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April 2025

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# High Risk of Low Magnesium



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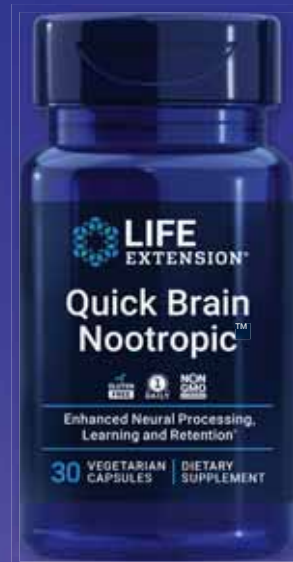
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# Magnesium Disorders



WILLIAM FALOON



In **2024**, the *New England Journal of Medicine* published a review describing the role of **magnesium** in health maintenance, and as an adjunctive **treatment** for certain diseases.<sup>1</sup>

The title of the review is “**Magnesium Disorders.**”

This might at first cause people to think it refers to **toxicity**.

Instead, it describes the *delays* by **conventional medicine** in recognizing magnesium’s multiple benefits.

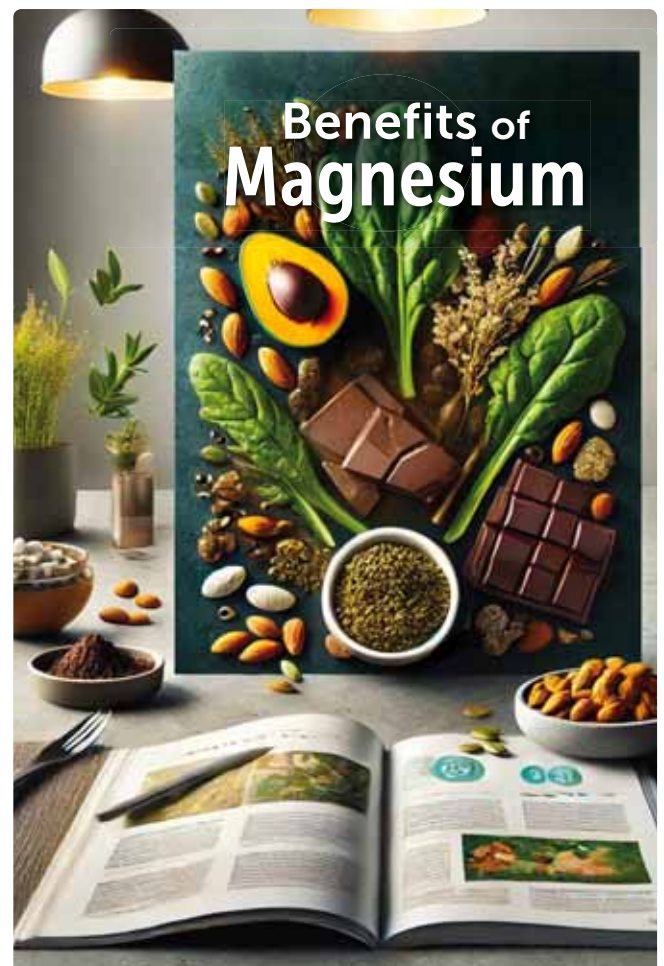
It opens with revelations made around year **1980** in which magnesium was described as a “**forgotten electrolyte**” and “**nature’s...calcium blocker**” in soft tissues.

Reasons given for the under-appreciation of magnesium’s **clinical significance** include the lack of **information** regarding the many **biological processes** that rely on magnesium.

This prestigious review focused on discoveries about how magnesium functions in the body, and on widespread magnesium deficits.

It noted that excess magnesium is rare and occurs primarily in patients with kidney disease receiving magnesium-retaining drugs.

On the next page I provide a summary of this medical publication.





**Magnesium** is present in all cells in all organisms from plants to higher mammals.

It is indispensable because it is an essential cofactor for cellular **energy** production.

Magnesium is also a cofactor for hundreds of *enzymatic* reactions in every cell type.

Magnesium has been shown to help regulate glucose, lipids and protein metabolism. It is involved in the control of neuromuscular function, regulation of cardiac rhythm, modulation of vascular tone, hormone secretion, bone density, and brain functions.

### ***New England Journal of Medicine*** **Review of Magnesium**

The journal published an extensive review to educate practicing doctors about magnesium. The **16** bullet points below summarize important data and their clinical significance:

- **Impact on Vascular Health:**  
Magnesium influences vascular health by preventing vascular calcification, maintaining endothelial function, and modulating vascular tone.
- **Essential Cofactor for ATP:**  
Magnesium is crucial as a cofactor for ATP, the primary energy source in cells. Magnesium is involved in over 300 *enzymatic* reactions including DNA and RNA synthesis.
- **Intracellular Regulation:**  
Magnesium regulates cellular processes, including neuromuscular function, cardiac rhythm, vascular tone, hormone secretion, and receptor modulation in the central nervous system.

- **Magnesium and Cardiovascular Health:**  
Low magnesium levels are linked to increased cardiovascular risk, including hypertension, arrhythmias, and endothelial dysfunction.

- **Associated Disorders:**  
Magnesium deficiency is associated with low potassium and calcium levels, whereas severe deficiency is associated with metabolic disorders, contributing to neuromuscular irritability and cardiovascular abnormalities.

- **Dietary Sources and Absorption:**  
Rich dietary sources include cereals, beans, nuts, and green vegetables, with **30%-40%** of dietary magnesium absorbed in the intestine.

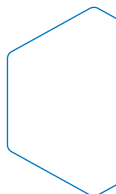
- **Bone Storage:**  
Bones store **60%** of the body's magnesium, serving as a reservoir to maintain plasma concentration, and influence not only bone health and formation but metabolism, nervous system function, and more.

- **Genetic Causes of Low Magnesium:**  
Genetic mutations affecting magnesium transporters can lead to magnesium deficit, which can sometimes be severe.

- **Drug-Induced Magnesium Deficits:**  
Drugs like proton-pump inhibitors, immune-suppressing drugs used to manage autoimmune disorders, and certain chemotherapeutics cause low magnesium by inducing renal magnesium wasting.

- **Therapeutic Use:**  
Magnesium sulfate is used therapeutically (in IV solutions) for conditions such as ventricular tachycardia, severe asthma exacerbations, and preeclampsia or eclampsia.

- **Symptoms of Magnesium Deficiency:**  
Patients with hypomagnesemia often present with nonspecific symptoms, such as lethargy, muscle cramps, or muscle weakness, and thus the diagnosis of magnesium deficiency may be overlooked.



- **Role in Bone Health:**

High magnesium intake increases bone mineral content, reducing the risk of fractures and osteoporosis. It influences bone formation by activating osteoblasts and osteoclasts.

- **Non-Drug Causes of Magnesium Loss:**

Increased loss of magnesium can occur due to gastrointestinal conditions like chronic diarrhea, inflammatory bowel disease, alcohol abuse and chronic kidney diseases.

- **Magnesium's Role in Diabetes:**

Hypomagnesemia is commonly observed in patients with type II diabetes, linked to insulin resistance and increased urinary excretion.

This 2024 published review concluded with the following:<sup>1</sup>

- Hypomagnesemia is common in hospitalized patients and is a risk factor for a prolonged ICU stay.
- Hypomagnesemia should be corrected with magnesium replacement therapy.
- Although there is still much to be learned about magnesium, the field has advanced, and clinicians should be more attuned to the importance of magnesium in clinical medicine.

### What the *New England Journal of Medicine* Did Not Discuss

This review educated physicians about magnesium's multiple mechanisms, the diseases that it helps treat, and the disorders in which magnesium deficit is a contributing factor.

