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September 2025

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Sesame seeds may improve blood pressure, lipid levels, body weight, BMI, arthritic knee pain, and inflammation in osteoarthritis.



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The 17-Year Delay



WILLIAM FALOON



Life-saving treatments often face unnecessary delays in being adapted into clinical practice.

An article published in *The Journal of the American Medical Association (JAMA)* highlights the **delays** humans face in gaining access to potential lifesaving therapies.¹

This *JAMA* article presents a frequently cited estimate:¹

"It takes an average of 17 years from when a biomedical discovery is made to change standard clinical practice and ..."

"... Only 1 in 5 of improved interventions end up being routinely prescribed."

In relation to this gap in care, the article quotes an implementation scientist who asked:

"Why aren't clinicians in the community using evidence-based practices?"

We here at **Life Extension** know all too well how slow the adoption of potentially helpful treatments can be.

For 48 years we have been advocating for wider adoption of metformin, cimetidine, certain beta-blockers, and other innovative therapies like **thymosin alpha-1**, to be used off-label in support of better outcomes alongside some conventional cancer treatments.²⁻¹²

We also suggest **blood testing** to identify controllable factors that can impede or promote tumor cell propagation.

For example, **prolactin** is a pituitary hormone that stimulates milk production (lactation) in postpartum **women**. When elevated, prolactin can also promote **prostate cancer** cell propagation in **men**.^{13,14}

Women use a drug called **cabergoline** to suppress lactation.^{15,16} It is effective in lowering prolactin levels.¹⁷

For **prostate cancer** patients, **cabergoline** can help impede propagation of certain tumor cells in advanced prostate cancer.^{18,19} It is rare that a prostate cancer patient who contacts us has had their **prolactin** blood levels tested to check if they are elevated.

Ditto for other blood tests that can identify additional treatment options.

In this editorial I describe a finding published in the **British Journal of Cancer** in **2015** that could potentially reduce **pancreatic cancer** risk.²⁰ This study garnered a lot of media attention, and we published an in-depth article about it in **Life Extension Magazine**.²¹

Yet here we are **10 years** out, pancreatic cancer deaths are increasing,²² and no one is talking about a low-cost method that might spare many of these deaths.

JAMA Medical News April 5, 2023¹

17 Years for Evidence to Change Practice

*"It Takes an Average of 17 Years
for Evidence to Change Practice.."*

*"Even then...only about 1 in 5 interventions
end up in routine clinical practice."*

A CRITICAL QUESTION:

*"Why aren't clinicians in the community using
evidence-based practices?"*

This year alone, it is estimated that approximately **67,000** Americans will be diagnosed with **pancreatic cancer** and about **52,000** will die from it.²³ Treatment side effects can be so horrific that some patients choose hospice with a morphine pump to self-medicate at will.^{24,25}

We've published numerous articles on ways to reduce **pancreatic cancer** risk, including keeping blood markers of **inflammation** and type 2 **diabetes** in optimal ranges.^{21,26-29}

Practical cancer prevention approaches have long been published, yet there have been no calls-to-action by public health authorities to take measures for sensible prevention strategies.



Protective Role of Magnesium

The **December 2016** issue of *Life Extension Magazine* published an article³⁰ showing a modest increase in **magnesium** intake from **diet** and **supplements** was associated with a profound reduction in **pancreatic cancer** risk.^{20,31}

What struck me about this study is that it did not require a **large** amount of additional **magnesium** to produce a meaningful reduction in **pancreatic cancer** incidence.²⁰

Researchers found that pancreatic cancer risk increased by **24%** for every **100 mg** decrease in **magnesium** intake below the recommended daily allowance (RDA).

For example, compared to a person who ingests **300 mg** a day of magnesium, an individual with a daily **magnesium** intake of **200 mg** would be expected to have a **24%** increased risk of **pancreatic cancer**.

Both intakes (**200 mg** and **300 mg** a day of magnesium) are considered deficient even by government standards.

This **2015** published study involved over 66,000 men and women aged 50-76 years who were followed for an eight-year period. The subjects were divided into the following three groups based upon their **magnesium** intake:

- **Optimal Intake** - Defined as ingesting greater than or equal to **100%** of the government recommended dietary allowance (RDA) for magnesium (**420 mg** a day for males and **320 mg** a day for females).
- **Sub-optimal Intake** - Daily intake of only **75%** to **99%** of the government RDA for magnesium.
- **Deficient Intake** - Less than **75%** of the government RDA for magnesium (less than **315 mg** a day for males and less than **240 mg** a day for females).

Those who ingested between **75%-99%** of the government's RDA for **magnesium** (sub-optimal intake) had a **42%** *greater* risk of **pancreatic cancer** incidence compared with those ingesting greater than or equal to **100%** of the **magnesium** RDA.

Those who ingested less than 75% of the government's RDA for magnesium (deficient intake) had a **76%** *greater* risk of **pancreatic cancer** incidence compared



to those whose intake of magnesium was equal to or greater than the government's (optimal intake) RDA.

When analyzing those who met or exceeded the government's RDA for total magnesium intake, only those who took **supplements** containing **magnesium** were able to achieve the benefits.

What struck me about these findings is that the amount of added **magnesium** needed to meet the government's RDA was exceedingly small.

For most people, taking one low-cost **magnesium capsule** a day, or obtaining it in a sufficiently potent multi-nutrient formula, is all that may be needed to garner protective effects.

Intolerable Delays

The snail's pace of progress against malignancies like pancreatic cancer should provoke societal outrage.

When I speak with high-level scientists about **delays** in Americans gaining access to lifesaving drugs used in other countries (like **thymosin alpha 1**), I often hear there are even more effective therapies "**on the shelf**" waiting for a backer to raise enough investor funding to enter the FDA's multi-\$million approval labyrinth.

This terrifies me to think there may be lifesaving therapies already discovered that may never make it into clinical practice.

Critiques are published in respected medical journals, frequently citing the broadly discussed "**17-year delay**" in advancing discoveries into clinical practice.^{1,32-35}

Yet the public tolerates treatments with harsh side effects that fail to cure over 600,000 Americans who will perish from cancer this year.

By contrast, we at **Life Extension** view bureaucratic roadblocks that impede delivery of better treatments as **intolerable delays** that will be ridiculed by future historians.

When something like low-cost **magnesium** to reduce multiple disease risks does not garner national recognition **10 years** after showing robust preventive potential-against pancreatic malignancies, what more sophisticated therapies might exist today that we may never learn about?

Sign the Petition

An increasing number of Americans are realizing that radical FDA reforms are needed to speed the delivery of lifesaving therapies.

Life Extension is networking with other organizations that collectively have enough people to persuade Congress to enact amendments to the **Food, Drug and Cosmetic Act**.

I urge **Life Extension**® readers to sign this petition by visiting:

age-reversal.net/fda/

The petition is an important first step in instituting meaningful changes to excess regulations that stifle biomedical advances.

We can't continue waiting an average of **17 years** for lifesaving discoveries to transition into routine clinical practice!

For longer life,

Bill Faloon, Co-Founder
Life Extension



Walking the Tightrope of New Drug Approval

Patients Face Long Delays in Accessing Better Treatments



Note. AI-generated image produced using ChatGPT from the prompt Walking the Tightrope of New Drug Approval.

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**MacuGuard® Ocular Support
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Item #01993 • 60 softgels

1 bottle \$32.25 • 4 bottles \$29 each



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item for me."

Martin

VERIFIED CUSTOMER
REVIEW

(Each bottle lasts for two months.)

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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Maury

VERIFIED CUSTOMER REVIEW

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to never run out
of this. Ever!"

Rusty
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REVIEW



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References: 1. *Nutrients*;14:5235.10.3390/nu14245235. 2. *J Alzheimers Dis.* 2016;49(4):971-90.

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In the News

CoQ10 May Help Prevent Diabetes in Statin-Treated Individuals

People taking statins who supplemented with coenzyme Q10 (CoQ10) had reduced odds of new-onset diabetes compared to those not on CoQ10, a recent study showed.*

Statins, which are cholesterol-lowering drugs, are associated with a small increased risk of developing diabetes.

The study included about 4,400 participants in the National Health and Nutrition Examination Survey (NHANES) from 1999–2018 who were treated with statins, of whom **3.8%** reported using CoQ10.

The odds of developing diabetes were **68% lower** among those taking CoQ10 compared to those not taking it. The protective effects of CoQ10 were not dependent on the dose, which was given according to weight.

Editor's Note: The authors explained that deficiencies of CoQ10 cause cellular alterations that can decrease insulin secretion and sensitivity, which may contribute to the development of new-onset diabetes.

* *Rev Cardiovasc Med.* 2025 Feb 19;26(2):26437.



Black Cumin Associated with Healthy Inflammatory Response

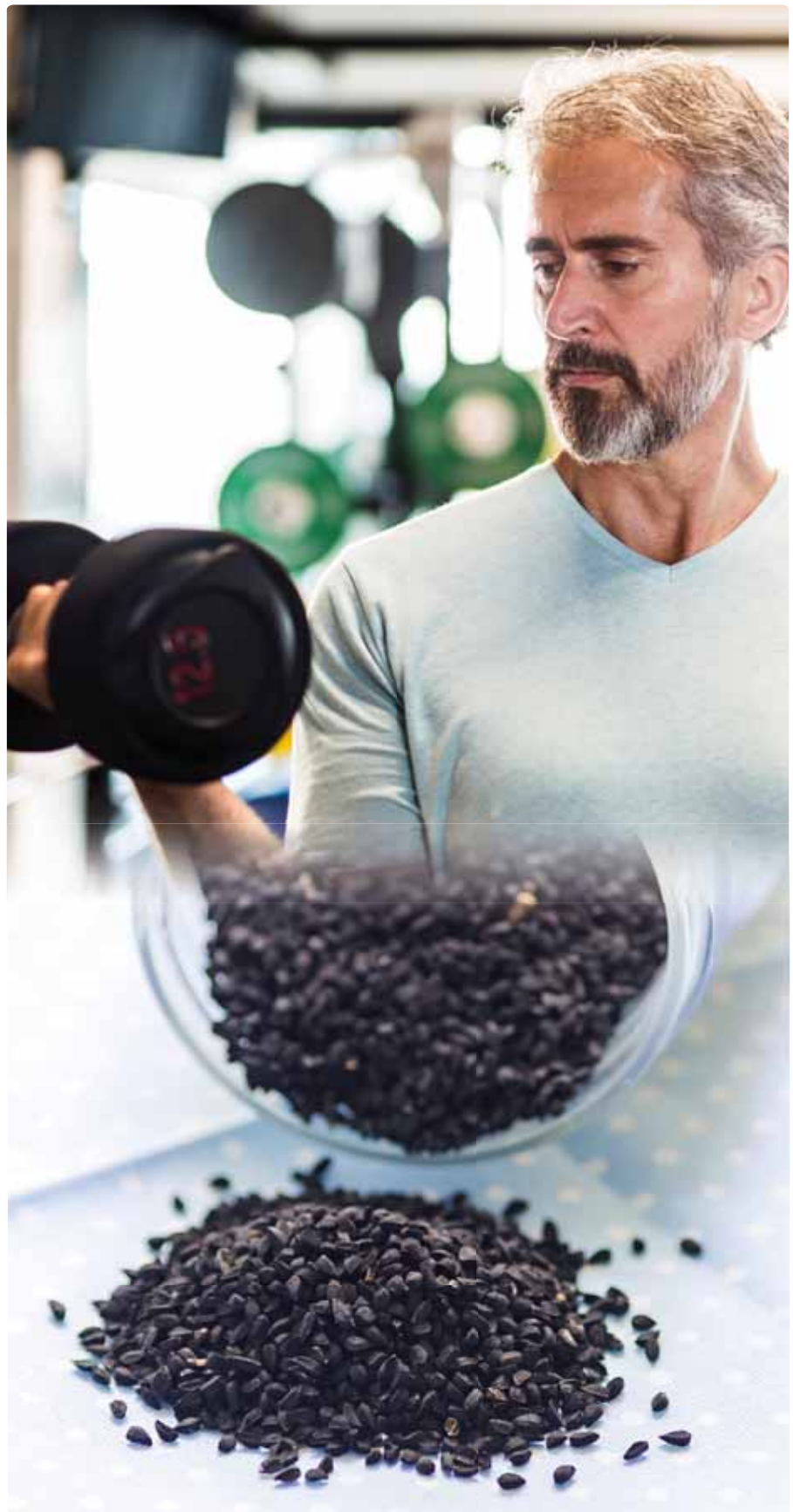
A review of seven meta-analyses affirmed that adding *Nigella sativa* (black cumin) seed to the diet is associated with antioxidant effects and a healthy inflammatory response.*

