



The Science of a Healthier Life®

January/February | 2025

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Female Sexual Health

PLUS
**Boost Your
Cognitive
Performance**
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"NAC is a powerful tool."

Maury

VERIFIED CUSTOMER REVIEW

TAP THE POWER OF N-ACETYL-L-CYSTEINE TO SUPPORT IMMUNE FUNCTION

N-Acetyl-L-Cysteine (NAC) has been shown to support healthy immune response and respiratory function.

NAC supports healthy levels of **glutathione** that helps promote a healthy **inflammatory response** and protect cells from **oxidative damage**.

This product is available at fine health food stores everywhere.



Item #01534

600 mg • 60 capsules

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



Fast-Acting Liquid Melatonin is a popular way to enhance the absorption of melatonin for sleep onset support.

The nice-tasting, citrus-vanilla flavor enables convenient “drop” dosing of **Fast-Acting Liquid Melatonin** for occasional sleeplessness.

Item #02234

3 mg per 20 drops, 2 fl. oz



FOR OCCASIONAL SLEEPLESSNESS.

Life Extension also offers a full range of melatonin in solid forms and a variety of dosages.

This product is available at fine health food stores everywhere.

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

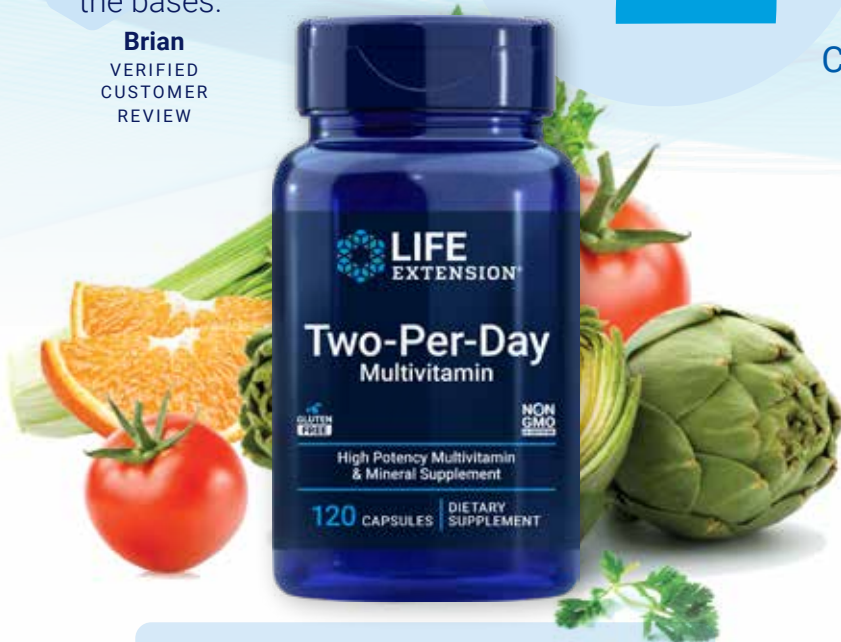
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VOTED #1 MULTIVITAMIN

"Covers all the bases."

Brian
VERIFIED
CUSTOMER
REVIEW

Compare **Two-Per-Day Multivitamin**
to the Leading Brand



The **Two-Per-Day** multinutrient formula is superior to commercial multivitamins because it provides vastly **higher** potencies of **vitamins, minerals and plant extracts**.



#1 Rated
Multivitamins | 11 Time Winner!†

**Compared to Centrum®
Silver Adult 50+
Two-Per-Day Provides:**

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25 TIMES THE VITAMIN B6

12 TIMES THE VITAMIN B12

10 TIMES THE BIOTIN

10 TIMES THE SELENIUM

8 TIMES THE VITAMIN C

3 TIMES THE VITAMIN E

2.5 TIMES THE VITAMIN B3

2 TIMES THE VITAMIN D

2 TIMES THE ZINC

Two-Per-Day Multivitamin Capsules

Item #02314 • 120 capsules (two-month supply)

Two-Per-Day Multivitamin Tablets

Item #02315 • 120 tablets (two-month supply)

Alpha lipoic acid, quercetin and plant extracts
lacking in most commercial multivitamins.

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fine health food stores everywhere.

CAUTION: Individuals consuming more than 50 mcg (2000 IU)/day of vitamin D (from diet and supplements) should periodically obtain a serum 25-hydroxy vitamin D measurement. Vitamin D supplementation is not recommended for individuals with high blood calcium levels.

†Product ratings based on results of the 2024 ConsumerLab.com Survey of Supplement Users. For more information, visit www.consumerlab.com/survey.

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"It is my goal
to never run out
of this. Ever!"

Rusty

VERIFIED CUSTOMER
REVIEW

NEURO-MAG®

THE SMART MAGNESIUM



Item #01603

90 vegetarian capsules

SUPPORTS OVERALL
COGNITIVE ABILITY

Neuro-Mag® Magnesium L-Threonate
helps maintain working
(short-term) memory, encourages
healthy processing speed, and
supports overall cognitive function.¹⁻³



Item #02032

93.35 grams of powder

These products are available at fine health food stores everywhere.

References: 1. *Neuropharmacology*. 2016 2016/09/01;108:426-39. 2. *Journal of Cellular Physiology*. 2016;231(9):1903-12. 3. *J Alzheimers Dis*. 2016;49(4):971-90.

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UP TO 45 TIMES GREATER
BIOAVAILABILITY

Curcumin

Patented technology combining **turmeric** and **fenugreek blend** (500 mg) results in up to **45 times** greater bioavailability of free **curcuminoids**.



Item #02407

500 mg
60 vegetarian capsules



This product is available at fine health food stores everywhere.

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

REPORTS



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ON THE COVER**

**Female
Sexual Health**

Studies show that **fenugreek seed extract** *enhanced* female **sexual function** and **libido**, while **saffron** extract *promoted* **desire** and **satisfaction**.

DEPARTMENTS

10 IN THE NEWS

Higher levels of nutrients in the blood may delay brain aging; salting food at the table linked to gastric cancer; female military recruits taking multivitamins suffer fewer injuries; flavonoid-rich diet lowers dementia risk



16 CLEAN UP YOUR CELLS WITH CURCUMIN

In preclinical models, **curcumin** *activated* **autophagy**, the internal **cellular cleansing** process that declines with age.



26 ASTAXANTHIN'S SYSTEMIC EFFECTS

In human studies, **astaxanthin** has been shown to benefit the **eyes**, while helping to *protect* against **skin aging**, cardio-metabolic risks, and age-associated **cognitive decline**.



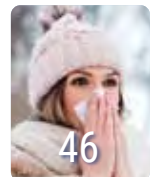
36 ENHANCE COGNITIVE FUNCTIONS

A study of older adults showed that a specific **sage extract** *improved* measures of **memory** by about **60%** and *improved* **attention** by **2.5-fold**. Combined with other compounds this may help protect **brain health**.



46 EFFECTS OF MUSHROOMS ON IMMUNITY

Combining **beta glucans** with **mushroom** extracts can *enhance* **immune functions** and *reduce* **upper respiratory infections**.



64 NAD⁺ CLINICAL TRIALS

Found in every living cell, **NAD⁺** levels sharply decline with age. In **clinical trials**, *restoring* **NAD⁺** *reduced* **inflammation**, *reduced* **fatigue** and *improved* **mitochondrial function**.



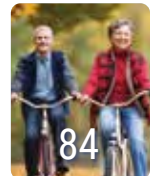
74 CALMING EFFECTS OF L-THEANINE

A recent study found that taking **L-theanine** daily *improved* **sleep quality**, *enhanced* **cognitive attention**, and *reduced* **stress** by **18%**, without causing drowsiness



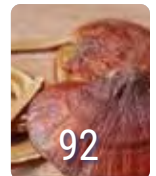
84 TAURINE UPDATE

Published studies show that **taurine** is associated with *healthier* **human lifespans**. A **2024** meta-analysis of 25 clinical trials helps corroborate this.



92 WHAT IS REISHI?

Modern research shows Reishi **mushrooms** boost **immune** protection and prolong **lifespan** in mice.





LIFE EXTENSION®

The Science of a Healthier Life®

January/February 2025

Food Freedom

**More cheese?
Yes, please!**
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indulge without
worrying about
occasional gas
and stomach
upset, as
well as other
gastrointestinal
discomforts.
Put digestive
comfort back on
the menu with
our new, plant-
based formula!



Item #02533

60 vegetarian capsules



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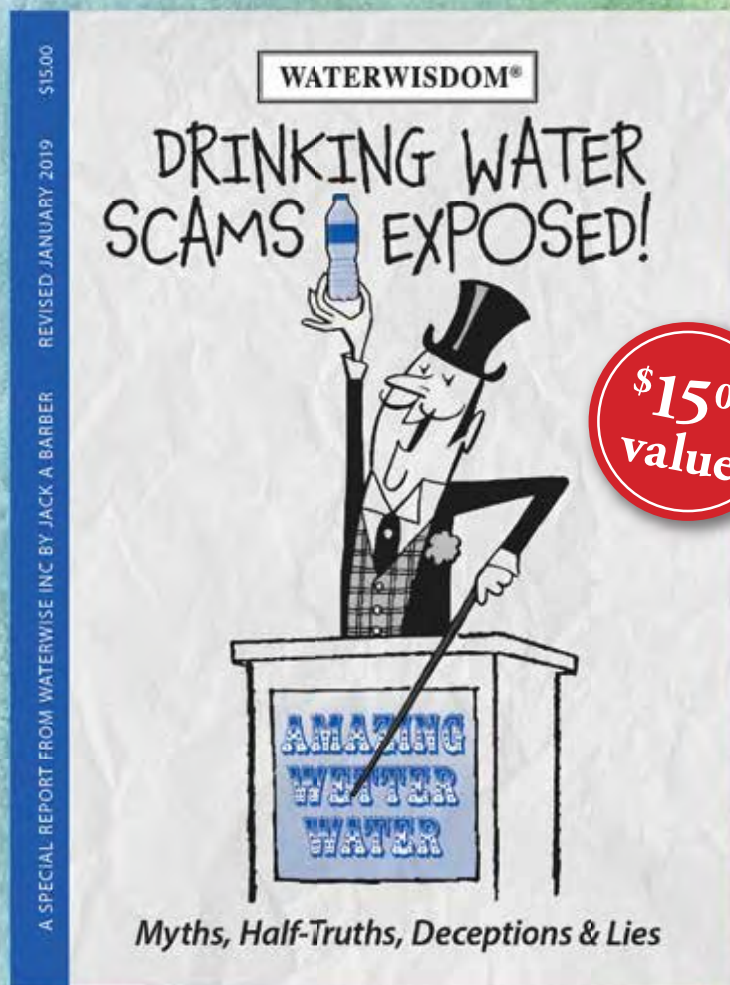
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In the News

Delayed Brain Aging Linked with *Higher* Nutrient Blood Levels

A recent study revealed an association between blood nutrient biomarkers and differences in indicators of **brain aging**.*

In people with delayed brain aging, compared to those with accelerated brain aging, blood nutrient biomarker assessment revealed *higher* levels of **omega-3** and other fatty acids, lutein, zeaxanthin, vitamin E, and choline.

Women and men with *delayed* brain aging performed better in tests of intelligence, executive function, and memory.

Individuals with accelerated brain aging had an average brain age of **65.1** years compared to people with delayed brain aging who had an average brain age of about **59.7** years.

Editor's Note: Participants included 100 older men and women who also received magnetic resonance imaging (MRI) of the brain to measure structure, metabolism, and functional connectivity. A total of 139 brain health variables were measured.

* *npj Aging* 10, 27 (2024).





Always Adding Salt to Food? You Could be Adding Risk of Gastric Cancer

Individuals who always add salt to their food at the table have an increased risk of gastric cancer, according to a study published in the journal *Gastric Cancer*.*

Using data collected from the UK Biobank, which included 471,144 people, researchers obtained information on the frequency of adding salt to food. They compared these findings to cancer incidence from national cancer registries.

Over an average follow-up of 10.9 years, people who reported “always” adding salt to their food had a **41% higher** risk of gastric cancer, compared to people who reported “never or rarely” adding salt to their food.

Editor’s Note: The American Heart Association recommends limiting daily sodium intake to no more than **2,300 mg** but ideally it should be no more than **1,500 mg** for most adults.** However, since numbers like these can be difficult to assess, the researchers concluded that using terms like “always adding salt to food” could be a useful indicator of salt intake, as well as a risk assessment of gastric cancer.

* *Gastric Cancer*. 2024 Apr 17.

** Available at: <https://www.heart.org/en/healthy-living/healthy-eating/eat-smart/sodium/how-much-sodium-should-i-eat-per-day>. Accessed September 6, 2024.

Female Military Recruits Who Take Multivitamins have Fewer Injuries

Female military recruits undergoing basic training who received in-person education about **multivitamins** and had better compliance with a multivitamin regimen were found to have significantly **fewer** overuse musculoskeletal injuries and bone stress injuries compared to those with less knowledge and poorer compliance.*

The study included 159 recruits in the seven-and-a-half-week initial entry training for all enlisting U.S. Air Force and Space Force recruits. They all received multivitamins. Seventy-nine trainees viewed an educational video created by dietitians concerning the subject of multivitamins and also received an in-person briefing by a group of experts. The remaining 80 women were only shown the video.

Women who received the in-person briefing concerning multivitamins reported greater **compliance** with **multivitamin** use.

In the group that received the briefing, musculoskeletal injuries were diagnosed among **17.72%** of the recruits and bone stress injuries among **5.06%**. In participants who viewed the video only, **31.25%** were diagnosed with musculoskeletal injuries and **15%** with bone stress injuries.

This study demonstrates the benefits of **in-person** learning as opposed to watching videos.

Editor’s Note: The multivitamin formula provided to the recruits included vitamins A, B complex, C, D, and E, calcium, iron and zinc.

* *Mil Med*. 2024 Aug 19;189(Supplement_3): 93-98.



High Intake of Flavonoid-Rich Foods Reduces Dementia Risk

A flavonoid-rich diet has been associated with a lower risk of dementia—especially among those with a high genetic risk or depressive symptoms—according to a study published in *JAMA Network Open*.*

Flavonoids are beneficial plant compounds found in common foods such as tea, red wine, and berries.

Compared to those in the lowest quintile of flavonoid intake, those in the *highest* quintile (which was defined as **six** additional servings of flavonoids per day) had a **28%** lower risk of dementia. The highest intake of flavonoids was associated with a **43%** lower risk among those with a high genetic risk of dementia, and a **48%** lower risk among those with depressive symptoms.

Consuming at least two of the following per day was connected to the greatest risk reduction: five servings of tea, one serving of red wine, or half a serving of berries.

Editor's note: This cohort study included 121,986 participants from the UK Biobank aged 40-70. Data were collected from 2006 to 2010, with an average follow-up of 9.2 years.

* *JAMA Netw Open*. 2024;7(9):e2434136.



YOUR BONE HEALTH...NOW **BOOSTED**



Bone Restore with Vitamin K2 combines skeletal-strengthening nutrients in one formula.

Item #01727

120 capsules



This product is available at fine health food stores everywhere.

Caution: Those taking a vitamin K antagonist (e.g. warfarin) should use Bone Restore without vitamin K2.

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

The Vitamin B Family is Complex. So is our formula.



Item #01945
60 vegetarian capsules



There's a whole bunch of different vitamin Bs out there, and you need all of them to stay sharp and full of energy.

There's also better vitamin Bs—forms of each nutrient that are easier for your body to use, absorb...or both.

BioActive Complete B-Complex is purpose-built to give you all the best vitamin Bs that your body needs so you can “B” at your most healthy.

This product is available at fine health food stores everywhere.



CAUTION: Temporary flushing, itching, rash, or gastric disturbances may occur.



NEW



Item #02533

60 vegetarian capsules



FOOD *Freedom*

More cheese? Yes, please! Feel free to indulge without worrying about occasional gas and stomach upset, as well as other gastrointestinal discomforts.

