

The Science of a Healthier Life®

March/April 2024

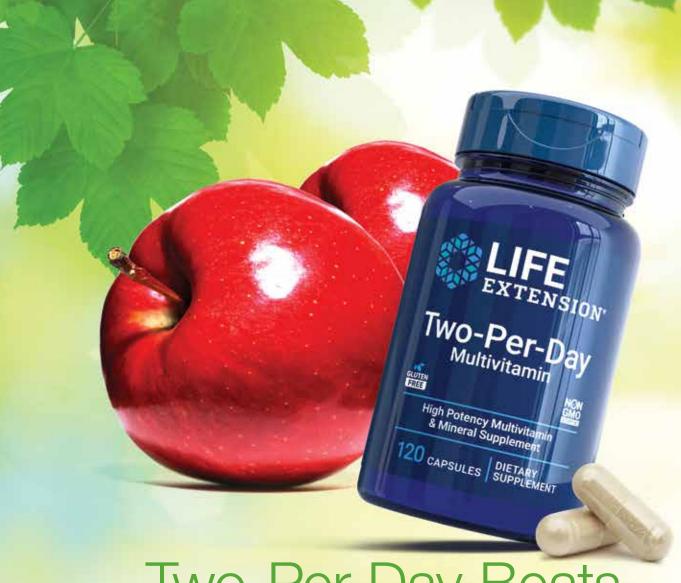
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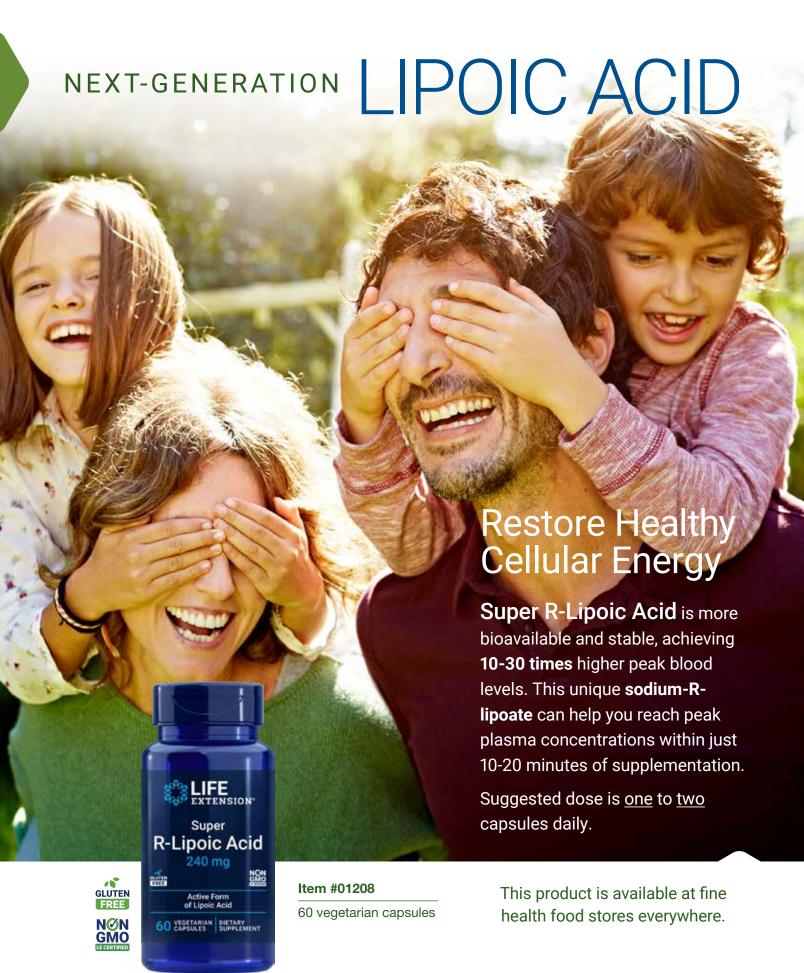
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Optimize the Benefits of Broccoli

Mature broccoli contains relatively little sulforaphane. Cooking reduces it even more.

A convenient solution is combining a sulforaphane precursor with an enzyme that converts the precursor to sulforaphane in the digestive tract.



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Less slow-wave sleep boosts dementia risk; thiamine lowers heart attack mortality risk; higher vitamin K intake lowers diabetes risk; higher DHA levels linked to lower hearing loss risk with aging.

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60 RECONNECT AGING BRAIN CELLS

MIT researchers developed a form of magnesium that was shown to reverse measures of brain aging and improve synaptic density.

70 UNDO DAMAGE OF SITTING TOO MUCH

Americans spend half their time sitting, a major risk for **deep vein** thrombosis and blood clots. Clinical data show that two plant extracts may reduce leg swelling and prevent venous clots.

78 PROTECT KIDNEY FUNCTION

Excess uric acid contributes to gout, kidney stones, and kidney disease. A human study showed that a plant extract lowered uric acid blood levels by 28.4% and improved measures of kidney health.

86 VITAMIN CAND GUM DISEASE

Gum disease is linked to stroke, diabetes, and more. New research demonstrates vitamin C's ability to decrease the risk and severity of gum disease.

91 WHAT IS MSM?

MSM, rich in sulfur, is found in the human body. Clinical studies show that MSM reduces joint pain and swelling in osteoarthritis patients, while improving physical function and mobility.



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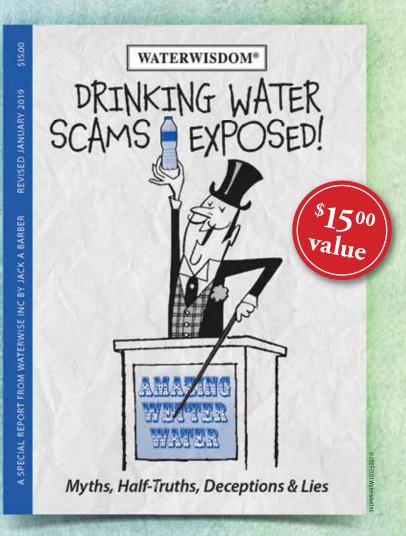
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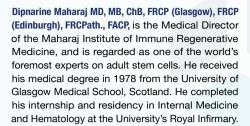
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In the News

More Vitamin K Intake Linked to Reduced Risk of Diabetes

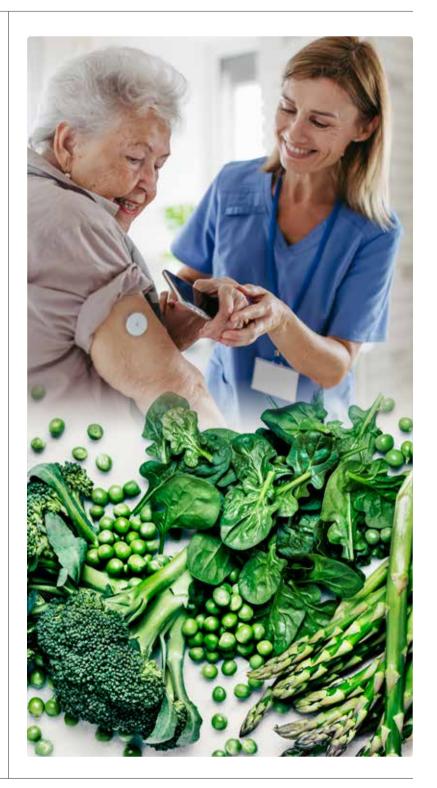
Individuals with a high intake of vitamin K were found to have lower blood glucose and less insulin resistance, as well as a reduced risk of developing type II diabetes, according to a systematic review and meta-analysis.*

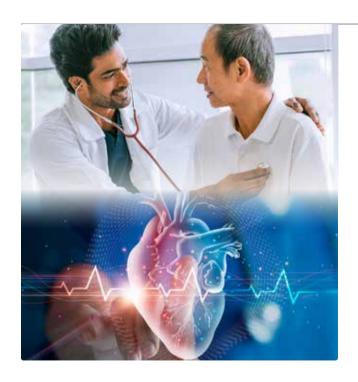
Meta-analysis of five observational studies examined the association between reported daily vitamin K intake and the development of type II diabetes among 105,798 participants. The researchers found a 21% lower risk of developing diabetes among those whose vitamin K intake was highest compared with those whose intake was lowest.

Meta-analysis of seven controlled trials compared the effects of treatment with vitamin K1 or K2 to a placebo or multivitamin formula that did not contain vitamin K. The decline in glucose from levels measured at the beginning of the trials was significantly greater at the end of the trials among diabetics who received vitamin K in comparison with those who did not receive it.

Editor's Note: A significant reduction was also found in insulin resistance among participants who received vitamin K2 compared with the control group.

* Food Funct. 2023 Oct 2;14(19):8951-8963.





Thiamine (Vitamin B1) May Improve Heart Attack Survival Rate

Heart attack patients admitted to an intensive care unit frequently suffer from thiamine insufficiency. Those given thiamine (vitamin B1) had a lower risk of dying in the hospital, as well as a lower mortality risk after 30 and 90 days, a retrospective, observational study showed.*

The study included 1,782 men and women who were admitted to an intensive care unit for a heart attack for at least 48 hours. One hundred seventy patients were given thiamine, while the other 1,612 were not.

Patients who were given thiamine had a 39.5% lower adjusted risk of in-hospital mortality than those who did not receive the vitamin. The thiamine group also had a 30-day adjusted mortality risk that was 38.2% lower and a 90-day mortality risk that was 37.4% lower than those who did not receive the vitamin.

Editor's Note: "Thiamine deficiency may aggravate endothelial dysfunction and chronic vascular inflammation, resulting in the loss of arterial vascular resistance that eventually develops into CVD [cardiovascular disease]. Therefore, thiamine supplementation may provide an unexpected benefit to the prognosis and outcome in patients with CVD," the authors stated.

Less Slow-Wave Sleep Increases Risk of Dementia

Lack of slow-wave sleep over time can increase the risk of dementia, according to a study published in JAMA Neurology.*

Slow-wave sleep is a phase of deep, restorative sleep in which the body facilitates removal of potentially harmful substances from the brain, such as beta amyloid plaque.

This study included 346 people averaging 69 years old who had participated in the Framingham Heart Study and had completed two overnight sleep studies. The researchers tracked the risk of developing dementia for up to 17 years after the two sleep studies.

First, the researchers found that aging itself was associated with a decline in slow-wave sleep, which accelerated from age 60 to age 80.

Then, they determined that for each percentage decrease in slow-wave sleep per year, there was a 27% increased risk of all-cause dementia, and a 32% increased risk of Alzheimer's dementia.

Editor's note: The researchers found that individuals who experienced declines in slow-wave sleep were more likely to have heart disease, to take medications that impact sleep, and to carry the APOE4 gene that increases Alzheimer's risk.

* JAMA Neurol. 2023; 10.1001/jamaneurol.2023. 3889.



^{*} Front Nutr. 2023 Aug 29;10:1227974.

Higher DHA Levels Associated with Lower Risk of Age-Related **Hearing Loss**

Higher plasma levels of the omega-3 fatty acid DHA (docosahexaenoic acid) have been linked to a lower risk of hearing loss in middle-aged and older adults, according to research presented at NUTRITION 2023, the annual meeting of the American Society for Nutrition.*

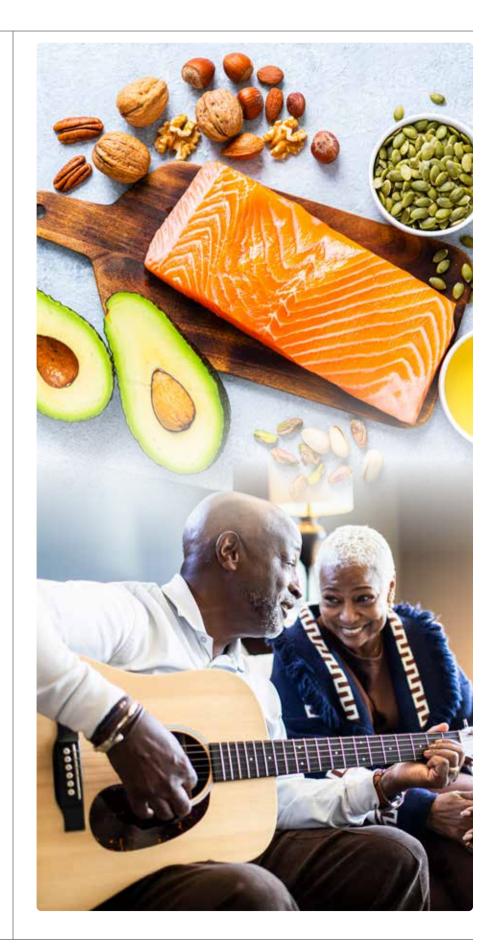
Researchers evaluated data from participants in the UK Biobank, which included men and women between the ages of 40 and 69 from 2007 to 2010. Information was available from 115,303 participants concerning whether they had difficulty hearing, from 113,134 respondents concerning if they had difficulty following a conversation if there is background noise, and from 71,368 regarding hearingaid use.