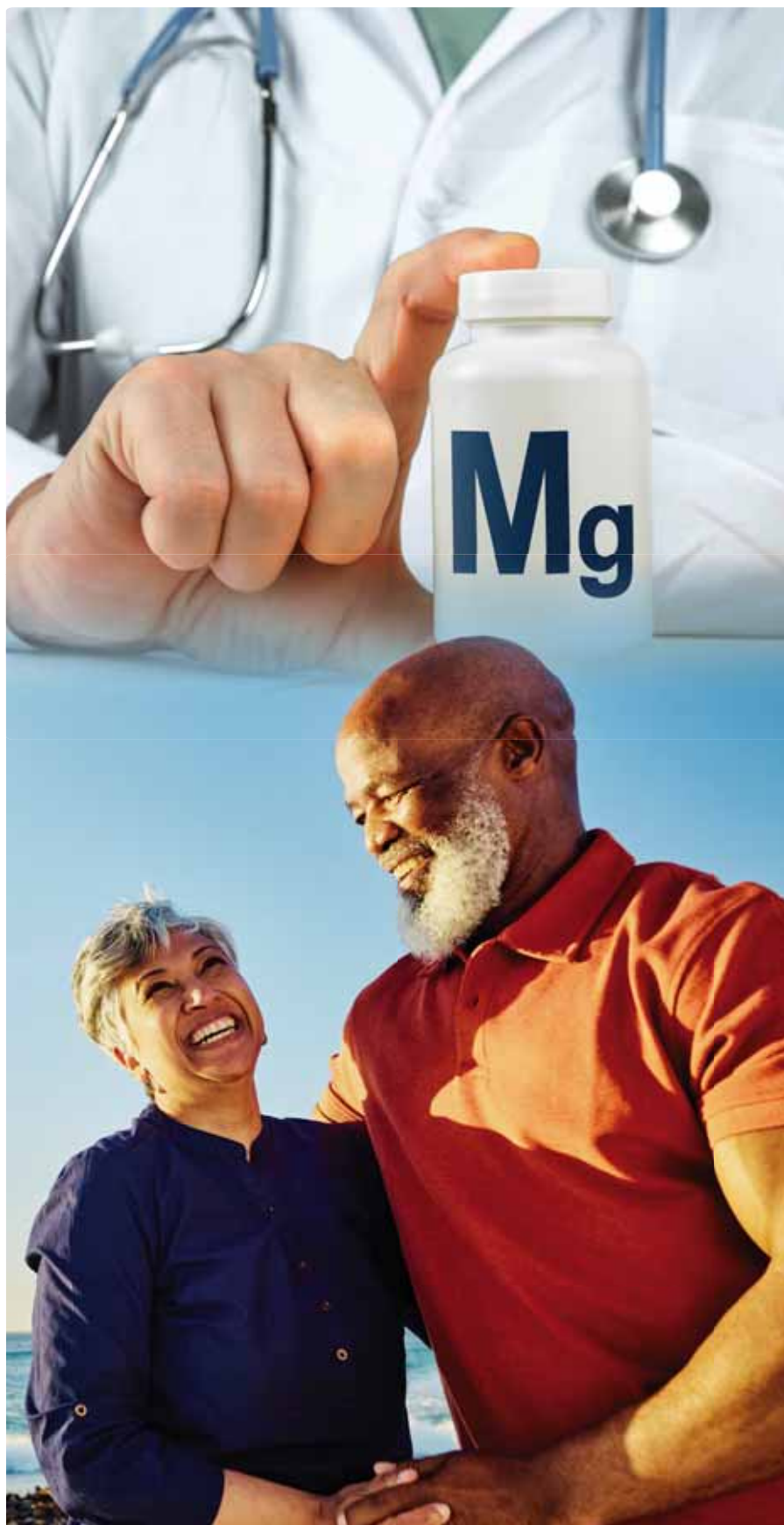
Black cumin is used in some regions to help treat or prevent gastrointestinal disorders, cardiovascular diseases, rheumatoid arthritis, diabetes, and asthma. The seven meta-analyses included 55 clinical studies that evaluated black cumin's effects on markers of oxidation and inflammation, which are involved in numerous disease processes.

The pooled results showed that black cumin seed reduced levels of **C-reactive protein (CRP)**, a systemic marker of inflammation; tumor necrosis factor-alpha, a cytokine that mediates inflammatory responses; and malondialdehyde, a marker of lipid peroxidation.

Editor's Note: Black cumin was also associated with improvements in total antioxidant capacity (measurement of all antioxidants) and levels of superoxide dismutase (SOD) which plays a crucial role in the first-line defense against oxidative stress.

* *Prostaglandins Other Lipid Mediat.* 2025 Jan;176:106945.





Magnesium Associated with Lower 28-Day Mortality Risk in Heart Failure Patients

A study found that **heart failure** patients with preserved ejection fraction, where the heart struggles to fill with blood, treated in an intensive care unit, had a significantly lower 28-day risk of all-cause **mortality** when given magnesium compared to those who did not receive it.*

Researchers compared 985 patients who received magnesium with another 985 who did not. Within 28 days, **20.3%** of the group not receiving magnesium died, whereas only **13.6%** of the magnesium group died. After adjustment for various confounding factors, magnesium intake was linked to a **32%** lower risk of mortality.

Subgroup analysis showed even greater benefits of magnesium, with a lower risk of mortality for certain groups: older patients, **35%** lower; women, **45%** lower; individuals without diabetes, **46%** lower; and patients with high blood pressure, **38%** lower.

Editor's Note: These findings suggest that magnesium could play a significant role in improving survival outcomes for heart failure patients.

* *Sci Rep.* 2025 Jan 14;15(1):1944.

L-Carnitine and Alpha-Linolenic Acid Help Women with Migraines

A randomized, triple-blind, placebo-controlled trial that included women who suffered from migraines found that L-carnitine and the plant-derived omega-3 fatty acid alpha-linolenic acid (ALA) lowered migraine frequency, severity and duration, and enhanced mental health and quality of life compared to a placebo.*

The study included 40 women who received **500 mg** L-carnitine plus **1,000 mg ALA** and 40 women who received a placebo daily for 12 weeks.

After 12 weeks, participants who received L-carnitine and ALA experienced a significant reduction in migraine frequency of approximately three per month versus almost no reduction in the placebo group. Migraine severity and duration were also significantly reduced, and depression and anxiety scores improved, compared with the placebo.

Editor's Note: Additionally, migraine-specific quality-of-life and headache-impact scores improved in the group that received L-carnitine and ALA compared with the placebo group.

* *Nutr J.* 2025 Mar 13;24(1):40.





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Steven

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†Studied against powder turmeric extract standardized to 95% curcuminoids

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- Support normal **hair growth** cycle,
- Support healthy **scalp oil** levels,
- Support **hair density** and **volume** for fuller hair, and
- Maintain already normal **DHT** levels (a hormone linked to maintaining hair follicle health).

In separate **clinical trials**, these standardized extracts show *reduced hair shedding*—by up to **48%** in one study.¹

Another study showed a **hair shedding reduction** of up to **20%**.² Some users noticed results in as little as two months.

For full product description and to order **HAIR GROWTH FOR WOMEN**, call **1-800-544-4440** or visit **www.LifeExtension.com**

VI-SPO® is a trademark of Vidya Herbs Inc. and used with permission. Ceramosides™ is a trademark of Seppic SA.

1. *Int J Cosmet Sci.* 2024;46(2):284-296.


2. *Clin Cosmet Investig Dermatol.* 2023;16:3251-3266.

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ZINC

Improves
Glucose Control



BY ROSS HOWZER

Many people take **zinc** to support their **immune** system.^{1,2} But zinc's benefits go far beyond.

Observational studies have found that low zinc levels are linked to insulin resistance, **type 2 diabetes**, poor blood sugar control,³⁻⁶ and the development of diabetic complications.^{3,7,8}

In **clinical trials**, oral zinc intake *improved* control of diabetes and associated disorders.⁹⁻¹¹

For those with **type 2 diabetes** or at risk for developing it, **zinc** reduced multiple measures of **blood sugar control**. This included fasting blood **glucose** and **hemoglobin A1C** (HbA1c), as well as a measure of insulin resistance.^{10,12,13}

Some studies suggest that *higher* zinc intake may modestly reduce the risk of developing **type 2 diabetes**.¹⁴

Zinc and Type 2 Diabetes

Zinc is a nutrient mineral that is a structural component of over 300 vital enzymes and 2,000 transcriptional factors in the body. This means that cells, organs, and tissues *require* zinc to function properly.¹⁵

It's essential for immune cell development and also plays a key role in brain, eye, and metabolic health.¹⁵

Unfortunately, inadequate zinc status and zinc consumption are surprisingly common, which increases the risk for various health issues, including **high blood sugar** and **type 2 diabetes**.¹⁶

Observational studies have shown that **low zinc** levels are associated with **type 2 diabetes**. This may be due to losing more zinc through urine, absorbing less from food, or high blood sugar and insulin resistance-related changes in how the body handles zinc.^{3,17}

One observational study compared serum zinc levels in 200 individuals with type 2 **diabetes** and 192 healthy controls. The results showed that those with diabetes had significantly **lower** average serum zinc levels (**66.5 µg/dL**) compared to healthy individuals (**82.6 µg/dL**).

Participants with zinc levels below **70 µg/dL** had markedly **worse glycemic** control, with an average fasting blood sugar of **140 mg/dL** and **HbA1c** of **9.77%**, compared to those with normal zinc levels, who had an average fasting blood sugar of **105 mg/dL** and **HbA1c** of **5.7%**.⁴

There is also evidence that **low** zinc status is associated with an increased risk of complications of diabetes.

