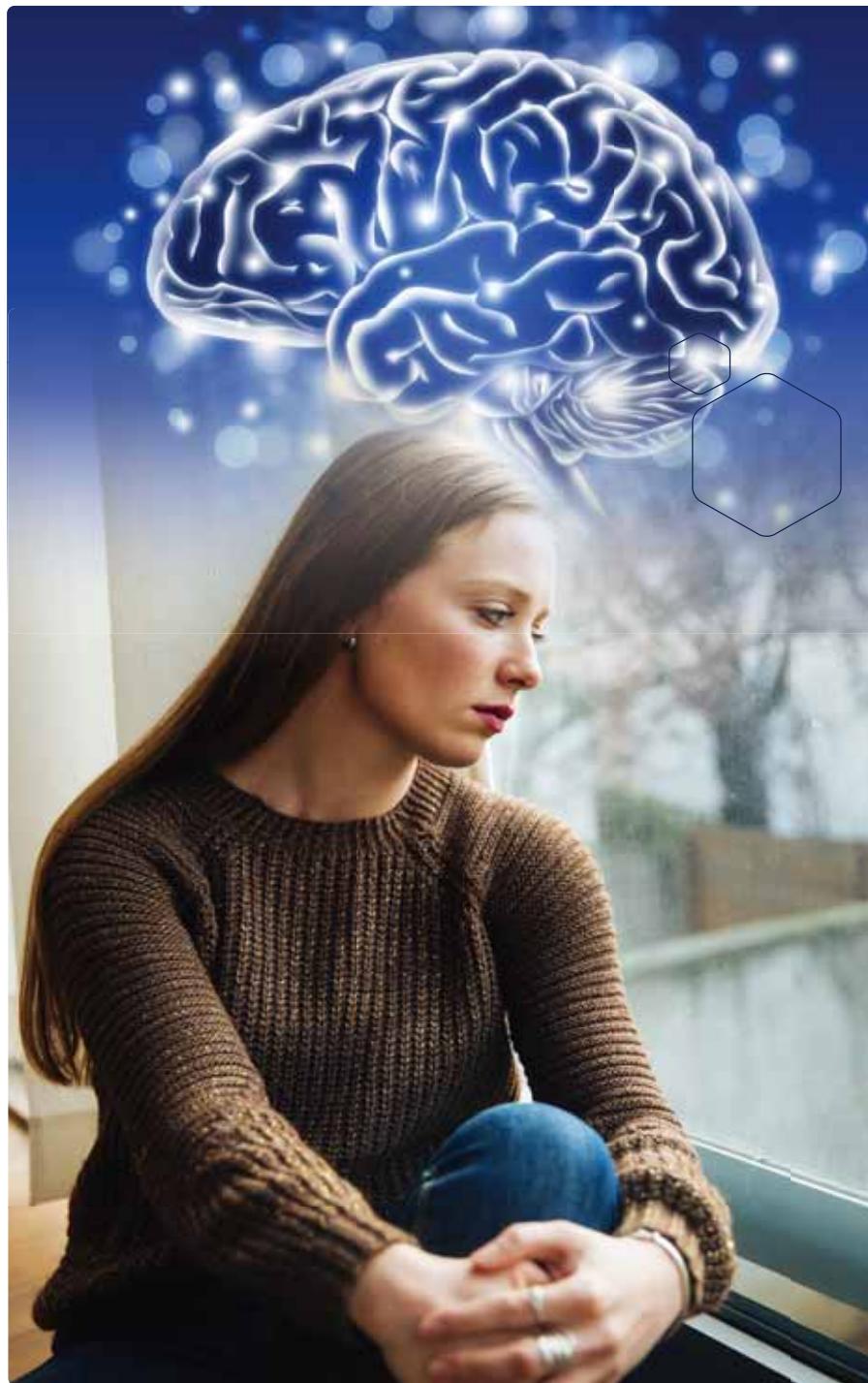
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# What is Tryptophan?