Individuals whose plasma DHA was among the top 20% of individuals in the study had an 8% to 20% lower risk of reporting hearing issues than those whose DHA was among the lowest 20%.

People in the top 20% of blood DHA levels were 16% less likely to answer 'yes' to the question 'do you have difficulty hearing?' compared with those in the lowest 20% of DHA levels.

Editor's Note: Plasma DHA was assessed as the percentage of total plasma fatty acids.

* https://nutrition.org/upping-your-intakeof-omega-3s-may-help-protect-yourhearing/





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Risks of Cold and Flu

Most adults have two to three colds a year. Symptoms typically last seven to 10 days but can linger for up to two weeks.9,10

Every year, as much as 20% of the U.S. population will contract the flu. 11,12 Hundreds of thousands of Americans are hospitalized and up to 52,000 flu-related deaths occur.13

Antiviral medications (like Xofluza®) may speed recovery from the flu, when taken within 48 hours after flu symptoms begin, 2,14 but they are not prescribed for colds.9 Flu viruses are constantly changing making them more resistant to the antiviral drugs. 15

That's where black elderberry comes in. An extract of this fruit has been shown to safely reduce the severity and speed the resolution of upper respiratory

Vital Immune Support

Black elderberries have historically been used for respiratory problems.^{2,4} Their extracts are used to stimulate immune function and reduce the impact of colds and flu.2-5,16

Elderberries contain plant pigments called flavonoids, including anthocyanins. Anthocyanins have immunomodulating, antioxidant, antiviral, and antiinflammatory effects.^{2,17} Standardized extracts of elderberries help preserve these active compounds, which are highly bioavailable (absorbable).17

Antiviral Effects

Extracts of elderberry and its flavonoids have demonstrated direct antiviral activity in cell cultures for both influenza A1,18 and B. the two main types that infect people.4,8

> In one lab study, elderberry extract was shown to inhibit H1N1 (subtype of human influenza A). This study showed this virulent "swine flu" H1N1 virus was prevented from entering host cells in a dose dependent manner.

The highest elderberry doses were capable of blocking almost 100% of cells from infection. This compared favorably to the anti-influenza

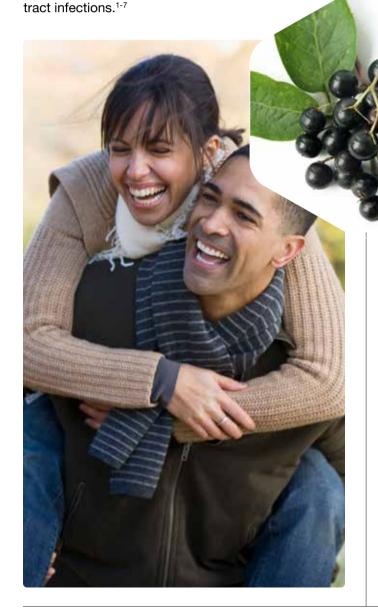
activities of the common antivirals oseltamivir (Tamiflu®) and amantadine.18

Another cell study suggests antiviral mechanism of elderberry by blocking the function of viral glycoproteins (proteins on the surfaces of viruses that aid infection) from attaching to host cells. Isolated anthocyanins also blocked viral infectivity.1

In a dual, cell and animal trial, elderberry juice concentrate containing a high flavonoid content was shown to enhance immunity and display antiviral activity. In the cell study, the elderberry interfered with early stages of viral replication, viral attachment, and penetration into host cells.19

When the elderberry juice was given to rodents infected with human flu, it led to an increase in antibodies that specifically attacked and eliminated the virus.19

It also stimulated the production of secretory IgA, an antibody that provides mucosal support against viral and bacterial infections. By contrast, mice taking a placebo or antiviral oseltamivir (Tamiflu®) showed a suppression of antibodies.¹⁹



Elderberry Helps the Body Battle Colds and Flu

- The average adult has **two to three colds** per year. Up to **20%** of Americans contract the flu annually. The elderly and immune-compromised are at risk for severe complications.
- Elderberries contain anthocyanins, compounds that have immunomodulating, antiviral, antibacterial, and anti-inflammatory properties.
- Black elderberry extract has been shown to fight viruses and bolster immune defenses.
- In clinical trials, elderberry extract safely decreased the duration and severity of colds and flu, resolving upper respiratory symptoms up to four days earlier than a placebo.

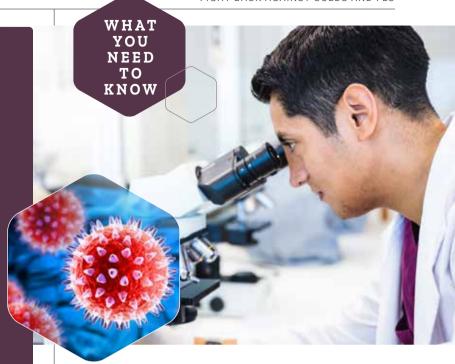
Treating Colds and Flu (Human Trials)

Human studies have validated the ability of **elder-berry** to speed recovery and decrease the intensity of symptoms in **colds** and **influenza**.

One placebo-controlled clinical trial with **312** subjects assessed the impact of elderberry on **cold** duration, severity, and incidents during overseas air travel. Those in the treatment group took **600 mg** of **black elderberry extract** for several days before travel and **900 mg** daily during their trip.⁵

Overall, those in the **elderberry** group had a total of **57** cold episode days compared to **117** days in the **placebo** group. The elderberry group also experienced **less than half** the symptom severity of the placebo group.

This means individuals who took elderberry had less severe cold symptoms and recovered about **two** days faster.



In another study of people suffering from **flu-like symptoms**, those who used elderberry daily for five days had their symptoms resolve **four days ear-lier** than those taking a placebo.⁸

Systematic reviews provide further evidence for **elderberry** as a remedy for colds and influenza:

- One meta-analysis found that standardized forms of elderberry were effective at reducing severity and duration of both cold and flu, regardless of vaccination status.²
- A review of elderberry and elderflower (which comes from the same plant) found that they increased antibodies to influenza and decreased the intensity and duration of symptoms.⁶
- In a 2021 review, elderberry was found to support the immune system without overstimulating it. One trial found that an elderberry-containing product lowered risk of influenza complications and adverse events when compared to oseltamivir.⁴
- A meta-analysis of clinical trials showed that when black elderberry was taken within 48 hours of the onset of an acute respiratory infection, common symptoms such as fever, headache, and congestion were reduced by an average of 50% in as little as two days.³

Many studies report that doses of **600-900 mg** daily were most effective during acute viral infections, while lower doses are sufficient for preventative support. ^{4-6,18,19}

Summary

When winter respiratory illnesses hit, flavonoid-rich **elderberr**y can help people feel better faster while bolstering their immune response.

Clinical studies show that elderberry extract can decrease the <u>severity</u> and <u>duration</u> of **colds** and **flu**, especially when taken at the first sign of symptoms. •

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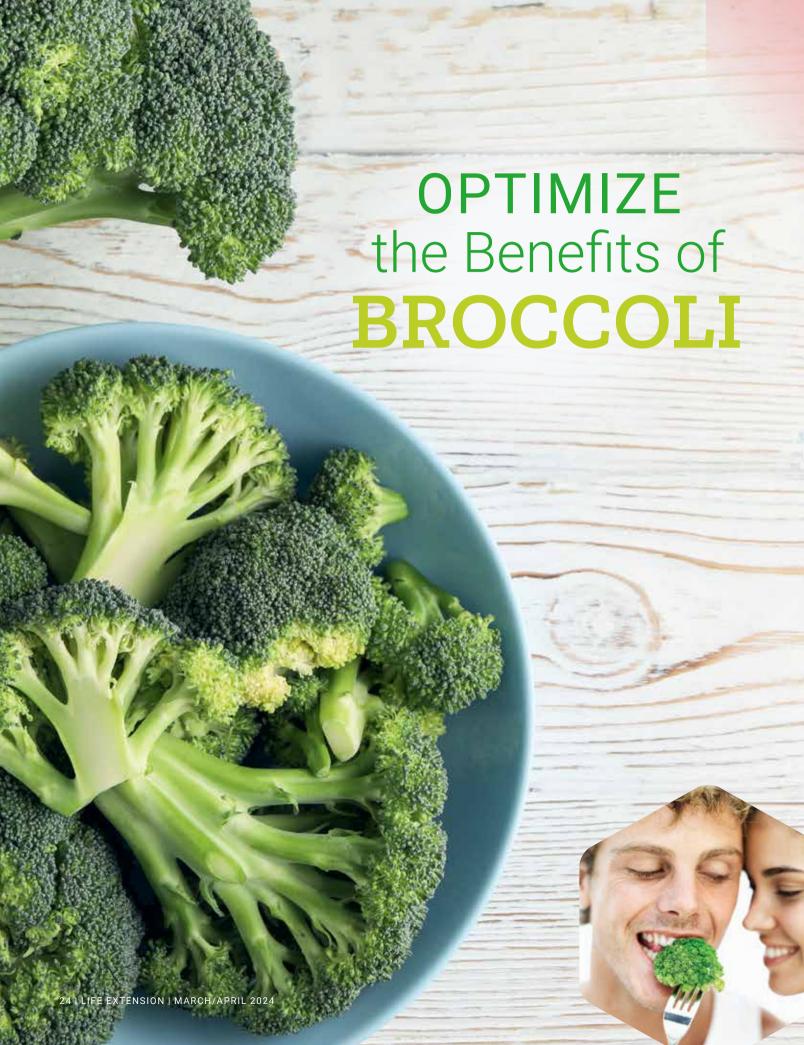
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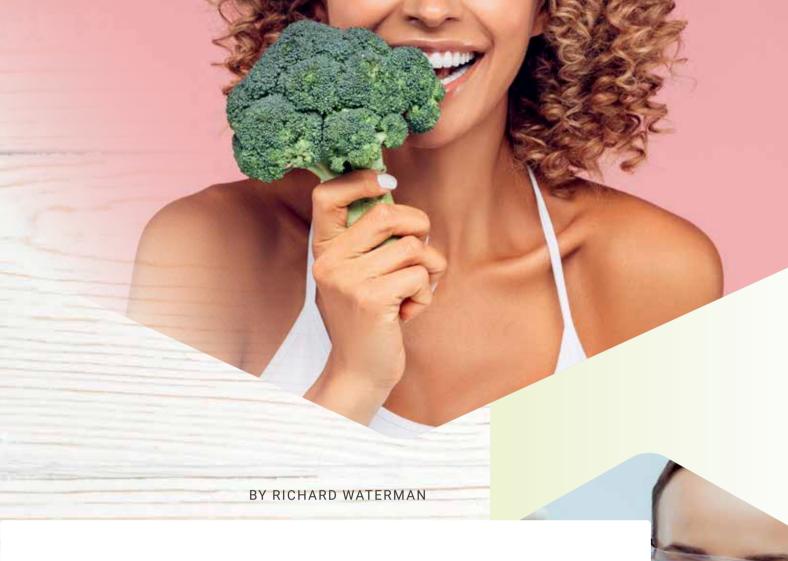
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Most of us grew up being urged to "eat your broccoli."

Turns out that was excellent advice.

Broccoli is a source of a nutrient called **sulforaphane**. 1,2

Sulforaphane consumption has been shown to offer wide-ranging health benefits, including protection against:

- Cancer.
- · Cardiovascular disease,
- Neurodegenerative diseases,
- Diabetes.
- And more.¹⁻⁴

But getting enough of this nutrient can be difficult, particularly because **cooking** broccoli <u>reduces</u> the availability of **sulforaphane**.^{2,3,5}

Scientists have discovered a way around this issue that mimics how nature delivers sulforaphane.

They combined a sulforaphane precursor with an enzyme that converts the precursor into **sulforaphane** in the digestive tract.

This enables <u>more</u> **sulforaphane** to be formed and distributed to cells throughout the body.

Broccoli's Powerhouse Nutrient

Broccoli contains a sulforaphane *precursor* called **glucoraphanin**, and an enzyme called **myrosinase**, which converts glucoraphanin into sulforaphane.²

These two compounds are found in *different parts* of broccoli cells. They mix together to form **sulforaphane** *only* when the plant is cut or chewed.

Cooking broccoli, as most of us do before eating it, *dramatically* reduces the amount of sulforaphane it can provide.^{3,6,7}

Chopped, **raw broccoli sprouts** are the best natural source of sulforaphane. But you would have to eat a massive amount daily to obtain desired levels.

Maximizing Delivery of Sulforaphane

Cruciferous vegetables are usually consumed cooked, which inactivates the plant enzyme **myrosinase**, required for activating **sulforaphane** inside the gut.⁶

Scientists have found a solution to maximize sulforaphane activation and absorption. They extract the sulforaphane *precursor* **glucoraphanin** from **broccoli seeds**. Then they combine it with the enzyme **myrosinase** from **mustard seed powder**.^{8,9}

Mustard plants belong to the same family of **cruciferous vegetables** as broccoli. The mustard-seed version of myrosinase is more robust than myrosinase from broccoli.⁸

The **sulforaphane precursor** and the **enzyme** only *combine* during **digestion**, rapidly releasing sulforaphane *in the gut*.