Omitted was a strong recommendation for healthy people to ingest enough magnesium to avoid deficiencies.

A significant portion of adult Americans are **magnesium deficient**. Estimates suggest that around **60%** consume less than the recommended amount, and about **45%** may have a clinically relevant deficiency.<sup>2</sup>

Prevalence of magnesium deficits is *higher* in specific populations such as those with chronic illnesses or those hospitalized. Some data suggest **>65%** of ICU patients suffer from low magnesium (hypomagnesemia).<sup>1</sup>

I wonder how many more people might survive an extended stay in the **intensive care unit (ICU)** if widespread magnesium optimization were utilized?

The review briefly mentions that “**Mild hypomagnesemia is managed with oral supplements.**”

But the review highlights a common side effect, **diarrhea**, as a challenge that affects some people who consume too much magnesium on an empty stomach.

Instead of recommending most people slowly increase their supplemental magnesium intake, it described pharmaceutical interventions (including magnesium infusions and off-label drugs) to optimize magnesium levels in resistant cases.

We think this impressive *NEJM*-published review should have featured a public health **alert** for most people to consider taking a low-cost **magnesium supplement**. Perhaps the authors made this recommendation, but it was edited out of the final *NEJM* published copy?



## What was Omitted from the *NEJM* Review?

As comprehensive as the *NEJM* review was, it omitted a few biological processes as follows:

- Magnesium plays a role in the body's response to stress, influencing adrenal hormone regulation and overall stress resilience.<sup>3-5</sup>
- Magnesium helps prevent age-related muscle loss. Magnesium deficiency can lead to muscle weakness.<sup>6</sup>
- Adequate magnesium levels are essential for maintaining cognitive function and preventing neurodegenerative diseases.<sup>7</sup>
- Improving magnesium status can help improve a wide range of persistent disorders.

## Validating the Pioneers

In 1980, Dr. Mildred Seelig published extensive research on magnesium, highlighting its **cardiovascular** benefits and the potential risks associated with its deficiency. Her research and tireless advocacy brought attention to the need for adequate **magnesium** intake and supplementation.<sup>8</sup>

By the early 2000s, the **National Institutes of Health** (NIH) began including magnesium supplementation in their dietary guidelines and recommendations,<sup>9</sup> especially for populations at higher risk of deficiency.

When writing this editorial, I initially overlooked that we wrote about Dr. Seelig's pioneering work in the early 1980s. I highlight her name "**Mildred Seelig**" here because she is one of many **medical pioneers** forgotten with time.

Dr. Seelig's early research was the genesis for many people supplementing with **magnesium** today...and more doctors are utilizing it in their medical practice.

I hope **Life Extension**® readers feel a sense of **vindication** as research continues to support the value of obtaining enough **magnesium** in one's diet and/or supplements.

For longer life,



William Faloon, Co-Founder  
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(2,520 mg of EPA + DHA in four softgels)

Item #01988 • 120 softgels

1 bottle **\$40.50**

4 bottles \$37 each



**SUPER OMEGA-3**  
EPA/DHA Fish Oil,  
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"Been using this for years. Love it."

**Gail**

VERIFIED CUSTOMER REVIEW



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Clinical evidence demonstrates that the nutrients in **DNA Protection Formula** help preserve healthy DNA by supporting the body's defenses against environmental toxins.

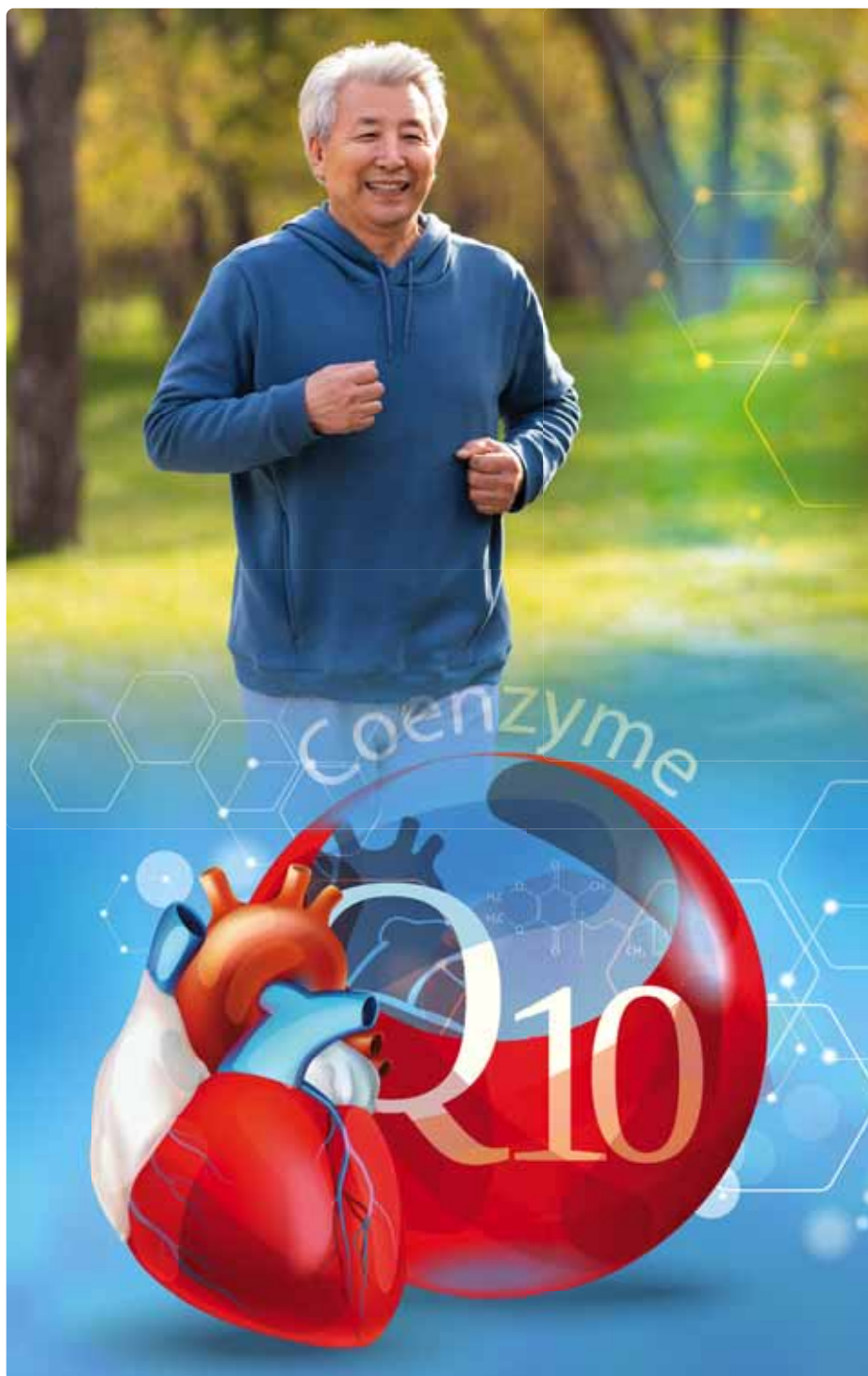
Ingredients in **DNA Protection Formula** include:

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- Chlorophyllin
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# In the News



## CoQ10 Reduces Heart Failure-Related Mortality

Clinical trials that evaluated **CoQ10** in heart failure patients found that it **improved** exercise capacity and survival.\*

A systematic review and meta-analysis included 16 randomized controlled trials that evaluated CoQ10's effect on mortality, exercise capacity, or left ventricular ejection fraction in people with **heart failure**.