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**.<sup>1</sup>

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.<sup>2</sup>

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

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.<sup>4</sup> 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.<sup>5</sup> In a randomized crossover study, a diet high in tryptophan improved **mood**.<sup>6</sup>

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

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**.<sup>7</sup>

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**.<sup>8</sup>

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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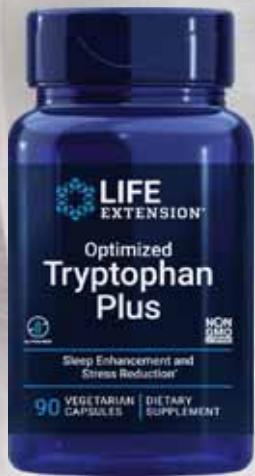
## PROMOTE SLEEP AND REDUCE STRESS

Tryptophan is the precursor of serotonin in the brain, a neurotransmitter associated with:<sup>1-4</sup>

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- Improved sleep
- Reduced stress

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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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# 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.

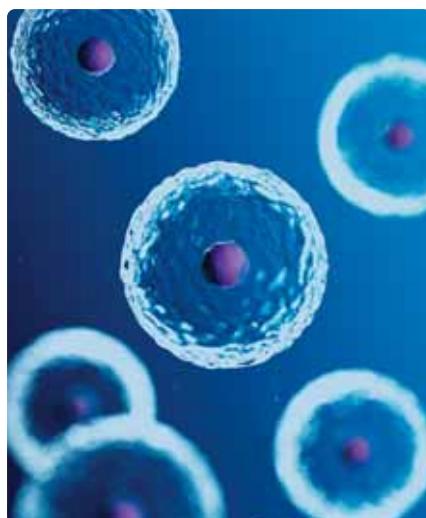
The FDA has stated that it expects to approve 10 to 20 new gene and cell therapies per year by the year 2025. This will drive the cost of gene therapy down and make it available for a wide range of health conditions.

### 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 **isetin** 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.

Reprinted with permission from BenBella Books, publisher of *The Science and Technology of Growing Young* by Sergey Young.

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

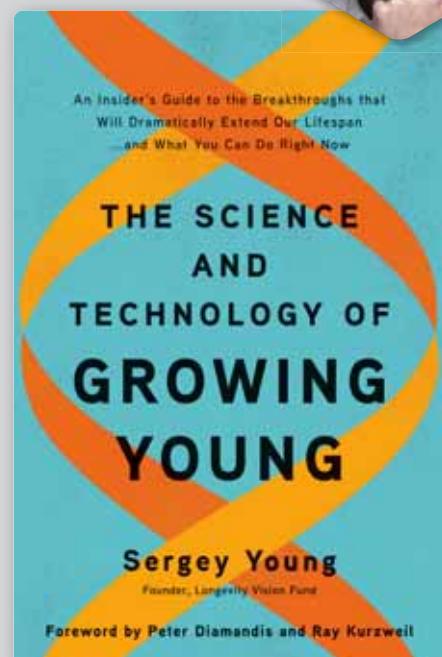
He is founder of the \$100 million Longevity Vision Fund, one of the few funds specializing exclusively in longevity and helping to accelerate longevity breakthroughs. He is also Development

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](http://www.LifeExtension.com)