This innovative method allows **sulforaphane** to be readily *absorbed* and circulated throughout the body while it is still active.

How Sulforaphane Protects Health

Sulforaphane has the ability to shield cells and tissues from threats. Think of it as a full-service **detox-ification nutrient**.

One of its most crucial functions is to activate **Nrf2**, a protein that regulates over **250 genes** that protect cells from oxidative damage and other stressors.^{2,3,10}

Nrf2 also activates **detoxification** enzymes that protect against a wide range of threats. This includes neutralizing **mutagens**, toxins that can cause mutations that could lead to **cancer**.¹¹

Sulforaphane also reduces harmful **chronic inflammation** by inhibiting **NF-kB**, a cellular complex that drives production of **pro-inflammatory** compounds.^{2,3,12}

Anti-Cancer Activity

Sulforaphane is one of the widely studied anticancer nutrients in the medical literature.³

It can help *prevent* cancer by favorably altering gene expression and reducing **chronic inflammation**. It has also been shown to fight against *existing* tumor cells and reduces tumor growth.⁴

In **preclinical** <u>and</u> **clinical studies**, sulforaphane has helped prevent the growth and spread of **cancer** in a few specific ways that include:^{2,3}

- Preventing adverse gene expression that can lead to cancer growth,
- Blocking new tumor blood vessel growth,
- · Inhibiting cancer cells' ability to reproduce, and
- Promoting the death (apoptosis) of cancer cells.

Many studies show that eating **broccoli** and other **cruciferous vegetables** is associated with a *lower* risk of different cancers in **humans**, including breast, prostate, colorectal, lung, and bladder cancers.⁴





Protection Against Other Diseases

Sulforaphane has been found to be beneficial against additional illnesses, including:

Cardiovascular Disease. Consumption of cruciferous vegetables is associated with reduced risk for cardiovascular disease. Studies have shown that sulforaphane can improve lipid levels, reduce obesity, and slow the progression of atherosclerosis, all actions that reduce risk and progression of heart disease.13

Neurodegenerative Disease. Preclinical studies have shown that sulforaphane is a neuroprotectant. shielding the brain and spinal cord from injury and disease. 13,14 It is able to cross the blood-brain barrier to exert its protective functions within the brain tissue itself.14 It also has the potential to defend against neurodegenerative disorders like Alzheimer's and Parkinson's.2,13,14

Type II Diabetes. Metabolic abnormalities like type II diabetes can lead to cardiovascular disease, dementia, kidney disease, fatty liver disease, eye disease, nerve damage, and more. Studies show that broccoli and sulforaphane have the potential to improve aspects of these metabolic diseases, including reducing blood sugar, improving blood lipid levels, and improving insulin sensitivity. 12 In human trials, sulforaphane intake improves levels of fasting blood glucose and hemoglobin A1c (HbA1c), a marker of long-term glucose control.15

Power of Broccoli

- Broccoli and other cruciferous vegetables are associated with many health benefits. including reduced risk for cancer, cardiovascular disease, neurodegenerative diseases, and type II diabetes.
- Scientists attribute many of broccoli's benefits to a compound called sulforaphane.
- When broccoli is cooked, its ability to produce sulforaphane is rapidly lost with processing and cooking.
- A new formula has been developed that combines a sulforaphane precursor found in broccoli with an enzyme from mustard seeds. Consuming this combination produces sulforaphane in the digestive tract, where it can be rapidly absorbed into the body.
- This formulation has the potential to maximize the benefits of sulforaphane to shield against metabolic and other chronic disorders.

Viral Infection. In cell studies and animal models, sulforaphane inhibits replication and reduces the impact of viruses that can cause respiratory infection in humans. ¹⁶⁻¹⁹

Maximizing the intake of **sulforaphane** may help its ability to fight these pathologies and promote overall health.

Summary

Many of the health benefits of broccoli and other cruciferous vegetables come from a nutrient called sulforaphane.

Sulforaphane has been shown to have activity against cancer, cardiovascular disease, neuro-degeneration, type II diabetes, and more.

The *enzyme* that converts the precursor to sulforaphane gets degraded when broccoli is cooked.

Scientists have discovered how to formulate the precursor of sulforaphane with the enzyme (myrosinase) that converts to active **sulforaphane** *in the gut*.

It can then be easily circulated throughout the body. •



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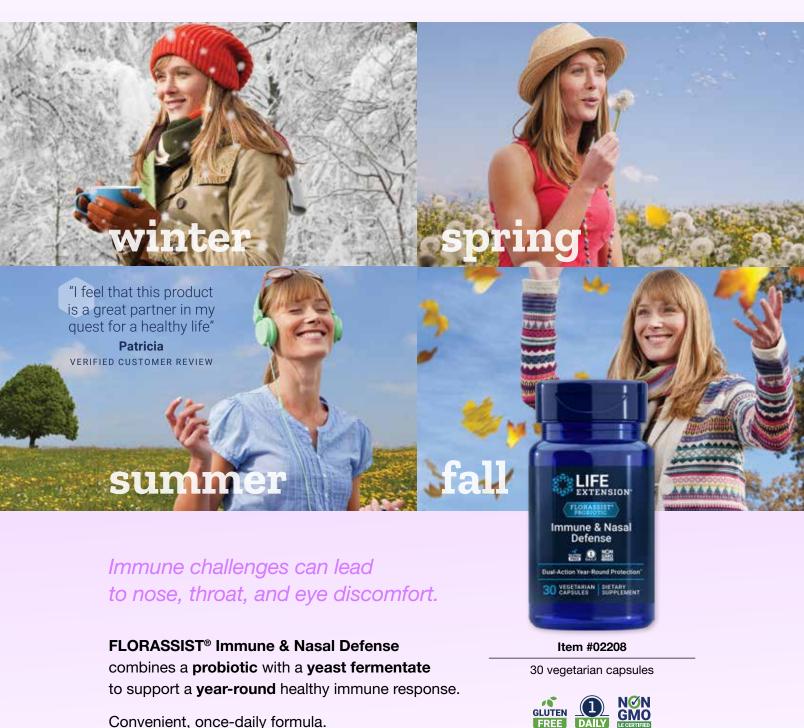
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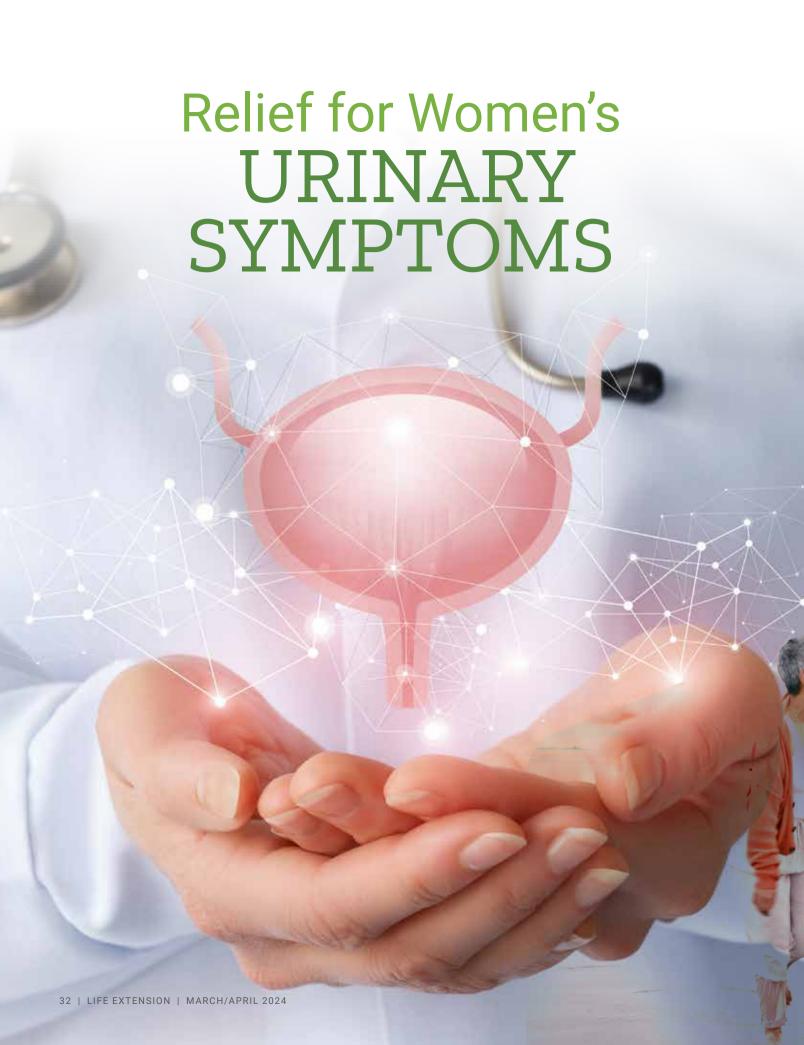


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Aging Worsens Bladder Symptoms

Many women experience **urinary symptoms** as they grow older, typically beginning after age **40**.⁵

The severity and frequency of these symptoms are greater in women than in men. A population study using data from the U.S., UK, and Sweden found that among women aged 40-99:⁶

- 56% reported experiencing incontinence,
- 36% dealt with urinary urgency,
- 34% complained of nocturnal urination, and
- 25% needed to urinate frequently throughout the day.

Most people need to urinate every three to four hours (5-7 times daily).⁷ Those with an **overactive bladder** may need to urinate more than **eight times** during the day, and **two times** or **more** at night.¹



Available medications provide little help. Only about **13%** of patients taking medications find relief from incontinence symptoms, with many discontinuing use due to **side effects**.³

Many women feel **embarrassed** by their symptoms, and simply assume they are an inevitable part of aging.^{5,8} But they don't have to be.

A clinical study demonstrated that a blend of three plant-based extracts^{3,4} made a *significant difference* in urinary symptoms and quality of life, with virtually no side effects.

Two Decades of Development

More than 20 years ago, Dr. Tracey Seipel, a naturopath and medical herbalist, sought an effective solution for her patients' **urinary problems**. 9 She gradually began administering several traditionally used **plant compounds** to address bladder issues. 3.9

Feedback from Dr. Seipel's patients led to research to fine-tune a treatment using **three plant extracts**, each with a proven track record of effectiveness:

- Horsetail (Equisetum arvense), used in Western herbal medicine, contains high levels of silica, which can improve urinary tissue strength and elasticity.
- Lindera (Lindera aggregata), long used in traditional Chinese medicine, is known for improving kidney and bladder health and may calm feelings of urgency.
- Three-leaf caper (Crateva nurvala), from Indian Ayurvedic medicine, is known for easing tense muscles and relaxing bladder spasms.

In a rodent model of symptomatic **overactive bladder**, a blend of these three extracts **reversed** changes in multiple biomarkers in urine, the bladder lining, and bladder control muscles.⁸

This improved bladder control symptoms in the:8

- Storage phase (frequency and urgency, waking to urinate), and the
- Void and post-void phase (dribbling, stream weakness, intermittency, hesitancy).

Validated In Human Trials

Researchers conducted a placebo-controlled **clinical trial** of this three-extract blend. They worked with 88 women with an average age of **62 years** who displayed two or more of these symptoms:

- 10 or more episodes of daytime urination,
- One episode or more of incontinence per day,
- Two or more episodes of urinary urgency per day, and
- Two or more nighttime urination episodes per night.

Those in the treatment arm of the trial took **840 mg** of the extract blend once daily. After only **eight** weeks:^{3,4}

- Daytime urination episodes returned to normal levels, falling from an average of more than 11 times a day to an average of under eight times a day.
- Episodes of incontinence associated with urgency were reduced by 65%, from an average of nearly three times a day to an average of just once per day,
- Urgent urinary episodes decreased nearly 60%, from an average of almost four times a day to an average of only 1.6 times a day, and
- Episodes of waking to urinate were reduced 43%, from an average of 3.8 times a night to an average of just over two times a night.

Better Quality of Life

Women who took the plant extract blend also reported substantial improvements in their **quality of life**, including:^{3,4}

- A 50% decrease in overactive bladder symptoms,
- A 39% reduction in incontinence episodes, and
- A 39% reduction in bladder discomfort.



A Solution for Women's Bladder Problems

- Many aging women experience **urinary symptoms**, which include frequent urination, urinary incontinence, urinary urgency, and nocturnal urination.
- In a clinical trial, a blend of extracts of the plants horsetail, lindera, and three-leaf caper significantly improved women's urinary symptoms and quality of life without side effects often seen in medication use.
- After only eight weeks, women taking this extract blend had their daytime urination frequency return to **normal**; incontinence episodes decreased by **65**%, urinary urgency episodes were reduced **60**%, and nighttime urination episodes declined **43**%.
- A whopping **79%** of women who took the plant extract blend reported feeling a **significant benefit**, compared to just **17%** of those taking a placebo.

In total, a stunning 79% of women in the plant extract group reported a dramatic improvement, compared to only 17% of participants taking the placebo.4

These benefits came without side effects typically seen with medications,3,4 providing relief for many women who might otherwise have resigned themselves to living with urinary problems.