Among the eight trials that evaluated mortality, there were **65** deaths among the 1,049 participants who received **CoQ10** and **116** deaths among 1,087 participants who received a **placebo**, resulting in a **40% lower** risk of premature mortality among those who received CoQ10.

Among the five trials that evaluated exercise capacity the results showed that CoQ10 supplementation resulted in significant **improvements** compared to placebo.

**Editor's Note:** There was no significant improvement in left ventricular ejection fraction in the group that received CoQ10 compared to the placebo, suggesting that CoQ10 may benefit people with heart failure through mechanisms other than increasing ejection fraction.

\* *Future Cardiol.* 2024 Mar 11;20(4): 221-228.

## Coffee, Tea, Caffeine May Protect Against Multiple Diseases

A study in the *Journal of Clinical Endocrinology & Metabolism* found that consuming moderate amounts of caffeine, tea and coffee was associated with a reduced risk of developing cardiometabolic multimorbidity, which was defined as having at least two of three diseases: coronary heart disease, stroke, or type II diabetes.\*

Researchers analyzed data from 188,091 UK Biobank participants to determine the relationship between coffee and tea intake and the risk of developing cardiometabolic multimorbidity. A similar analysis of 172,315 UK Biobank participants evaluated the effects of caffeine intake on cardiometabolic multimorbidity risk.

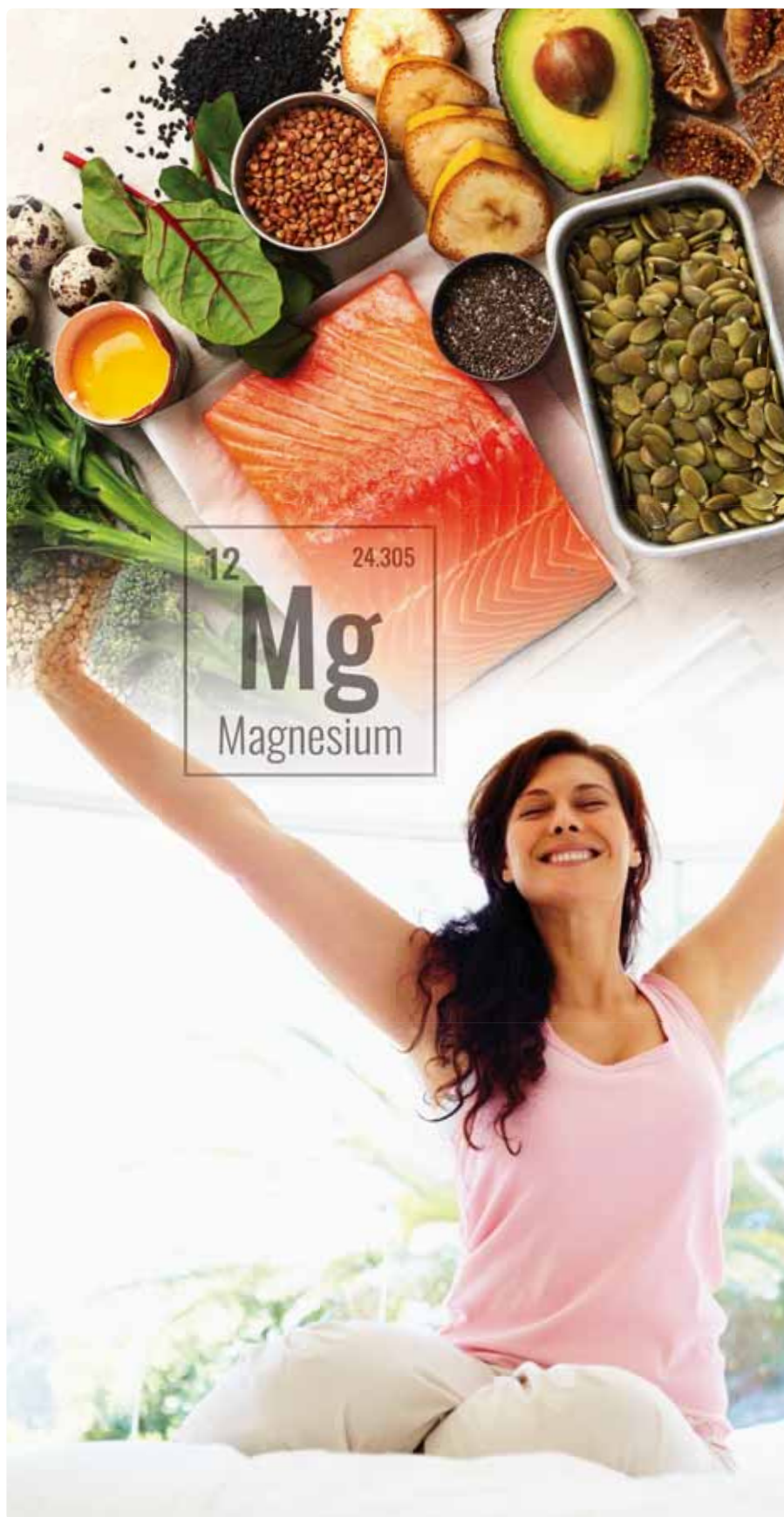
All amounts of coffee or caffeine intake were associated with a lower risk of developing cardiometabolic diseases during follow-up. Moderate caffeine intake, defined as **200–300 mg** caffeine per day, was associated with a **40.7% lower** risk of new onset cardiometabolic multimorbidity compared with consuming less than **100 mg** caffeine.

**Editor's Note:** Drinking three cups of coffee daily was associated with a **48.1%** lower risk of developing cardiometabolic diseases than not drinking coffee, the researchers found.

\* *J Clin Endocrinol Metab.* 2024 Sep 17:dgae552.







## Magnesium-L-Threonate Improves Sleep Quality, Daytime Alertness

**Sleep** quality and daytime functioning significantly **improved** among people who received a type of magnesium known as magnesium-L-threonate, compared with a placebo, a randomized, double-blind, placebo-controlled, parallel-arm study found.\*

The study included 80 men and women, aged 35-55, who reported poor sleep quality. For 21 days, 40 participants received **1,000 mg** magnesium L-threonate per day, and 40 subjects received a placebo. Sleep quality and daytime mood and activity were assessed weekly using questionnaires, and daily by means of diaries, and wearable sleep and activity trackers.

Compared to those receiving a placebo, the magnesium-L-threonate-supplemented individuals had better **deep sleep** and rapid eye movement (REM) sleep scores. They also reported improvements in behavior after waking, with better mood and mental alertness compared with the placebo group.

**Editor's Note:** Daily diary entries documented better perceived energy and daytime productivity.

\* *Sleep Med X*. 2024 Aug 17;8:100121.

## 40% of Cancer Cases and 44% of Cancer Deaths Attributed to Avoidable Risk Factors

A study led by American Cancer Society researchers found that in 2019, **40%** of cancer cases and **44%** of cancer deaths in adults 30 years and older in the U.S. were attributed to potentially modifiable risk factors.\*

The researchers examined data for 30 cancer types from 1,781,649 men and women aged 30 years and older, in 2019. The risk factors evaluated included smoking, second-hand smoke exposure, excess weight, alcohol intake, dietary factors, physical inactivity, ultraviolet radiation, and more.

Smoking cigarettes was the **number one** avoidable cancer risk factor, which was associated with **19.3%** of cancer cases and **28.5%** of cancer deaths. Being overweight was associated with **7.6%** of cancer cases and **7.3%** of cancer deaths.

**Editor's Note:** "For 19 of 30 evaluated cancer types, more than one half of the cancer cases and deaths were attributable to the potentially modifiable risk factors considered in this study," the researchers stated.

\* *CA Cancer J Clin.* 2024 Sep-Oct;74(5):405-432.