Food Sensitivity Relief with Diamine Oxidase is formulated to encourage healthy metabolism of histamine-rich foods like cured meats, cheeses and wine, so you can make friends with your favorite foods again.

Put digestive comfort back on the menu with our new plant-based formula!

This product is available at fine health food stores everywhere.

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Clean Up Your Cells with **CURCUMIN**



BY BRIAN WILTON

To keep a car running smoothly we regularly change the oil, replace worn parts like spark plugs and brake pads, and perform other basic maintenance tasks.

Our **cells** work much the same way.

As we age our cells accumulate damaged proteins and other toxic debris. This leads to accelerated **degenerative** processes, and risk for chronic disorders.

A natural housekeeping process called **autophagy** functions as a built-in cleansing service whereby damaged cellular components are identified and eliminated.¹⁻³

The vital **autophagy** process *declines* with age.^{1,3,4}

Curcumin, a compound found in the spice turmeric, has been shown to boost autophagy.⁵⁻¹¹ Preclinical and clinical studies have shown that it can help combat several key factors involved with **degenerative aging**.

Importance of Autophagy

The body has a natural way to detect, clean and recycle the cellular damage that accumulates over time.¹⁻⁴ This process, called **autophagy**, enables cells to clean up their metabolic waste.

Autophagy literally translates to “self-eating.” In this process, cells devour and break down old, worn-out internal components to make room for fresh, new replacements.

This helps enable cells to continue functioning optimally.

Aging and poor diet lower the rate of autophagy. As it slows down, metabolic waste accumulates inside cells and compromises optimal functions.

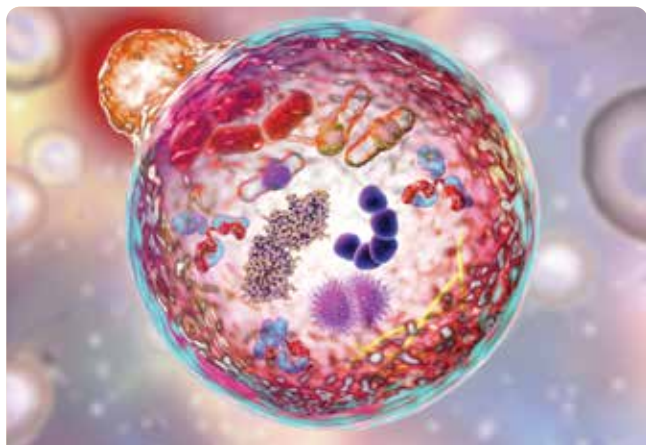
Cell and animal studies show that when autophagy is **deficient**, organisms suffer premature aging, chronic disease, and shortened lifespan.^{1,4} In several animal studies, when autophagy is **enhanced**, longevity is *increased*.¹²⁻¹⁵

For example, in one study, activating autophagy in mice extended the average **lifespan** by **17.2%**.¹⁵

Ways to Stimulate Autophagy

Research has indicated that physical **exercise**¹⁶ and **intermittent fasting** or **calorie restriction**¹⁷ stimulate **autophagy**.

Metabolic abnormalities contribute to chronic diseases. The enzymes **mTOR** and **AMPK** play a key role in modulating cellular autophagy.^{1,4}



Autophagy. A lysosome (orange) fusing with an autophagosome (large sphere). Autophagy is the natural mechanism that destroys unnecessary or dysfunctional cellular components and recycles their materials. The target components are first isolated from the rest of the cell within the double-membraned autophagosome. This then fuses with a lysosome, the contents of which degrade the target components.

When calorie intake is high, **mTOR** is activated and *shuts off* autophagy, whereas inhibiting excess **mTOR** activity can increase **autophagy**.¹⁸

AMPK *activates* autophagy. Increased cellular **AMPK** activity has been shown to improve metabolic health and longevity.¹

When **AMPK** is *increased* and **mTOR** is *decreased*, autophagy is most active.^{1,4}

As we age, the autophagy process can become impaired or diminished, leading to catastrophic results. Most age-related **chronic diseases**, from cardiovascular to neurodegenerative disorders and cancer, have been linked to **diminished autophagy**.^{1,4}

A decline in autophagy leads to metabolic conditions, which further impair autophagy, creating a vicious cycle that advances aging.¹

Curcumin Promotes Autophagy

Curcumin is a polyphenol compound found in turmeric root.

In clinical studies, curcumin has long been known as a potent **anti-inflammatory**. By reducing oxidative stress and chronic inflammation, it may support metabolic, cardiovascular, and gastrointestinal health.¹⁹⁻²¹ Maintaining metabolic health slows the progression of damage related to aging and chronic conditions.²²

Preclinical research over the last decade has also identified curcumin as a promoter of **autophagy**.^{5-7,23-25}

It works by *suppressing* **mTOR** activity and *boosting* **AMPK** activity.^{5,6,23,24} It also binds to and activates a key protein in cells called transcription factor **EB**, or **TFEB**, which triggers cellular machinery important for autophagy.²⁵

In cell and animal models, curcumin has been shown to augment autophagy,^{5-7,26} improve health,^{5-7,23-27} and extend life.^{28,29}

Giving fruit flies **curcumin** led to as much as a **26%** extension of their average **lifespan**.²⁸

Reduced Risk for Chronic Disorders

By promoting autophagy and combating oxidative stress and inflammation, curcumin may lower risk for a wide range of age-related and chronic diseases.

Adequate levels of autophagy help reduce risk for most chronic diseases of aging, which suggests that curcumin's potential benefits extend to other illnesses.^{8,30}



WHAT YOU NEED TO KNOW

Curcumin Boosts Autophagy for Better Health

- In **autophagy**, a cellular housekeeping process, old and faulty cellular components are removed to make room for new parts. This helps rejuvenate each cell and keep it running smoothly.
- Autophagy typically declines with age, allowing damaged and dysfunctional parts to accumulate. Reduced autophagy contributes to most forms of age-related **chronic diseases**, including neurodegeneration, cardiovascular disease, and cancer.
- In cell and animal models, boosting autophagy supports healthy aging and promotes **longer life**.
- **Curcumin**, a compound found in turmeric root, has been shown in cell and animal models to activate **autophagy** to rejuvenate cells and counter age-related diseases.
- Curcumin extends lifespan in animals and has shown an ability to improve memory, cardiovascular health, and more in **human studies**.

Mild cognitive impairment, Alzheimer's, Parkinson's, and other **neurodegenerative diseases** are associated with the accumulation of abnormal proteins in the nervous system. Autophagy may help clear these proteins.

In animal models of Alzheimer's, curcumin intake induces autophagy and reduces build-up of **amyloid plaques**.^{5,31} In models of Parkinson's, it has been shown to reduce accumulation of an abnormal protein called **alpha-synuclein** and improve disease symptoms.^{6,32}

Being obese and overweight increases the risks of developing chronic conditions like heart disease, stroke, cancer, and diabetes. Inflammation associated with obesity also accelerates the aging process.³³

A meta-analysis of 876 subjects randomized to receive **curcumin** supplementation showed a reduction in **body weight** and body mass index (BMI).³⁴

In preclinical studies curcumin has demonstrated benefits in **cardiovascular disease** in diabetic²³ and non-diabetic models.³⁵ Activating autophagy helps protect blood vessel health and shield the heart from damage.^{23,36}

In a study of diabetic mice on a high-fat diet, curcumin supplementation resulted in increased **AMPK activity** and **autophagy** in heart muscles, resulting in improvement of overall cardiac muscle function.²³

In a **human** study of young, obese men, 12-weeks of a specially formulated curcumin-galactomannan supplement led to a **34%** increase in protective **HDL** ("good") cholesterol and a **29%** reduction in **homocysteine** (an amino acid linked to development of atherosclerosis) compared to **placebo**.³⁷

A large review of 54 meta-analyses of human trials revealed curcumin intake was associated with reduction of **inflammatory** markers like **C-reactive protein**. There were also reductions in markers of metabolic health—fasting blood glucose levels, **A1c** (a long-term marker of blood sugar management), insulin resistance, and cholesterol levels.³⁸

The review suggests the potential of curcumin in prevention and management of chronic metabolic inflammatory diseases.

In cell cultures and animal studies curcumin has shown promising results in reducing growth and inducing **apoptosis** of various types of **cancer cells**.

Autophagy plays a role in combating **cancer**. By boosting autophagy, curcumin has been shown in lab studies to fight cancer cell growth in a wide range of cancer types, including aggressive cancers like **melanoma** and **brain gliomas**.^{26,39-42}

A systematic review and meta-analysis of **21** clinical trials in patients with different types of cancers was conducted. Five trials were associated with relieving side effects of aggressive cancer treatment when curcumin was given as an adjuvant to standard treatment, while 16 of the 21 clinical trials were associated with the effectiveness of curcumin on various types of cancers.

The results from these **clinical trials** highlight curcumin's potential for cancer risk reduction and adjuvant intervention.⁴³

Summary

The process of **autophagy** identifies faulty and deteriorating cellular components and removes them, so they can be replaced with new parts.

This **rejuvenation** effect helps keep our bodies running smoothly and may slow aging and onset of age-related disorders.

Unfortunately, beneficial **autophagy** tends to decrease with age, which has been tied to many chronic conditions. Cell and animal models show that boosting **autophagy** can improve health and extend lifespan.

The compound **curcumin**, along with healthy dietary and physical activity practices, helps to increase **autophagy**. •





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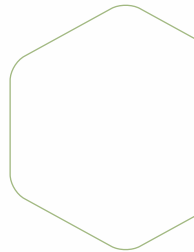
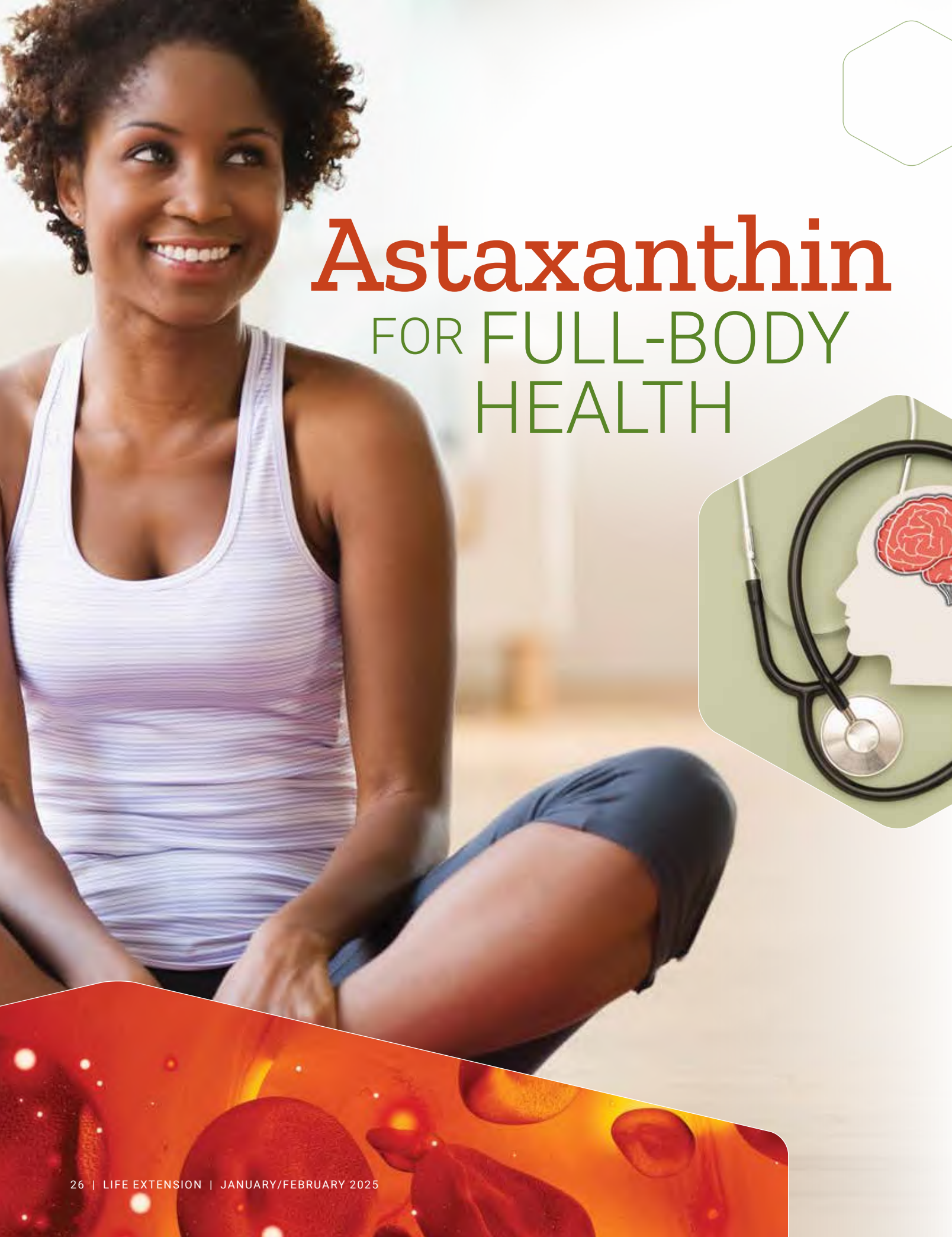


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Astaxanthin

FOR FULL-BODY
HEALTH





BY RICHARD REEVES

Astaxanthin is a **carotenoid** with impressive anti-inflammatory/antioxidant properties.^{1,2}

Research shows that astaxanthin has the potential to provide benefits throughout the body and can be a valuable component of anyone's health program.

While best known for its **eye health** benefits, astaxanthin has also been shown to hold promise for improvement in skin, liver, neurological functions, and more.³



What Is Astaxanthin?

Astaxanthin (pronounced “asta-zanthin”) is a red pigment in the **carotenoid** family, which also includes lycopene, lutein, and zeaxanthin.¹

It is formed in **microalgae** and **phytoplankton** in the sea.^{4,5} When eaten by some animals, the pigment concentrates in their tissues, leading to the reddish-pink colors of lobsters, crabs, shrimp, and salmon.^{2,6}

Astaxanthin is best known for its benefits to **eye health**. Its consumption can **protect vision** and help reduce the risk for and progression of chronic diseases of the eyes.^{2,7,8}

But astaxanthin can do much more.^{1,3,9} One recent review analyzes **dozens** of disorders that it has the potential to benefit, including Alzheimer’s, cardiovascular disease, diabetes, fatty liver disease, and others.³

How It Works

Scientists have studied how this carotenoid could provide a variety of health benefits. One likely explanation for astaxanthin’s biological power is its remarkable antioxidant activity, which is greater than many carotenoids,¹ as well as vitamins C and E.¹⁰

By helping cells scavenge free radicals, astaxanthin neutralizes these cellular toxins *before* they can damage tissues.^{1,11}



Astaxanthin’s chemical structure allows it to insert itself into cellular membranes, which are susceptible to oxidative damage. There, astaxanthin acts as an **internal shield**, helping eliminate the threat of oxidative stress and mitochondrial damage¹⁰ that contribute to rapid aging and risk for chronic disease.^{10,12}

Astaxanthin is a superior free radical scavenger for preventing **oxidative damage** to cell membranes. And this property makes it beneficial for cardiovascular and immune health support.¹⁰

Astaxanthin is also a potent **anti-inflammatory**, reducing activity of **NF-kB (nuclear factor-kappa B)**, a signaling protein that contributes to production of pro-inflammatory compounds.^{3,12}

This powerful pigment may also protect against many different conditions of aging that are associated with chronic inflammation. In one recent study, astaxanthin extended the **median lifespan** of male mice by **12%**.¹³

It also has the potential to improve **metabolic** health through its effects on two proteins, **AMPK** and **mTOR**, that regulate cellular metabolism. By *stimulating AMPK* and *inhibiting mTOR*, astaxanthin may reduce the risk for metabolic disease and insulin resistance.^{14,15}

In a **clinical trial** of diabetic patients, a **10 mg** daily dose of astaxanthin for 12 weeks resulted in reduction of **inflammatory** markers and **mTOR** activity.¹⁴

This suggests astaxanthin supplementation is a potentially effective strategy for improving cellular defenses, augmenting cellular housekeeping, and promoting autophagy.