Summary

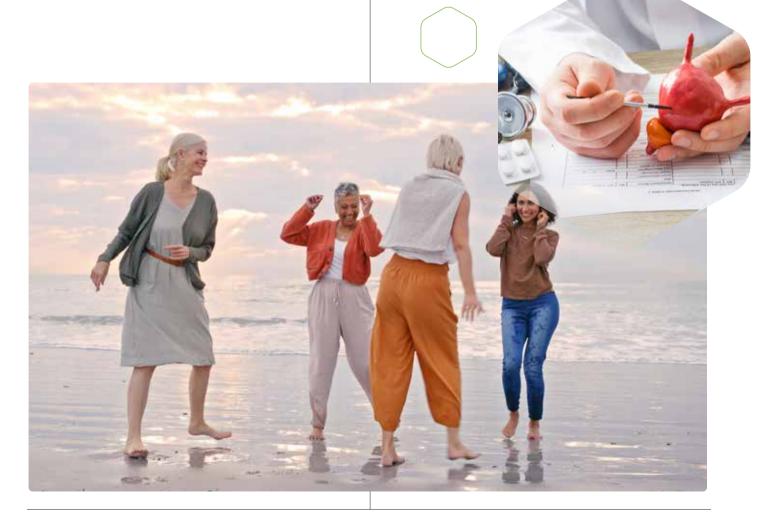
Many women suffer from urinary symptoms, especially after age 40.

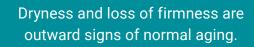
A clinical study has shown that a blend of extracts of the plants horsetail, lindera, and three-leaf caper was effective in reducing daytime urinary frequency, urinary incontinence, urinary urgency, and nocturnal urination in women.

It achieved these benefits and improved quality of life without side effects that often come with medications.

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- 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 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.





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A More Restful Sleep

Serene Sleep contains <u>two</u> plant extracts that in independent clinical studies were shown to support restorative, high-quality sleep for *occasional sleeplessness*.

Clinical trials have demonstrated that:

- A standardized black cumin extract encouraged sleep efficiency and supported healthy sleep patterns.¹
 Additionally, black cumin extract maintained restorative sleep along with sleep efficiency, latency, and total sleep time.²
- **Ashwagandha** maintained measures of restorative sleep,³ reduced stress measures,³ and maintained healthy levels of the stress hormone *cortisol*.⁴

Take just one softgel 20 to 30 minutes before bed.

For Occasional Sleeplessness

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Item #02526

30 softgels



SIMARII B12 Body & Brain

B12

BIOACTIVE FORMS OF VITAMIN B12

Only <u>two</u> **bioactive** coenzyme forms of vitamin B12 can be used directly by the body and brain.

This **B12 Elite** provides both:

ADENOSYLCOBALAMIN

- Active in brain cell mitochondria.
- Preclinical evidence suggests that it may support already healthy levels of dopamine.
- Supports cellular energy production.

METHYLCOBALAMIN

- Supports cognition within brain cells.
- Promotes red blood cell production.
- Helps maintain healthy homocysteine levels.

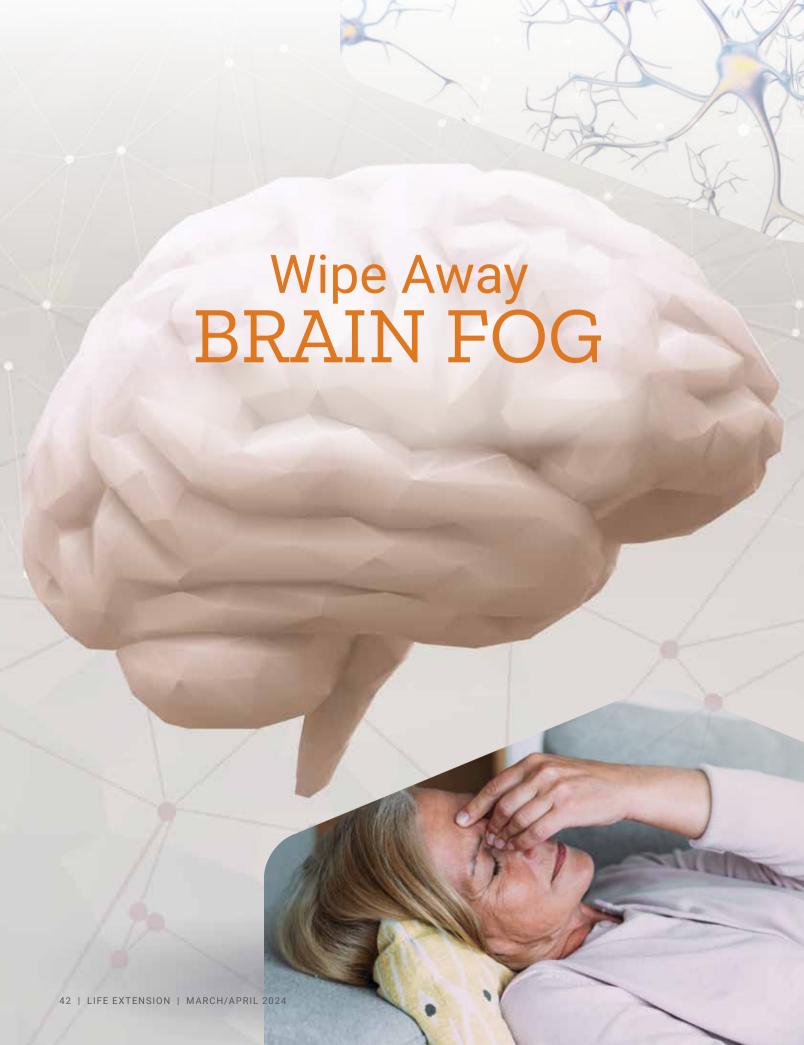
Dissolve in the mouth or chew one vegetarian **lozenge** daily.

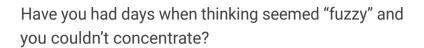


Item #02419 60 vegetarian lozenges



NØN GMO





If it interferes with daily life, you may be suffering from **brain fog**.^{1,2}

Brain fog refers to an overall feeling of **decreased focus** and **low mental energy**.

After pinpointing *biological changes* in the brain that may trigger brain fog, researchers identified two **plant-based nutrients** that can prevent or reverse these changes to boost alertness and mental sharpness.

In clinical trials, mango leaf extract:3,4

- · Improved reaction time,
- Reduced mental fatigue,
- Boosted attention,
- · Increased performance accuracy, and
- Enhanced working memory.

In additional clinical studies, peppermint oil:5

- · Reduced development of mental fatigue,
- Improved aspects of memory, and
- Boosted attention levels.

Taken together, mango leaf extract and peppermint oil may help replace that fog with focus.

Origins of Brain Fog

Brain fog is more than an annoyance. The feeling of mental fatigue, difficulty concentrating, and foggy thinking can impair cognitive performance and get in the way of school, work, family time or day-to-day activities.

To understand brain fog better, scientists studied medical conditions that produce some of the same **mental symptoms**.

Complaints consistent with **brain fog** have been reported by people with:^{2,6-12}

- · Various inflammatory disorders,
- Allergies (including seasonal allergies),
- Immune disorders, which increase inflammation, and
- Dietary sensitivities.

After analyzing the **biological alterations** associated with these conditions, scientists proposed that brain fog may be caused by:^{6-8,13}

- Release of histamine (the chemical that causes allergic symptoms),
- Inflammation, and
- Neurotransmitter imbalance and impairments in neuronal activity.

Reversing Harmful Changes

Based on this research, scientists began studying compounds that met **two criteria**:

- They could prevent or reverse the biological alterations seen in conditions that lead to brain fog, and
- They have been shown in animal or human studies to improve symptoms of brain fog.

They identified <u>two</u> plant-derived ingredients that met **both** of these conditions and seemed the most promising:

- Mango leaf extract has been clinically shown to improve reaction time, mental fatigue, attention, performance accuracy, and working memory,^{3,4} and
- Peppermint oil has been clinically shown to reduce mental fatigue and improve aspects of attention and memory.⁵

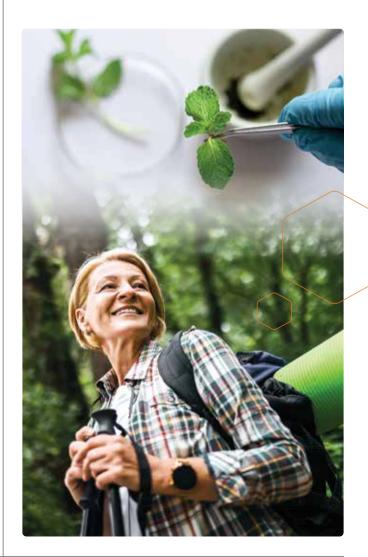
Mango Leaf's Protective Effects

Mango leaf has long been used in Asia and Africa to treat fatigue. It has neuroprotective, anti-inflammatory, and anti-diabetic properties, which scientists suggest may help prevent brain fog.³

These effects are believed to be largely attributable to the polyphenol compound **mangiferin**.

In animal and human studies, **mangiferin** showed a capacity to **protect the brain** by:^{3,14-18}

- · Decreasing neuroinflammation,
- Reducing oxidative stress,
- · Providing neurotransmitter support,
- Preventing cognitive and memory impairment,
- Improving key brain fog symptoms, and
- Exhibiting anti-allergic properties.





Fight Brain Fog

- Brain fog is the feeling of reduced mental energy, clarity, focus, and performance.
- Preclinical studies show that mango leaf extract and peppermint oil each counter the underlying mechanisms thought to contribute to brain fog.
- In clinical studies, mango leaf extract and peppermint oil improve symptoms of brain fog, reducing mental fatigue and improving attention, memory, and cognitive performance.
- A combination of these two ingredients may maximize their brain-supporting power and help lift brain fog.

Clearing Mental Fog

To explore the ability of mango leaf to treat symptoms of **brain fog**, scientists conducted controlled **human** trials.

In one study, healthy adults were randomized into four groups. Each group was given one of the following:³

- Mango leaf extract containing 60% mangiferin,
- Caffeine,
- Mango leaf extract and caffeine, or
- A placebo.

The **mango leaf extract** group had, compared to baseline:³

- A striking 47% reduction in fatigue, and
- An almost 5% improvement in reaction time.



These results were significantly *greater* than those observed with **caffeine** alone or with a combination of caffeine and mange extract.

Additionally, brain electrical activity tests showed that taking mango leaf extract increased activity in regions associated with **attention**, **complex cognitive processing**, and **memory**.³

In another clinical study, healthy young adults took either **300 mg** of **mango leaf extract** or a **placebo**.

The mango leaf improved several areas of **cognitive function**, including aspects of:⁴

- Attention,
- · Performance accuracy, and
- Working memory.

Improvements were also accompanied by a more relaxed mood. This is critical, because many people who take **caffeine** to counter brain fog find that it increases nervousness and jitters.

These findings demonstrate that **mango leaf extract** boosts brain activity, decreases mental fatigue, and supports mental focus and performance.

Peppermint's Brain Effects

The herb **peppermint** has traditionally been used to promote digestion and induce calm.

Placebo-controlled studies have shown that plants rich in **monoterpenes** provide cognitive benefits.¹⁹⁻²¹ Peppermint oil contains many compounds from this group, including **menthol** and **menthone**.²¹

Human studies show that peppermint teas:22

- Improve memory, and
- Boost mental alertness.

In addition, mint species have shown the ability to modulate various **neurotransmitters** in the brain, such as **acetylcholine** and **GABA**, which play roles in cognition, mood, and mental alertness.⁵

Boosting Brain Power

In a clinical trial, healthy adults took either **peppermint oil** containing **60% monoterpenes** or a **placebo**.⁵

Tests were administered to assess aspects of memory, attention, and mood.

Participants who took the **peppermint oil** showed significant benefits, including:⁵

- Reduced development of mental fatigue, and
- Enhanced aspects of attention and working memory.

By contrast, those who took the **placebo** were fatigued within a few hours after performing various cognitive tasks.⁵

Taking peppermint oil and mango leaf extract together may maximize their ability to banish brain fog.

Summary

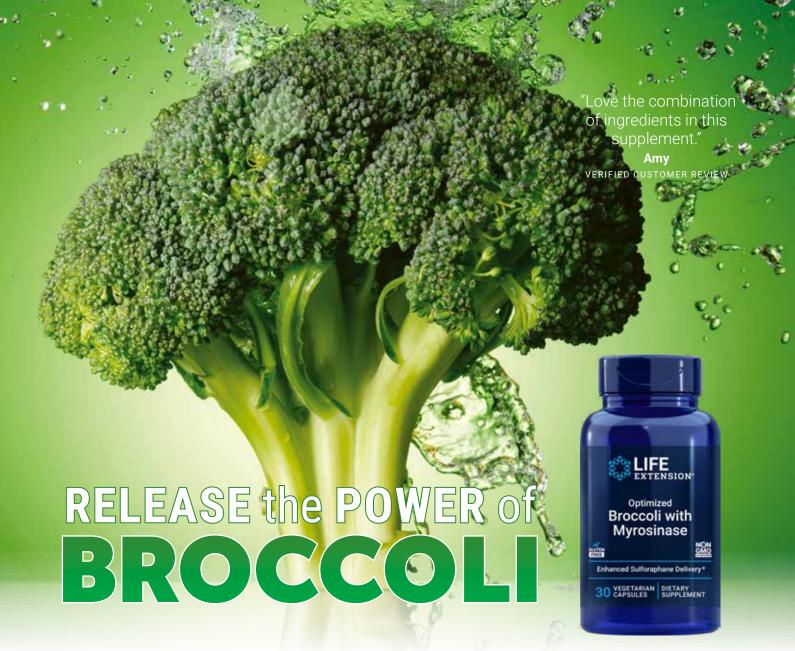
Two plant-based ingredients can improve symptoms of **brain fog**.