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**Marcia**

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REVIEW

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\* *Biomed Pharmacother.* 2016(3);78:50-9.



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

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# Support Vaginal Health with PROBIOTICS

BY LAURIE MATHENA

The **gut microbiome** contains bacteria that are critical for overall health.

For women, the presence of healthy bacteria is just as critical for ***gynecological health***.

An unhealthy mix of bacteria (dysbiosis) increases a woman's risk of **bacterial vaginosis** and **yeast infections** ("vaginal candidiasis").<sup>1</sup>

Vaginal candidiasis globally impacts over **138 million** women every year.<sup>2</sup>

Scientists have identified two strains of ***Lactobacillus* bacteria** that, taken orally, can help maintain vaginal health.

One strain helps improve the composition of the vaginal microbiome<sup>3</sup> and **reduces** symptoms in women prone to recurrent **yeast infections**.<sup>3,4</sup>

A second bacterial strain adds support for **immune health** and can ease **gastro-intestinal symptoms** that often accompany menstruation.<sup>5-7</sup>

Together, these two **probiotics** can help support a woman's unique health needs.

## The Vaginal Microbiome

Many people are familiar with using **probiotics** to improve their gut microbiome. Probiotics, taken orally, can also be used to balance the **vaginal microbiome** for improved gynecological health.

Bacteria of the *Lactobacillus* genus are the most abundant types in a healthy vaginal microbiome.<sup>8</sup> One of their jobs is to produce lactic acid, which protects **vaginal health** by reducing pathogens and blocking the spread of harmful organisms.<sup>1,8,9</sup>

If levels of *Lactobacillus* decline, unhealthy yeast like *Candida albicans* and harmful bacteria like *Gardnerella vaginalis* can grow unchecked. This can lead to **vaginal dysbiosis**,<sup>9</sup> when unhealthy pathogens outnumber healthy microflora.

This imbalance can result in **bacterial vaginosis**, an infection that may cause unusual vaginal discharge, strong odor, itching, and burning during urination.<sup>10</sup> It can also increase the risk of **sexually transmitted diseases** and **fertility problems**.<sup>1,9,10</sup>

An overgrowth of *C. albicans*, in particular, results in vaginal **yeast infections**, which often cause symptoms including pain during urination or sex, swelling and redness, abnormal vaginal discharge, and itchiness.

It is estimated that over **138 million** women annually suffer from recurrent **yeast infections**.<sup>2</sup> And as many as **29%** of women ages 14 to 49 have **bacterial vaginosis**.<sup>1</sup>

Supporting healthy vaginal microbiomes could help protect against these types of infections.<sup>4,9</sup>

## Restore Healthy Vaginal Flora

Researchers have developed a strain of **probiotics** specifically designed to restore healthy bacterial flora in the vaginal microbiome and promote **vaginal health**.

In a preclinical study, the strain, *Lactobacillus plantarum* P17630, has shown the ability to adhere to the vaginal wall and inhibit the adhesion of *Candida* yeast in a competitive manner.<sup>11</sup>

It has also been studied clinically in multiple settings for women's health, displaying its ability to adhere to vaginal cells and maintain vaginal health.<sup>12,13</sup>

This can allow healthy, protective strains of bacteria to flourish.<sup>13</sup>

In a small **clinical trial**, participants received *L. plantarum* P17630 orally for 60 days. After 30 days *L. plantarum* P17630 successfully colonized the vagina of **80%** of the participants and led to an improvement in the vaginal microbiome; the colonization was observed even after 15 days of a washout period.<sup>3</sup>

A separate study of women with recurrent yeast infections demonstrated that taking *L. plantarum* P17630 orally for three treatment cycles—each consisting of 15 days of supplementation followed by a 15-day washout period—resulted in improvements in vaginal flora. Significant improvement was observed after the first cycle, and after 90 days, a remarkable **95%** improvement in healthy vaginal flora levels was achieved. This improvement was also associated with a reduction in clinical symptoms such as redness, swelling, and discharge.<sup>4</sup>

Compared to a placebo, it significantly decreased the severity of two main symptoms of yeast infections, vaginal **redness** and **swelling**.

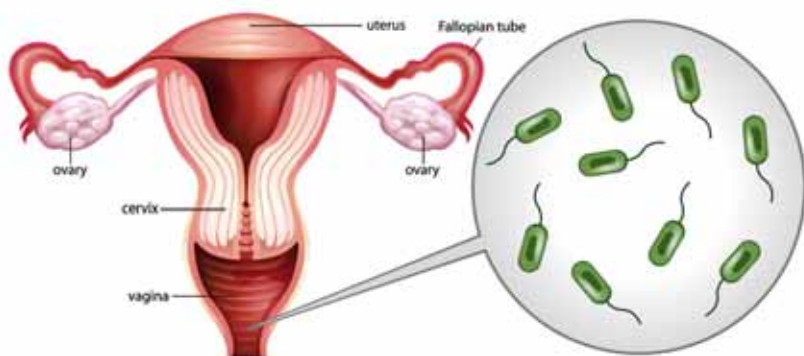
## Gastrointestinal Support

**Gut health** is another major concern for women.

Up to **73%** of women experience at least one gastrointestinal symptom, such as abdominal pain or diarrhea, before or during **menstruation**.<sup>14</sup> Women also have higher rates of **irritable bowel syndrome** than men.<sup>15</sup>

In preclinical studies, another *Lactobacillus* species, *L. helveticus*, has been shown to inhibit growth of pathogens such as *Listeria*,<sup>16</sup> *Candida*,<sup>17</sup> and *E. coli*,<sup>7</sup> in the gastrointestinal

## Bacterial Vaginosis (BV)



Bacterial Vaginosis (BV) is caused by an imbalance of bacteria in the vagina. It can cause symptoms such as strong odor, vaginal discharge and itching or burning.





What You  
Need  
To Know

## Probiotics For Women's Health

- Millions of women suffer from **vaginal dysbiosis**, an imbalance of good and bad bacteria, which increases the risk of yeast infections, bacterial infections, and sexually transmitted diseases.
- ***Lactobacillus plantarum P17630*** is an oral probiotic strain that can help prevent the spread of harmful organisms within the vagina and promote a well-balanced vaginal microbiome.
- ***L. plantarum P17630*** reduces the growth of organisms like *Candida* that contribute to vaginal **yeast infections**. In a clinical study, it decreased symptoms of yeast infections, including redness and swelling.
- A second *Lactobacillus* strain, ***L. helveticus L10***, has been shown to improve gastrointestinal symptoms often associated with menstruation and to enhance immune function.
- Together, these probiotic strains help support women's **vaginal, digestive, and immune health**.

tract and vagina, and to enhance immune function<sup>18</sup> and reduce **inflammation**.<sup>19</sup> These pathogens have the potential to cause a variety of gastrointestinal and flu-like symptoms.

In a clinical study, ***L. helveticus L10*** significantly improved **gastrointestinal symptoms** such as diarrhea, crampy abdominal pains, constipation, and flatulence in two weeks.<sup>20</sup>

### Enhanced Immune Response

Another benefit that has been demonstrated with *L. helveticus* supplementation is that it has significantly improved **immune function** in studies with ordinary human subjects and in fatigued athletes. Intense training can impair immune function, which can increase the risk of **upper respiratory tract infections**.

In one study, the strain ***L. helveticus L10*** was given to healthy and fatigued athletes. Fatigued athletes had signs of recurrence of viral infections (sore throats, and impaired performance) and reduced **interferon gamma** (an immune regulatory protein from T cells).<sup>21</sup>

After one month, *L. helveticus* administration resulted in a stunning **311%** increase in **helper T cells** in the fatigued athletes as compared to the beginning of the study.<sup>21</sup> These are critical immune cells that help defend against viruses, bacteria, and even cancer.