Additional preclinical studies support these mechanisms of action related to inflammatory response, mitochondrial function, and autophagy, and suggest that astaxanthin could provide benefits in age-related chronic conditions including atherosclerosis, osteoarthritis, and neurodegenerative disorders.⁹

Eye and Skin Health

Preclinical and clinical studies have shown that astaxanthin is protective against a range of chronic eye conditions, including **cataracts** and age-related **macular degeneration**.^{2,4,8}

In **human studies**, astaxanthin intake improves **visual acuity** (sharpness of vision) in healthy adults⁴ and protects against **eye strain**, even in people whose work involves looking at digital displays all day.^{2,16}



In two separate clinical studies of healthy volunteers, a **6-12 mg** daily dose of astaxanthin for two to four weeks resulted in improved **ocular blood flow**. One of the two trials even reported improvement of visual acuity.⁴ In another trial of patients with cataracts in both eyes, participants underwent surgery in one eye before receiving astaxanthin. The other eye was operated on after intake of the supplement for two weeks. At the end of the study, it was noted that intake of astaxanthin reduced markers of oxidative stress that can cause damage to the eyes.¹⁷

The skin serves as a primary barrier from the external environment. With advancing age, skin structure and integrity deteriorate, in part due to exposure to ultraviolet (UV) radiation.¹⁸ Oxidative stress and UV damage lead to accelerated skin aging, also known as “photo-aging.”^{18,19}

In preclinical studies, astaxanthin acts as an internal sunscreen, absorbing potentially harmful wavelengths of light²⁰ that cause **wrinkles**, dry skin, pigmentation, inflammation, and reduced skin elasticity.¹⁸

In a clinical trial, participants were randomized to receive **4 mg** daily astaxanthin or placebo for nine weeks. At the end of the study, they were exposed to controlled levels of UV rays. Upon exposure, participants in the treatment group had increased time before burning (sunburn), and reduced loss of skin moisture in areas exposed to UV light. Non-irradiated areas in the **astaxanthin** group showed significant improvement in skin texture and roughness.²¹

In addition, a 2021 **meta-analysis** of studies concluded that **astaxanthin** improves skin moisture content and elasticity and reduces **wrinkles**.²²

WHAT YOU NEED TO KNOW

A Powerful Pigment

- **Astaxanthin** is a carotenoid pigment responsible for the pinkish-red color of many fish and crustaceans. It is one of the most potent **antioxidants** and has many other health-promoting properties.
- Astaxanthin has long been known for its **eye health** benefits. It has been shown to improve visual sharpness and protect against common eye diseases.
- Human studies show that astaxanthin also helps protect against **skin aging**, reduces risk factors for **metabolic** and **cardiovascular disease**, improves **liver** health, and boosts measures of **cognitive function**.

Metabolic and Cardiovascular Disease

Beyond its proven antioxidant abilities, many studies have demonstrated astaxanthin's protective effects on inflammation and lipid and glucose metabolism, which offer potential to improve **arterial health**.

In preclinical studies astaxanthin has been shown to support healthy **glucose** metabolism and reduce the risk of **arterial blockage**. In clinical studies astaxanthin has shown an ability to inhibit **LDL** oxidation and increase **HDL** (“good”) cholesterol, thereby helping protect against risk factors for heart disease.²³

In one pilot study of **heart failure** patients, a three-month intake of astaxanthin not only *suppressed oxidative stress* and improved **cardiac contractility**, but it also *improved* their **exercise tolerance**.²⁴

Astaxanthin also improves several markers and risk factors for cardiovascular disease. In a study of healthy adults, astaxanthin intake reduced **triglycerides** and increased **HDL** (“good”) cholesterol.²⁵ Similar results were seen in a trial of prediabetic adults with high cholesterol: **12 mg** astaxanthin daily for 24 weeks resulted in reduced levels of **fibrinogen** (a marker of CVD risk).²⁶

In another clinical study, participants, who were obese men, were randomized either to:

- Receive **20 mg** astaxanthin or a placebo, or
- Undergo high-intensity exercise training, or
- Receive astaxanthin along with undergoing high-intensity training.

After 12 weeks the exercise group had decreased body weight and had an improved lipid and metabolic profile. These changes were more pronounced in the group that received astaxanthin along with the training.²⁷

In postmenopausal women, taking **12 mg** of astaxanthin daily for eight weeks reduced **blood pressure**, improved markers of blood vessel health, and reduced signs of oxidative stress.²⁸



In a study of prediabetic individuals, taking **12 mg** of astaxanthin daily for 12 weeks resulted in improved glucose tolerance and heart function and reduced **hemoglobin A1c** levels (a measure of average glucose levels over time) and cholesterol.²⁹

Astaxanthin can even boost **physical performance**. In studies of younger athletes³ and older adults,^{3,30} astaxanthin intake increased endurance, improved walking distance and speed, and enhanced other measures of exercise performance.

Brain and Liver Function

As seen in preclinical studies, astaxanthin may help support neurologic functions and reduce risk for **dementia** in several ways, including:³

- Protecting brain cells from cell death,
- Preventing **glutamate toxicity** (which can kill neurons),
- Reducing buildup of the proteins associated with Alzheimer’s disease and other neurodegenerative conditions, and
- Reducing neuroinflammation.

Human studies in both younger and older adults have shown that taking astaxanthin improves measures of cognitive function, including **memory** and **brain processing speed**.³

A trial in healthy middle-aged and elderly individuals who reported age-related decline in memory showed that supplementation with astaxanthin at a dose of **12 mg** daily for 12 weeks improved cognitive function.³¹

In animal models and preliminary human studies, astaxanthin can also help defend the liver from common threats. These include prevention and even reversal of fatty liver changes, liver fibrosis (scarring), and alcohol-induced liver damage.³

In a trial of **humans** with existing **fatty liver**, subjects were randomized to receive either **12 mg** of **astaxanthin** per day for 24 weeks or a **placebo**. Compared to the placebo, astaxanthin was able to reduce liver fat and **slow the progression** of fatty liver.³²

Even in a study of healthy older women, astaxanthin reduced liver *enzymes* in the blood, which can be markers of **liver damage**.³³ This provides evidence that astaxanthin intake may protect the liver in people *with* or *without* any obvious signs of liver damage.

Summary

The carotenoid pigment **astaxanthin** has long been recognized for its protective effects in the **eyes**.

Preclinical and clinical studies show that astaxanthin intake has benefits for **skin** and **liver** while also supporting the health of the **cardiovascular, metabolic, and neurological systems**.

More benefits of astaxanthin are being uncovered, making this pigment a vital part of a health maintenance program. •

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"I have been taking it
for many years
and would not stop."

Alicia

VERIFIED CUSTOMER
REVIEW

CoQ10 helps energize
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But standard CoQ10
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The ubiquinol form of
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#1 Rated CoQ10 Products - 6 Time Winner!†

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"Love the combination
of ingredients in this
supplement."

Amy

VERIFIED CUSTOMER REVIEW

RELEASE the POWER of BROCCOLI



Many of broccoli's benefits come from **sulforaphane**—a compound that is *activated* when the plant is cut or chewed.¹⁻³

Mature broccoli provides relatively little **sulforaphane precursor** compared to broccoli sprouts. Cooking further depletes the sulforaphane precursor.^{2,4}

Optimized Broccoli with Myrosinase improves conversion of the precursor into **sulforaphane**, and its absorption into the bloodstream.^{2,5,6}

Each capsule contains:

Glucoraphanin, a sulforaphane precursor found in broccoli seed extract, that is standardized to a high concentration.^{3,4}

Myrosinase, an enzyme found in mustard seed that converts **glucoraphanin** to **sulforaphane**.²⁻⁶

Vitamin C, a cofactor for the myrosinase enzyme for more efficient *enzymatic conversion*.⁷

Item #02368

30 vegetarian capsules

**This product is available
at fine health food stores
everywhere.**

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Brains & **BRAWN**

Creatine & Acetyl-L-Carnitine Energy Plus promotes healthy **energy** production and supports **exercise performance** and **cognitive function**.

Clinical studies show that:

- 5 grams of creatine increase both workout capacity and lean tissue mass^{*1,2}
- 2 grams of acetyl-L-carnitine support physical and mental energy, as well as cognitive function³

Each scoop of **Creatine & Acetyl-L-Carnitine Energy Plus** provides **5 grams** of **creatine** and **2 grams** of **acetyl-L-carnitine**. This unflavored powder has no added sugars. It can be mixed easily into a smoothie, shake, juice, or water.

*When combined with a regular resistance training/exercise program

This product is available at fine health food stores everywhere.

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

1. J Int Soc Sports Nutr. 2017;14(1):18. 2. Open Access J Sports Med. 2017;8:213-226. 3. Curr Opin Gastroenterol. 2023;39(2):125-128.

NEW



Item #02532

Net Wt. 233 g (0.51 lb)

Aging can Wait

Support for a Healthy Lifespan



In recent years, three **nutrients** have emerged as having healthy **lifespan-enhancing** potential:

Taurine

Functions via a range of *anti-aging* mechanisms¹⁻⁵

Lithium

In epidemiological studies higher dietary intake of lithium (drinking water) is associated with lower risk of mortality.⁶⁻⁸

Spermidine

In epidemiological studies, higher intake correlates with longer healthspan.⁹⁻¹¹ A one-year study showed that a diet enhanced with **spermidine** daily supports healthy memory scores.¹²

Consumers have used some of these **nutrients** for decades, albeit at lower dosages than what may be optimal for healthy aging.

New **Healthy Aging Powder** provides the following in one scoop:

- **Taurine** 5,000 mg
- **Lithium** 2,000 mcg
- **Spermidine** 3,000 mcg

(0.2% standardization from 1,500 mg wheat germ extract)

These nutrients may promote **healthy aging** by supporting cardiovascular health, exercise performance, and cognitive function.

Item #02527 • Net Wt. 210 g (0.46 lb)

The full dose is one scoop daily mixed with water or juice.



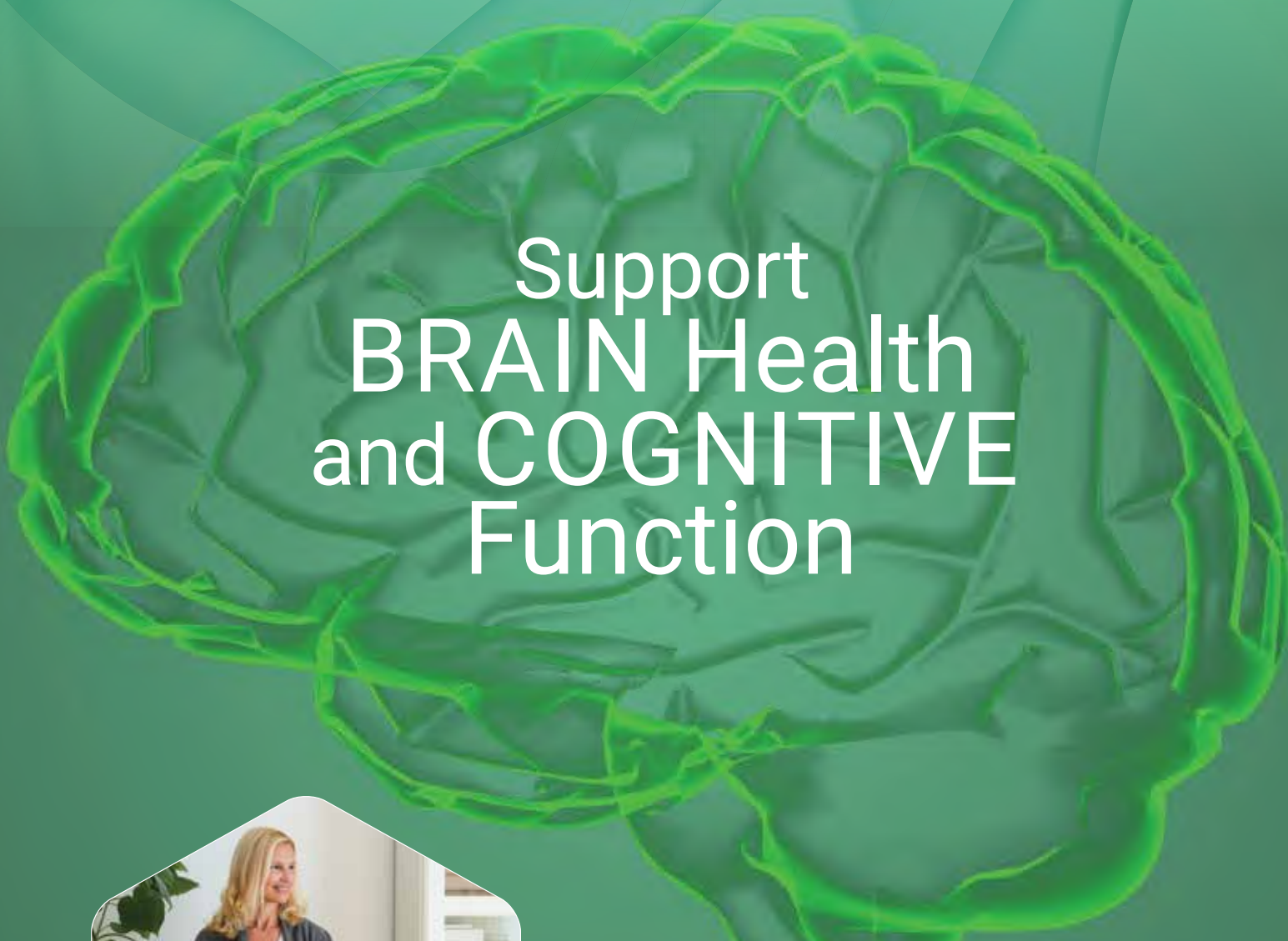
This product is available at fine health food stores everywhere.

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Contains wheat.

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



Support BRAIN Health and COGNITIVE Function





SAGE



ASHWAGANDHA



BLUEBERRIES



PERIWINKLE

BY RANDY STEVENS

Several plant extracts have been found to benefit **brain health** and boost **cognitive function** in human studies.¹⁻⁵

In a clinical trial of older adults, taking a specific **sage extract** led to a roughly **60%** improvement in measures of **memory** and a **2.5-fold** enhancement in accuracy of **attention**, compared to a **placebo**.⁶

Scientists have combined this extract with other compounds to support optimal brain function and potentially ward off neurological dysfunction.

Defend the Brain

Mild cognitive impairment is common with advancing age, and can progress to Alzheimer's and other forms of dementia.⁷

Researchers have found nutrients that may improve and defend **brain health**, providing resources the brain needs to function optimally.

In particular, the Mediterranean herb **sage** can influence biological mechanisms that benefit brain health. Studies have shown promising memory^{1,6,8,9} and cognition-enhancing effects of sage in **human** adults.^{6,8,9}

Optimizing Sage Extract

Sage has long been used for culinary and medicinal purposes. It is rich in compounds with known benefits, including **rosmarinic acid**, **carnosic acid**, and **luteolin**.⁹

In preclinical studies rosmarinic acid has been shown to *increase* **brain-derived neurotrophic factor**, a regulator of neuronal growth and function.⁹

Several studies demonstrate health benefits of sage and its extracts.^{1,9}

Researchers zeroed in on a **standardized sage extract** from a source of the herb farmed in England.¹⁰

This **sage extract** was tested against others in animal models. It was found to **prolong lifespan** in roundworms by **12%**, while other sources of sage did not.¹¹



Human Studies

Several studies have documented that **sage extract** has a significant impact on human **brain health**.