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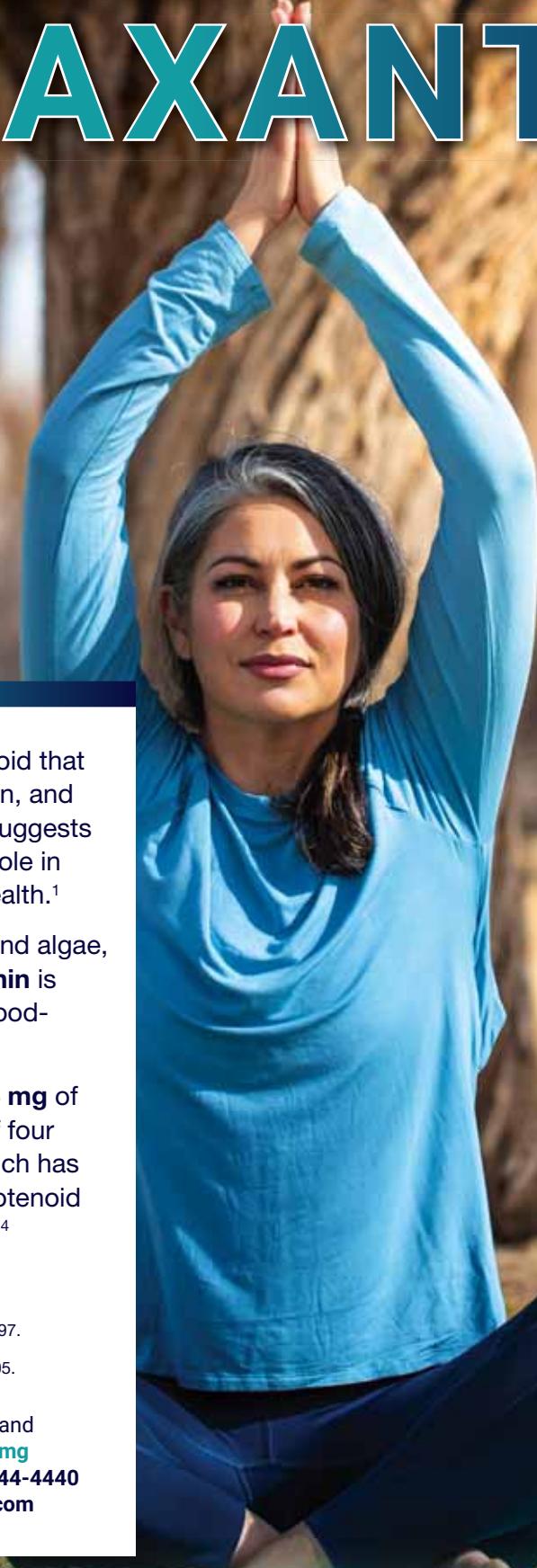
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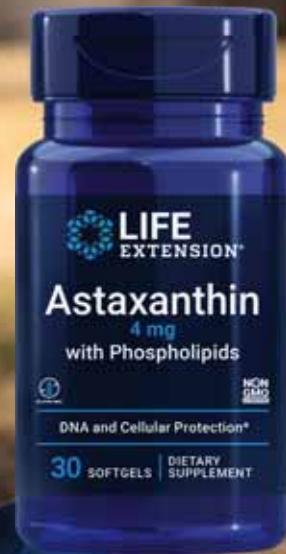
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**References**

1. *Nutrients*. 2020 Jun; 12(6): 1896.
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4. *Int J Pharm*. 2011 June 30; 412(1-2):99-105.