A case-control study found that diabetic patients with polyneuropathy had significantly lower zinc levels than both diabetic patients without neuropathy and healthy individuals. Lower zinc levels were strongly linked to more severe neuropathy symptoms, poorer nerve function, and worse blood sugar control (higher HbA1c).⁷

What Zinc Can Do

Basic science and preclinical research show that zinc plays a key role in metabolic functioning. For instance:

- Zinc has demonstrated anti-inflammatory effects by blocking NF-κB (nuclear factor-kappa B), a protein complex that promotes **inflammation**.^{3,18} This could have important implications for blood sugar control and reducing obesity-related complications in diabetes.¹⁹
- Zinc aided in forming, storing, and releasing insulin, a hormone that allows tissues to take up glucose from the blood, lowering blood sugar.³
- In preclinical models, zinc *deficiency* impairs the response of tissues to insulin, contributing to **insulin resistance**, which is known to predispose to **high blood glucose** levels (hyperglycemia).²⁰⁻²² In rodents, supplementing with zinc improved insulin response.²¹
- Diabetes (chronic hyperglycemia) can lead to nerve damage, eye disease, kidney disease, cardiovascular disease, and more.²³

Increasing zinc intake through supplements helps ensure adequate levels of zinc in blood and tissues, potentially reducing the incidence and impact of insulin resistance and diabetes.^{9,12,13}



Oral Intake Offers Hope

Human studies on **zinc intake** in individuals with diabetes—or those at risk of developing it—have shown significant promise.^{9,10,12}

One systematic review and meta-analysis of 22 clinical studies in patients with **type 2 diabetes** found that zinc supplementation reduced:²⁴

- Fasting blood glucose,
- After-meal blood sugar,
- HbA1c levels,
- Systolic (top number) and diastolic blood pressure, and
- Total and LDL (bad) cholesterol.

Another **meta-analysis** of **32 clinical trials**, including 1,700 participants with diabetes, prediabetes, obesity, or other metabolic impairments, showed that zinc supplementation improved several markers of glucose control, including:⁹

- Fasting glucose,
- Post-meal glucose,
- HbA1c,
- Insulin resistance, and
- High-sensitivity C-reactive protein (a marker of chronic inflammation).

A very large **meta-analysis** of randomized controlled trials, mostly in patients with type 2 diabetes or prediabetes, further confirmed that zinc supplementation significantly improved key glycemic biomarkers in adults with or at risk for type 2 diabetes, including fasting blood sugar, insulin levels, HOMA-IR (a measure of insulin resistance), and HbA1c, compared to control groups.¹²

The studies analyzed used a range of daily zinc doses with supplementation durations ranging from **four weeks** up to **six months**.

These findings suggest that zinc supplementation may serve as an effective adjunct strategy for improving glycemic control in individuals with type 2 diabetes or prediabetes.



Zinc's Metabolic Benefits

- Zinc is well known for supporting immune health and playing an essential role in the optimal function of thousands of proteins throughout the body.
- Zinc is required for normal **insulin** function. Low levels contribute to insulin resistance and poor glucose control.
- Some studies have found that low zinc levels appear to increase the risk of **type 2 diabetes** and other metabolic disorders.
- Meta-analyses of clinical trials have found that zinc supplementation can improve glucose control, **lowering blood sugar** in those with diabetes or at risk for developing it, while also reducing blood pressure and improving lipid profiles.

Summary

Thousands of proteins rely on **zinc** to function, affecting the immune system and tissues throughout the body.

Zinc plays crucial roles in supporting metabolic health, including proper **insulin** function. Low zinc levels are associated with poor glucose control and a higher risk of diabetic complications.

Clinical studies involving people with diabetes—or those at risk of developing it—have shown that zinc supplementation can improve insulin function and glucose control, helping to reduce elevated blood sugar levels that can cause widespread damage in the body. ■

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

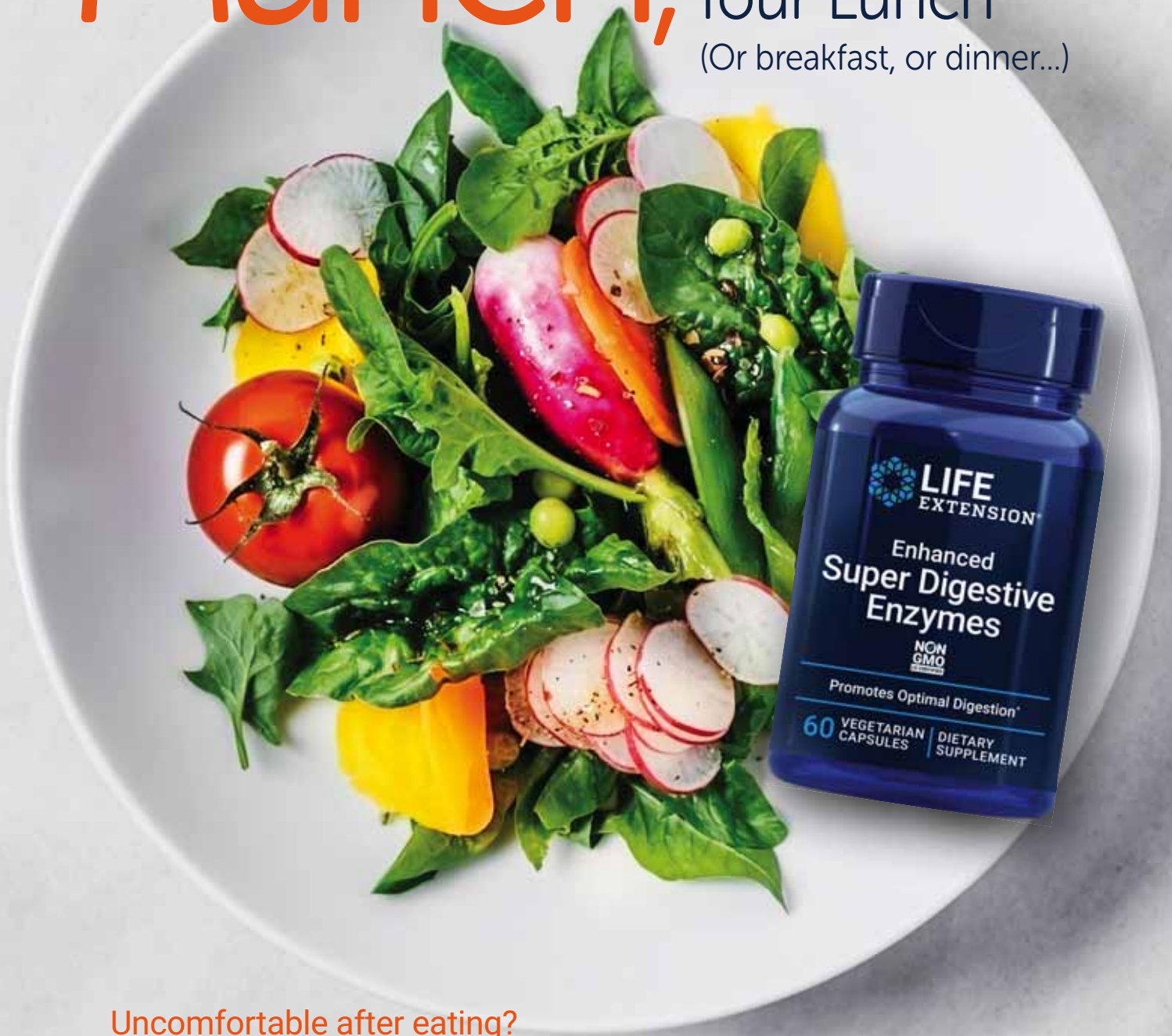
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* Curr Drug Metab. 2016;17(2):187-93.

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Aged
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Garlic**
For Heart Health.



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1
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Black garlic is created through a patent-pending, solvent-free, 30-90-day **aging** process.

This produces a high content of **S-allyl-cysteine**, a phytochemical associated with cardiovascular health.¹⁻⁴

Clinical research has shown that, **aged black garlic** provides targeted support for healthy serum triglycerides, blood pressure, and cholesterol within normal range.⁴

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

References: 1. *Molecules*. 2021 Aug 19;26(16):5028. 2. *Journal of Functional Foods*. 107(2023):105657. 3. *Molecules*. 2017 Jun 1;22(6):919. 4. *OAJCAM*. September 20, 2023;6(1).

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

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This formula combines **cinnamon** and **seaweed** extracts with a unique **chromium** stabilized with standardized **amla** and **shilajit** to maintain optimal healthy blood-sugar levels already in normal range.



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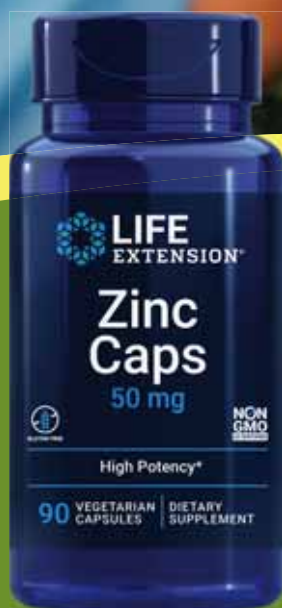
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If more than 50 mg of supplemental zinc
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PROBIOTIC DEFENSE Against Gum Disease

BY MARSHA MCCULLOCH, MS, RD

In a study of 794 adults, **82%** of those who reported gingival bleeding believed it to be a harmless condition.¹

Bleeding gums, however, are a common sign of **periodontal disease**, which can damage the tissues that anchor teeth in place.^{2,3}

Even more worrisome, periodontal infections may increase the risk of non-oral conditions, including **diabetes**, **heart disease**, and **dementia**.⁴

A key driver of periodontal disease is an imbalance of **microbes** in the mouth that promote harmful bacteria and the buildup of dental **plaque**.^{2,4}

Plaque can result in gaps between the teeth and gums, called **periodontal pockets**, which can become infected and inflamed.²

Scientists have identified a specific **probiotic** strain that helps keep problematic oral bacteria in check. It has been clinically shown to reduce **gum bleeding** and **inflammation** by **31%** when taken daily.^{5,6}

Researchers have also developed a heat-treated bacteria, a **postbiotic**, that in a clinical trial reduced periodontal pocket depth **64%** better than the **placebo** group.⁷

Taking this **probiotic** and **postbiotic** daily in addition to brushing and flossing may provide a strong defense against **periodontal disease**.

Microbiome of the Mouth

The link between **periodontal disease** and other conditions may be driven by **chronic inflammation**, **immune dysregulation**, and the spread of **harmful bacteria** from the mouth to other parts of the body.²

The oral microbiome includes beneficial bacteria like ***Streptococcus salivarius*** (*S. salivarius*) as well as harmful bacteria like ***Streptococcus mutans*** (*S. mutans*).¹⁶

S. mutans is one of the top promoters of tooth decay. This bacteria thrives in an acidic (low pH) oral environment.¹⁶

In the mouth, ***S. mutans*** ferments sugars from food and produces acid that can erode tooth enamel. This promotes the buildup of plaque on teeth, which can lead to tooth decay and periodontal disease.¹⁶

Improving the Oral Ecosystem

The M18 strain of ***S. salivarius*** can provide a robust defense against ***S. mutans***.