In a separate placebo-controlled study of elite athletes, taking *L. helveticus* L10 daily for 14 weeks during winter reduced the **duration** of upper respiratory tract infections by **3.4 days** and decreased the **severity** of symptoms.<sup>5</sup>

In another trial in elite athletes, 14 weeks of supplementation with *L. helveticus* L10 helped preserve **immunoglobulin A (IgA)**, an antibody that helps protect the body from infections.<sup>6</sup>

This indicates that *L. helveticus* L10 enhances the **immune response**, which helps support respiratory health<sup>5,6</sup> and fight gut infections.<sup>21</sup>

A combination of *L. helveticus* L10 and *L. plantarum* P17630 can support women's vaginal, gastrointestinal, and immune health.

## Summary

Women frequently suffer from **vaginal dysbiosis**, an imbalance of bacteria that increases the risk of yeast infections, bacterial infections, and sexually transmitted diseases.

Taken orally, the probiotic strain *Lactobacillus plantarum* P17630 can improve the composition of the **vaginal microbiome** and reduce symptoms like redness and swelling in women prone to **yeast infections**.

A second *Lactobacillus* strain, *L. helveticus* L10, has been shown to boost **immune function** and **gut health** by inhibiting harmful bacterial overgrowth, promoting protective antibodies, and fighting inflammation.

Together, these strains of healthy bacteria provide comprehensive support for a woman's health needs. ●

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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a woman needs.

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# Female- Targeted Probiotic

**Vaginal, Digestive,  
and Immune Support**



**Item #02505**

30 vegetarian capsules

1 bottle **\$24** • 4 bottles \$22 each

Contains soybeans.

For full product description  
and to order **FLORASSIST®  
PROBIOTIC Women's Health**,  
call 1-800-544-4440 or visit  
[www.LifeExtension.com](http://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.



# DISCOVER PMS Relief



Daily PMS Relief is a nutrient blend designed to help relieve premenstrual syndrome (PMS) symptoms.

This formula includes a **ginger extract**, standardized to contain at least **26% gingeroids**—five times the amount in standard ginger.

In a clinical study, taking **200 mg** of this extract daily resulted in an average **84% reduction** in menstrual-cramp discomfort score.

It also eased period-related nausea, fatigue, and low back pain.<sup>1</sup>

**Magnesium** and **vitamin B6** are included in this nutrient blend.

Taken together daily, in clinical studies, the combination helped alleviate PMS related irritability and mood swings.<sup>2,3</sup>

#### References

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**Item #02537**  
60 vegetarian capsules  
1 bottle **\$15**  
4 bottles \$13.50 each

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

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# FEED YOUR BRAIN

## Neuro-Mag<sup>®</sup> Magnesium L-Threonate

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

**Rusty**

VERIFIED CUSTOMER REVIEW



### SUPPORTS OVERALL COGNITIVE ABILITY

Neuro-Mag Magnesium L-Threonate helps maintain working (short-term) memory, encourages healthy processing speed, and supports overall cognitive function.<sup>1,2</sup>



Item #01603 • 90 vegetarian capsules  
1 bottle **\$31.50** • 4 bottles \$28.50 each



Item #02032 • 93.35 grams of powder  
1 jar **\$31.50** • 4 jars \$28.50 each

For full product description and to order **Neuro-Mag<sup>®</sup> Magnesium L-Threonate** or **Neuro-Mag<sup>®</sup> Magnesium L-Threonate Powder**, call **1-800-544-4440** or visit **www.LifeExtension.com**

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

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# The High Risks of LOW MAGNESIUM





BY MICHAEL DOWNEY

**Magnesium** is required for the function of over **300 enzymes** in the body.<sup>1,2</sup>

A **deficiency** of this mineral has been tied to increased risk for body-wide health conditions including osteoporosis,<sup>3,4</sup> cardiovascular and metabolic disease,<sup>3-5</sup> cognitive decline,<sup>4</sup> and **dementia**.<sup>4</sup>

It's estimated that about **60%** of Americans don't get enough magnesium from their diet,<sup>6</sup> making supplementation important for many individuals.<sup>7</sup>

The potential benefits can be enormous:

- In an observational study, men with a *higher* intake of magnesium had a **41% lower stroke risk** compared to those with a lower intake.<sup>8</sup>
- In a prospective study, older women with *higher* magnesium intake had a **12% reduced** risk of **frailty** as compared to those with the lowest intake.<sup>9</sup>

- In another prospective study of adults with or at risk for osteoporosis, women with the *highest* dietary magnesium intake **reduced** their **fracture risk** by up to **62%**; in men this risk was reduced by **53%**.<sup>10</sup>

- In people with or at risk for type II diabetes, taking magnesium **improved glucose control**<sup>11-13</sup> and **insulin sensitivity**.<sup>11,14</sup>

- In a clinical trial of individuals with metabolic syndrome and low magnesium levels, supplementation with magnesium significantly **reduced** multiple **cardiovascular risk factors** in a clinical trial.<sup>15</sup>

These favorable **human** data have caused **magnesium supplementation** to surge upward in recent years.

## Magnesium Deficits

In the U.S., about **45%** of the overall population are magnesium deficient.<sup>6,16</sup>

This poses serious health risks.<sup>6,7,17</sup> Magnesium has been shown to:

- Facilitate **cellular energy** production,<sup>17,18</sup>
- Support **DNA** synthesis and repair,<sup>3,19</sup> and
- Counter chronic **inflammation**.<sup>20,21</sup>

Multiple body systems and functions *depend* on adequate magnesium and suffer when **deficiency** occurs.<sup>17,22</sup>

## Cardiovascular Effects

Blood levels of **magnesium** are strongly associated with **cardiovascular risk**.<sup>23,24</sup>

An epidemiological study of 3,523 men aged **60-79**, with no prior history of cardiovascular disease, found that **heart failure** risk declined with rising **magnesium** levels, particularly in men who were at a higher risk of ischemia.<sup>25</sup>

Higher magnesium consumption is also associated with lower **stroke risk**. One observational study found that men in the top **30%** of magnesium intake had a **41% reduction** in stroke risk compared to those in the bottom **10%** of magnesium intake.<sup>8</sup>

Magnesium helps regulate blood pressure by a variety of mechanisms, including improving **dilation** of blood vessels.<sup>26</sup> In one intervention study of patients with essential hypertension, **300 mg** magnesium supplementation for a month resulted in a significant reduction in both **systolic** and **diastolic blood pressure**.<sup>27</sup>

A meta-analysis of seven randomized controlled clinical trials found that magnesium supplementation improved **endothelial function**,<sup>28</sup> a critical determinant of vascular health and overall cardiovascular risk.<sup>29</sup>

A meta-analysis of human trials found that **300 mg** per day of magnesium supplementation for a duration of one month in hypertensive patients reduced **systolic** and **diastolic blood pressure**.<sup>30</sup>

Patients with low magnesium levels are more susceptible to **arrhythmias** (irregular heartbeat).<sup>31,32</sup> Magnesium deficiency is common among individuals with congestive heart failure or those undergoing diuretic therapy. Magnesium supplementation helps maintain normal heart rhythm in high-risk individuals.<sup>7</sup>

In a clinical study of adults with **metabolic syndrome** and magnesium deficiency, taking magnesium significantly improved multiple parameters of **metabolic disease** and **cardiovascular complications**, including blood pressure, fasting glucose, triglycerides, and HDL (“good”) cholesterol.<sup>15</sup>