In acute effects studies of healthy subjects, consuming sage extract led to a boost in **mental performance**, with improved mood,^{8,12} less anxiety, and improvements to memory and attention.¹² In one of these studies participants even reported less mental fatigue.⁸

In a randomized placebo-controlled trial of acute effects of sage extract, 20 healthy older adults were given a standardized extract of sage at doses ranging from **167 mg** to **1,332 mg**. The participants took single doses separated by seven-day washout periods. The **333 mg** dose of standardized sage extract from England led to about **60%** improvement in a composite measure of **memory** and **2.5-fold** enhancement in accuracy of **attention**, compared to a placebo.⁶

Remarkably, these improvements were seen just **hours** after taking the extract.

Studies that used different types of sage extract achieved similar findings in older adults with **cognitive dysfunction**.^{13,14}

For instance, in patients suffering from mild to moderate **Alzheimer's disease**, a different **sage extract** was administered daily for four months and resulted in better **cognitive function** assessment scores than in those who took a placebo.¹³

How Sage Works

Sage helps defend the brain and boost its function in multiple ways, including:

- **Inhibiting acetylcholinesterase.** Preclinical⁹ and clinical^{8,12} research has shown that sage inhibits *acetylcholinesterase*, an enzyme that breaks down the neurotransmitter **acetylcholine**.

Low levels of acetylcholine are tied to cognitive deficits and are seen with cognitive impairment and Alzheimer's disease.¹⁵

In one clinical study of patients with Alzheimer's, *blocking* acetylcholinesterase with drugs was found to be associated with more than **20% lower mortality** overall.¹⁶ Cholinesterase inhibitors are one of the available medication options for cognitive support and delay in the progression of dementia.¹⁷

WHAT YOU NEED TO KNOW

Better Brain Health

- Brain function typically declines with age, in many cases leading to cognitive impairment and dementia.
 - In an acute effects clinical study of healthy older adults, a standardized **sage extract** boosted performance of memory tasks by about **60%** and improved attention **2.5-fold** compared to a placebo.
 - A different sage extract also boosted cognitive function scores in adults with mild to moderate **Alzheimer's disease**.
 - Combining sage extract with other compounds and extracts was shown to support **brain health** and may improve cognitive function.
- **Reducing beta-amyloid buildup.** In preclinical studies, sage and its components have demonstrated an ability to reduce aggregation of **beta-amyloid**, a protein that forms plaques in the brains of Alzheimer's disease patients.^{9,18,19} This has improved cognitive function and prevented cognitive dysfunction in animal models.⁹
 - **Supporting neurotrophin levels.** Lab experiments have shown rosmarinic acid in sage helps support healthy levels of neurotrophins, including **brain-derived neurotrophic factor (BDNF)**.^{9,20} Neurotrophins are regulating compounds that support brain structure and function. Lower levels of **BDNF** are seen in patients with Alzheimer's and mild cognitive impairment.^{9,21}



- **Anti-inflammatory activity.** Amyloid brain deposits in Alzheimer's are widely believed to be contributors to cognitive decline. Amyloid may also cause inflammation and oxidative stress. Compounds in sage possess potent antioxidant and anti-inflammatory properties.⁹ Both neuroinflammation and oxidative stress may occur in the early stages of Alzheimer's disease and cause damage to brain cells.²²

Other Brain-Supporting Compounds

In addition to sage, other nutrients have been shown to support brain health, including:

PHOSPHATIDYLSERINE

Phosphatidylserine is a phospholipid component of **nerve cell membranes**, which carry nerve impulses in the brain. It is also a vital part of the **myelin sheath** that insulates nerve fibers, making their conduction more efficient and rapid.²³

Supplementing with phosphatidylserine can help maintain optimal cognitive function. A meta-analysis of human studies concluded that phosphatidylserine intake ranging from **100 to 300 mg** daily improved **memory** in older adults with cognitive decline.²

ASHWAGANDHA

Used in traditional Indian medicine for centuries, the herb **ashwagandha**²⁴ is best known for improving **mood** and reducing **stress**.^{4,24,25} Preclinical as well as some clinical research shows that ashwagandha extract protects neurons from neurodegenerative processes associated with Alzheimer's, Parkinson's, and Huntington's diseases.²⁶

In human studies, ashwagandha extract has also been shown to improve memory and cognitive function.²⁷⁻²⁹ In a study of older adults with mild cognitive impairment, ashwagandha intake improved **memory**, **attention**, and **executive function**, our reasoning and decision-making ability.²⁸

BLUEBERRY EXTRACT

Anthocyanins, polyphenols with wide-ranging health benefits, are concentrated in dark-colored fruits like blueberries.

Human trials have found that **blueberry** intake leads to improved cognitive performance in older adults,^{3,30-33} including enhanced **memory**, and faster **processing speeds**. Blueberry juice intake has been shown to significantly improve **mood** in children and younger adults.³⁴

VINPOCETINE

Vinpocetine, a compound derived from the periwinkle plant, shows benefits for the nervous system in animal and cell studies, including improving blood flow in the brain.³⁵

In a clinical trial of patients with ischemic stroke, 12-week oral supplementation with vinpocetine improved the cerebrovascular reserve capacity and improved cognitive status and general condition of patients with chronic hypoperfusion.³⁶

URIDINE 5'-MONOPHOSPHATE

Loss of **synapses** occurs with age and neurodegeneration. Synapses are the structures where brain cells communicate with another part of our neural network.

Uridine 5'-monophosphate is a compound that supports the formation of synapses, the structures where brain cells communicate. Loss of synapses occurs with age and neurodegeneration.^{37,38}

Studies show that patients with **Alzheimer's disease** may have low levels of uridine 5'-monophosphate.^{39,40} Supplemental intake of uridine has been shown to be beneficial for patients with Alzheimer's disease.³⁸

PREGNENOLONE

Pregnenolone is a hormone that helps modulate nervous system function.

In preclinical studies, pregnenolone demonstrates **neuroprotectant** activity with benefits to **mood**, **memory**, and other cognitive functions. In human trials it has shown significant improvements in well-being, psychomotor activities (cognition and motor performance), and learning.⁴¹

Taking these compounds together with **sage** may help maximize brain health benefits and improve memory and cognition.

Summary

Millions of older adults suffer from cognitive decline, Alzheimer's disease, and other forms of dementia.

A standardized **sage extract** has been shown to improve **cognitive function** in a clinical trial.

Combining this extract with other ingredients shown to support **brain health** may boost cognitive function and help protect against degenerative decline. •



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"I take this every morning and what a difference it makes!"

Kathryn

VERIFIED CUSTOMER REVIEW

Astaxanthin is a carotenoid that benefits the eyes, immune system and cognitive functions. Research suggests that astaxanthin can play a role in promoting cardiovascular health.

Found naturally in seafood and algae, as little as **50%** of **astaxanthin** is normally **absorbed** in the bloodstream.^{1,2}

Life Extension combines **4 mg** of **astaxanthin** with a blend of four different **phospholipids**, which has been shown to enhance carotenoid **absorption** by **several-fold**.²

References

1. *Mol Nutr Food Res.* 2012 Sep;56(9):1385-97.
2. *Eur J Pharm Sci.* 2003 Jul;19(4):299-304.

This product is available at
fine health food stores everywhere.



Item #01923

30 softgels



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

Menopause Relief

**For Hot Flashes and 10 Other
Menopause Discomforts**

Menopause Relief contains a proprietary extract of Siberian rhubarb that in clinical studies has been shown to provide relief for up to **11 menopause discomforts** on the menopause rating scale, including:

- Hot flashes
- Night sweats
- Irritability
- Muscle discomfort
- Mood swings
- Sleep disturbances
- Exhaustion
- Sexual function
- Joint discomfort
- Urinary discomfort
- Vaginal dryness

This product is available at fine health food stores everywhere.

CAUTION: Consult with your health-care practitioner if you have, or have a history of, estrogen-dependent tumors.

**ESTROGEN
FREE**

**GLUTEN
FREE**

**1
DAILY**

**NON
GMO
LE CERTIFIED**



Item #02204

30 enteric-coated
vegetarian tablets

Get More Out Of Life

Wishing for healthy aging? Start by protecting every cell in your body

Resveratrol is a legendary healthy aging nutrient that's good for your heart, mind, and cellular health. Resveratrol Elite™ contains *trans*-resveratrol in a hydrogel coating—acting as a sort of “genie in a bottle”—to improve bioavailability to help you keep things working like they did when you were younger.

Item #02210

30 vegetarian capsules



This product is available at
fine health food stores everywhere.

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



Item #02121

60 vegetarian capsules

MAINTAIN HEALTHY

Homocysteine Levels

For Brain, Heart, and Hearing Health

Homocysteine Resist supports healthy levels of homocysteine, an unfavorable amino acid that can increase with normal aging.

Just one daily capsule of **HOMOCYSTEINE RESIST** provides:

5-MTHF (activated folate)	8,500 mcg°
Methylcobalamin (activated vitamin B12)	1,000 mcg
Pyridoxal 5'-phosphate (activated vitamin B6)	100 mg
Riboflavin (vitamin B2)	25 mg

°DEF (Dietary Folate Equivalents)



This product is available at fine health food stores everywhere.

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



Mushrooms

Maitake
Shiitake
Chaga



Effects of MUSHROOMS on Immune Functions

BY HEATHER L. MAKAR

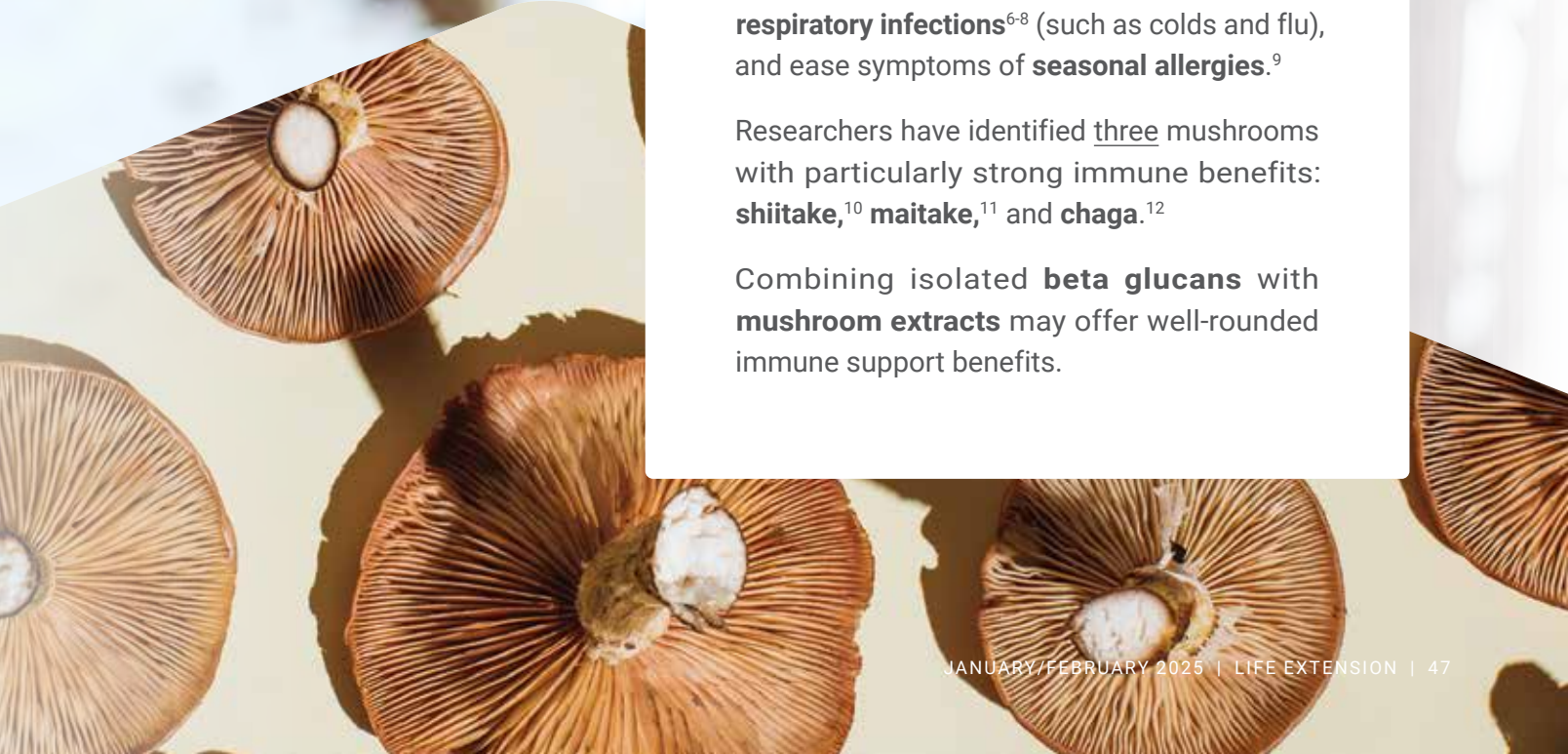
Mushrooms have been used in traditional **medicine** for thousands of years.^{1,2}

Fungi, including mushrooms and yeast, are rich in compounds called **beta glucans**, which have **antiviral** and **immune-supporting** effects.^{3,4}

In **human** studies, taking **beta glucans** was shown to boost immune response,⁵ reduce the number, severity, and duration of **upper respiratory infections**⁶⁻⁸ (such as colds and flu), and ease symptoms of **seasonal allergies**.⁹

Researchers have identified three mushrooms with particularly strong immune benefits: **shiitake**,¹⁰ **maitake**,¹¹ and **chaga**.¹²

Combining isolated **beta glucans** with **mushroom extracts** may offer well-rounded immune support benefits.



Beta Glucans Boost Immunity

Beta glucans are polysaccharides bound within the walls of fungi, bacteria, and some whole grains like oats. They are found in particularly high amounts in **mushrooms** and can be isolated from **yeast**.

They can help support **immune** health and boost defenses against **viruses** and other pathogens.¹³⁻¹⁵

They have also been shown in preclinical studies to reduce the effects of **endotoxins**, harmful byproducts of bacterial infections that cause inflammation.^{16,17}

There are two types of immune responses: **innate** and **adaptive**.^{18,19}

Innate immunity is the body's first line of defense. **Macrophages** engulf and neutralize viruses and other pathogens, while **natural killer (NK) cells** target and destroy unhealthy cells that are cancerous or infected by viruses and other pathogens.

Adaptive immunity is a more specific, targeted response that develops after exposure to a particular pathogen and provides long-term protection. This response is driven by **T-cells** and **B-cells**.

Beta glucans activate and stimulate both **innate** and **adaptive** immunity.^{10,20,21}

As we age, our immune system weakens and loses its ability to fight off infections and cancer, a condition known as **immunosenescence**.



Animal studies indicate that **beta glucan** intake can prevent or even reverse immunosenescence.^{20,22}

Renewing these immune responses is particularly important to older individuals.

Mushrooms With Maximum Benefits

Mushrooms contain health-promoting compounds, including **indoles**, **polyphenols**, and **carotenoids**.

Beta glucans are among these biologically active immune-supporting compounds found in mushrooms.²³

There are thousands of species of mushrooms that have health benefits.²⁴ Three mushrooms that have been found to provide especially strong immune effects are: **shiitake**, **maitake**, and **chaga**.

SHIITAKE

Shiitake mushrooms have long been used in traditional Chinese medicine.

In an animal model of severe bacterial **lung infection**, beta glucans from **shiitake mushrooms** significantly reduced the bacterial load in the lungs and improved health.²⁵

Cell studies show that shiitake mushrooms inactivate viruses and downregulate viral replication.^{26,27}

As demonstrated in a clinical study, these immune-boosting effects are likely due to shiitake's ability to increase the number of **immune system cells**, including T-cells and NK cells.¹⁰

Shiitake mushrooms also decrease markers of harmful **chronic inflammation** and stimulate secretion of **antibodies** that protect the gut.¹⁰

MAITAKE

Maitake mushrooms, often used in Asian cuisine, also provide powerful **immune benefits**.