In a clinical trial involving 69 young adults aged 18–40 at high risk for tooth decay, 22 participants took a nightly lozenge containing *S. salivarius* M18 (**2.5 billion CFU**) after brushing.

After 30 days, the M18 group showed better oral health outcomes compared to those following standard oral care practices without the M18 probiotic.¹⁷

The M18 probiotic group experienced a **75% decrease** in salivary levels of harmful ***S. mutans***. In the control group, *S. mutans* decreased by only **11%**.



The **M18** probiotic group also had a **5.2% increase** in salivary pH, meaning it was less acidic and better for oral health, while the control group's saliva became slightly more acidic.¹⁷

Increased acidity can lead to an increase in dental problems because when the pH of the oral cavity becomes **more acidic**, *S. mutans* can become more competitive and damaging.^{16,18}

Less Dental Plaque, Healthier Gums

In a randomized controlled clinical trial, 61 participants with gingivitis aged between 18 to 25 years were randomized to receive a daily ***Streptococcus salivarius* M18 (500 million CFU)** lozenge or a placebo nightly after brushing, for four weeks. The probiotic improved gum health in young adults with gingivitis.⁵

Participants showed **31%** reduced gingival inflammation index, and mild but significant improvement in **dental plaque** index compared to placebo after four weeks. Continued use of ***S. salivarius* M18** might be needed to maintain results.

In another trial, a three-month supplementation with ***Streptococcus salivarius* M18** has been shown to reduce gingival bleeding and dental plaque in young adults with gingivitis.⁶

In this longer randomized controlled trial, 62 individuals with gingivitis were randomized to receive ***S. salivarius* M18 (500 million CFU)** or a placebo every evening for three months followed by a four-week washout period.

The daily use led to significant improvements in gum health compared to placebo. The probiotic group had a **31%** placebo-adjusted reduction in **gum bleeding** and a **7%** reduction in dental **plaque buildup**.⁶

The best results for gum health and dental plaque control likely come from **long-term** use of the probiotic.

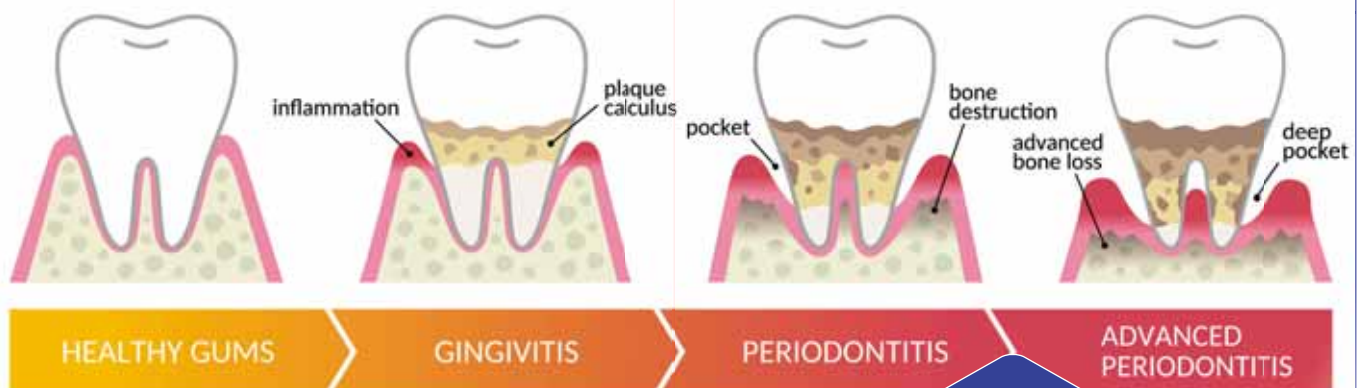
Postbiotic Improves Periodontal Pockets

As part of a routine checkup, dental staff may probe a person's gums to check **periodontal pockets**. A pocket depth of **4 mm** or more suggests **periodontal disease**.¹⁹

Scientists explored living oral **probiotics** and heat-treated **postbiotics**. Postbiotics include components of inactivated beneficial microbes.²⁰

For a randomized controlled trial, researchers recruited 39 older adults with **chronic periodontitis**, including one or more periodontal pockets measuring at least **4 mm**.⁷

Stages of Periodontal Disease



What You Need To Know

Banish the Bacteria Behind Gum Disease

- Bleeding gums can be a sign of **periodontal disease**, which harms the gums and bones that support teeth. Periodontal disease is also linked to an increased risk of heart disease, diabetes, and dementia.
- A major driver of periodontal disease is an overgrowth of **harmful bacteria** that promotes dental plaque buildup, inflammation, and destruction of oral tissues.
- The probiotic ***Streptococcus salivarius* M18** is clinically shown to counteract harmful oral bacteria, reducing gum inflammation and bleeding by **31%**.
- Heat-treated ***Lactobacillus plantarum* L-137**, a postbiotic, has been clinically shown to reduce periodontal pocket depth by **64%** greater than seen in placebo group.
- Daily oral intake of this probiotic-postbiotic **combination** can be a beneficial addition to dental care routines.

Subjects took **50 mg** of heat-treated ***L. plantarum* L-137** (a postbiotic) or a placebo daily for 12 weeks. Both groups also underwent standard periodontal therapy.

The postbiotic group showed a **64%** greater reduction in **pocket depth** than the placebo group.⁷

Previous studies have shown that heat-treated ***L. plantarum* L-137** stimulates the action of **IL-12**, a cytokine (signaling molecule) that supports healthy immune function. The researchers suggest that this immune modulation may help promote oral health.^{7,21}

Together, ***S. salivarius* M18** and heat-treated ***L. plantarum* L-137** may offer a balanced combination for optimizing periodontal health.

The Mouth-Body Connection

Periodontal disease (also called **gum disease**) starts with **gingivitis**, a condition characterized by red, swollen gums that bleed easily.^{2,8}

This can progress to **periodontitis**, severe gum disease that includes deepening **periodontal pockets**. These pockets trap infection-causing bacteria and plaque between the teeth and gums.^{2,8}

The body's immune response to this microbial assault leads to **inflammation** and damage to the teeth's **structural support**, potentially resulting in tooth removal.^{8,9}

Damage caused by periodontal disease isn't necessarily confined to the teeth.

Cardiovascular disease, **diabetes**, and **dementia** are just a few of the non-oral conditions associated with periodontal disease.^{4,10-15}

Summary

A balanced **oral microbiome** promotes periodontal health.

In clinical trials, the probiotic ***S. salivarius* M18** inhibited the growth of **harmful** oral bacteria, reduced gum inflammation and bleeding, and helped prevent **dental plaque** buildup.

A heat-treated postbiotic, ***L. plantarum* L-137**, was clinically shown to reduce periodontal pockets.

Long-term use of this oral probiotic-postbiotic **combination** can help keep teeth and gums healthy, with benefits for overall health. ■

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



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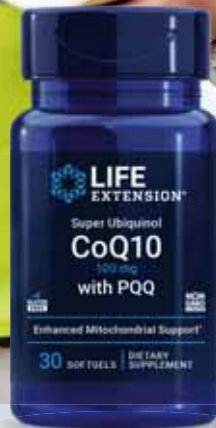
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EXTRA VIRGIN OLIVE OIL: More Benefits Discovered

BY LAURIE MATHENA

Many of the health benefits associated with the **Mediterranean** diet are thought to be due, in part, to one of its key components: extra virgin olive oil.¹

Consumption of **olive oil** has been shown to be associated with improvement in:

- Symptoms of mild cognitive impairment and biomarkers of Alzheimer's disease,^{2,3}
- Insulin resistance biomarkers,⁴
- Cardiovascular disease,⁵
- Type 2 diabetes,^{5,6} and
- Cancer.⁷

It has also been associated in different studies with a lower risk of **death** from cardiovascular events, cancer, and *from **any cause***.^{5,8,9}

But not all olive oil is equal. For optimal health benefits, choose a cold-pressed **extra virgin olive oil** high in **polyphenols**.

Brain Protection

Extra virgin olive oil (EVOO) and its phenolic compounds help combat key processes involved in the development of **Alzheimer's** disease.

Evidence from preclinical studies, summarized in a comprehensive review published in **2024**, suggests that this includes reducing the buildup of harmful plaques, easing inflammation, enhancing the brain's protective barrier, and lowering oxidative stress.¹⁰

In human studies examined in that same **2024** review, it was found that regular consumption of **extra virgin olive oil** improved not only **cognitive function** but also biomarkers and indices associated with developing **mild cognitive impairment** and Alzheimer's.¹⁰

It may also reduce the risk of *dying* from dementia.

In an analysis of data from two large prospective cohorts—the Nurses' Health Study in **60,582** women and the Health Professional Follow-up Study in **31,801** men, followed for 28 years—it was found that those who consumed more than **7 grams** (just over **half a tablespoon**) of **olive oil** per day had a **29% lower risk of dementia-related death** than those who consumed little or no olive oil.⁹



Boost Metabolic Health

Olive oil has been identified as a key contributor to the **cardiovascular** benefits of the Mediterranean diet.^{11,12}

Research has highlighted the polyphenol content of olive oil, revealing that its anti-inflammatory effects play a major role in improving lipid profiles and blood vessel function, promoting healthy arteries and blood pressure.^{13,14} As a result, extra virgin olive oil polyphenols may lower the risk of heart attack, stroke, and sudden cardiac death.¹⁴

A famous multicenter trial involved about 7,500 people aged between 55-80 years, who were at high cardiovascular risk but without any diagnosed disease at the start of the study. Participants were assigned to one of three groups and followed for nearly **five** years:

- Mediterranean diet supplemented with extra virgin olive oil group,
- Mediterranean diet supplemented with mixed nuts, and
- Controlled diet (with advice to reduce dietary fat).

The olive oil group consumed, on average, roughly two-thirds of a tablespoon of extra virgin olive oil daily and had a **31% reduced risk of a major cardiovascular event** (including **myocardial infarction, stroke, or cardiovascular death**), compared to those following a low-fat diet.¹⁵

A systematic review and meta-analysis of 29 clinical trials and four cohort studies found that *higher* olive oil intake is associated with a significantly reduced risk of developing **type 2 diabetes**. Individuals with the highest intake had a **16% lower risk** of incident type 2 diabetes compared to those with the lowest intake.

In people with established type 2 diabetes, olive oil supplementation also improved glycemic control, leading to a significant reduction in **HbA1c** levels and fasting plasma glucose.⁶

One review found that **extra virgin olive oil (EVOO)** outperformed other dietary fats in several key areas of health. It was more effective at lowering blood pressure and LDL ("bad") cholesterol, while also increasing HDL ("good") cholesterol. Additionally, EVOO contributed to better glucose control and supported healthy weight management. These benefits are believed to stem from EVOO's rich polyphenol content.¹

In an early randomized controlled trial, 23 people with high blood pressure were randomly assigned to follow either a diet high in monounsaturated fatty acids (MUFA) from extra virgin olive oil or a diet high in polyunsaturated fatty acids (PUFA) from sunflower oil for six months, after which they crossed over to the alternate diet for another six months. At the end of six months, blood pressure drug dosage was reduced by **48%** in the extra virgin olive oil group as compared to the sunflower oil group.¹⁶

Fight Against Fatty Liver Disease

Non-alcoholic fatty liver disease (NAFLD) is a growing health concern in the U.S., characterized by excess fat buildup in the liver.