## Promoting Brain Health

In the **brain**, magnesium plays key roles in **cognitive function**, including learning and memory.<sup>33,34</sup>

In adults aged 50-70 years with **cognitive impairment**, one form of magnesium, **magnesium threonate**, *improved* overall cognitive ability. By the end of a 12-week randomized trial, magnesium supplementation improved measures of **brain aging** by **nine years**.<sup>35</sup>

In another trial of patients with mild to moderate **dementia**, magnesium led to improvements in **cognitive function** after 12 weeks. Increased levels of magnesium in red blood cells were also associated with improvement in **executive function** (which includes mental skills like problem-solving and organizing) and overall cognition in some patients.<sup>36</sup>



## Blood Sugar Control

Many enzymes that rely on **magnesium** are involved in **insulin** function and the metabolism of **blood glucose**.<sup>2,5,37</sup>

Observational studies show that the **lower** the dietary **magnesium** intake, the **higher** the risk of developing **diabetes**.<sup>5,37,38</sup>

In clinical studies of people with **type II diabetes** or at high risk of developing it, taking **magnesium**:

- Improved control of **glucose** and **A1C** (which measures glucose levels over time),<sup>11-13</sup>
- Enhanced **insulin sensitivity**,<sup>14</sup> and
- Positively affected metabolic pathways.<sup>39</sup>

These effects may reduce damage inflicted by type II diabetes *and* help delay its development.

## Stronger Bones

**Magnesium** is necessary for **bone remodeling**, the process by which old bone is broken down and new bone is formed.<sup>40,41</sup>

This explains why about **half** of all magnesium in the body is stored in the bones.<sup>3</sup>

Magnesium deficiency is associated with a **decrease** in bone mass and an increase in inflammation and tissue damage, which can lead to **osteoporosis**.<sup>2,41</sup>

In a prospective study of **3,765** participants ranging from 45 to 79 years old, those with the highest magnesium intake reduced their **fracture risk** over eight years by **53%** for men and **62%** for women.<sup>10</sup>

The benefits of magnesium are evident throughout the body.

## Summary

**Magnesium** promotes health throughout the body, and a **deficiency** increases the risk of chronic health problems.

Higher magnesium intake or blood levels have been shown to improve **cardiovascular health**, reduce **stroke risk**, enhance **cognitive function**, improve **blood sugar** regulation, and strengthen bones. ■



What You  
Need  
To Know

## The Importance of Magnesium

- **Magnesium** plays critical roles throughout the body and is required for over **300** enzymatic reactions.
- Most Americans do not get enough magnesium, placing them at higher risk for cardiovascular disease, type II diabetes, and other **chronic diseases**.
- Magnesium intake has been shown to improve cognition, support cardiovascular and metabolic health, lower stroke risk, improve insulin sensitivity and glucose control, and promote bone strength.

## Different Forms of Magnesium

All forms of magnesium are absorbed in the body. The key to maintaining optimal magnesium levels is regular supplementation and adherence to the recommended dosage on the product label. Oral magnesium comes in many different forms, including the following:

- **Magnesium glycinate** combines magnesium with the amino acid glycine,<sup>42</sup> enhancing its stability and solubility.<sup>43</sup> This compound is easily absorbed in the small intestine, is well tolerated and is associated with fewer gastrointestinal side effects.<sup>44</sup> Magnesium glycinate is a good option for those who have gastrointestinal distress with other forms.
- **Magnesium citrate** is more soluble than magnesium oxide,<sup>47</sup> which allows for quick release in a form that is readily absorbed for shorter-term benefits.
- **Magnesium oxide** is less soluble than magnesium citrate but contains a higher percentage of elemental magnesium per single dose.<sup>45</sup> It is commonly used for maintaining bowel regularity by people with chronic constipation and for supporting healthy magnesium levels.<sup>46</sup>

- **Magnesium L-threonate** has demonstrated brain health benefits in adults with cognitive dysfunction.<sup>35</sup>
- **Magnesium acetyl taurate** is rapidly absorbed in the body and has been shown to help manage anxiety.<sup>48,49</sup>
- **Magnesium carbonate** has been shown to help relieve gastrointestinal symptoms such as heartburn and constipation.<sup>50</sup>

Some forms, such as magnesium citrate and glycinate, offer high solubility, making them ideal for delivering a lower dose of elemental magnesium in a single dose. Other forms offer a higher concentration of elemental magnesium in a single dose, making it desirable for multi-ingredient products that aim to deliver higher concentrations of elemental magnesium without increasing the number of pills.<sup>45</sup>



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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## The Importance of Taking Vitamin D with Magnesium

Magnesium and vitamin D are linked in the following ways:

- **Vitamin D** supports optimal **absorption** of magnesium in the intestines.<sup>1,17,51</sup>
- **Magnesium** is required for **vitamin D activation**. Vitamin D must be converted into its active, useful form in the body by enzymes that require magnesium.<sup>1,17</sup>
- **Vitamin D transport** to tissues relies on the vitamin D-binding protein, which requires magnesium to function.<sup>1</sup>

If *either* nutrient is lacking, the other suffers as well. It's vital to get enough of both.

# THINK ZiNC

FOR IMMUNE HEALTH

You know zinc is good for you—  
but are you getting enough?

Zinc promotes critical **immune** functions  
and healthy **bones**.

This formula provides **50 mg** of zinc in a  
convenient, vegetarian capsule.



Item #01813

50 mg • 90 vegetarian capsules

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**Caution:** Supplemental zinc can inhibit the  
absorption and availability of copper. If more  
than 50 mg of supplemental zinc is to be  
taken daily for more than four weeks, 2 mg of  
supplemental copper should also be taken to  
prevent copper deficiency.

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

OptiZinc® is a Lonza trademark, registered in the USA.

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.



Some Things  
Get Better With Age

Aged  
**Black  
Garlic**  
FOR HEART HEALTH



**Black garlic** is created through a patent-pending, solvent-free aging process that can take up to 90 days.

This produces a high content of s-allyl-cysteine, a phytochemical associated with **cardiovascular** health.<sup>1-4</sup>

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



**Item #02530**

30 500 mg vegetarian capsules

1 bottle **\$18**

4 bottles \$17 each



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

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# Feeling Fatigued and Forgetful?



A healthy thyroid gland helps keep overall metabolism running smoothly, including the burning of fat for energy.<sup>1-3</sup>

#### Thyroid Support Complex:<sup>4</sup>

- Helps maintain already healthy thyroid hormone levels.
- Supports healthy thyroid activity and function.
- Encourages healthy metabolism and body weight.
- Promotes energy, motivation and concentration.

#### References

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Item #02003  
60 capsules  
1 bottle **\$26.25**  
4 bottles \$23.25 each



**CAUTION:** If you have a thyroid condition or are taking antithyroid medications, do not use without consulting your healthcare practitioner.

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GS15-4™ is a trademark of ILHWA N.A.

For full product description and to order **Thyroid Support Complex**,  
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"One of my main daily 'go to' supplements."

**Lew**

VERIFIED CUSTOMER REVIEW

# Get MORE Vitamin D

For a strong immune system, bones and heart, you need the sunshine vitamin. Most people don't get enough from their diet or time outdoors.

Good thing there's Life Extension® Vitamin D3.

For full product description and to order **Vitamin D3**, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)



Item #01713  
125 mcg (5000 IU)  
60 softgels

1 bottle \$7.50

4 bottles \$6.50 each

**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.



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.