In animal studies, **maitake extract** significantly increased **NK cells** and **bacterial elimination**.^{28,29} This effect was even more pronounced when blended with shiitake extract.²⁹

Maitake extract also promoted secretion of **interferon gamma (IFN-γ)**, a protein that blocks viral replication.²⁹

CHAGA

Chaga mushrooms are native to colder climates and often grow on birch trees. They are immuno-modulators, and in preclinical studies chaga extract has shown antiviral activity.³⁰

In a study of immune-compromised mice, chaga extract **restored immune cells** to nearly normal levels and regulated the levels of **tumor necrosis factor alpha (TNF- α)**, a marker of inflammation, indicating that chaga extract prevented excess inflammation.³¹

In preclinical studies, chaga extract has also exhibited beneficial **activity** against a wide range of **viruses**.^{12,30,32}

Defense Against Infectious Diseases

Beta glucans have been shown to help protect against and treat infections from **bacteria**, **viruses**, and **parasites**.³³⁻³⁵

In various placebo-controlled **human trials**, participants were randomized to receive **beta glucans** or **placebo**. These trials used at least **250 mg** of **beta glucans** daily.

Participants who were part of the beta-glucan group had:^{5-8,36,37}

- Reduced **upper respiratory infections**, including colds and flu,
- Shortened duration of symptoms,
- Fewer lost workdays,
- Increased circulating **interferon**, and
- Higher levels of salivary **antibodies**, which protect against respiratory and digestive pathogens.

Another study investigated beta glucans' effect on adults who suffer from moderate **seasonal ragweed allergies**.

Compared to a placebo, those who took **250 mg** of beta glucans daily had a reduction in the **duration** and **intensity** of **allergy** symptoms, along with improvements in sleep, quality of life, energy, and mood.⁹

Better Gut Health

There are a variety of microorganisms in the digestive tract. A balanced **microbiome** is critical to fighting infection and maintaining immune health.³⁸

One way beta glucans and mushrooms support immunity is by promoting the growth of healthy microorganisms in the **gut**.



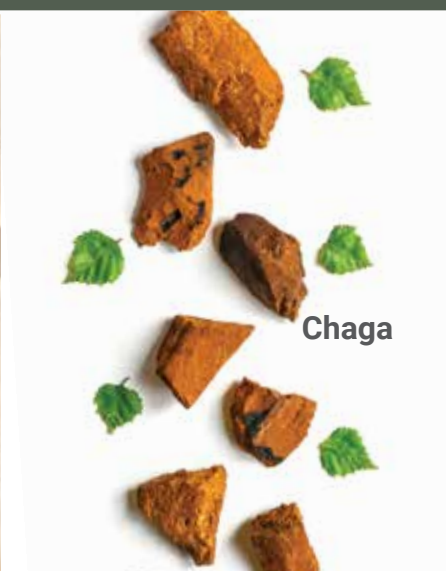
Mushrooms' Benefits for the Immune System

- **Mushrooms** have been used in traditional medicine for thousands of years.
- Fungi, including mushrooms and yeast, are rich in many active compounds responsible for immune-supporting benefits, including **beta glucans**.
- In human trials, taking beta glucans reduced the number and duration of **upper respiratory infections**, including colds and flu, and relieved seasonal allergy symptoms.
- In a meta-analysis of observational studies, those who consumed the most mushrooms had a **34% lower risk of cancer** than those who ate none.
- Combining beta glucans with extracts of the immune-supporting mushrooms **shiitake**, **maitake**, and **chaga** may optimize the immune system's ability to ward off infections and other illnesses.

Three Types of Mushrooms with Strong Immune Benefits



Maitake



Chaga



Shiitake

Beta glucans serve as a **prebiotic fiber** that nourishes beneficial bacteria.^{13,39}

Preclinical and clinical studies have shown a healthy microbiome contributes to a robust **immune** response, supports a healthy gut lining and digestive health, and inhibits growth of disease-causing bacteria and inflammation.^{13,40-42}

In addition, beta glucans promote the production of **short-chain fatty acids**, which are vital for gut health and maintaining the integrity of the gut barrier.^{13,40,42}

Fighting Cancer

In September 2021, scientists with the College of Medicine at **Pennsylvania State University** published results from a cohort study of over **30,000 people**. They also included their data in a meta-analysis of prospective studies that had over **600,000** participants, on the relationship between **mushroom intake** and **mortality**.⁴³

They found that *higher* mushroom consumption correlated with a *lower* risk of **death** from *any cause*.

This study had several major strengths, including the fact that it analyzed a nationally representative sample of the American adult population, and involved a very comprehensive meta-analysis of cohort studies around the world.

When operating properly, the immune system can identify and neutralize **cancerous cells**. By supporting immunity, mushrooms may improve this ability.

One meta-analysis of observational studies that included over 615,000 people, nearly **20,000** of whom were cancer patients between 1966 and 2020, found that those who consumed the *greatest* amount of **mushrooms** had a **34% decreased** risk of cancer compared to those who ate the least.⁴⁴

Beta glucans and other compounds in **shiitake**, **maitake**, and **chaga** mushrooms increase the activity of protective signaling proteins that can inhibit tumor cell growth.^{30,45}

A combination of beta glucans and extracts of these mushrooms can provide a wide range of immune-supportive compounds.

Summary

Mushrooms have been used medicinally for thousands of years. Research shows that they contain compounds called **beta glucans**, which support immunity and gut health and help protect against viruses and cancer.

A blend of beta glucans isolated from **yeast**, with extracts of **shiitake**, **maitake**, and **chaga** mushrooms may offer well-rounded immune support benefits. •

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VITAMIN

"I like the fact that it's high potency and so small and easy to swallow."

Barbara
VERIFIED CUSTOMER
REVIEW



FOR LASTING HEALTH

Strong bones and a healthy heart—two incredible benefits of adding vitamin K to your routine. This essential vitamin helps maintain your body's calcium balance and, in turn, supports everything from your arterial health to healthy bone density.

But even if your diet is healthy, you may not be getting enough to maximize vitamin K's benefits. Fortunately, you can ensure you're getting enough of this important nutrient by supplementing with exactly as much—or as little—vitamin K as you need.

Super K*
Item #02334

90 softgels

Low Dose Vitamin K*
Item #01936

90 softgels

Mega Vitamin K2*
Item #02417

30 capsules

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

These products are available at fine health food stores everywhere.



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

"I'm a big fan
of it."

Sue

VERIFIED CUSTOMER
REVIEW

Multi-Action Support for Aging Joints!

Clinically studied
ingredients for maintaining
joint health.

JUST TWO CAPSULES A DAY PROVIDE:

Glucosamine sulfate 2KCl (derived from corn)	1,500 mg
AprèsFlex® Indian frankincense (<i>Boswellia serrata</i>) extract (gum resin) [std. to 20% AKBA ^a]	100 mg
NT2 Collagen™ standardized cartilage providing 10 mg Total Collagen	40 mg
Boron (calcium fructoborate as patented FruiteX-B® OsteoBoron®)	1.5 mg

NT2 Collagen™ is manufactured by Bioibérica. AprèsFlex® is a registered trademark of PLT Health Solutions-Laila Nutraceuticals LLC. Fruitex B® and OsteoBoron® are registered trademarks of VDF Futureceuticals, Inc. Pat. Fcpatent.com

^a 3-O-acetyl-11-keto-B-boswellic acid.

Item #02238

60 capsules



This product is available at
fine health food stores everywhere.

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The 'Healthy Aging' Amino Acid

Essential Youth with L-Ergothioneine

L-ergothioneine is a nutrient derived from the amino acid histidine and found naturally in mushrooms.

L-ergothioneine may support healthy aging by:

- Protecting **mitochondrial DNA** function¹
- Helping to maintain **telomere** length²
- Supporting **DNA function** in cells subjected to UV exposure³

One daily capsule of **Essential Youth** provides **5 mg** of **L-ergothioneine**.

One daily capsule provides as much **L-ergothioneine** as up to 2 to 5 cups of white button mushrooms.^{4,5}



Item #02431

30 vegetarian capsules

This product is available at fine health food stores everywhere.

References

1. *Cell Death Differ.* 2010 Jul;17(7):1134-40.
2. *J Diet Suppl.* 2020 Dec 7:1-14.
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4. *FEBS Lett.* 2018 Oct;592(20):3357-66.
5. *Food Chem.* 2017 Oct 15;233:429-33.



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

Our **Skin Care Collection** focuses on skin renewal, supports cell regeneration, and replenishes moisture.

DAY CREAM and **NIGHT CREAM** contain skin-nourishing nutrients including shea butter, MSM, lime, ruscogenin, ginger, hibiscus, jojoba oil, aloe vera extract, rice ceramide complex, vitamin B5 and vitamin E, among others. Plus, both **DAY** and **NIGHT CREAM** focus on skin cell renewal with **retinyl palmitate**, a vitamin A derivative.

ANTI-AGING SERUM contains aloe vera extract, lime, hibiscus, ruscogenin, ginger, sunflower oil, rice ceramide complex, resveratrol, vitamin E, and vitamin B5, among others.



Day Cream

For all-day protection and deep nourishment

Item #02130

1.65 oz. (47 g)



Night Cream

Restore and rejuvenate while you sleep

Item #02131

1.65 oz. (47 g)



Anti-Aging Serum

An advanced serum for use under both the DAY and NIGHT CREAM

Item #02129

1.75 fl oz. (50 ml)

These products are available at fine health food stores everywhere.

The
Science
of
Beauty

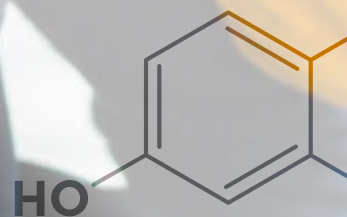


FENUGREEK SEED



SAFFRON

ESTRADIOL





Improving SEXUAL HEALTH for **WOMEN** of All Ages

BY HEATHER L. MAKAR



In a large population-based survey in the United States, over **40%** of females reported sexual concerns and **12%** reported distressing symptoms.¹

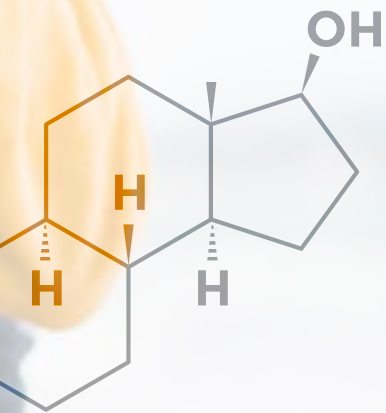
These data reflect sexual problems many women struggle with, including low desire, reduced enjoyment, and other sexual health issues.

Researchers have identified two plant-derived ingredients that can improve multiple aspects of women's sexual function, including supporting **libido**.

In clinical trials:

- **Fenugreek seed extract** improved **sexual drive, arousal, and orgasm**, and more than **doubled** the frequency of sexual activity,² and
- **Saffron extract** improved sexual function score by **62%**, boosting **desire, lubrication, and satisfaction**.³

This article describes potential solutions to improving female sexual health.



Women's Sexual Health Challenges

In 2008, a large population-based survey of more than **31,000 women** aged 18 and older, showed that nearly half the respondents reported sexual concerns, with low **sexual desire** being the most common.¹

Decline in estrogen during menopause causes thinning of vaginal lining, loss of elasticity and lubrication leading to discomfort, and lack of interest in sexual activities.⁴

However, **sexual dysfunction** is not limited to menopausal and post-menopausal women. **Younger women** also commonly experience issues with desire, arousal, and orgasm difficulties.¹

These issues impact women's **quality of life** and place significant **strain on relationships**.^{5,6}

Women's desire, enjoyment, and satisfaction can be impacted from:⁴

- Medication use, such as mood-altering prescriptions^{7,8} and birth control,^{1,8}
- Mood (stress,^{7,8} anxiety, and depression^{8,9}),
- Hormonal changes (in women of all ages),^{1,7} including pregnancy, hormonal birth control, perimenopause or menopause,⁸ and
- Health issues limiting blood flow to those areas where it is crucial for lubrication.⁴

The Role Hormones Play

Hormone balance modulates female sexual function in multiple ways.^{7,10} The receptors for estrogen, progesterone, and testosterone are present in vaginal tissues.¹⁰

- **Testosterone**, the primary male sex hormone, has important effects in females on ovarian function and sexual behavior.^{7,11} In post-menopausal women it may enhance the effects of low-dose estrogen therapy.^{7,12}
- **Estradiol**, the main form of **estrogen**, enhances arousal and lubrication while facilitating the production of neurotransmitters involved in sexual excitement. Decreased estrogen can precede thinning of vaginal tissue and dryness.^{4,7,10}
- **Progesterone** is commonly associated with a dampening effect on libido, countering the desire-promoting effects of testosterone and estradiol.⁷

While menopause can change the balance of these hormones, they can shift at **any point** in a woman's life, during and after pregnancy, by use of hormonal birth control, and by being perimenopausal, limiting interest in and satisfaction from sex.⁸

Fortunately, there are ways to support hormonal health and promote healthy female **sexual function**.

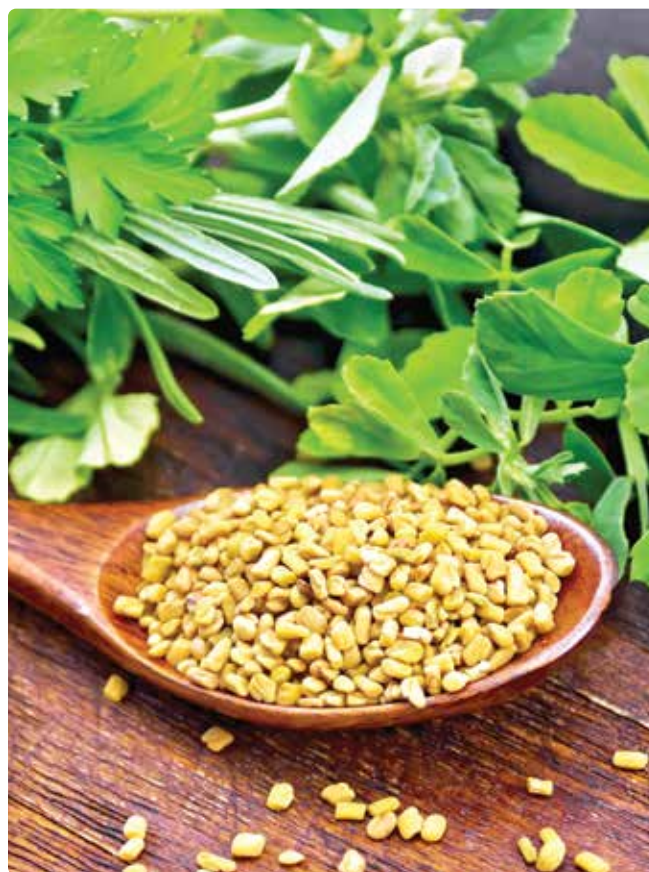
Plant-Derived Solutions for Sexual Function Support and Satisfaction

Optimal sexual function generally includes healthy **desire** (libido), **arousal** (physical preparation for sex), and **satisfaction** (pleasure and orgasm).¹³

Researchers have identified two **plant-derived extracts** that promote all these areas of female sexual enjoyment.

Fenugreek seed¹⁴⁻¹⁶ and **saffron**¹⁷⁻²⁰ both have a long history of use in **traditional medicine** to safely support female gynecological function and health.

Clinical evidence supports that they promote healthy sexual function, including **arousal, lubrication, and fulfillment**.





Boost Female Libido and Satisfaction

- Women of all ages can suffer from declining **sexual desire** or an inability to experience sexual pleasure.
- In a clinical trial, **fenugreek** seed extract boosted sexual desire, arousal, and orgasm.
- **Saffron** extract improved total sexual function index scores by **62%**, increasing arousal, lubrication, and satisfaction, in another clinical study.
- A **blend** of these extracts may offer a comprehensive approach to improving women's libido and sexual satisfaction.