Cases have surged in recent years, and a 2018 forecast determined that by 2030, more than **100 million** Americans would have the condition—a whopping **21%** increase from 2018 levels.¹⁷

In a study of 2,436 adults, those who consumed more than **2.7 tbs** of extra virgin olive oil per day had a **27% lower chance** of having NAFLD compared to those who consumed **0–1.75 tbs** daily.

The benefits in people with excess weight were impressive:

- **18% lower risk** of NAFLD in overweight individuals, and
- **26% lower risk** of NAFLD in those with obesity.¹⁸

In another observational study of 2,754 people with *and* without non-alcoholic fatty liver disease, those who consumed **2.25 tbs** or more of extra virgin olive oil per day had a **27%–34%** lower risk of **all-cause mortality** compared to those who consumed about **1.5 tbs** or less, with greater protection associated with higher levels of daily extra virgin olive oil.

In those with NAFLD (non-alcoholic fatty liver disease), the protective effect was even greater.⁸

Reduced Cancer Mortality

Consuming a Mediterranean-style diet is associated with a reduced risk of numerous types of **cancer**, including breast, colorectal, prostate, gastric, bladder, head and neck, and lung cancers.¹⁹

Olive oil may play an important role in this benefit.



What You
Need
To Know

The Protective Effects of Extra Virgin Olive Oil

- **Olive oil** is a key component of the Mediterranean diet that is likely responsible for many of its health benefits.
- Consuming higher amounts of **extra virgin olive oil** is associated with a reduced risk of dementia, cancer, heart disease, and liver disease.
- It has also been connected to a lower risk of **dying** from cancer, dementia, or any cause at all.
- Cold-pressed extra virgin olive oil is the least processed olive oil and contains higher amounts of **polyphenols**, plant compounds responsible for many health benefits.

In a 17-year observational study, researchers analyzed dietary intake of olive oil and compared it to mortality data. Results showed that consuming²⁰ about **2.25 – 3.75 tbs** per day was linked to a **24%** lower risk of **all-cause mortality**. Consuming about **3.75 tbs** or more daily was linked to a significant reduction in death from **cancer**, including a:

- **60%** lower mortality for **gastrointestinal cancer**, and
- **50%** reduction in mortality from **other cancers**.

Virtues of Cold-Pressed Olive Oil

All olive oil isn't the same. **Cold-pressed extra virgin olive oil** is the highest-quality variety. It is the champagne of olive oil.

Cold pressing uses a mechanical press to extract oil without heat or chemicals, helping preserve more of its health benefits by promoting compounds such as polyphenols, which also provide flavor.^{21,22}

Greater dietary intake of **polyphenols** helps improve lipid profiles and lower blood pressure, insulin resistance, and systemic inflammation.²³

The polyphenol content of olive oil varies based on factors including the climate, ripeness of the olives, how the oil is extracted, and the storing process.²²

Olive oil is also high in **monounsaturated fatty acids** (primarily **oleic acid**), which can lower LDL cholesterol, another potential contributor to olive oil's abundant health benefits.¹¹



Olive Oil and Oral Health

Olive oil may even help reduce gingival inflammation²⁴ and dental plaque.^{24,25}

In a clinical study, 75 adults with **gingivitis** (early gum disease) caused by plaque bacteria used extra virgin olive oil as a daily **mouthwash**. After 30 days, they had a **48%** reduction in plaque formation and a **64%** reduction in gum bleeding.²⁴

Participants in this study held one **tablespoon** of extra virgin olive oil in their mouths and swished it around for five minutes, one time per evening before going to bed, after brushing and flossing.



Summary

Extra virgin olive oil is a key component of the **Mediterranean diet** that is thought to contribute to many of the diet's health benefits.

Consuming higher amounts of **extra virgin olive oil** is associated with a reduced risk of numerous age-related health conditions, as well as a lower risk of dying from heart events, strokes, dementia, cancer, or any cause at all.

For the greatest health benefits, choose a cold-pressed **extra virgin olive oil** with a high **polyphenol** content. ■

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

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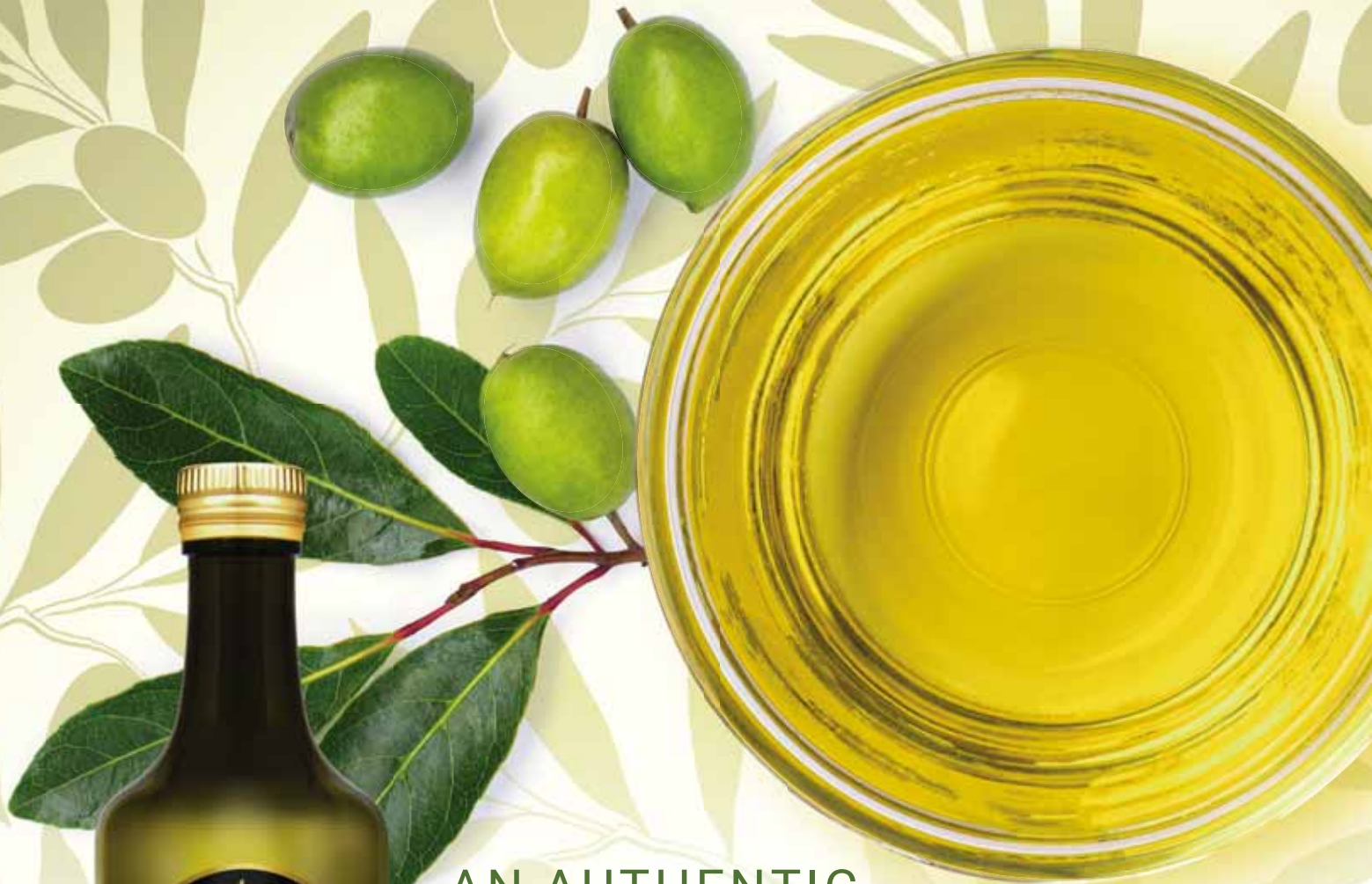
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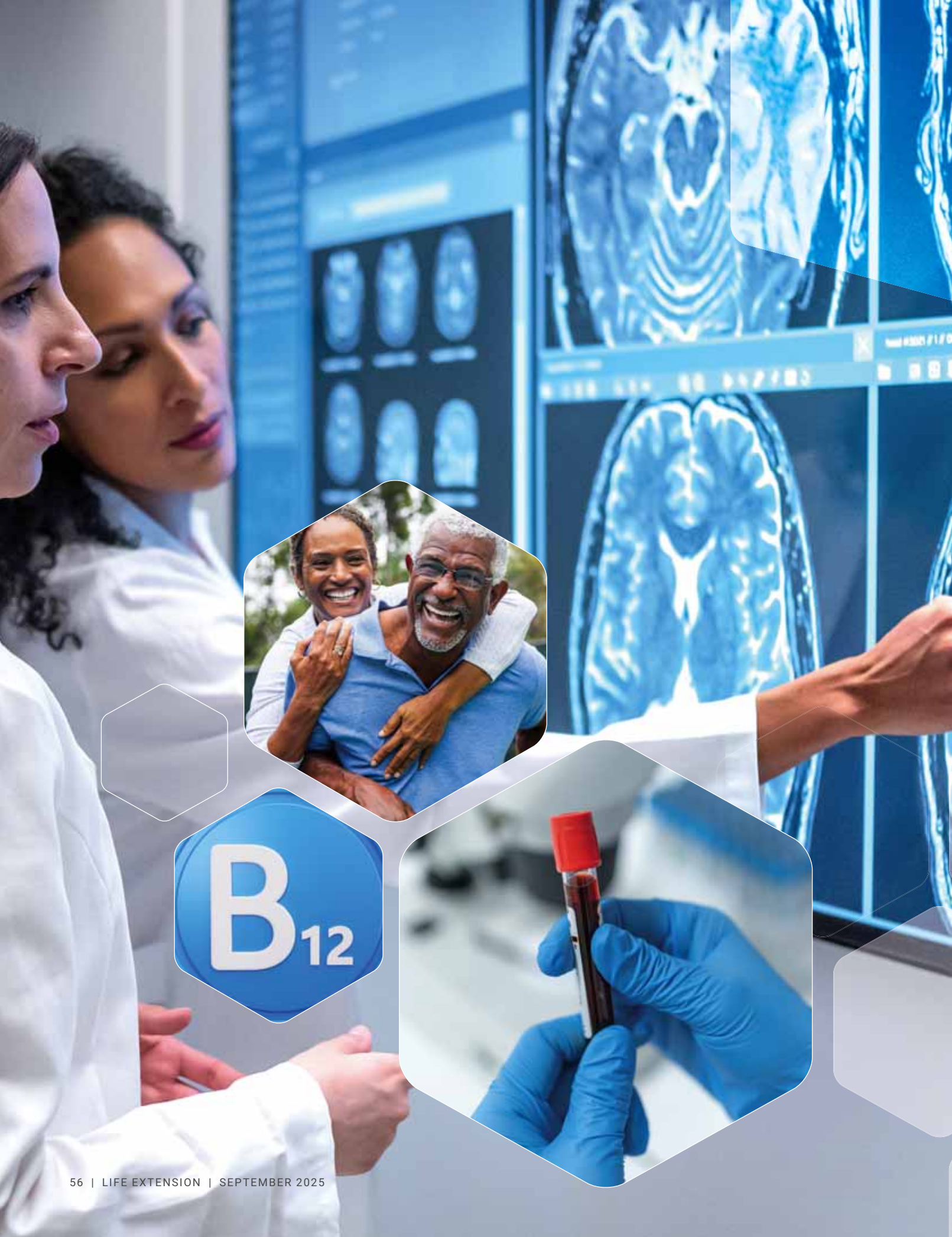
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B₁₂



Impact of Slightly Low Vitamin B12 on BRAIN AGING

BY BRAD TAYLOR

A recent study challenges the definition of what constitutes vitamin B12 **deficiency**.