Mango leaf extract and peppermint oil have each been shown in clinical studies to help bring back mental clarity, energy, and focus.

Combined, they may help reduce, or even *eliminate*, symptoms of **brain fog**. •

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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 <u>little</u> **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.

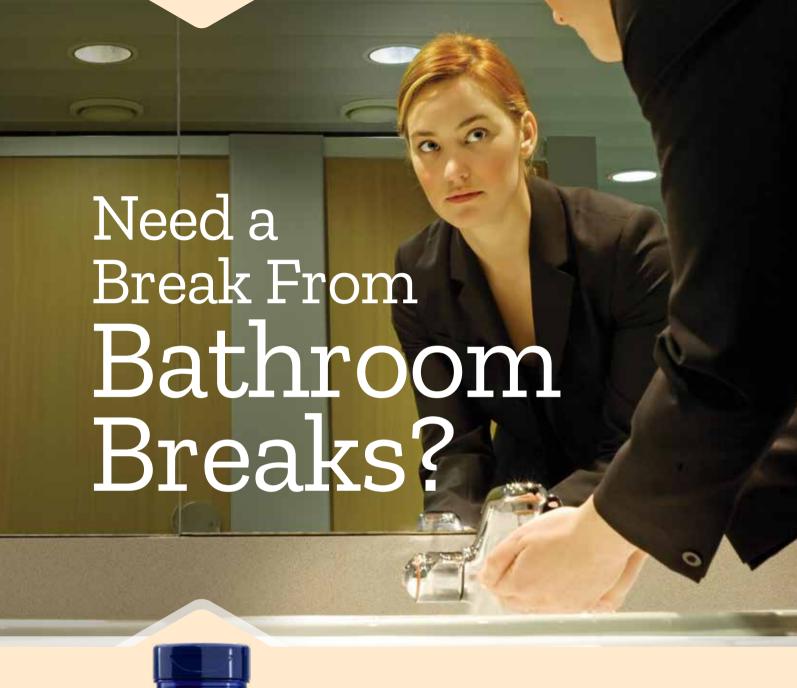
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A clinically studied combo of horsetail, lindera and caper extracts can help maintain bladder comfort and normal urinary frequency, day and night.

Item #02513

60 vegetarian capsules









Fighting Colds and Flu

American adults get an average of two to four colds annually.⁷

Colds, **flu**, and **seasonal allergies** cause **75%** of all employees to miss some work, with an average time out of work of two to three days per upper respiratory episode.⁸

Researchers have identified two compounds, a **probiotic**² and a **dried yeast fermentate**,⁴ that can help prevent colds and flu and their symptoms *and* reduce their **severity** and **duration** when they occur.

Probiotics are beneficial bacteria and yeast. Their formal definition is "living microorganisms that promote health when ingested in sufficient amounts." The specific strain *Lactobacillus rhamnosus* CRL1505 can enhance immunity against respiratory infections.^{5,9}

Using a proprietary fermentation process, scientists created a special dried **fermentate** of baker's **yeast** (S. cerevisiae).

The **fermentate** helps promote the body's healthy **immune response** by increasing the antibody **secretory IgA**. 10,11

Secretory IgA is known to block pathogens from penetrating mucosal surfaces, ^{12,13} which may provide protection from environmental triggers of allergies, such as pollen.

Yeast fermentate is rich in **beta-glucans**, complex carbohydrates shown to have *immune-enhancing* effects such as supporting activity of **natural killer cells**. 14,15

Avoid Allergy Drug Side Effects

While over-the-counter medications can provide temporary relief from cold, flu, and allergy symptoms, they don't impact the frequency or duration of these illnesses.

Side effects from drugs for seasonal flu and allergic rhinitis include drowsiness, headaches, rapid heartbeat, and sleep problems.¹⁶ Some allergy medications, such as **anticholinergics**, are associated with increased risk of cognitive impairment.^{17,18}

The **probiotic** *Lactobacillus rhamnosus* CRL1505 and yeast fermentate are associated with little to no adverse effects.

An Immunity-Boosting Probiotic

L. rhamnosus CRL1505 was originally isolated from goat's milk in Argentina.⁵

Cell and animal research has found that this probiotic can improve innate **respiratory immunity**, increase levels of **anti-pneumococcal antibodies** (which fight a wide range of infections),¹⁹ and reduce the **inflammatory** response that causes some cold/flu symptoms.^{20,21}

A **human study** found that oral use of this probiotic significantly increases levels of antibodies known as **immunoglobulin A (IgA)**.²

These antibodies are secreted from mucous membranes including the nose, mouth, and lungs, and can block viruses that cause **colds** and **flu** from invading cells and causing infection.





Preventing Infections

In Argentina, scientists enrolled preschool children attending day care centers in a **placebo-controlled** study of a yogurt containing the *L. rhamnosus* **CRL1505** probiotic strain.

Over a six-month period, compared to a group receiving yogurt *without* the probiotic, children receiving **100 million CFUs** (colony-forming units) of *L. rhamnosus* **CRL1505** five days a week had:

- 55% fewer cold and flu occurrences,
- 48% fewer instances of fever,
- 49% fewer overall infections, and
- 47% higher levels of beneficial secretory IgA.

The treatment group also had **61%** <u>fewer</u> cases of **tonsillitis** and **pharyngitis** (a throat infection).

These results captured the attention of the Argentinian government, which has been distributing the probiotic yogurt to more than **200,000 children annually** since **2008**.²

Reduce the Misery of Colds, Flu, and Allergies

- In a clinical trial, the probiotic strain Lactobacillus rhamnosus CRL1505 reduced cold and flu occurrences by 55%, infections by 49%, and fevers by 48% over six months.
- Taking dried yeast fermentate also reduced cold and flu symptoms and dramatically reduced symptoms of seasonal allergies, leading to 43% fewer days with nasal congestion.
- These ingredients boost aspects of the immune system, including natural killer cell activity and antibodies against viruses and bacteria.
- A combination of yeast fermentate and *L. rhamnosus* CRL1505 may help decrease the frequency, duration, and severity of allergies, colds, and flu.

Yeast Fermentate Strengthens Immunity

The effects of **yeast fermentate** were discovered unintentionally when it was noticed that factory workers in Cedar Rapids, Iowa, who inhaled the yeast daily, took significantly fewer sick days than their officeworker counterparts.6

This observation led to multiple human studies, which found that oral intake of dried yeast fermentate resulted in:3,6,15,22,23

- Increased levels of secretory IgA, the antibody providing mucosal immune defense against viruses and bacteria, and
- Increased activity of natural killer cells. immune cells that are part of the first line defense against infected cells.

A company in lowa went on to develop a dried yeast fermentate using baker's yeast. At least five placebocontrolled clinical trials have since validated its protection against colds, flu, and allergies. 15,22,23

In one clinical trial, taking 500 mg of dried yeast fermentate daily from January through March (peak cold and flu season) led to a 13% reduction in cold or flu symptoms, compared to a placebo group.4

In a similar study, the same dose reduced the duration of cold and flu symptoms by 17%.24

Relief for Allergy Symptoms

Yeast fermentate also helps relieve symptoms of seasonal allergies.

Allergy symptoms are primarily caused by immunoglobulin E (IgE) antibodies, which trigger the body's release of chemicals such as histamine that cause these reactions.

Yeast fermentate has shown an ability to prevent IgE levels from rising too much, reducing allergic reactions.23

In a pilot study, adults were given a placebo or 500 mg of dried yeast fermentate daily for five weeks during allergy season. Symptoms were unchanged in the placebo group, while half of those taking yeast had a complete absence of allergy symptoms. Symptoms returned within two weeks after stopping the yeast fermentate.23

A larger clinical study of adults with seasonal allergies and hay fever showed that those taking 500 mg of dried yeast fermentate daily had 43% fewer days with nasal congestion and reduced severity of runny noses and congestion.3

Taking yeast fermentate and L. rhamnosus CRL1505 together may help provide broad protection against colds, flu, and allergies.



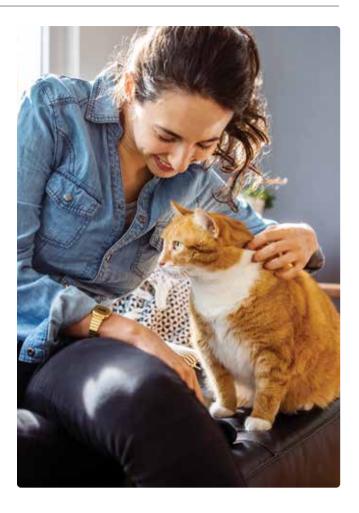
Summary

In separate clinical studies, dried yeast fermentate and the probiotic L. rhamnosus CRL1505 significantly reduced the severity, frequency, and duration of symptoms associated with colds and flu.

Yeast fermentate also reduced allergy symptoms. These two ingredients have been found to enhance immune defenses against viruses and bacteria in numerous wavs. •

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MEGA VITAMIN K2

Japanese physicians use high-dose vitamin K2 for maintaining healthy bone density.



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

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.

TWO WAYS TO GET



FOR
HEALTHY BONES
+
HEALTHY HEARTS

SUPER K

The best selling **vitamin K** formula for bone and heart health.



Vitamin K1 1,500 mcg (converts to K2 in some people)

Vitamin K2 (MK-4) 1,000 mcg (for bone & vascular health)

Vitamin K2 (MK-7) 100 mcg (long-acting protection)

Super K • Item #02334 • 90 softgels (3-month supply)

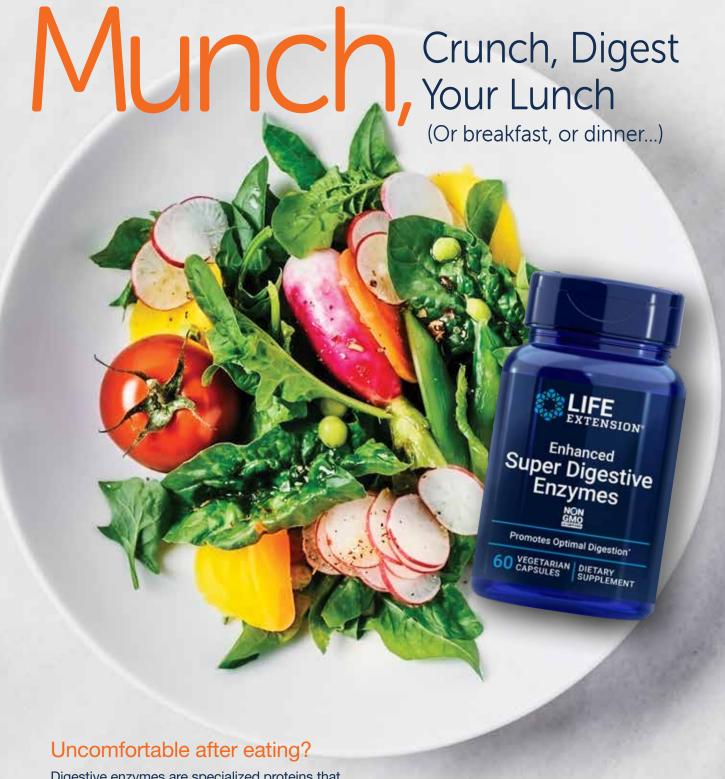












Digestive enzymes are specialized proteins that help you break down the foods you eat.*

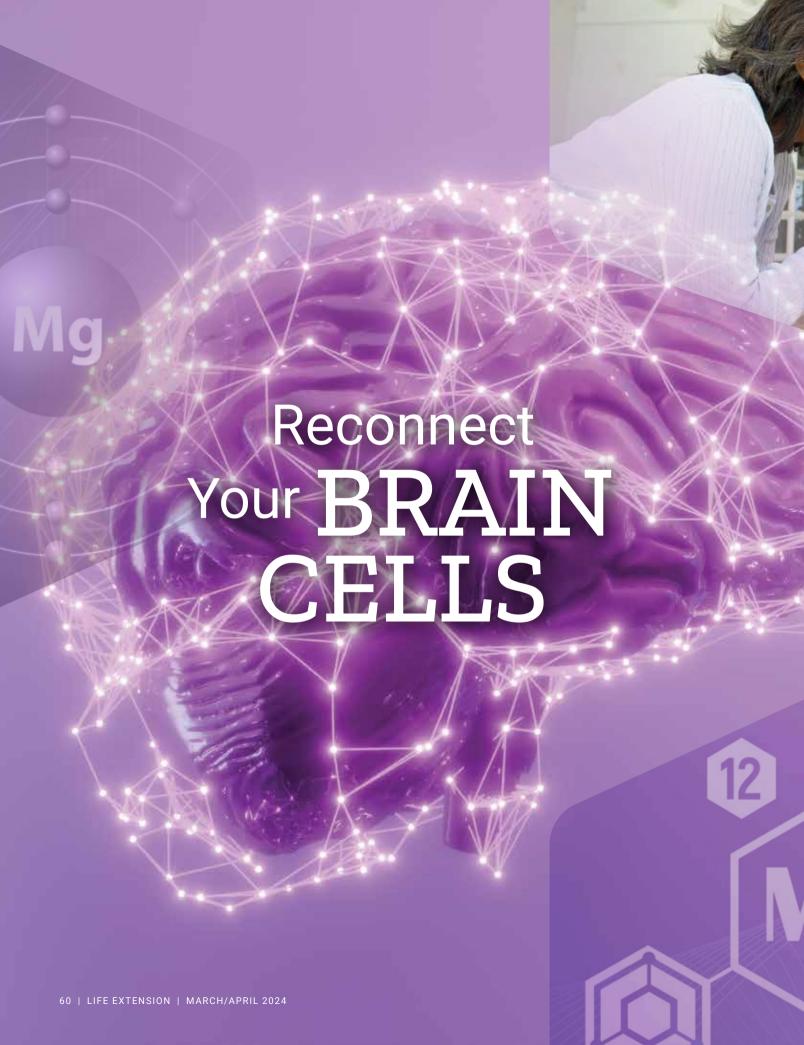
Enhanced Super Digestive Enzymes combines 10 vegetarian-friendly enzymes to help you break down hard-to-digest foods and encourage a healthy gastrointestinal balance...so you can feel good after you eat!