Fenugreek Supports Desire and Function

Fenugreek, an herb native to Western Asia and the Mediterranean, has been extensively used in Ayurvedic medicine for enhancing libido and balancing female hormones.^{14,15}

Fenugreek is rich in **saponins**, a compound that is believed to be responsible for these effects.^{21,22}

In a placebo-controlled clinical trial of 80 healthy women aged 20-49 with **low libido**, those taking **600 mg** of standardized **fenugreek seed extract** daily for eight weeks had:²

- Improved **sexual arousal** and **orgasm** based on the Female Sexual Function Index questionnaire, a commonly used scale for assessing sexual health,
- Increased the **frequency of sexual activity** from one or two times *per month* to once *per week*, and
- Elevated **free testosterone** levels by **24%** and estradiol levels by **66%**, promoting female sexual response while leaving other hormones unaffected.

Saffron Enhances Arousal and Satisfaction

In South Asia, the Mediterranean, and ancient Persia, saffron was celebrated for its **aphrodisiac** properties and commonly used as an ingredient in formulas to **enhance libido** and promote women's sexual desire and satisfaction.^{17,20}

In a clinical trial, women (ages 18-55) with low sexual function who took **30 mg** of **saffron extract** daily for six weeks had a:³

- **62%** improvement in **total Female Sexual Function Index** scores compared to baseline, and
- Significant improvements in **arousal, lubrication, and satisfaction**.

A Combination for Women's Sexual Health

Fenugreek and **saffron** extracts work in different ways to promote female sexual function.^{2,3}

Fenugreek helps balance hormones essential for a healthy female sex drive,² boosting free testosterone to promote **sexual desire** and increasing estradiol to support **arousal**.²

Saffron promotes **sexual enjoyment**,³ enhancing **desire**, **lubrication**, and **satisfaction** while supporting a pleasurable intimate experience.³

Combining these plant extracts may help support healthy sexual desire and satisfaction in women of all ages.

Summary

Women of any age can face sexual issues like low desire and decreased satisfaction.

Research has identified two plant-based ingredients that support **women's sexual health**.

Fenugreek seed extract enhances arousal and hormone balance, while saffron extract promotes desire and sexual satisfaction.

Combined, these ingredients can offer a comprehensive way to support healthy female libido and support women's sexual health. •



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REVIEW

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abundant in the drinking
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several ways to support
cognition and overall brain
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*European Journal of Nutrition. 2011;50(5):387-389.

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One tablet per day dosing.

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Boost **NAD⁺** For Better Health



BY JON BERGMAN

Nicotinamide adenine dinucleotide (NAD⁺), found in every cell in our bodies,^{1,2} is required for reactions that provide energy and essential cell processes like **repairing DNA**.^{1,3}

The problem is that levels of NAD⁺ **decline** as we age.^{3,4}

But there's a solution: A nutrient called **nicotinamide riboside (NR)** has been shown to boost cellular **NAD⁺**.⁵⁻⁷

Preclinical studies show that it can support brain, heart, and metabolic health.⁵⁻⁷

NR also has shown the potential for supporting a **healthy aging process** and helping the body resist the impact of age-related decline.⁸⁻¹²

In **human trials**, researchers demonstrated that increasing NAD⁺ levels through NR supplementation can improve mitochondrial function and lower inflammatory cytokines in heart failure patients.¹³

What Is Nicotinamide Riboside?

Nicotinamide riboside is an activated form of vitamin B3 that functions as a **precursor** to one of the most important compounds found in all living cells, **NAD⁺**.¹¹

NAD⁺ plays multiple roles in cells, many that are critical to **healthy aging**.^{3,4,8,14}

Preclinical studies have shown that boosting **NAD⁺** levels reduces **chronic inflammation**,^{11,15-17} a driver of most age-related chronic diseases.¹⁵⁻¹⁷

The Importance of NAD⁺

NAD⁺ is a coenzyme required for **cellular respiration** and **metabolism**. Without an ample supply of **NAD⁺**, cells can't properly convert nutrients into energy.

Some tissues, including those in the **brain**, **heart**, and other **muscles**, have particularly high metabolic rates. That means they require *more* cellular respiration and *more* **NAD⁺** to power them.

NAD⁺ is critical for metabolism and energy supply to the cells and is also required for the normal function of over **300** enzymes and proteins, including many which help protect and maintain the integrity of a cell's **DNA**.³

For example, **sirtuins** are protective proteins that shore up a cell's health in multiple ways, including by preventing DNA damage, improving DNA structure and maintaining cellular health.^{18,19}

In animal models ranging from worms to mammals, *increased* sirtuin activity is associated with *increased lifespan*.^{18,19}



Sirtuins require **NAD⁺** to function.^{4,20} But in older adults, **NAD⁺** levels and sirtuin function tend to drop. In preclinical research, this *declining* sirtuin function has been associated with **accelerated aging** and increased risk for age-related disease.²¹

As a **NAD⁺** precursor, **NR** can readily replenish **NAD⁺** levels in cells,²²⁻²⁵ allowing sirtuins and other enzymes to continue working effectively.

Wide-Ranging Benefits

Raising **NAD⁺** levels with **NR** has been shown to improve various aspects of health in preclinical studies.

For example, in rodents, nicotinamide riboside:

- Improves memory in models of Alzheimer's disease,²⁶
- Helps prevent heart **failure**,²⁷ and
- Improves metabolism and helps prevent weight gain.²⁶

Giving animals **NR** also resulted in an **extension of lifespan**.²⁸⁻³¹

In worms, for instance, lifespan was extended by at least **10%**. In mice the human equivalent of 70 years old,³¹ nicotinamide riboside extended their life by about **5%**, the human equivalent of **four additional years of life** based on today's average U.S. human life expectancy of **76** years.³²

Human Studies

Nicotinamide riboside is a relatively newly studied nutrient. The first human study of its use was only published in **2016**.²³

In early clinical studies, **NR** has been shown to be **safe** and well tolerated.^{23,33}

Taking various doses has been shown to increase body levels of **NAD⁺**²²⁻²⁵ as much as **five-fold**.²² The increase in **NAD⁺** levels correlates with an increase in cellular **metabolic adaptations**.^{23,34}

In a randomized controlled trial of adults with **Parkinson's disease**, taking **1,000 mg** of nicotinamide riboside daily for 30 days significantly increased brain levels of **NAD⁺** (measured via magnetic resonance imaging). Supplementation was associated with decreases in markers of inflammation and *mild clinical improvement* in symptoms of Parkinson's disease.³⁵



In a randomized controlled crossover trial, a **1,000 mg** daily dose of nicotinamide riboside in mildly overweight, healthy, elderly men for 21 days resulted in elevated levels of NAD⁺ in muscles of participants in the intervention group. Nicotinamide riboside also reduced levels of circulating **inflammatory** cytokines.³⁶

In another study, four patients hospitalized with advanced heart failure were given escalating doses of NR (**500 mg** to **2,000 mg**) for five to nine days. Blood samples were collected before and after the intervention.

In this human study, whole-blood NAD⁺ levels and respiration of peripheral white blood cells were increased. The researchers demonstrated that increasing **NAD⁺** levels through NR treatment can improve mitochondrial function and lower inflammatory cytokines in **heart failure** patients.¹³

Mitochondrial dysfunction in heart failure patients is associated with reduced NAD⁺ levels. In a trial of clinically stable heart failure patients with reduced ejection fraction (a measurement of the heart's ability to pump blood) **1,000 mg** of NR twice daily for 12 weeks resulted in increased blood levels of NAD⁺ and improved mitochondrial respiration. It also reduced the proinflammatory marker in circulating immune cells, evidence that boosting NAD⁺ with NR may help reduce systemic inflammation.³⁷

The Emerging Benefits of Nicotinamide Riboside

- **Nicotinamide adenine dinucleotide (NAD⁺)** is critical to many cellular processes, including energy metabolism and DNA repair, and to proper function of protective sirtuin proteins.
- **NAD⁺** levels tend to wane with older age. Nicotinamide riboside (NR), a precursor to NAD⁺, has been shown in human studies to restore NAD⁺ levels in cells.
- In preclinical studies, nicotinamide riboside has reduced risk for disease, improved health, and **extended lifespan**.
- In **human trials**, nicotinamide riboside reduced inflammation and oxidative stress, boosted physical performance, and led to improvements in Parkinson's disease.

Nicotinamide Riboside and Resveratrol: A Powerful Combination

Resveratrol is a polyphenol found in red wine, grapes, and various other plants. It has been shown in preclinical settings to **activate sirtuins**, proteins linked to healthy aging.^{20,39}

Sirtuins require **NAD⁺** to function, and the possible lifespan extension benefits of calorie restriction may be associated with the role of sirtuins.⁴⁰

A combination of **nicotinamide riboside** to boost levels of **NAD⁺** and **resveratrol** to increase sirtuin function can maximize sirtuins' ability to protect cells.



In a randomized controlled, crossover trial, 12 young and 12 aged men were given nicotinamide riboside or placebo. Muscle fatigue and strength were assessed two hours before and after exercise along with the collection of blood and urine samples. At rest, older individuals had lower red blood cell antioxidants and NAD⁺ reserves. NR supplementation increased NAD⁺ reserves and lowered oxidative stress in both groups, and increased antioxidant reserves in the elderly participants. In **elderly** subjects who were supplemented with NAD⁺, there was an improvement in the **fatigue** index and in one measure of **isometric strength**.³⁸

Research into nicotinamide riboside is exploding, with about **100** ongoing **clinical trials** listed in the National Institutes of Health's directory.³⁹ But already there is evidence for its potential to improve many aspects of health.

Summary

Maintaining optimal **NAD⁺** levels can help support cellular metabolism and DNA repair.

Levels of NAD⁺ decline with age, but **nicotinamide riboside** is capable of helping to restore them.

In **human trials**, nicotinamide riboside reduced markers of inflammation, reduced oxidative stress, led to clinical improvements in Parkinson's disease, and improved exercise performance in older adults.

Many clinical trials for other conditions are underway. •

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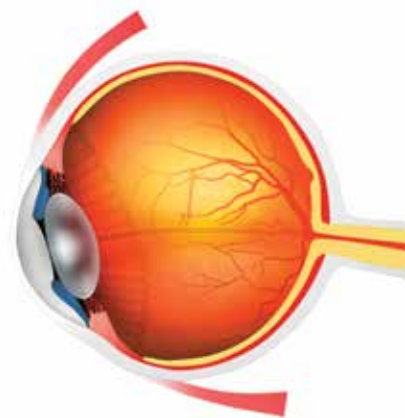
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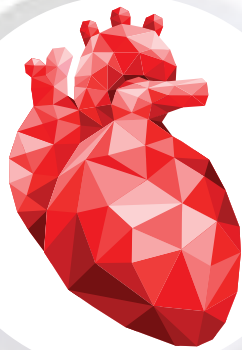


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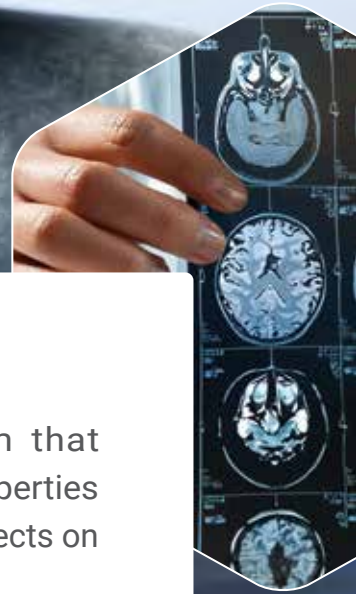


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BY MICHAEL DOWNEY

In today's hectic world, many of us need to find safe ways to reduce **stress** and calm down.

Stress can severely harm quality of life. Chronic stress boosts risk of physical and mental problems,¹ and can impact an individual's **immune** function.²

L-theanine is an amino acid found in green tea. It has been recognized for its ability to safely reduce anxiety, calm the mind and produce a state of **relaxation**³ without drowsiness.³⁻⁵

Clinical studies confirm that L-theanine has relaxing properties that have *stress-relieving* effects on the body.⁶⁻⁹

One study published in **2024** showed that **L-theanine** lowered perceived **stress** by nearly **18%**, enhanced **sleep** quality, and provided a sustained improvement in **cognitive** attention.⁷

A Serious Health Risk

Stress is the body's way of helping you deal with occasional, serious risks to life and health. After a perceived danger has passed, your stress hormones, heart rate, and blood pressure levels are supposed to return to normal.¹⁰

But when life throws constant stressors at you, that **fight-or-flight reaction** can stay turned on.¹⁰

Excessive exposure to stress hormones such as **cortisol** and the *long-term* activation of the stress response system can put your health in danger. This **chronic stress** increases the risk of:^{1,10}

- Heart disease, heart attack, high blood pressure, and stroke,¹⁰
- Musculoskeletal problems,¹⁰
- Depression,¹⁰
- Digestive issues,¹⁰
- Headaches, muscle tension, and pain,¹⁰
- Chronic fatigue,¹⁰
- Hormonal imbalance/menstrual irregularities,¹⁰
- Dysregulation of the immune system,^{1,10}
- Weight gain,¹⁰ and
- Memory and cognition problems.¹



Researchers have looked for healthy ways to promote non-sedative **alert relaxation**.

Despite containing caffeine, **green tea** has traditionally been associated with producing a *calming* effect.¹¹

In **1949**, scientists identified the specific compound in green tea leaves associated with these relaxing, **anti-stress** effects: **L-theanine**.¹¹

How L-Theanine Blocks Stress

L-theanine is a water-soluble amino acid⁷ that has the ability to cross the blood-brain barrier.⁵

L-theanine works to **reduce stress** by the following mechanisms:

- Preclinical evidence suggests that it modulates activity of the excitatory neurotransmitter **glutamate**.¹²
- In preclinical studies L-theanine is found to be associated with *stimulating* the production of the *relaxing* neurotransmitter **GABA** (our main inhibitory neurotransmitter) as well as enhancing dopamine release.⁵ Levels of GABA are associated with sleep, and *reduced* feelings of stress and anxiety. Dopamine is associated with learning and mood.¹³
- In human studies L-theanine has been shown to *increase* **alpha wave** activity in the brain, especially in individuals with moderate to high anxiety levels.^{6,7,14} Alpha waves are associated with a relaxed but alert mental state.¹⁵