# HIGHLY ABSORBABLE ASTAXANTHIN

*Supports Whole-Body Health*

**ASTAXANTHIN** is a carotenoid that benefits the eyes, immune system and cognitive functions. Research suggests that astaxanthin can play a role in promoting cardiovascular health.<sup>1-4</sup>

Found naturally in seafood and algae, as little as **50% of astaxanthin** is normally **absorbed** in the blood-stream.<sup>5</sup>

**Life Extension** combines **4 mg of astaxanthin** with a blend of four different **phospholipids**, which has been shown to enhance carotenoid **absorption by several-fold**.<sup>5</sup>

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For full product description and to order **ASTAXANTHIN 4 mg with Phospholipids**, call **1-800-544-4440** or visit **www.LifeExtension.com**



Item #01923  
30 softgels

1 bottle \$12

4 bottles \$10.50 each



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

**Kathryn**

VERIFIED CUSTOMER  
REVIEW



NEW

LE

# Oh-Mg!



*Bioavailable*

## MAGNESIUM GLYCINATE For Whole-Body Health

Magnesium is involved in over **300** biochemical reactions in the human body.

Each capsule of **Magnesium Glycinate** provides **105 mg** of elemental magnesium. This can enable healthy magnesium levels to be achieved throughout the body.

Item #02535  
90 vegetarian capsules  
1 bottle \$18  
4 bottles \$16 each

For full product description and to order **Magnesium Glycinate**, call 1-800-544-4440 or visit [www.LifeExtension.com](http://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.





BY SARAH A. LOBISCO, ND, IFMCP

# Nutrition for HEALTHIER BABIES

Proper nutrition is vital during **pregnancy** to ensure the health of the mother and the fetus.<sup>1,2</sup>

Doctors recommend taking **prenatal vitamins** to ensure that essential nutrient needs are met.<sup>3,4</sup>

But many commercially available formulas lack optimal support for the baby's **brain** and **eye development**.

A comprehensive prenatal formula that contains **DHA**,<sup>5</sup> **choline**,<sup>6</sup> and the carotenoids **lutein** and **zeaxanthin**<sup>7</sup> can help promote a healthy pregnancy. This includes the proper development of a baby's brain, eyes, and other tissues.



## Deficiencies Are Common

The U.S. diet is often deficient in vitamins and other vital nutrients.<sup>1,8</sup> During pregnancy, low blood levels of these nutrients increase the risk of complications.<sup>1</sup>

A large population study based on data from the National Health and Nutrition Examination Survey (NHANES) found that **41%** of American women aged **19** to **50** had one or more vitamin deficiency or anemia. That number was an astonishing **47%** in pregnant or breastfeeding women.<sup>8</sup>

In a study of Western European women wishing to get pregnant, about **half** had inadequate **folate** intake, **67%** were **vitamin D** deficient, and over **half** had sub-optimal intake of **omega-3 fatty acids**.<sup>9</sup>

That means many women are not getting adequate nutrition for optimal **fetal development** and a **healthy pregnancy**. The health-associated risks to pregnant women and newborns may be reduced by proper use of prenatal supplementation.<sup>1</sup>

## Prenatal Support

Physicians generally advise women to start taking **prenatal vitamins**, particularly folic acid, before trying to get pregnant. That's because most fetal organs begin to form before many women even know that they're expecting.<sup>4,10-12</sup>

During pregnancy, the vitamins are transferred to the fetus through the placenta and later through breast milk in breastfed infants.<sup>7</sup> These not only help with a healthy pregnancy but also improve maternal health and reduce the risk of complications in pregnancy.<sup>13</sup>

Nutritional demands of pregnancy differ from those of a regular diet, and not all **multivitamins** contain the adequate amounts of nutrients needed before, during, and after pregnancy.<sup>1,4</sup> For example, **vitamin D** levels can *decrease* significantly during pregnancy due to increased nutrient demand, with potentially serious consequences.<sup>1,14</sup>

An analysis of two studies in pregnant women in South Carolina found that those with a vitamin D blood level of **40 ng/ml** or higher had a **57%** lower risk of preterm birth than women with levels below **20 ng/ml**.<sup>15</sup>

This same pattern is true for many crucial nutrients.<sup>1,16</sup>



## Problems With Prenatal Vitamins

**Prenatal vitamins** can provide the missing nutrients to reduce the risk of pregnancy complications and fetal developmental problems.<sup>1,13</sup>

But not all vitamins are the same.

A 2022 review paper assessed over **200** articles to propose optimal levels of prenatal nutrients for American women. Researchers compared these recommendations with levels in over **180** commonly available prenatal vitamins.<sup>1</sup>

Many prenatal formulas contain only a **subset** of essential vitamins, and their levels are often below those needed to prevent complications.<sup>1</sup>

Some of the nutrients that are most often lacking in prenatal vitamins are choline, DHA, and certain **carotenoids**.

To reduce the likelihood of pregnancy risks and birth defects, a healthy diet should be augmented with prenatal vitamins containing these nutrients along with increased levels of **folate**, **vitamins A, C, D**, the **B vitamins**, and many others.

Women should continue taking prenatal vitamins as long as they are **breastfeeding**, since they are passing nutrients to the baby through breast milk.







What You  
Need  
To Know

### Choline and DHA for Healthy Brains

Many women who are pregnant or of child-bearing age are often deficient in two nutrients essential for brain and nervous system development: **choline**<sup>17</sup> and **DHA**.<sup>17,18</sup>

**Choline** is a precursor needed to make **acetylcholine**, a neurotransmitter that supports **attention, learning, and memory**.<sup>19,20</sup>

Preclinical studies show that choline intake may decrease the risk of defects of the **neural tube**,<sup>1,19</sup> a structure that develops into the brain and spinal cord and may lower the chances of developing **autism** and **Down syndrome**.<sup>1</sup> It is also involved in the development of the hippocampus, which is a part of the brain involved in learning and memory.<sup>19,20</sup>

Several studies found that increased intake and levels of maternal choline in humans are associated with improved childhood **visual memory**<sup>20</sup> and **cognitive scores**.<sup>17,19,20</sup>

## Choosing the Right Prenatal Vitamins

- Many **pregnant** and **breastfeeding** women are deficient in nutrients needed to support a healthy pregnancy and baby. This increases the risk of pregnancy complications, birth defects, and developmental problems.
- **Prenatal vitamins** can help ensure adequate levels of nutrition, improving pregnancy outcomes.
- In addition to standard amounts of the usual vitamins and minerals, an ideal prenatal formula should include adequate amounts of **folate, DHA, choline, and carotenoids**, which are essential for fetal eye and brain development.

**DHA** (docosahexaenoic acid), an **omega-3 fatty acid** found in fish oil, is a critical component of the brain and retina and influences their functions.<sup>1,13,18</sup>

Prenatal supplementation with omega-3 helps support **visual** and **cognitive function** in infants.<sup>13</sup>

Reviews of clinical studies show that DHA may help reduce the risk of **preterm birth**<sup>1,13,21</sup> and **preeclampsia** (a pregnancy complication often marked by high blood pressure and kidney damage),<sup>1</sup> treat **gestational diabetes**,<sup>1,18,21</sup> and prevent **postpartum depression**.<sup>1,18</sup>

### Folate Supports Nervous System Development

**Folate**, also known as **folic acid**, is essential for DNA synthesis and the proper development of the **brain** and **spinal cord**.<sup>1,19</sup>

Folate supplementation should begin before conception. Its intake has been clinically shown to decrease the risk of maternal folate-deficiency **anemia** and fetal neural tube disorders such as **spina bifida**, which can cause disability and shorten life expectancy.<sup>13,22</sup>

Having optimal folate levels also reduces the rate of other **birth defects**, such as anencephaly (a fatal disorder) and of **preterm birth**.<sup>1</sup>