The results, published in *Annals of Neurology* in **2025**, suggest that low blood **vitamin B12** levels are associated with *early* neurological changes *even at levels previously considered to be adequate* in older adults.¹

This data adds to a growing body of research indicating that even *slightly low* B12 levels are associated with harmful changes in the brain and increased risk for **cognitive impairment** and **dementia**.²⁻⁶

Oral **vitamin B12** can maintain adequate levels to help ward off that increased risk.

Getting Enough Vitamin B12

Vitamin B12 is found in animal sources such as beef, lamb, fish, seafood, poultry, and dairy foods. It is not produced in plants, which means vegetarians and especially **vegans** have an elevated risk of low B12 levels.⁷

In addition, many individuals have difficulty absorbing vitamin B12 due to factors such as gastritis, gastrointestinal surgeries or abnormalities, certain medications (including antacids and metformin), and other underlying conditions.⁸

Vitamin B12 is critical for the development, function, and maintenance of the **nervous system**. It plays a key role in DNA synthesis and supports enzymes essential for nerve health.⁸

A deficiency in B12 can lead to **megaloblastic anemia** and serious **neurological problems**.^{8,9}

These B12-deficiency related neurological problems can include cognitive impairment, psychosis, nerve damage, and balance concerns, even without signs of anemia.

Neurological pathologies caused by B12 deficiency may not become evident until years after the initial deficiency begins. At this point vitamin B12 **supplementation** can no longer correct the damage, and neurological recovery may no longer be feasible. Early diagnosis and intervention are essential to prevent permanent damage, especially in older adults.¹⁰

The most commonly used initial test for diagnosing B12 deficiency is a simple vitamin B12 blood test with a reading of **148 pmol/L** or lower often used to indicate deficiency. This level has been historically linked to the onset of clinical symptoms like anemia and neuropsychiatric issues.¹¹

But a growing number of scientists have criticized this cutoff.^{1,12,13} That's because even in people with *modest* reductions in B12 levels that fall within the normal range, damaging changes can occur in the **brain** that may be associated with a range of neurodegenerative conditions, including **Alzheimer's**, **Parkinson's**, and **multiple sclerosis**.^{1-4,6}

B12 and Brain Health

The new (2025) study,¹ led by researchers at the University of California, San Francisco, took a fresh approach to evaluating the impact of vitamin B12 on brain aging.

Most studies test for total **vitamin B12** in blood. But B12 exists in more than one form in the bloodstream. Therefore, in this study researchers tested the participants for both forms of B12 using both the **bioavailable** and **total B12** blood tests.¹

Some circulating B12 is bound to a protein called **transcobalamin**. This form can be readily used by cells and is considered the **active** form of vitamin B12.

B12 can also be bound to a protein called **haptocorrin**. Most cells in the body cannot access haptocorrin-bound B12, making this form functionally **inactive**.

B12 Blood Test Ranges

According to LabCorp, a nationwide laboratory, the current range for acceptable B12 levels is **232–1245 pg/mL**.¹⁸

Life Extension has long advocated for maintaining serum vitamin B12 levels above **400 pg/mL** to support overall health.

Current research now supports this position, suggesting that ideal B12 concentrations for cognitive support range from, approximately, above **350 pmol/L**, though values may vary.¹

Individuals with lower levels can easily correct deficiencies through oral B12 supplementation.

Those taking B12 from various supplements often have high B12 levels, which is typical since the lab reference range was created from the general population, and not from those taking B12. Typically, any excess B12 is eliminated in the urine since B12 is a water soluble vitamin.



This 2025 published study enrolled 231 healthy older adults, median age about 71, with no history of cognitive decline or dementia. Researchers also performed various tests of the structure and function of their nervous system.

They found that lower levels of the **available form** of vitamin B12 correlated with:

- Slower conduction of signals in the brain,
- Slower **cognitive processing speeds** (how quickly we take in, interpret, and react to information), and
- Increased abnormalities in **brain white matter**, the nerve fibers that connect different areas of the brain to each other and to the spinal cord.

Many of the subjects with lower **bioavailable B12** levels were in the normal range for **total B12**. But they were still susceptible to the negative effects of low B12.

This suggests that many older adults with “normal” B12 levels may in fact be functionally vitamin B12 deficient, and thus at elevated risk of neurodegenerative disease and cognitive decline.

This frequently goes unrecognized because *normal* B12 lab levels are assumed to mean “healthy.” Older adults can benefit from taking **oral vitamin B12** to keep their active B12 levels in a higher range.

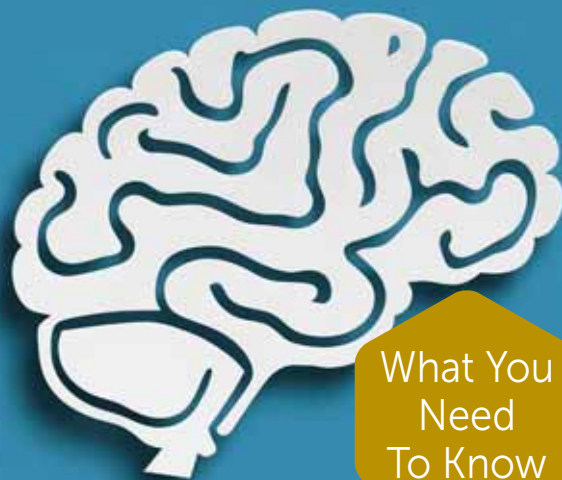
B12 Boosts Cognitive Function

The 2025 published study is not the first to demonstrate that low B12 levels are connected to accelerated **brain aging**.

A prospective observational study of 107 adult volunteers aged 61 to 87 years, found that low levels of B12 were associated with greater **loss of brain volume**. Those with the lowest B12 levels had over **six times** the risk of brain *atrophy* compared to those with the **highest** levels.¹⁴

In another observational study of older adults, researchers found that markers of vitamin B12 **deficiency** were associated with smaller total brain volume and poorer cognitive function, including **memory**.¹⁵

A systematic review and meta-analysis of 12 observational studies including participants aged 7 to 70 years, found that vitamin B12 deficiency was associated with **cognitive decline** and structural (as seen on MRI) and functional brain abnormalities across all age groups.



What You
Need
To Know

B12 Protects the Brain

- Deficiency of **vitamin B12** can lead to nervous system disorders.
- A recent study of older adults found that even low normal levels of the **active form** of vitamin B12 are associated with slower brain processing speeds and damage to the brain.
- This and other studies suggest that many more adults than previously realized may be at risk for **cognitive decline** due to suboptimal vitamin B12 levels.
- Oral B12 intake can keep levels of active vitamin B12 high to help reduce risk of **brain aging**.

In three of these studies that included cognitive testing after vitamin B12 replacement, there was partial to complete **recovery of cognitive function**.¹⁶

These data sets show a clear link between B12 status and brain health. The newest study reveals that many more adults may have dangerously low B12 levels than previously understood.

Taking **oral B12** may help to prevent structural brain damage and loss of cognitive function.

Summary

A study published in **2025** reveals that the lower end of “normal” **vitamin B12** levels is associated with loss of **cognitive function** and harmful changes in the brain in older adults.

This study and others suggest that people with both deficient, or low “normal” levels of vitamin B12 should urgently consider taking a vitamin B12 supplement to support brain health, help slow **brain aging**, and ward off cognitive decline. ■

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

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Two Bioactive Forms of Vitamin B12

Many people already take **methylcobalamin**, one of two **bioactive** forms of vitamin B12, in their multivitamin.

But there is *another* active B12 form—**adenosylcobalamin**—that may play its own particular role in the body.⁷

Preclinical research has shown therapeutic potential for **adenosylcobalamin**. Scientists performed a series of experiments in *in-vitro* models, worms, and mice.¹⁷

Worms with a Parkinson's-related mutation show impaired movement and accelerated loss of dopamine-producing neurons. However, when treated with **adenosylcobalamin** during their larval stage, these worms exhibited normal movement and significantly improved neuron survival.¹⁷

In a related mouse study, brain slices treated with adenosylcobalamin maintained stable dopamine levels during stimulation, unlike untreated slices, which showed a **20% drop** in dopamine release. This suggests that adenosylcobalamin may help preserve dopamine function in Parkinson's-like conditions.¹⁷

These findings suggest that vitamin B12 may offer a novel therapeutic approach targeting processes involved in pathogenesis of Parkinson's disease

A combination of both active forms of **vitamin B12** offers protection for aging brain cells.



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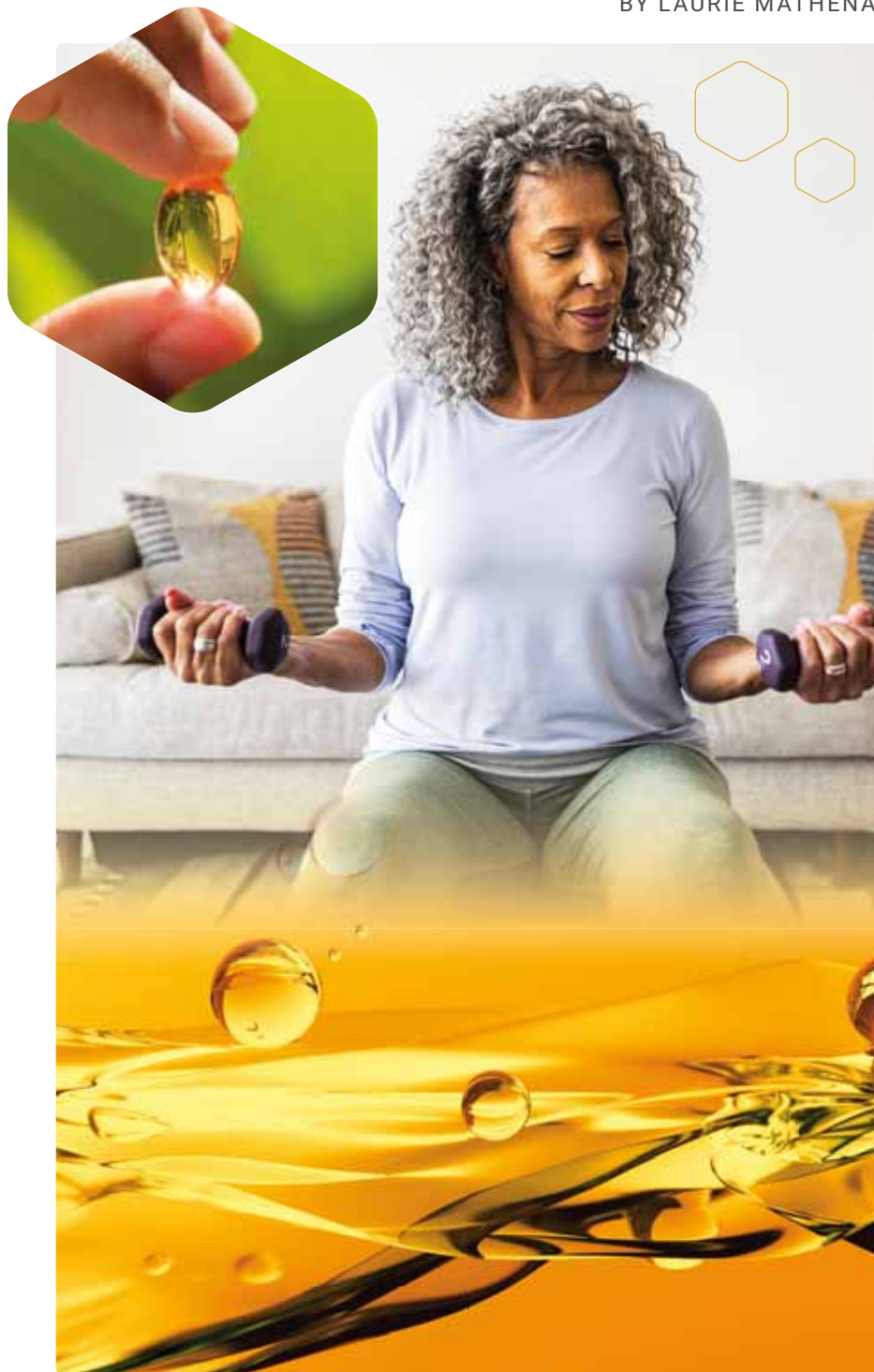
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Expanding the Role of Vitamin E in Health