* Curr Drug Metab. 2016;17(2):187-93.

Item #02021

60 vegetarian capsules Contains wheat and soybeans.







fail to efficiently cross the **blood-brain barrier**. 6,8-10

MIT researchers developed a novel form called magnesium L-threonate that changes all that. It is easily absorbed and does cross the blood-brain barrier.8,11,12

Taken orally, magnesium L-threonate has the ability to significantly boost brain magnesium levels. This enables it to improve synaptic density and plasticity, and thus help reverse these aspects of brain aging.8,10,13,14

The effects are striking. In a **human** study, volunteers who took **magnesium L-threonate** had a reversal in measures of brain age of more than nine years.13

Magnesium's Brain Impact

The mineral **magnesium** works throughout the body as a cofactor required for normal functioning of hundreds of *enzymes*. 15,16

Magnesium's role in the **brain** is especially critical. It protects **synapses**, the communication <u>connection</u> points between brain cells.¹⁰

In order to learn, or access memory, the brain's synapses require **plasticity**, the ability to adapt and change in response to stimuli.¹⁷

<u>Decreased</u> synaptic plasticity is a major contributor to **cognitive decline** in older adults.¹

Animal studies show that increasing **brain** levels of **magnesium**:^{7,8,10-12,18}

- Increases the total number of synapses,
- Improves synaptic plasticity,
- Stimulates the growth of new brain cells, and
- Improves learning and memory.

Reaching the Brain

The majority of the U.S population are not getting enough magnesium in their diet.¹⁹ And very little magnesium from supplements enters the brain.^{8,20}

A clinical study found that increasing **blood** magnesium levels by approximately **160**% changed magnesium levels in **cerebrospinal** fluid by only **15**%.²¹

As a result, taking standard oral magnesium provides **bodily** benefits but may <u>not</u> significantly improve **brain function**.8

There *is* a way around this problem. Researchers developed a specific form of magnesium that elevates levels of magnesium in the **brain**.^{8,10} It is called **magnesium L-threonate** (**MgT**).

In a rodent study, **MgT** raised cerebrospinal fluid levels of magnesium by approximately **15%** and successfully <u>increased</u> **synaptic density**, an effect also observed in a separate cell culture study.⁷

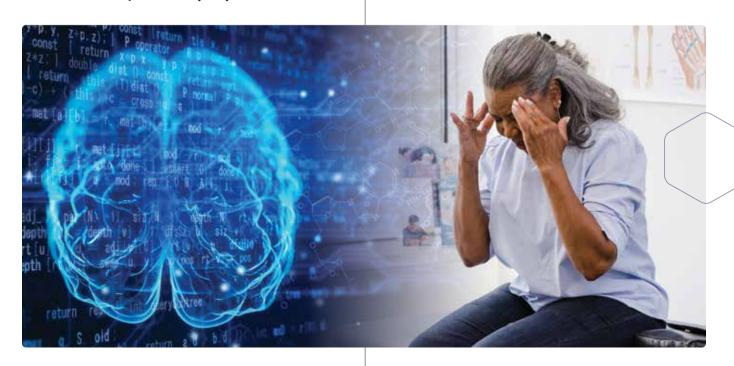
Improving Memory

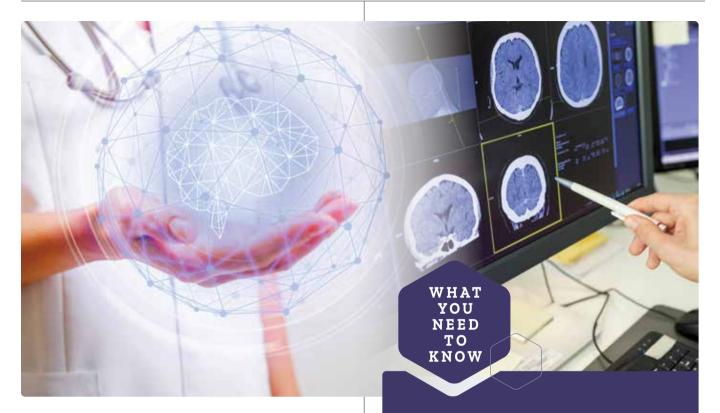
In this study, the effect on rodents' **cognitive** ability was dramatic.

Aged rats given **magnesium L-threonate** had enhanced **learning** ability, with improvements in short-term *and* long-term **memory**.⁸

Magnesium L-threonate was also tested in two studies utilizing a mouse model of **Alzheimer's**. In both studies, it *prevented* the *loss of synapses* associated with the disease and maintained or *improved memory*. ^{10,12}

Another mouse study showed that **magnesium L-threonate** stimulated growth of *new brain cells* in brain areas central to memory and learning. Growth of these cells typically slows or stops in older animals, but magnesium L-threonate *restricted* this decline.¹⁸





Human Trial

To test the cognitive benefits of magnesium L-threonate in **humans**, scientists conducted a randomized, placebo-controlled trial.¹³

Volunteers aged 50-70 years old were given either a placebo or **1,500-2,000 mg** of **magnesium L-threonate** (depending on body weight) daily for 12 weeks. The participants all had some impairment in executive functioning, the ability to plan, adapt, focus, and make decisions.

Compared to placebo subjects, those receiving magnesium L-threonate showed *improved cognitive abilities* after six weeks.

A further **20%** improvement from baseline was observed after 12 weeks¹³ including significantly increased performance speed for **executive function** and **cognitive processing**.

The treatment group's composite scores for <u>all</u> tests combined increased significantly compared to their **baseline** scores and compared to the **placebo** group's scores at weeks six and twelve.¹³

All subjects were assigned a "brain age" by comparing their cognition test scores with normal scores for people the same age. At the start of the trial, the participants' chronological ages averaged 57.8 years. Their brain ages averaged a much older 68.3 years.

Magnesium L-Threonate Takes Years Off Your Brain Age

- Magnesium helps prevent brain aging and the loss of synapses seen with cognitive decline.
- In animal studies, magnesium

 L-threonate crossed the bloodbrain barrier and boosted brain
 magnesium levels to a vastly
 greater degree than other forms.
- In animal models and human trials, magnesium L-threonate improved cognitive function. In one human study, it reversed cognitive measures of brain age by a remarkable nine years.

After six weeks, those who took magnesium **L-threonate** had improved their *brain age* by an astounding *nine years* and by the end of the study the number was further improved to 9.4 years.13

Overall, taking magnesium L-threonate:13

- Improved memory and executive function,
- Improved cognitive abilities and speed,
- Reduced fluctuations in cognitive function (cognitive function being worse on some days than others is an early warning sign of mild cognitive impairment), and
- · Reversed measures of brain age.

These improvements are consistent with the greater synaptic density and plasticity shown in preclinical studies of magnesium L-threonate.5,10,12,14,18,22

In another clinical study, scientists tested magnesium L-threonate in patients with mild to moderate dementia. Even at this more advanced stage of cognitive decline, magnesium L-threonate led to improvements in cognition and executive function.²³

Whether taken in a capsule, powder, or gummy form, magnesium L-threonate shows potential to delay or reverse some measured aspects of brain aging.

Potential ADHD Benefits

Based on magnesium L-threonate's brain benefits, researchers wondered whether it could also improve neuropsychiatric conditions.

In a pilot study, they gave magnesium L-threonate to 15 adults with moderate ADHD (attention deficit hyperactivity



Summary

Magnesium supports youthful brain function, and it is needed for functioning of brain synapses, vital for complex tasks such as learning and memory.

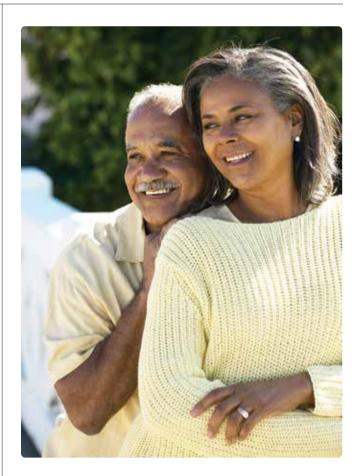
Unlike other forms magnesium L-threonate increases brain magnesium levels by a significant

This enables it to boost synaptic density and plasticity.

A clinical study found that magnesium L-threonate reversed measures of brain age in people by nine vears.

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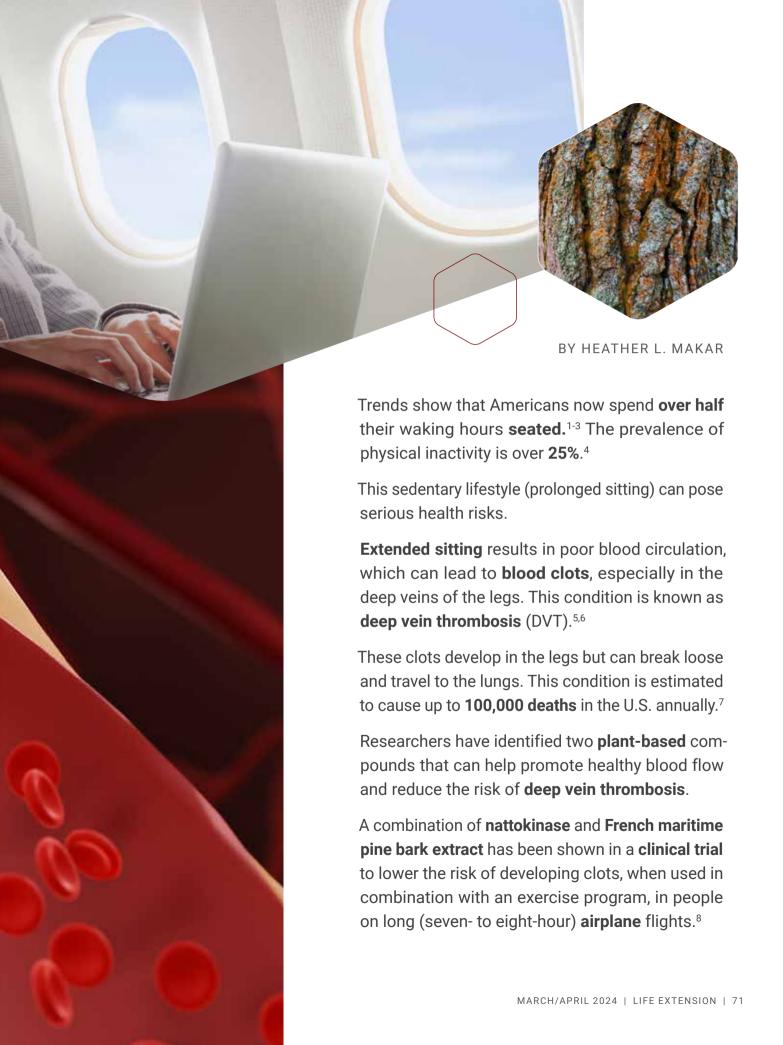
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The Risks of Prolonged Sitting

Sitting for extended periods can increase risk of **deep vein thrombosis (DVT)**. ⁹ Even those who exercise regularly may be at risk if they have other risk factors, including spending excessive time **seated**. ¹⁰

That's because sitting **immobilizes the calf muscles**, preventing them from contracting to transport deoxygenated blood back up to the heart.^{11,12}

This can reduce **blood flow** by up to **two-thirds** in the legs, leading to blood pooling in vessels.¹³ This stagnant blood can then **form a clot** in the veins deep in the body.¹⁴

Symptoms may include swelling, pain, or warmth in the affected leg.