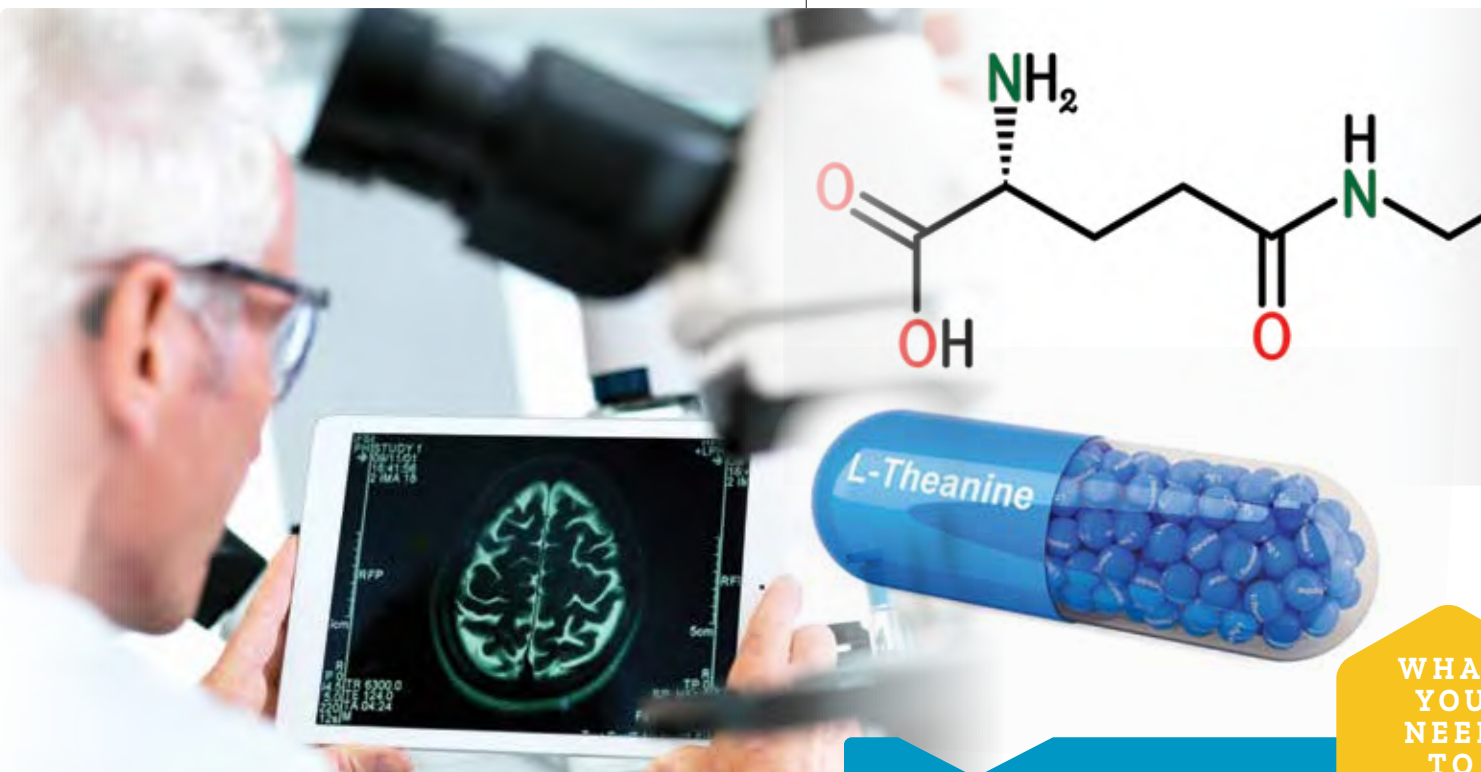
In **1964**, after Japanese researchers conducted numerous clinical trials demonstrating that **L-theanine** is both safe and effective, Japanese authorities declared it to be completely safe and approved adding it to foods.¹⁶

Since then, multiple **clinical studies** have shown that L-theanine effectively reduces **stress**.^{3,17-19}

Clinically Validated

In one unpublished study, scientists enlisted healthy subjects, aged 21 to 47, who were considered *not particularly stressed*. The study involved initial screening and an experimental visit lasting two hours.⁹

During this experimental visit one group took a **placebo**, and the other took **200 mg of L-theanine**.



WHAT
YOU
NEED
TO
KNOW

Prior to taking the doses participants were tested for alpha brain waves (by electroencephalography, or EEG) seven times over a 120-minute period and received a stress test. Ninety minutes after receiving the dose, two further **stress tests** were administered, and heart rate was measured three times.⁹

The **L-theanine** group had:⁹

- Increased **alpha brain wave** activity, indicating increased **relaxed wakefulness** (while the placebo group's activity was *unchanged*),
- Significantly less fatigue than the placebo group,
- Decreased **tension** and **anxiety**, and
- Lower **heart rates**, a further sign of stress reduction.

This shows L-theanine is effective in helping to reduce heart rate and increase relaxation, and has the potential to relieve stress.⁹

In a triple blind, placebo-controlled, crossover study, individuals aged 19 to 60 were evaluated who were *moderately stressed*.⁶

Decrease Stress Without Drowsiness

- Chronic **stress** affects millions of American adults. It can contribute to low-quality sleep, poor general health, and increased risk for anxiety, depression, and heart disease, and can also impact immune function.
- In clinical studies, **L-theanine**, an amino acid found in **green tea**, has been shown to reduce stress and promote relaxation while maintaining *alertness*—unlike sedating medications.
- Results of a clinical trial published in **2024** found that taking **400 mg** of L-theanine daily significantly reduced feelings of stress, improved sleep quality, and enhanced cognitive attention.

At screening, participants were randomized to the L-theanine or placebo group and were given instructions and kits to collect salivary cortisol levels. Subjects were given either a **placebo** or **200 mg of L-theanine**, as well as an arithmetic test to induce mental stress before and after they received the dose.

Alpha brain wave activity, **salivary cortisol** levels, and vital signs were recorded before and after participants took the arithmetic test. There was a seven-day washout period between the L-theanine test and placebo test. Participants returned for the cross-over period and all assessments from the first study period were repeated.

All participants experienced stress during the test, as evidenced by increases in heart rate, blood pressure, and self-reported stress and anxiety. But **three hours** later, those who had taken **L-theanine** had greater **alpha wave** activity compared to the placebo, showing a higher level of alert relaxation without drowsiness.

L-theanine also resulted in greater decreases in salivary **cortisol** levels, compared to placebo, further indicating increased relaxation and calm.⁶

These studies show how L-theanine can reduce the nervous system's stress reaction, which can yield benefits for body and mind.

Recent Human Trial

A clinical study published in **2024** enrolled healthy but *moderately stressed* subjects. But this time, treatments continued over a **28-day** period.⁷

Subjects ranging from 18 to 65 years were randomly given either a placebo or **400 mg of L-theanine** daily, taken as **200 mg** in the morning and at night.

Participants were asked to maintain their normal lifestyle, avoid high caffeine consumption (no more than two cups of coffee a day), and refrain from vigorous exercise within 24 hours of testing days.

Tests and other evaluations were done at baseline, day 14, and day 28. On day **28**, the **L-theanine** group had:⁷

- About **18%** lower levels of **perceived stress**,
- Improved **sleep quality**, and
- Greater **cognitive attention**.

The significantly lower levels of self-perceived stress corresponded with a decrease in morning **salivary cortisol**.



This shows that **L-theanine** can reduce general stress *over an extended period* in people who experience stress on a regular basis, and this may improve the quality of life.⁷

Green tea has only about **8 mg** of **L-theanine** per cup.²⁰ Studies on L-theanine's anti-stress effects usually use a **200 mg** dose, taken once or twice daily.^{6,7}

Summary

Stress contributes to reduced quality of life and greater risk for chronic disorders and impaired immune system function.

L-theanine, an amino acid found in green tea, has been clinically shown to **reduce stress** and enhance relaxation while maintaining **alertness**.

In **human** trials, **L-theanine** reduced signs of stress after just a single **200 mg** dose. It also improved sleep, relaxation, and cognitive attention after **28 days** of daily use without serious adverse effects. •

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Shell-broken Reishi mushroom **150 mg**
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TAURINE

Supports
Healthy Aging



BY THOMAS STRIKE

Taurine is the most abundant amino acid found in nearly all tissues.¹ It facilitates multiple biological functions.¹⁻⁴

But levels drop by about **80%** in **older** adults.⁵

That decline puts our health at risk. A **2023** study even named **taurine deficiency** a “**driver of aging**.”⁵

In animal models, inadequate taurine results in accelerated **aging** and *higher* risk for disease.⁶⁻⁸ Oral intake to maintain *higher* levels has demonstrated beneficial effects.^{5,7}

In **human** studies, **taurine** intake ranging from **500-6000 mg** daily has shown:

- Lowered blood pressure⁹⁻¹¹ and cholesterol,¹⁰⁻¹³
- Reduced markers of inflammation,¹⁴⁻¹⁶
- Reduced complications in people with metabolic dysfunction,^{11,18}
- Improved blood sugar and insulin levels in adults with type II diabetes,¹²
- Improved cognitive function in elderly women with dementia.¹⁹

These and other findings indicate the role taurine plays in supporting **healthy aging**.

Taurine's Role in Aging and Disease

Most animals, including humans, synthesize some amount of **taurine** internally.

Additional taurine is obtained in our diets, with seafood being the richest source, and some coming from meat and dairy.^{2,7}

Similar to aging humans, cats and some dogs do not produce enough taurine internally. They must get ample taurine in their diet or via supplementation to avoid a **taurine deficiency**.⁷

Taurine deficiency in animals affects a wide range of their organ systems, leading to visual, cardiovascular, neurological and reproductive defects^{6,7} along with a weakened immune system.⁷

The situation also occurs in **humans**. With age, body levels of taurine tend to drop precipitously. Older adults, on average, have **80% less** taurine than young, healthy adults.⁵

These lower levels of **taurine** are associated with age-related disorders.

A 2023 study in a large cohort of European adults performed an association analysis. Levels of taurine, its precursor, and its metabolites were measured. Higher blood taurine and related compounds were associated with lower body mass index (BMI) and less **abdominal obesity**, as well as lower levels of the inflammatory marker **C-reactive protein** (CRP). Higher taurine metabolite levels were associated with less chance of **type II diabetes** as well as with lower **glucose** levels.⁵

Taurine is so vital that our cells contain **transporters specific to taurine**.^{6,7} When taurine is consumed orally, these transporters shuttle it into cells to maintain an adequate supply.⁴ Experimental animals that are missing taurine transporters develop significant health problems and have a **shortened lifespan**.⁷

In numerous animal and cell studies, taurine has been found to:

- Support mitochondrial health^{7,20} and improve cellular energy metabolism,^{7,8}
- Regulate healthy gene expression,⁷
- Improve neurotransmitter function in the nervous system,²¹
- Boost cellular quality control and house-keeping,²⁰
- Protect against oxidative stress⁷ and chronic inflammation,^{7,20} and
- Protect DNA from damage and shortening of telomeres.^{5,20}

These and other beneficial effects may have a favorable impact on healthy aging.

In a recent study elderly mice supplemented daily with taurine increased **life expectancy** up to **25%**, compared to a placebo.^{5,20}

These supplemented mice suffered from less age-related deterioration and disease. Similar results were seen in rhesus **monkeys** given taurine.



An observational study found low levels of **taurine** within the brain are associated with major **depressive** disorder in young women.²²

In an observational survey in 25 countries, with more than **14,000 people**, scientists measured urinary excretion of taurine and used that to estimate dietary taurine intake. They found that Japanese people had the *highest* intake of seafood and thus of taurine, and they also had the lowest rate of **heart disease** and the *longest* average **lifespan**.²³

Wide-Ranging Benefits

Clinical studies of taurine intake have shown a huge range of benefits that can promote healthy aging.

In Japan, taurine has been used to help improve the **heart function** and exercise capacity of **heart failure** patients.²⁴⁻²⁷

This improvement in **energy metabolism** and **exercise capacity** has been observed in other subjects as well.

In a crossover trial of healthy young elite athletes, participants were randomized to receive **6,000 mg** of **taurine** or **placebo** in the first session. After a 72-hour washout period the groups were reversed, with the first-session placebo group receiving supplementation and the supplemented group getting placebo. Participants were tested with a series of physical and blood tests for lactate levels (an indirect marker for fatigue in exercising muscle).

It was found that taurine intake enhanced their peak, average, and minimum **power output**, and their functional response to the training, as compared to a placebo.²⁸

Several other studies have found that taurine supports **heart** and **metabolic health**:

- In adults with **type II diabetes**, taking **3000 mg** of taurine per day for eight weeks significantly reduced insulin resistance, blood sugar, hemoglobin A1c, and cholesterol levels. The markers of **glycation damage** caused by high blood sugar were also reduced.¹² Two other trials in diabetics have shown improvements in **glycemic** markers and lipid profile at the same dose.¹³ These results suggest that taurine supplementation may have potential to help with diabetic complications by improving glycemic control.



Healthier Aging with Taurine

- **Taurine** is an amino acid available mostly from seafood but also meats and dairy; it is also produced by the body. Its levels drop dramatically with advancing age.
- Lower levels of taurine have been tied to **accelerated aging** and increased risk for age-related chronic disease.
- In elderly mice, taurine intake increased **lifespan** up to **25%**.
- **Human studies** show that taurine intake can improve many aspects of health, including reducing elevated blood sugar and blood pressure, lowering cholesterol, improving cognitive function, and reducing risk for metabolic syndrome.

- In preclinical studies taurine has shown an ability to protect against common diabetic complications, including diabetic **kidney** disease, **eye** disease, and **neuropathy**.^{29,30}
- A review of clinical studies found that taking from **1000-6000 mg** of taurine daily significantly reduced both systolic (top number) and diastolic **blood pressure**.¹⁰ This effect has also been documented in adults with **pre-hypertension** or **hypertension**.³¹
- A meta-analysis affirmed taurine's ability to reduce blood pressure while also lowering **cholesterol** and **triglycerides** in patients with liver or metabolic dysregulation at a dose of **500-6000 mg** for a period of 15 days to six months.¹¹
- In a study of obese females, a combination of **3000 mg** taurine intake and nutritional counselling for eight weeks reduced C-reactive protein (CRP) levels—a marker of systemic **inflammation**.¹⁵ A meta-analysis of trials has shown similar results for CRP and biomarkers of oxidative stress.¹⁶
- A **2024** meta-analysis of 25 human trials including a total of over one thousand participants determined that taurine (in doses ranging from **500-6000 mg** per day) for a follow-up period of 5–365 days was capable of reducing blood pressure, fasting blood glucose and triglycerides. These markers are associated with risk for **metabolic syndrome**, a cluster of conditions that increases risk for cardiovascular disease and type II diabetes.¹⁸

Other studies show benefits beyond heart and metabolic health.

For example, in hospitalized elderly women with dementia, taking **3000 mg** of taurine daily led to improvements in **cognitive function** after just four weeks.¹⁹

In a clinical trial of patients with chronic liver disease, **2000 mg** per day of oral supplementation with taurine resulted in a clinically significant reduction in the frequency, duration, and intensity of muscle cramps (which are commonly seen in patients with chronic liver diseases).³²

And in patients recovering from a traumatic **brain injury**, taurine reduced the marker of inflammation and improved clinical outcomes.¹⁴

Dozens of studies are currently testing taurine's benefits for everything from diabetes to mental health disorders.³³ The existing evidence clearly shows how vital it is for **healthy aging**.

Strikingly Low Taurine Levels in Food

In youth, **taurine** is synthesized in our body from the amino acid **cysteine** by an enzyme called **cysteine sulfinic decarboxylase**.³⁴

With age, levels of this enzyme plummet. The result is lower body taurine. Studies indicate elderly people have about **80%** less taurine compared to their youth.⁵

Published studies use thousands of milligrams a day to achieve clinical results. Yet the typical dietary intake of taurine is only **100-180 mg** a day. (Strict vegetarians/vegans may only obtain **17 mg** of taurine from their plant based diet (no seafood or meat).³⁴

Based on accumulating published clinical data, people today are supplementing with **3,000 to 6,000 mg** daily of **taurine**.

The only caveat about these higher doses is people with end stage **kidney failure** who may not be able to properly clear excess taurine from the blood.