BY LAURIE MATHENA



Vitamin E is a fat-soluble antioxidant that helps support heart and brain health, immune function, and more.¹

Twenty years ago, *Life Extension* reported on a meta-analysis of 19 clinical trials² showing that people with the *highest* levels of serum **alpha-tocopherol** (a form of vitamin E) had significantly lower risk of dying from cancer, cardiovascular disease, and other causes.³

Emerging evidence from observational studies, along with findings from prospective clinical trials, point to a promising role for vitamin E in supporting various aspects of health and well-being.

Here are some highlights.

Higher vitamin E intake associated with reduced mortality in rheumatoid arthritis patients.⁴

Researchers analyzed data from the **National Health and Nutrition Examination Survey (NHANES)** from 1999 to 2018 on **2,906** patients aged 20 and older with **rheumatoid arthritis**. They found that *higher* dietary intake of vitamin E was associated with a lower risk of all-cause mortality among patients with rheumatoid arthritis.

Those in the top **50%** of vitamin E intake had significantly lower risk of death from any cause, compared to those in the bottom half of intake.

Higher vitamin E intake associated with reduced risk of all-cause mortality and chronic lower respiratory disease mortality in COPD.⁵

In a study of **1,261** patients aged 40 and older with **chronic obstructive pulmonary disease (COPD)**, a group of lung conditions causing restricted airflow and breathing problems, researchers found that *higher* vitamin E intake was associated with a lower risk of all-cause mortality and death from chronic lower respiratory disease.

Higher vitamin E intake associated with lower incidence of non-alcoholic fatty liver disease.⁶

In a study analyzing data from **6,122** adults, researchers evaluated vitamin E intake using two 24-hour dietary recalls. They found that both dietary and supplemental vitamin E were significantly linked to reduced odds of **non-alcoholic fatty liver disease**. Dietary vitamin E intake in the *highest* quartile was associated with a **40% lower** risk of non-alcoholic fatty liver disease, while supplement use was associated with a **34% reduction**.

Vitamin E improves markers of metabolic function.⁷

A systematic review and meta-analysis of seven clinical trials involving participants aged 25 to 64 years found that vitamin E significantly improved liver health in adults with **metabolic associated fatty liver disease** (another name for non-alcoholic fatty liver disease).

It significantly improved two markers of liver function: alanine aminotransferase (ALT) and aspartate aminotransferase (AST). It reduced fat buildup in the liver, reduced inflammation in the lobes of the liver, and reduced swelling of liver cells. Vitamin E was also found to increase the *resolution* of **metabolic dysfunction-associated steatohepatitis**, a more severe form of fatty liver disease.

Studies administered **200 to 600 mg** of vitamin E daily for durations ranging from eight to 96 weeks.

Vitamin E improves insomnia in postmenopausal women.⁸

In a prospective, double-blinded, controlled trial, 160 postmenopausal women with chronic insomnia disorder were randomly assigned to receive either vitamin E (**268 mg** of mixed tocopherols) or a placebo daily.

After one month, the vitamin E group showed significantly improved scores on a standardized **sleep** quality questionnaire, indicating better sleep quality compared to the placebo group. The vitamin E group also had a greater reduction in the percentage of patients requiring sedative medications—**15%** compared to **7.5%** in the placebo group.

Summary

Vitamin E has been connected to reduced mortality and reduced risk of many health conditions.

One concern specific to vitamin E is an issue of lower bio-availability when delivered synthetically.⁹ For optimal benefits, choose a non-synthetic vitamin E. •

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

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Just one capsule daily.



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- **Enhance mood**
- **Reduce perceived stress**

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This **probiotic** blend is augmented with a standardized saffron extract.

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

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

"It is everything I wanted
in a B12 supplement."

Christine

VERIFIED CUSTOMER REVIEW



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SMART
BODY & BRAIN

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"Terrific."

Christina

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REVIEW

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immune health**



Vitamin D3 is the ultimate whole-body health supporter. A daily dose of D3 also helps maintain healthy cardiovascular function.

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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. Do not exceed 10000 IU per day unless recommended by your doctor. Vitamin D supplementation is not recommended for individuals with high blood calcium levels.

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"This product is
very effective."

Kimberly

VERIFIED CUSTOMER
REVIEW



Item #02033

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Soothe DIGESTIVE DISCOMFORT

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FOOD *Freedom*



Occasional digestive discomforts may be caused by **histamine**, a compound in many foods and beverages associated with “**food sensitivity**” complaints.¹

The enzyme **diamine oxidase (DAO)** is produced by our bodies to help *break down histamine* in our digestive tract.

Food Sensitivity Relief provides plant-based **diamine oxidase**.

Human studies showed that supplementation with **diamine oxidase** *before* meals may help provide occasional digestive relief due to **histamine** food sensitivity.²⁻⁴

Take one capsule *before* the heaviest meals, up to three times daily.



Item #02533

60 Vegetarian Delayed Release Capsules

1 bottle **\$28.50** • 4 bottles \$26 each

For full product description and to order

Food Sensitivity Relief with Diamine Oxidase, call **1-800-544-4440** or visit **www.LifeExtension.com**

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CAUTION: This product breaks down histamine but won't prevent severe allergic or gluten-related (celiac) reactions. Do not knowingly ingest food you are allergic to.

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Are You Taking the Right Form of Vitamin E?

"It works for me."

Janice

VERIFIED CUSTOMER
REVIEW



Most people obtain **alpha-tocopherol** in their multivitamin, but miss out on critical **gamma-tocopherol**.

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Gamma E Mixed Tocopherols, call **1-800-544-4440**
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Item #02075 • 60 softgels

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

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

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Taurine

A Wellness Trip for Your
Heart & Mind



Item #01827

1000 mg

90 vegetarian capsules

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4 bottles \$9 each



"An absolute must-have in any supplement plan."

Donald

VERIFIED CUSTOMER
REVIEW

Healthy aging is your destination

Taurine is one of the most abundant **amino acids** in the body.

It supports a healthy **heart** and **brain**, muscle mass and exercise performance.

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

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Sesame Seeds

BY LAURIE MATHENA



Sesame seeds are often used as a topping on bagels, chicken, or crackers for their nutty flavor and crunchy texture. However, using these seeds as merely a garnish misses an abundance of nutrients and health benefits that come from consuming them in greater quantities.

Sesame seeds have been called an “all-purpose nutrient bank” because of their rich and diverse nutrient profile. For example, **100 grams** of sesame seeds (about **3.5 ounces**) provide approximately **17 grams** of protein, **50 grams** of fat, and **15 grams** of fiber, along with an abundance of calcium, potassium, magnesium, folate, and more.¹

Consuming various types of sesame seeds has been shown to have a positive effect on factors that contribute to heart disease.^{2,3}

A clinical trial of 38 people with high cholesterol found that those who consumed **40 grams** of hulled sesame seeds daily (with a 240-calorie adjustment to account for the extra intake), alongside standard treatment, experienced significant reductions in cholesterol and triglyceride levels, as well as increases in beneficial antioxidants, compared to those who received only standard treatment.⁴

In a study of 30 people with prehypertension (between **120/80** and **139/89**), half took **2.5 grams** of powdered black sesame seeds in capsule form daily, while the other half took a placebo. After four weeks, those taking sesame seeds had a **6%** drop in their systolic blood pressure compared to the placebo group.⁵

This could translate to significant health benefits, as research has shown that every **5 mmHg** drop in systolic blood pressure decreases the risk of cardiovascular events by **10%**.⁶ Those taking the sesame seed powder also had a significant increase in vitamin E, another potent antioxidant.⁵

A review of 16 clinical trials with 908 participants found that taking sesame seeds (**25–50 grams** per day) or sesame oil (**2–3 tbs** per day) for four to 12 weeks led to noticeable health improvements. People who took sesame saw reductions in total cholesterol, triglycerides, blood pressure, body weight, BMI, and both waist and hip measurements, compared to those who didn't.²

Consuming sesame seeds could also be beneficial for those suffering from arthritis pain. In a study of 50 people with knee arthritis, half consumed **40 grams** of sesame seed powder per day together with standard medical therapy, while the other half only took standard therapy. After two months, the sesame seed group experienced a **63%** decrease in knee pain, compared to a **22%** decrease in the drug therapy group.⁷

At the same dose, in another trial of 25 people with osteoarthritis, sesame seed supplementation resulted in reduction in inflammatory markers like interleukin-6 (IL-6) and high-sensitivity C-reactive protein (hs-CRP).⁸

You can incorporate more sesame seeds into your diet by utilizing the seeds themselves for added flavor, using sesame oil for cooking, and sesame paste (tahini) for sauces and spreads.