Air travel is a major risk factor for deep vein thrombosis. The risk of DVT persists for over **two weeks** after extended flights.¹⁵

Other risk factors for deep vein thrombosis include advanced age, pregnancy, bed rest after an injury or surgery, diabetes, hormonal imbalances, dehydration, obesity, and smoking.^{9,14,16}

Those **over 75** are at dramatically increased risk compared to those **under 40** because of impaired clotting mechanisms.¹⁷

Scientists have identified two ingredients that can support healthier blood flow and inhibit venous blood clots: the *enzyme* **nattokinase** and an *extract* of **French maritime pine bark**.¹⁸⁻²⁰

Nattokinase Fights Clotting

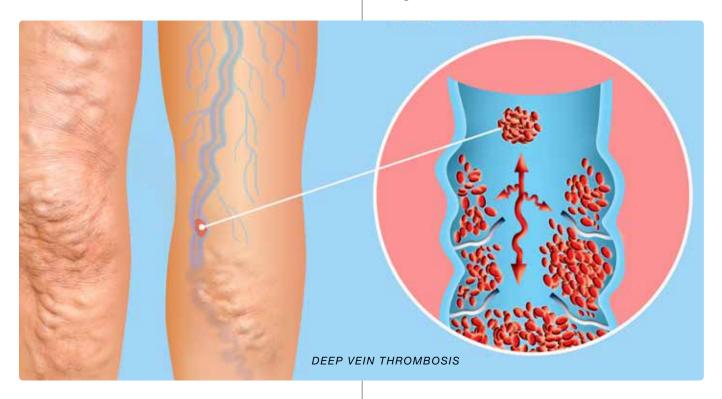
Natto, a traditional Japanese food contains an *enzyme* called **nattokinase**. ¹⁹ Researchers found, two decades ago, that nattokinase is a more powerful **anticlotting agent** than 173 other foods tested. ²¹

Nattokinase helps fight dangerous clots by:18,19,22-26

- Dissolving fibrin, the protein that binds clots together,
- Reducing activation of pro-clotting factors.
- Lowering the amount of fibrinogen, a protein that is converted into fibrin,
- Suppressing platelet accumulation to decrease clot formation, and
- Decreasing high blood pressure.

In a **placebo-controlled** study, these anti-clotting properties were detected in the blood samples of participants within *two to five hours* of taking a single dose of **2,000 fibrinolytic units** of **nattokinase**.²³

In another study of 153 adults who sought treatment for **deep vein thrombosis** or related vascular issues, all subjects were given either a daily dose of **2,000 fibrinolytic units** of **nattokinase** after vascular surgery or a month-long course of an anticoagulant **drug**.





Nattokinase reduced deep vein thrombosis difficulties beyond the previous drug or surgery, leading to *complete remission* of remaining vascular symptoms. It worked <u>without side effects</u> such as internal bleeding, a common effect of anticoagulant drugs. 18,27,28

Maritime Pine Bark Protects Veins

French maritime pine bark extract contains compounds called procyanidins.²⁹

Procyanidins offer anti-inflammatory and platelet-modulating benefits that help contribute to **vascular protection**.^{8,29-31}

The extract also stimulates the synthesis of **nitric oxide** in the inner lining of blood vessels.²⁹ Nitric oxide is found in the **endothelium** (lining) of blood vessels that promotes **vascular elasticity.**³²

In a preclinical screening of **13** polyphenol-rich plant extracts, *only* French maritime pine bark *improved* **nitric oxide** availability in both healthy and dysfunctional endothelial cells of **veins**.³³

Those at risk of deep vein thrombosis often suffer from lower leg swelling, or **edema**.

Help Prevent Deep Vein Thrombosis

- Sitting for long periods can lead to deep vein thrombosis, which may cause a fatal pulmonary embolism.
- The enzyme **nattokinase** helps prevent this dangerous clotting.
- An extract of French maritime pine bark also prevents deep vein thrombosis and reduces leg swelling.
- In a clinical study, a <u>combination</u> of these ingredients prevented deep vein thrombosis and reduced ankle swelling in high-risk passengers on long flights.

Leg veins contain **one-way valves** which prevent blood from backflowing. These valves can become damaged, causing blood and fluids to remain in the lower legs, leading to swelling.³⁴

Medical professionals frequently advise the use of **compression socks** or stockings to relieve this swelling. However, patients report multiple challenges with consistently using compression stockings, including difficulty putting them on, discomfort wearing them (especially in hot weather), and appearance.³⁵

Research conducted over a 12-month period showed that French maritime pine bark extract was roughly as effective as **compression stockings** in reducing leg edema, and that the combination of the two was superior.³⁶

Reducing Future DVT Risk

Roughly **one-third** of those who suffer from **deep vein thrombosis** are likely to have *another* episode within a decade, especially within the first year.¹⁶

In addition, **up to 50%** of those with DVT suffer from **post-thrombotic syndrome** as long-term sequelae. Symptoms include chronic leg discomfort, persistent swelling, skin discoloration, and heaviness of the affected limb.³⁷

In a study of 815 participants, each subject was tested twice a year for **six years** following their initial thrombosis. All subjects adhered to a **standard treatment** involving compression stockings, weight management, and regular exercise.

Some subjects also took either aspirin, prescription anticoagulants, or **200 mg** of French maritime **pine** bark extract.³⁸

The rate of a **deep vein thrombosis** <u>recurrence</u> or **post-thrombotic syndrome** was:

- 14.9% in those receiving only standard treatment,
- 12.9% in those taking aspirin,
- Between 6.7% and 10.7% in those taking anticoagulants, and
- Just 3.6% in those taking French maritime pine bark.

French maritime pine bark extract was by far the most effective way to prevent future clotting problems.

Powerful Combination

Combining nattokinase with French maritime pine bark extract offers significant protection against deep vein thrombosis.⁸

In a study of 204 **high-risk** passengers traveling long distances by air, half took **nattokinase** and **French maritime pine bark extract** two hours before their flight, with a second dose six hours later. The rest received placebos.⁸

While **5.4**% of the placebo group suffered flight-induced deep vein thrombosis, there were *no cases* in those taking the nattokinase-pine bark combination.⁸

Furthermore, the **placebo** group had a **12**% <u>increase</u> in lower **leg edema** (swelling) score, compared to a **15**% reduction in the treatment group.⁸

Together, these two ingredients relieved swelling and helped prevent thrombosis.8

Summary

Sitting too much greatly increases one's risk of a dangerous clotting condition, **deep vein thrombosis**.

Research has shown that the enzyme **nattokinase** and an extract of **French maritime pine bark** can reduce the risk of clotting and of deep vein thrombosis.

These compounds protect vein health by inhibiting blood clots and promoting healthy blood flow. •



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BY MARK FULTON

Uric acid is a waste product that is normally produced by the body in small amounts.

When uric acid blood levels get too *high*, this is associated with problems including **gout**, **kidney stones**, and certain types of kidney disorders.¹

Data from 2007–2016 show that roughly **20%** of U.S. adults had <u>elevated</u> **uric acid** levels, and about **4%** were diagnosed with **gout**.²

Up to two-thirds of people with **high** uric acid levels don't show any symptoms.³

Medications to lower uric acid levels come with potential **side effects**.³

Scientists have discovered that an extract of the fruit of the *Terminalia bellerica* tree can safely <u>reduce</u> elevated uric acid levels in **humans**.⁴

In a study of patients with **chronic kidney disease** and <u>elevated</u> **uric acid**, a dosage regimen of *Terminalia bellerica* extract <u>reduced</u> uric acid by nearly **20**% and improved markers of **kidney** health.⁵

In the same study, elevated **creatinine** levels, a marker of impaired kidney function, decreased by over **11.5%.**⁵

In a clinical study, *Terminalia bellerica* offered kidney protection for individuals with high **uric acid** levels.

Causes of Elevated Uric Acid

Uric acid is a normal product of metabolism.

In a healthy body, the small amount of uric acid that is produced is easily filtered by the kidneys and removed from the body in urine.

<u>High</u> levels of uric acid, called **hyperuricemia**, can lead to a painful arthritic condition known as **gout**.

Risk factors for gout include, high blood pressure and obesity, as well as excess intake of alcohol and certain foods (including organ meats, bacon, turkey, and sardines).³

Individuals with impaired **kidney function** are not able to properly filter waste products from the blood, and this results in buildup of those **waste products**. This includes uric acid. Even in people without kidney disease, kidney function wanes with age, so <u>less</u> **uric acid** is eliminated.⁶

Dangers of Hyperuricemia

Only about **4%** of the population suffers from **gout**, but at least **21%** of adults have high **uric acid** levels.²

Even asymptomatic hyperuricemia has been found to be significantly associated with risk of health-related issues including hypertension, chronic kidney disease, cardiovascular disease, and insulin resistance syndrome.⁷

Uric acid tends to **crystalize** when its concentration is too great. The formation of solid crystals in the joints between bones causes inflammation and pain, known as **gout**.

Crystals can also form in the urine, causing painful **kidney stones**.³

Reduce Uric Acid

High uric acid levels can lead to many other significant problems.

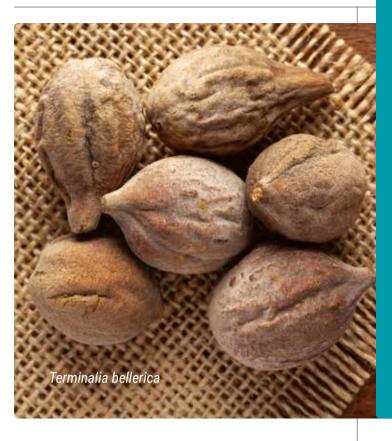
Long-term elevated uric acid can damage the linings of blood vessels and accelerate the development of **cardiovascular disease**. 5.8.9

It is also associated with metabolic diseases, including metabolic syndrome and type II diabetes.^{5,8,9}

A few medications help reduce uric acid, most notably allopurinol and febuxostat. However, they can lead to various side effects, including cardiovascular and liver abnormalities and even renal failure. Incredibly, some gout medicines can precipitate gout symptoms.¹⁰

Scientists investigating ways to <u>safely</u> reduce uric acid levels focused on *Terminalia bellerica*, a tree native to Southeast Asia. Its fruit has been used for centuries in Indian Ayurvedic medicine to promote overall health.





Reduce Uric Acid for Kidney Health

- Uric acid is a metabolic waste product.

 High blood levels of uric acid are common in adults and can cause painful gout and kidney stones.
- An extract of the fruit of the Terminalia bellerica tree safely and effectively reduced high uric acid levels in human studies.
- A clinical trial in patients with **chronic kidney disease** and elevated uric acid
 levels found that one dosage of *Terminalia*bellerica extract improved markers of
 kidney function, reducing **creatinine** levels
 by over **11.5**% and improving the kidneys'
 blood-filtering activity.

Research suggested that bioactive compounds in the *Terminalia bellerica* fruit provide anti-inflammatory effects.¹¹ This tannin-rich extract is believed to inhibit xanthine oxidase, an *enzyme* involved in the synthesis of **uric acid**.⁴

In a pilot study on patients without chronic kidney disease but with **hyperuricemia**,⁴ groups receiving *Terminalia bellerica* **extract** had a significant <u>reduction</u> in serum uric acid levels starting at four weeks. Levels continued to drop for 16 weeks, then stabilized at a lower level.

On average, those receiving **500 mg** of *Terminalia* bellerica extract **twice a day** had a **28.4%** uric acid reduction.

This reduced uric acid blood levels *below* **6 mg/dL**, which is the therapeutic target doctors aim for in treating patients with **gout**.¹²

Terminalia bellerica may help prevent many different kinds of health problems caused by elevated uric acid.

Clinical Trial Shows Additional Benefits

After early studies showed *Terminalia bellerica*'s ability to lower uric acid, scientists decided to evaluate whether it could help patients who had both **chronic kidney disease** and elevated **uric acid**.⁵

In a trial of patients with **chronic kidney disease** and **elevated uric acid,** participants were randomized to receive:

- the gout/uric acid medication febuxostat 40 mg, once daily, or
- two different dosages of Terminalia bellerica extract.

After 24 weeks, <u>reduced</u> <u>uric</u> acid and <u>creatinine</u> levels were seen in <u>all</u> the groups along with beneficial *increases* in renal filtration rate.

The fruit extract *lowered* uric acid levels starting at just four weeks in all participants.

The *higher* dosage of **1,000 mg** twice a day *lowered* uric acid by almost **20%** by the end of the 24-week treatment period.⁵

People with chronic kidney disease have compromised kidney function—meaning their kidneys have difficulty keeping up with regular housekeeping and clearing out waste. Reducing **uric acid** *production* may have lowered the kidney workload in trial participants.

This may explain in part why in this trial, *Terminalia* bellerica extract improved measures of kidney function.

In those taking 1,000 mg twice a day of Terminalia bellerica, creatinine levels decreased by over 11.5% by the end of the study. Creatinine is a widely used marker of kidney function.