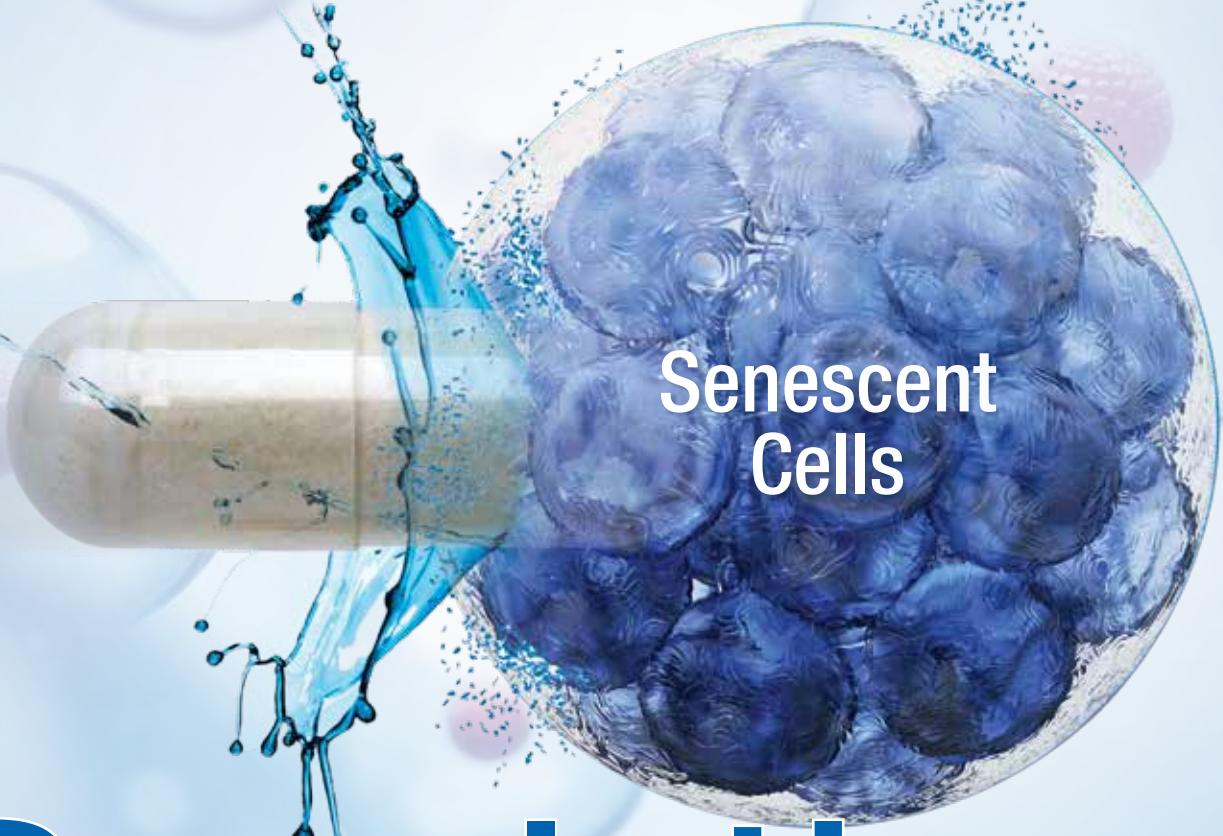
Summary

Taurine is an amino acid available mostly from seafood but also meats and dairy. It is also made in the human body. Its levels tend to plummet with age, and lower levels are associated with increased risk for numerous diseases.

Taurine intake increases **lifespan** in animal models. In **human studies**, it has reduced high blood sugar, cholesterol, hypertension, oxidative stress, and chronic inflammation, helping to promote **healthy aging**. •

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This formula contains a patented **fisetin** that is more **bioavailable** than regular fisetin.

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The **Senolytic Activator**® formula provides the following nutrients:

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- **APIGENIN** (a natural flavonoid)
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The suggested dose of the **Senolytic Activator**® is **3 capsules** once a week. Each bottle lasts 3 months and costs very little.

This product is available at fine health food stores everywhere.

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"Excellent."

Chris

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REVIEW

Testosterone builds muscle, maintains sexual health, supports cardiac function, strengthens bones, and nourishes brain cells.^{1,2}

Testosterone Elite helps maintain healthy testosterone levels:[†]

- A clinical trial showed that pomegranate and cacao elevated free testosterone levels up to **48%** from baseline in just eight weeks.³
- Helps support physical strength and other benefits of healthy testosterone levels.[†]
- Just one capsule a day.

PLANT-BASED
NUTRIENTS

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† This product is intended to support testosterone levels but does not contain testosterone.



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What is Reishi?

BY LAURIE MATHENA

Immune-Boosting Properties

A strong immune system is a key factor necessary for a longer, healthier life. Unfortunately, immune systems decline with age.⁴

Preclinical⁵⁻⁷ and clinical⁸⁻¹¹ research has validated reishi's ability to modulate immune function.

Animal research has shown that **reishi** promotes the maturation and activation of immune cells that are part of both the innate and adaptive immune systems.¹²

The **innate immune system** is the body's first line of defense against harmful invaders like viruses, bacteria, and cancer cells.¹³

Adaptive immunity targets the specific pathogens causing a problem.¹³

In preclinical studies the bioactive compounds from reishi have shown an ability to activate immune cells including T cells, natural killer cells, dendritic cells, and macrophages.^{5,14}

Activating **natural killer cells** is crucial for protection against viruses, which is especially critical for older adults who often suffer from diminished natural killer cell activity. This is one crucial reason why, with increasing age, people are susceptible to high rates of infection with viruses ranging from influenza to various herpes viruses.^{15,16}

Lab studies show that reishi also helps combat inflammation by increasing protective **IL-10** levels and lowering pro-inflammatory **IL-6** levels.^{17,18}



Reishi mushrooms (*Ganoderma lucidum*) have been utilized in Chinese folk medicine to promote health and longevity.¹

They are so revered in traditional Chinese medicine for their health benefits that they have been referred to as the "**mushroom of immortality**."¹

More recently, modern research has validated that reishi contains key health-promoting components that boost immune function, reduce inflammation, and stop the growth of cancer cells.¹

And animal research has shown its potential to increase **lifespan**.^{2,3}

In a clinical trial, 30 older women received either **2000 mg** daily reishi extract or placebo. After eight weeks, reishi extract consumption was shown to regulate T-lymphocyte function and IL expression, leading to significant anti-inflammatory action as compared to a placebo group.⁸

Infection-Fighting Power

With its ability to boost components of both innate and adaptive immunity, reishi could protect the aging body from infections.

Lab studies demonstrate activity against many common viruses, including:

- **Herpes simplex viruses** (the causes of oral and genital herpes),¹⁹
- **Influenza viruses** (cause of the flu),^{19,20}
- **Epstein-Barr virus** (causes mononucleosis and can contribute to the formation of cancer),¹⁹
- **Hepatitis B virus** (a common cause of liver disease that can lead to cirrhosis, liver cancer, and liver failure),^{21,22}
- **Human immunodeficiency virus** (the virus that causes HIV/AIDS).^{22,23}

Anti-Cancer Properties

Reishi's ability to boost the function of immune cells gives it potential anti-tumor and anti-cancer properties.²⁴

In preclinical studies, reishi was shown to target tumor cells by activating anti-tumor activity of natural

killer (NK) cells and by cytokine release from T-lymphocytes and macrophages.⁵

Reishi may also directly combat tumors through many mechanisms, including the following:¹⁹

- Stopping tumor cells from growing,
- Preventing tumor blood vessels from developing,
- Starving abnormal cells, and
- Directly killing cancer cells.^{25,26}

A meta-analysis of five clinical trials of cancer patients found that patients who were given reishi in combination with their standard chemotherapy/radiation therapy had greater tumor regression with treatment than those treated with standard therapy alone. Treatment groups were also found to have improved quality of life.²⁷

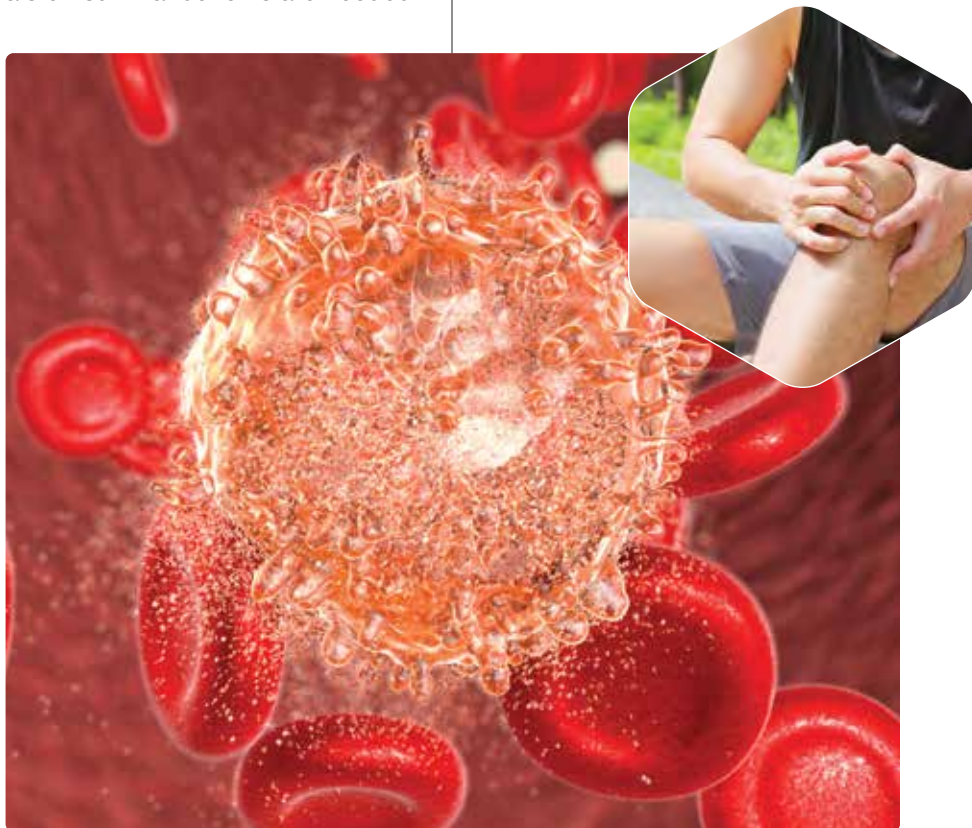
However, further analyses and trials on survival benefits are needed.

Blood Sugar Support

Reishi contains compounds like polysaccharides, proteoglycans, and triterpenoids that have all been shown in preclinical settings to help lower blood sugar levels.²⁸

Animal studies have demonstrated reishi's potential to decrease blood sugar and improve lipids.^{29,30}

In a clinical trial to assess the cardiometabolic benefits of reishi in people with mild hypertension or high lipids, participants received **1.44 grams** of reishi extract or placebo for 12 weeks. After 12 weeks the treatment group showed improvements in plasma insulin and insulin resistance along with a reduction in triglycerides and elevation of HDL cholesterol. Overall results indicate its potential to support health in diabetics and improve dyslipidemia. However, further clinical trials are needed to confirm this benefit in humans.³¹



Lifespan Extension

A mouse study has provided an exciting glimpse into reishi's potential to expand lifespan.³²

This study showed that the mice supplemented with reishi lived as much as *148 days longer* than the un-supplemented control group.

This represents a dramatic increase in longevity given that the lifespan of a mouse is typically less than two years.

Summary

Reishi mushrooms have earned the nickname “mushroom of immortality” because of their potent health benefits.

Preclinical and clinical research has shown **reishi mushroom's** potential to improve immune function, reduce inflammation, help regulate blood sugar, and fight against cancer.

Reishi is a low-cost plant extract that helps support health for aging individuals. •

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VERIFIED CUSTOMER REVIEW

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Phages target intestinal bacteria to support a balanced microbiome.

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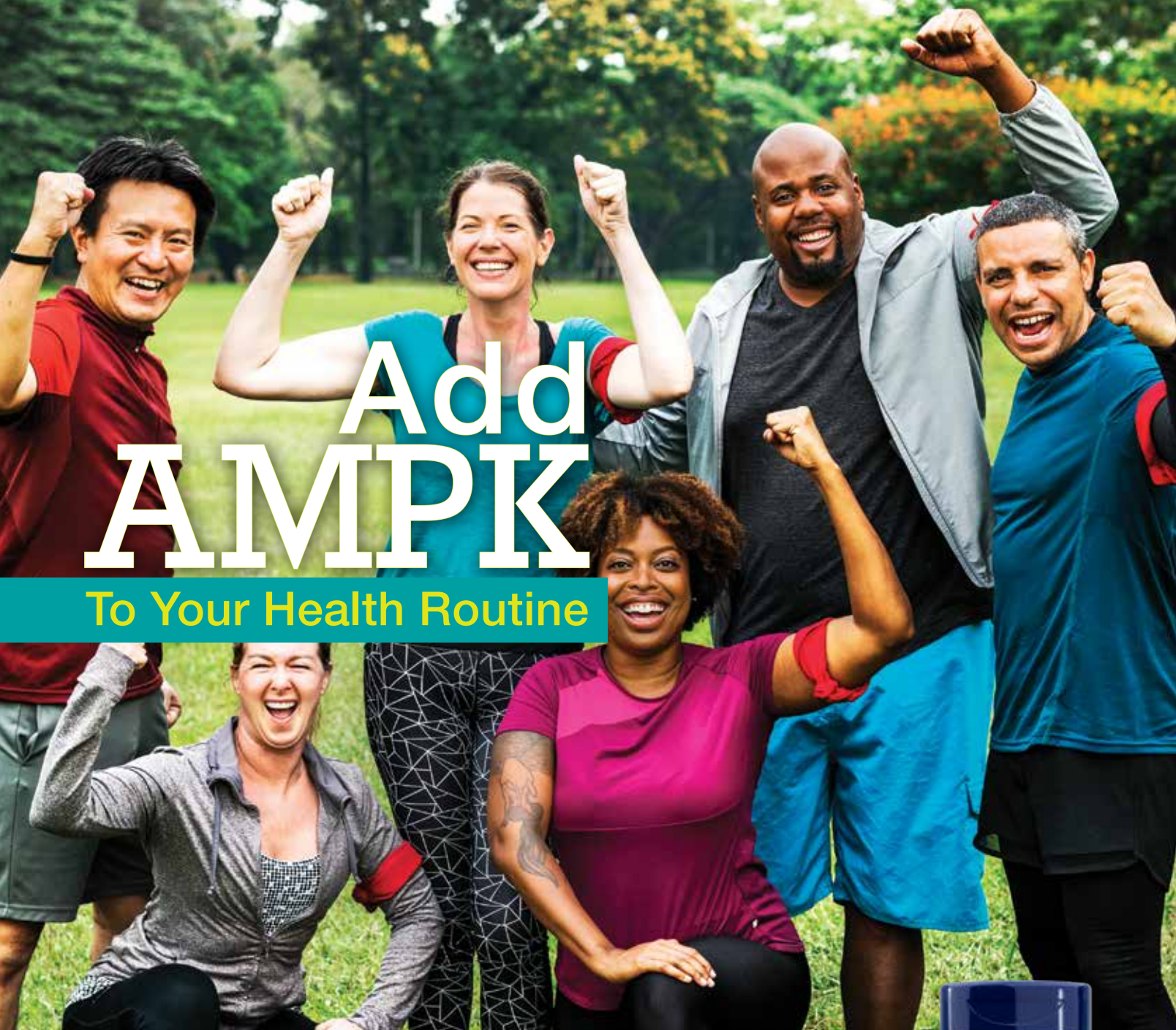
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Add AMPK

To Your Health Routine

AMPK is an enzyme in the body that signals cells to burn **fat** for energy.

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IN THIS EDITION OF LIFE EXTENSION MAGAZINE®



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16 CLEAN UP YOUR CELLS WITH CURCUMIN

In preclinical models, **curcumin** activated *autophagy*, a vital cellular housekeeping process.



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26 ASTAXANTHIN'S SYSTEMIC EFFECTS

In human studies, **astaxanthin** benefits the **eyes**, while helping to *protect* against skin aging, cardiometabolic risks, and age-associated **cognitive decline**.



36

36 ENHANCE COGNITIVE FUNCTIONS

In a study of older adults, a specific **sage extract** *improved* measures of **memory** by about **60%** and *improved attention* **2.5-fold**.



56

56 FEMALE SEXUAL HEALTH

Studies show that **fenugreek seed extract** *enhanced* female **sexual function**, while **saffron** extract *promoted desire*.



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64 X NAD⁺ CLINICAL TRIALS

NAD⁺ levels decline with age. In **clinical trials**, *restoring NAD⁺* *reduced inflammation*, *reduced fatigue*, and *improved mitochondrial function*.



74

74 CALMING EFFECTS OF L-THEANINE

Taking **L-theanine** daily *improved sleep quality*, *enhanced cognitive attention*, and *reduced stress* by **18%**, without drowsiness.