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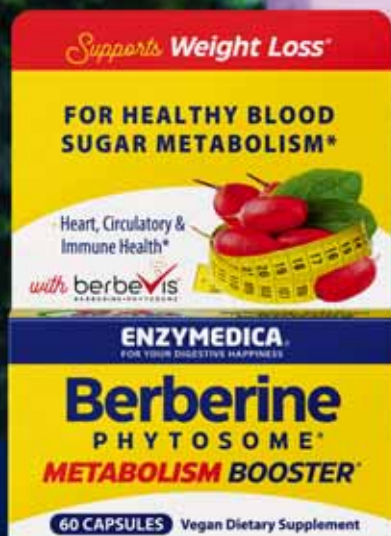
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Susan

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- 02029 Ultra Prostate Formula

MINERALS

- 01661 Boron
- 02107 Extend-Release Magnesium
- 01677 Iron Protein Plus
- 02403 Lithium
- 01459 Magnesium Caps
- 01682 Magnesium (Citrate)
- 02535 Magnesium Glycinate
- 01328 Only Trace Minerals
- 01504 Optimized Chromium with Crominex® 3+
- 02309 Potassium with Extend-Release Magnesium
- 01740 Sea-Iodine™
- 01879 Se-Methyl L-Selenocysteine
- 01778 Super Selenium Complex
- 00213 Vanadyl Sulfate
- 01813 Zinc Caps

MISCELLANEOUS

- 00577 Potassium Iodide

MOOD & STRESS MANAGEMENT

- 02519 Ashwagandha Plus
- 02434 Calm-Mag
- 02312 Cortisol-Stress Balance
- 00987 Enhanced Stress Relief
- 02542 GABA
- 01683 L-Theanine
- 02175 SAME (S-Adenosyl-Methionine)
200 mg, 30 enteric coated vegetarian tablets
- 02176 SAME (S-Adenosyl-Methionine)
400 mg, 30 enteric coated vegetarian tablets
- 02174 SAME (S-Adenosyl-Methionine)
400 mg, 60 enteric coated vegetarian tablets
- 02429 Theanine XR™ Stress Relief

MULTIVITAMINS

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

NERVE & COMFORT SUPPORT

- 02202 ComfortMAX™
- 02303 Discomfort Relief

PERSONAL CARE

- 02322 Hair, Skin & Nails Collagen Plus Formula
- 01278 Life Extension Toothpaste
- 00408 Venotone
- 02252 Youthful Legs

PET CARE

- 01932 Cat Mix
- 01931 Dog Mix

PROBIOTICS

- 01622 Bifido GI Balance
- 01825 FLORASSIST® Balance
- 02421 FLORASSIST® Daily Bowel Regularity
- 02125 FLORASSIST® GI with Phage Technology
- 01821 FLORASSIST® Heart Health
- 02250 FLORASSIST® Mood Improve
- 02208 FLORASSIST® Immune & Nasal Defense
- 02120 FLORASSIST® Oral Hygiene
- 02203 FLORASSIST® Prebiotic
- 02505 FLORASSIST® Probiotic Women's Health
- 02539 FLORASSIST® Probiotic Youthful Gut

SKIN CARE

- 02423 Daily Skin Defense
- 01938 Shade Factor™
- 02129 Skin Care Collection Anti-Aging Serum
- 02130 Skin Care Collection Day Cream
- 02131 Skin Care Collection Night Cream
- 02096 Skin Restoring Ceramides
- 02528 Vegan Pro Collagen

SLEEP

- 01512 Bioactive Milk Peptides
- 02300 Circadian Sleep
- 01511 Enhanced Sleep without Melatonin
- 02234 Fast-Acting Liquid Melatonin
- 01669 Glycine
- 02308 Herbal Sleep PM
- 01722 L-Tryptophan
- 01668 Melatonin • 300 mcg, 100 veg capsules
- 01083 Melatonin • 500 mcg, 200 veg capsules
- 00329 Melatonin • 1 mg, 60 capsules
- 00330 Melatonin • 3 mg, 60 veg capsules
- 00331 Melatonin • 10 mg, 60 veg capsules
- 00332 Melatonin • 3 mg, 60 veg lozenges
- 02201 Melatonin IR/XR
- 01787 Melatonin 6 Hour Timed Release
300 mcg, 100 veg tablets
- 01788 Melatonin 6 Hour Timed Release
750 mcg, 60 veg tablets
- 01786 Melatonin 6 Hour Timed Release
3 mg, 60 veg tabs
- 01721 Optimized Tryptophan Plus
- 01445 Quiet Sleep Melatonin • 5 mg, 60 veg capsules
- 02502 Rest & Renew
- 02526 Serene Sleep

VITAMINS

- 01533 Ascorbyl Palmitate
- 00920 Benfotiamine with Thiamine
- 01945 BioActive Complete B-Complex
- 00102 Biotin
- 00084 Buffered Vitamin C Powder
- 02229 Fast-C® and Bio-Quercetin®
- 02075 Gamma E Mixed Tocopherol Enhanced with
Sesame Lignans

- 02070 Gamma E Mixed Tocopherol & Tocotrienols
- 01913 High Potency Optimized Folate
- 01674 Inositol Caps
- 02244 Liquid Vitamin D3 • 50 mcg (2000 IU)
- 02232 Liquid Vitamin D3 (Mint) • 50 mcg (2000 IU)
- 01936 Low-Dose Vitamin K2
- 00373 No Flush Niacin
- 01939 Optimized Folate (L-Methylfolate)
- 01217 Pyridoxal 5'-Phosphate Caps
- 01400 Super Absorbable Tocotrienols
- 02334 Super K
- 01863 Super Vitamin E
- 02422 Vegan Vitamin D3
- 02028 Vitamin B5 (Pantothenic Acid)
- 01535 Vitamin B6
- 00361 Vitamin B12 Methylcobalamin
- 01536 Vitamin B12 Methylcobalamin
1 mg, 60 veg lozenges
- 01537 Vitamin B12 Methylcobalamin
5 mg, 60 veg lozenges
- 02228 Vitamin C and Bio-Quercetin®
60 veg tablets
- 02227 Vitamin C and Bio-Quercetin®
250 veg tablets
- 01753 Vitamin D3 • 25 mcg (1000 IU), 90 softgels
- 01751 Vitamin D3 • 25 mcg (1000 IU), 250 softgels
- 01713 Vitamin D3 • 125 mcg (5000 IU), 60 softgels
- 01718 Vitamin D3 • 175 mcg (7000 IU), 60 softgels
- 01758 Vitamin D3 with Sea-Iodine™
- 02040 Vitamins D and K with Sea-Iodine™

WEIGHT MANAGEMENT & BODY COMPOSITION

- 02479 7-Keto® DHEA Metabolite
100 mg, 60 veg capsules
- 02207 AMPK Metabolic Activator
- 02504 Body Trim and Appetite Control
- 02478 DHEA Complete
- 02506C Mediterranean Weight Management
- 01432 Optimized Saffron
- 02511 Thermo Weight Control
- 02509 Waistline Control™

WOMEN'S HEALTH

- 01942 Breast Health Formula
- 02537 Daily PMS Relief
- 02534 Estrogen Balance Elite
- 01894 Estrogen for Women
- 02541 Hair Growth for Women
- 02204 Menopause Relief
- 02319 Prenatal Advantage
- 02536 Sexual Health for Her
- 01649 Soy Isoflavones
- 02513 Women's Bladder Support

Don't Wait to Feel Great

Maintain Optimal Hormone Levels



Item #02478 • 60 vegetarian capsules
1 bottle **\$36** • 4 bottles **\$32** each

DHEA Complete can help maintain DHEA levels to support lean muscle mass, bone health, libido and cognitive function.

DHEA Complete delivers 7-Keto® DHEA (100 mg) and regular DHEA (25 mg), plus extracts from curcumin, green tea, and whole red grapes.

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

CAUTION: Consult a physician or licensed qualified health care professional before using this product if you have, or have a family history of breast cancer, prostate cancer, or other hormone-sensitive diseases.

7-Keto® is a Lonza trademark registered in USA.

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

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



#1 Rated
Multivitamins | 11 Time Winner![†]

TWO-PER-DAY Multivitamin provides:

Vitamin A (beta-carotene, and acetate)	1500 mcg RAE [^]
Vitamin B1 (thiamine HCl)	75 mg
Vitamin B2 (riboflavin, riboflavin 5'-phosphate)	50 mg
Vitamin B3 (niacinamide, niacinamide ascorbate)	50 mg NE [•]
Vitamin B5 (D-calcium pantothenate)	50 mg
Vitamin B6 (pyridoxine HCl, pyridoxal 5'-phosphate)	75 mg
Folate (5-MTHF)	680 mcg DFE [°]
Vitamin B12 (methylcobalamin)	300 mcg
Biotin	300 mcg
Vitamin C (ascorbic acid, calcium and niacinamide ascorbates)	470 mg
Vitamin D3 (cholecalciferol)	(2,000 IU) 50 mcg
Vitamin E (D-alpha tocopheryl succinate, D-alpha tocopherol)	67 mg
Vitamin E (gamma, delta, alpha, beta tocopherols)	20 mg
Iodine (potassium iodide)	150 mcg
Magnesium (magnesium oxide)	100 mg
Zinc (zinc citrate, L-OptiZinc [®] zinc mono-L-methionine sulfate)	25 mg
Manganese (manganese citrate, gluconate)	2 mg
Chromium [Crominex [®] 3+ chromium stabilized with Capros [®] amla extract (fruit), PrimaVie [®] Shilajit]	200 mcg
Molybdenum (amino acid chelate)	100 mcg
Inositol	50 mg
Alpha lipoic acid	25 mg
Bio-Quercetin[®] Proprietary Blend providing 35% quercetin (5 mg) [from Japanese sophora concentrate (flower bud)], 30% galactomannans (4 mg) [from fenugreek (seed)]	14 mg
Marigold extract [std. to 5 mg <i>trans</i> -lutein, 155 mcg <i>trans</i> -zeaxanthin]	11.12 mg
Apigenin	5 mg
Boron (boron amino acid chelate)	3 mg
Lycopene [Lycobeads [®] natural tomato extract (fruit)]	1 mg
Selenium [as sodium selenite, SelenoExcell [®] high selenium yeast, Se-methyl L-selenocysteine]	200 mcg

[^] RAE (retinol activity equivalents). [°] DFE (dietary folate equivalents). [•] NE (niacin equivalents).

For complete list of ingredients and dosages, visit www.LifeExtension.com

Good Things Come in Twos

Two-Per-Day Multivitamin Tablets

Item #02315 | 120 tablets
1 bottle \$18.38
4 bottles \$16.25 each

Two-Per-Day Multivitamin Capsules

Item #02314 | 120 capsules
1 bottle \$19.13
4 bottles \$17 each

Each bottle provides a two-month supply.

For full product description and to order
Two-Per-Day Multivitamin,
call 1-800-544-4440 or visit www.LifeExtension.com

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.

[†] Ratings based on results of the 2024 ConsumerLab.com Survey of Supplement Users. More information at www.consumerlab.com/survey.

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



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22 ZINC IMPROVES GLUCOSE CONTROL

Meta-analyses found that **zinc** supplementation *improved* fasting **glucose**, **A1c**, **insulin resistance**, and **C-reactive protein**.



32 PROBIOTIC DEFENSE AGAINST GUM DISEASE

In a clinical trial, a **probiotic** *inhibited* harmful **oral bacteria**, *reduced* **gum bleeding**, and **plaque buildup**. Plus, a **postbiotic** clinically *reduced* **periodontal pockets**.

44 SYSTEMIC EFFECTS OF OLIVE OIL

Extra virgin **olive oil** is associated with *decreased* risks of **dementia**, **cardiovascular** disease, and **non-alcoholic fatty liver**, along with *improved* **cognitive function**.



56 VITAMIN B12 BLOOD LEVELS AND BRAIN AGING

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63 EXTENDING THE ROLE OF VITAMIN E

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