Terminalia bellerica also significantly lowered CRP (C-reactive protein), a marker of systemic inflammation, and led to improvements in endothelial function, a sign of blood vessel health.13

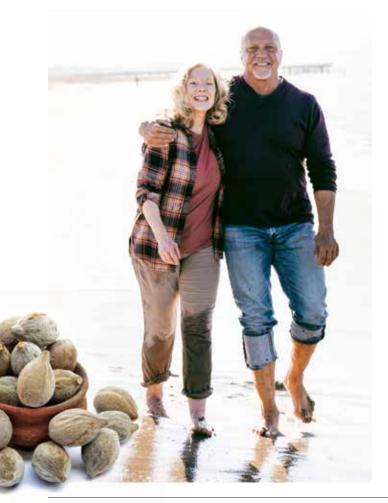
The estimated glomerular filtration rate (eGFR), a measure of the blood-filtering capacity of the kidneys, increased, indicating a boost in kidney function.

These data sets indicate potential benefits for those with kidney disease and high uric acid levels.

Summary

Elevated levels of uric acid in the blood are common in adults and tend to worsen with age.

This can lead to gout and kidney stones. Uric acid elevations are also associated with chronic kidney disease and other long-term health problems.



Studies show that extracts of the fruit of the Terminalia bellerica tree can be effective at reducing uric acid levels in humans.

In patients with kidney disease and elevated uric acid, Terminalia bellerica was able to improve multiple markers of kidney function. •

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Set D The Healthy Aging Flavonoid

Fisetin, a flavonoid found in strawberries and apples, is currently being studied for its effectiveness as a **senolytic** in humans.¹

Fisetin has low bioavailability due to its breakdown in the small intestines.

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A human trial showed bioavailability of this fisetin compound increased up to 25 times compared to fisetin by itself.²

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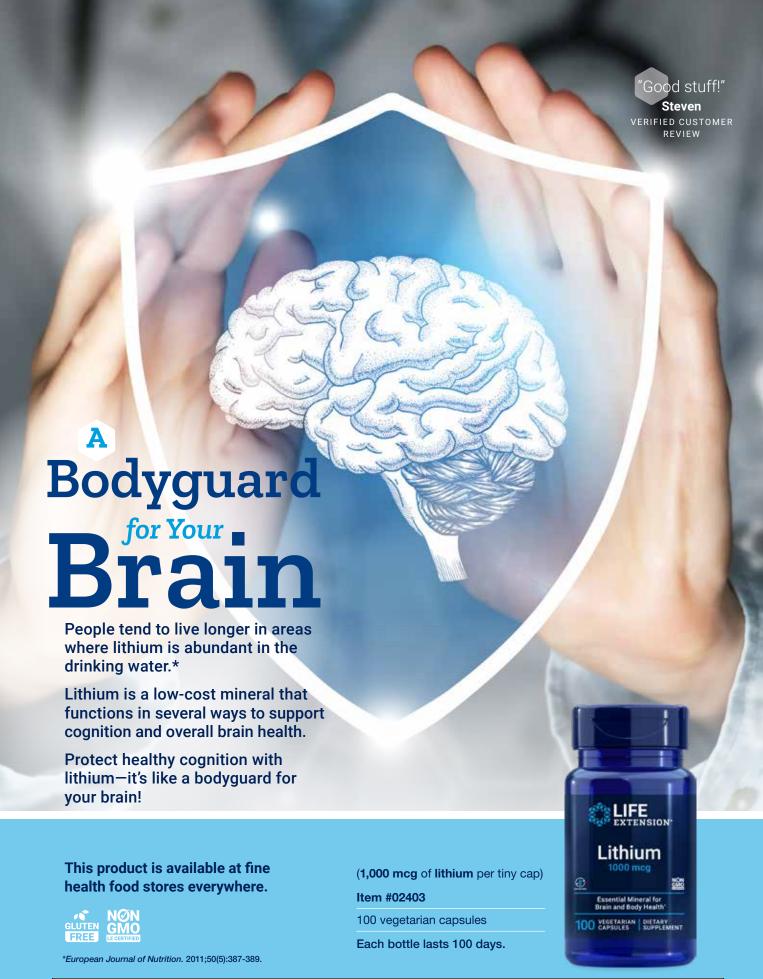
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MacuGuard® Ocular Support with Saffron

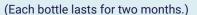
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MacuGuard® Ocular Support is available with or without astaxanthin.

MacuGuard® Ocular Support with Saffron has met ConsumerLab.com standards for ingredient and product quality for Lutein and Zeaxanthin in independent testing. More information at www.consumerlab.com.

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Vitamin C and Gum Disease

BY LAURIE MATHENA



Periodontitis is a gum infection that damages the soft tissue around teeth, leading to tooth loss.

It has been connected to an increased risk of cardiovascular and respiratory diseases, arthritis, premature births, and other serious conditions.1,2

Diabetics are at a high risk for periodontitis.²

Nearly half of adults over age 30 have some form of periodontal disease, while in those over age 65 the prevalence rises to over 70%.3

gum disease have found the following:

 Vitamin C deficiency is a risk factor for periodontitis.4 In an observational study of patients with periodontitis, vitamin C levels were significantly lower in those with Stage IV periodontitis (the most severe stage, with the potential for loss of all teeth) as compared to the people with early stages of disease. This led researchers to conclude that vitamin C deficiency could increase risk of periodontitis.

- Higher vitamin C intake is associated with less plaque.5 Another observational study revealed that patients with periodontitis did not meet the recommended intake levels of vitamin C However, the *higher* the intake of vitamin C, the lower the plaque index value (an assessment of the levels and rate of plaque formation on tooth surfaces). These results reinforce evidence that vitamin C could help protect against the onset of periodontal disease.
- Poor dietary intake of vitamin C and other nutrients increases risk of periodontal disease.6 A systematic review of research databases found that lower intake of vitamin C (as well as vitamin E, beta-carotene, and calcium) was associated with increased risk of periodontal disease in older adults.

 Smoking could increase periodontitis by reducing vitamin C levels.7 Smokers have a higher prevalence and severity of periodontal disease than nonsmokers. Smokers also require almost two-fold higher intake of vitamin C than nonsmokers to reach adequate vitamin C concentration.8 One study investigated the association between smoking and vitamin C levels and its impact on periodontal condition in older adults. The researchers found that subjects with the highest prevalence of periodontal issues had the lowest vitamin C levels; this may be influenced by smoking status.7

The above evidence suggests that vitamin C intake when used in conjunction with daily oral healthproper brushing and flossing—and regular periodontal checkups may help combat gum disease, reduce plaque, and support oral health.



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MSM (methylsulfonylmethane) is a compound found in some fruits, vegetables, and grains.1

Boosting the body's supply of MSM has been shown to reduce joint pain and swelling in people with osteoarthritis, while improving physical function and mobility.

These properties make MSM a popular nutrient for those seeking to support joint health.

Reducing Joint Pain

Human and animal model studies have shown beneficial effects of bathing in sulfur-rich thermal mineral waters.

MSM is a sulfur-containing compound.² An animal study showed significantly improved joint mobility in a treatment group that received baths in sulfur-rich water as compared to a control group that received no treatment, and another control group that was bathed in plain tap water. The sulfur-bath group also had decreased cartilage degeneration compared to controls.3

A human study of participants with osteoarthritis of the hand also showed similar improvements in joint pain and overall quality of life in the treatment group after three months of sulfur water bathing, compared to a control group that bathed in tap water.4

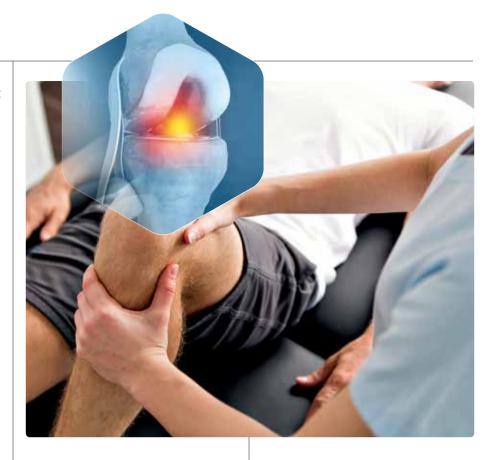
Human studies have found that oral intake of MSM can reduce joint pain and improve physical function in people suffering from osteoarthritis:

- A randomized, placebocontrolled trial in adults with knee osteoarthritis found that taking 1,125 mg of MSM three times a day for 12 weeks resulted in some improvement in pain and physical function.⁵
- In individuals with knee osteoarthritis, taking 3,000 mg of MSM twice a day for 12 weeks decreased pain and reduced physical impairment, compared to a placebo.⁶ The MSM group also reported improvements in performing daily activities.
- In people with hip and/or knee osteoarthritis, taking 6,000 mg of MSM daily for 26 weeks decreased pain and improved functional performance, compared with a placebo.⁷
- In a randomized controlled trial in Japanese people with mild knee joint pain, taking 2,000 mg of MSM daily for 12 weeks led to a significant reduction in pain as well as improvements in systemic health conditions as compared to placebo.8

These results indicate that MSM reduces arthritis-related joint pain.

Anti-Inflammatory Effects

Osteoarthritis leads to degradation of joint **cartilage** that cushions the ends of bones, leading to pain, stiffness, and loss of mobility. **Inflammation** is one of the factors that contributes to the destruction of cartilage.



MSM combats osteoarthritis by:1

- 1. Fighting inflammation, and
- 2. Helping prevent cartilage damage.

In preclinical and clinical studies, MSM has well-documented antiinflammatory effects, which include:

- Inhibiting the inflammationpromoting protein complex NF-kB,
- Inhibiting the release of inflammatory signaling proteins,^{1,9}
- Increasing levels of glutathione,¹ the body's "master antioxidant."

In a preclinical study, MSM supplementation in mice with osteoarthritis resulted in significantly <u>decreased</u> cartilage joint surface degeneration.¹⁰

In a clinical trial of physically active men, participants were randomized to receive **3,000 mg** of MSM or placebo 28 days prior to a knee exercise regimen. It was observed that in the group that

received MSM, there was a reduction of inflammation-inducing **IL-1 beta** as well as a small decrease in proinflammatory cytokines.¹¹

IL-1 beta is a key mediator of inflammatory response that is, along with other proinflammatory molecules, implicated in the destructive process of cartilage.¹

This clinical study in physically active men demonstrated the potential of MSM to help prevent **joint degeneration** in arthritis.

Boosts Effects of Glucosamine and Chondroitin

MSM enhances the effects of two popular supplements for joint pain treatment: glucosamine and chondroitin.

Human studies have shown significant improvement in arthritis-associated pain and stiffness through the use of glucosamine, chondroitin sulfate, and MSM.^{12,13}

A randomized controlled double-blind trial compared glucosamine and chondroitin either alone or combined with **MSM**. The group that received the combination that included **MSM** had significant improvements in pain and physical function after just four weeks.¹⁴

In another randomized, placebocontrolled trial, patients with osteoarthritis took one of the following for 12 weeks:¹⁵

- Glucosamine 1,500 mg alone,
- MSM 1,500 mg alone,
- A combination of the Glucosamine and MSM, or
- A placebo.

Compared with the **placebo**, all treatments led to impressive improvements in pain and swelling.

However, in the group taking glucosamine *plus* **MSM**, there was an astounding **79%** reduction in the average **pain** score. The combination also worked *faster* than either treatment alone.

Summary

MSM (methylsulfonylmethane) helps support muscle and joint comfort, promoting joint mobility and function.

Oral intake of MSM can help combat inflammation that contributes to cartilage damage.

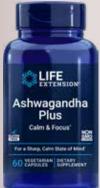
In clinical studies of people with osteoarthritis and joint discomfort, MSM reduces pain and swelling and improves physical function and joint mobility. •

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SUPPORT

A DAY

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VERIFIED CUSTOMER REVIEW





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It also maintains *higher* vitamin levels throughout the day.¹

Just <u>one</u> vegetarian tablet daily provides around-the-clock vitamin C support.

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



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16 FIGHT BACK AGAINST COLDS AND FLU

In clinical trials, **elderberry** extract significantly *resolved* cold/flu symptoms up to **four days** sooner compared to **placebo**.

24 OPTIMIZE THE BENEFITS OF BROCCOLI

Mature broccoli contains relatively little **sulforaphane**. Researchers combined a suforaphane precursor with an *enzyme* that delivers more suforaphane to the digestive tract.





32 RELIEF FOR WOMEN'S URINARY SYMPTOMS

In a clinical study, three plant extracts improved women's daytime and nighttime **urinary** symptoms, with **79**% of women reporting improvements.



Two plant ingredients, in separate clinical trials, reduced mental fatigue, boosted attention levels and improved aspects of memory





60 RECONNECT AGING BRAIN CELLS

MIT researchers developed a form of **magnesium** that was shown to reverse measures of **brain aging** and improve **synaptic density**.

91 WHAT IS MSM?

MSM, rich in sulfur, has been shown to *reduce* **joint pain**, while improving function and mobility in clinical trials of **osteoarthritis** patients.