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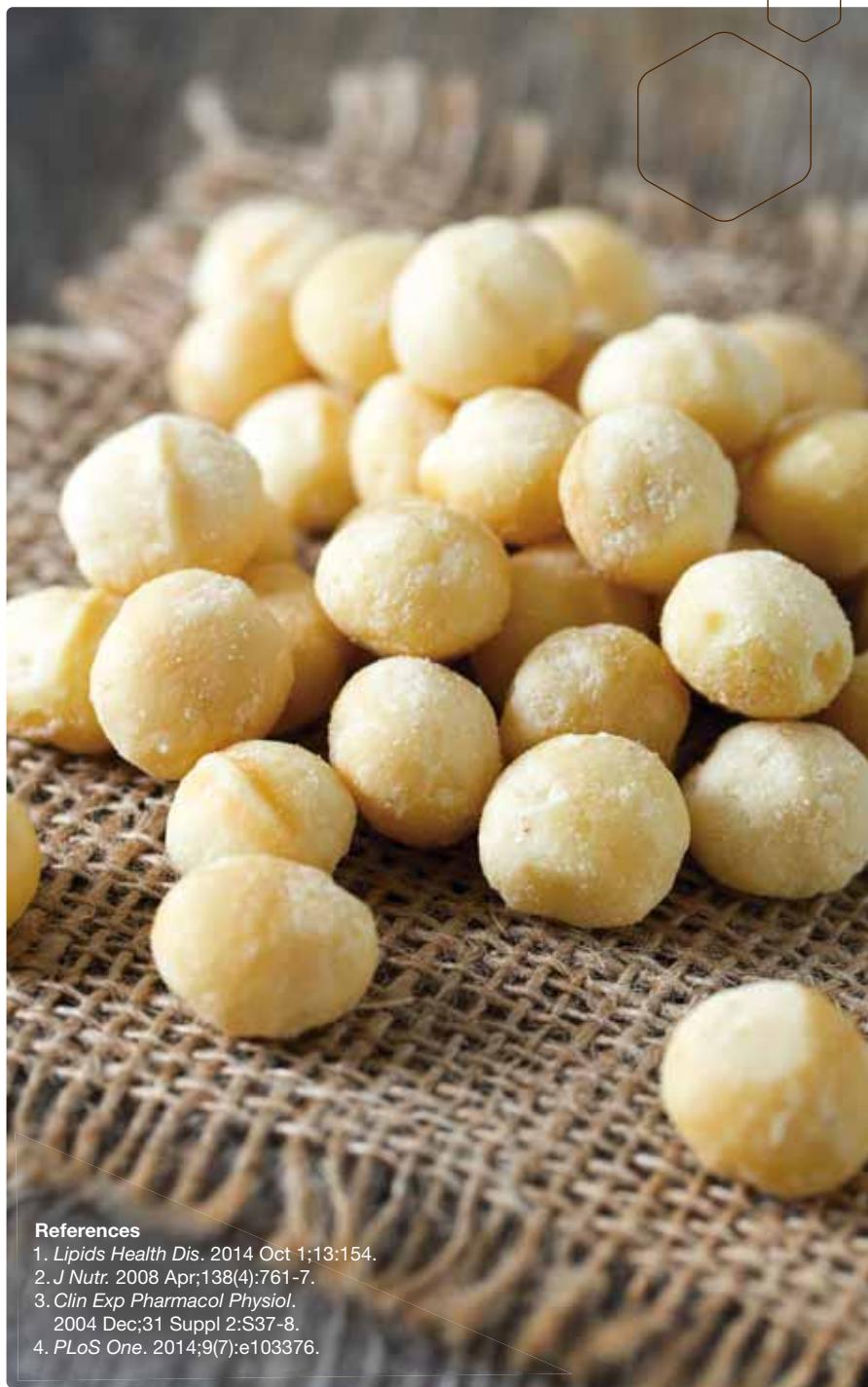
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# Macadamia Nuts

BY LAURIE MATHENA



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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.<sup>1</sup>

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.<sup>2</sup>

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.<sup>3</sup>

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.<sup>4</sup>

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.

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 00605 Regimint  
 01386 TruFiber®

**ENERGY MANAGEMENT**

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

**EYE HEALTH**

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

**FISH OIL & OMEGAS**

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

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

**FOOD**

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

**GLUCOSE MANAGEMENT**

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

**HEART HEALTH**

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

**HORMONE BALANCE**

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

**IMMUNE SUPPORT**

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	Boswellia
02467	Curcumin Elite™ Turmeric Extract • 30 veg capsules
02407	Curcumin Elite™ Turmeric Extract • 60 veg capsules
01804	Cytokine Suppress® with EGCG
02223	Pro-Resolving Mediators
00318	Serraflazyme
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 Prellox® 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	Progesterone-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** of **tamarind-curcumin** extract

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](http://www.LifeExtension.com)

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

TamaFlex® is a trademark of NXT USA, Inc. Patents pending.



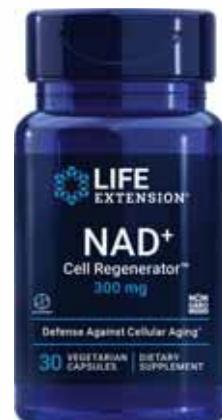
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# Multiple Benefits of

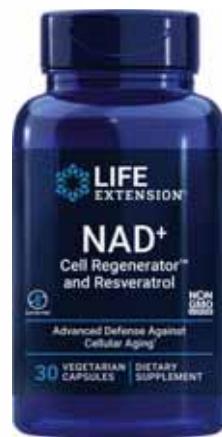
# NAD<sup>+</sup>



- 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<sup>+</sup> Cell Regenerator™ provides 300 mg of nicotinamide riboside chloride.

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

For full product description, pricing and to order NAD<sup>+</sup> Cell Regenerator™, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

\* For pricing available to readers of this magazine,  
call 1-800-544-4440 or visit [LifeExtension.com/NAD](http://LifeExtension.com/NAD)

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The Science of a Healthier Life®

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