One meta-analysis found that regardless of ethnicity, maternal use of folic acid during pregnancy could significantly reduce the risk of childhood **autism** as compared to the women who did not use folic acid during pregnancy.<sup>23</sup>

### Carotenoids for Eye and Cognitive Health

**Carotenoids** are health-promoting pigments found in various plants.<sup>7,24,25</sup> One of the best known is **beta-carotene**, a precursor to vitamin A that is essential for normal function of the **eyes**.<sup>26,27</sup>

In multiple studies, *higher* levels of carotenoids are associated with a *lower* risk of **preeclampsia**.<sup>1</sup>

**Lutein** and **zeaxanthin** are carotenoids that have vital roles in the development of the **eyes** and **brain**.<sup>7,28</sup>

Studies in children and adults have found a correlation between levels of lutein and zeaxanthin and **visual** and **cognitive performance**.<sup>7,24,28</sup>

In one study of 1,580 mother-child pairs, higher maternal intake of **lutein** and **zeaxanthin** during pregnancy was associated with improved **verbal intelligence** and **behavior-regulation** ability in mid-childhood.<sup>29</sup>

A prenatal formula containing these carotenoids and optimal levels of other nutrients can help ensure a healthy pregnancy and minimize risks of fetal developmental problems.

### Summary

Women planning to get pregnant, expecting a baby, or breastfeeding are often deficient in critical nutrients that help support healthy fetal development and decrease risk for maternal health problems.

Standard **prenatal vitamins** can alleviate some deficiencies but are often low in nutrients that support eye and brain development.

Choosing a comprehensive prenatal formula with optimal levels of **choline**, **DHA**, **folate**, and carotenoids like **lutein** and **zeaxanthin** can support maternal and fetal health throughout pregnancy.

Pregnant women, as well as those planning to conceive, should discuss prenatal supplements with their healthcare provider to ensure they are getting the necessary nutrients for a healthy pregnancy and a healthy child. ■

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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\*European Journal of Nutrition. 2011;50(5):387-389.

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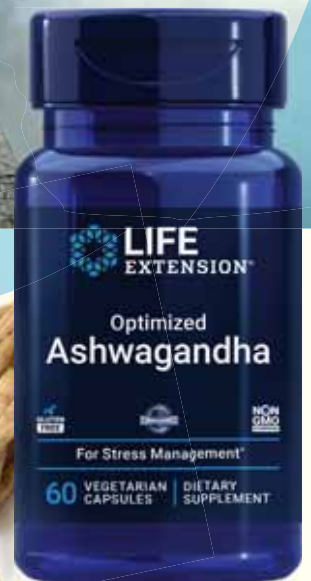


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**Prenatal Advantage** provides vitamins and key nutrients recommended for about-to-become-pregnant, pregnant, and nursing women to optimally support their baby's overall health.

Scientifically formulated **Prenatal Advantage** contains:

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Take **4** softgels daily, in divided doses with meals, or as directed by a healthcare practitioner.

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Chinese  
Chaste Tree  
Leaf and Fruit



Ginger

# Unlock Relief for BACK PAIN

BY ADAM CRUZ, MMSC

**Back pain** is the **leading cause** of disability worldwide.<sup>1</sup> As many as **80%** of adults will experience at least one episode of lower back pain during their lifetime.<sup>2</sup>

Many sufferers turn to over-the-counter pain medication for relief. Unfortunately, these often come with **side effects**—occasionally severe ones—when used long-term.<sup>3,4</sup>

In the search for better alternatives, scientists evaluated **two plant-derived extracts** that have shown an ability to safely reduce inflammation and ease pain *without* side effects.

In a clinical trial, a **combination** of these two extracts significantly reduced **lower back pain** in **79%** of patients in just 30 days.<sup>5</sup>

This represents an advancement for individuals suffering from back pain, with the potential to improve their quality of life.



## The Burden of Back Pain

**Lower back pain** is frighteningly common.

An estimated **619 million** people worldwide were suffering from lower back pain in 2020, according to a systematic review of population-based studies.<sup>6</sup>

In the U.S., roughly **8.2%** of adults have **chronic severe back pain**, according to surveys, and nearly **75%** of them have trouble with **mobility**.<sup>7</sup>

Back pain can damage mental health and quality of life. An analysis of an insurance claims database of more than **101,000** patients found that, compared to those without pain, those with chronic low back pain had a:<sup>8</sup>

- **6.9%** increase in **depression**,
- **4.6%** increase in **anxiety**, and
- **6.6%** increase in **sleep disorders**.

A systematic review of studies indicated that most cases of back pain are categorized as **non-specific**,<sup>9</sup> which means there is no one injury or ailment to blame for the pain. Unfortunately, that means there is often no specific fix.

Many people rely on **non-steroidal anti-inflammatory drugs (NSAIDs)** like ibuprofen (Advil®, Motrin®), naproxen (Aleve®), and acetaminophen (Tylenol®) to cope. But these medications come with **long-term side effects**, including increased risk of liver damage,<sup>4</sup> cardiovascular issues,<sup>3,4</sup> gastrointestinal issues,<sup>3</sup> and kidney damage.<sup>3</sup>

There is a need for safer, effective alternatives that can provide relief *without* side effects.



## Chaste Tree Reduces Pain and Inflammation

**Chinese chaste tree** (*Vitex negundo* L.), also known as **five-leaf chaste tree**, is a flowering shrub that grows in parts of Asia and the Middle East.<sup>10</sup>

It is well-known for its **anti-inflammatory** properties<sup>10,11</sup> and has been used in traditional **Chinese** and **Ayurvedic medicine** to treat a range of ailments, from **fever** and **pain** to **respiratory disorders**.<sup>10-12</sup>

A detailed chemical analysis of the plant revealed that it contains a wide variety of health-promoting active compounds, including **flavonoids**, **terpenoids**, and **alkaloids**, which contribute to its **anti-inflammatory**, **antioxidant**, and **antimicrobial** activities.<sup>10,13</sup>

Preclinical studies have found that some of these compounds can alleviate inflammatory pain by reducing the drivers of persistent inflammation, such as **NF-kB (nuclear factor-kappa B)**<sup>14,15</sup> and **TNF-alpha** (tumor necrosis factor-alpha),<sup>15,16</sup> highlighting its potential as an alternative for pain relief.

## Ginger: A Time-Honored Pain Remedy

**Ginger** is a plant native to Southern Asia. Its root has been used medicinally and in global cuisine for centuries.<sup>17,18</sup>

One of its key bioactive compounds, **gingerol**, has been extensively researched for its therapeutic effects on inflammation,<sup>19,20</sup> pain,<sup>19</sup> nausea,<sup>20,21</sup> digestive function<sup>20</sup> and tumor cell growth.<sup>20-23</sup>

A review of 16 preclinical studies concluded that **ginger** and **gingerol** were significantly effective in treating different types of **pain** through multiple pathways, including modulation of receptors critical for pain signaling.<sup>23</sup>

Clinical studies have shown that ginger reduces levels of inflammatory mediators such as: **tumor necrosis factor alpha**,<sup>24</sup> **C-reactive protein**,<sup>24,25</sup> and **nuclear factor kappa B (NF-kB)** pathways,<sup>26,27</sup> which are involved in the initiation of inflammation.

## Combined for Powerful Results

To evaluate the effects of these two plants on back pain, scientists combined extracts of **Chinese chaste tree leaves** and **ginger root**. They recruited 72 relatively sedentary men and women suffering from back pain for a **clinical trial**.<sup>5</sup>

Each participant had experienced moderate to severe **lower back pain** for under a year and had had an episode of persistent back pain that lasted 7–12 weeks.

Participants were randomly assigned to receive either a **placebo** or **200 mg** of a **chaste tree-ginger** extract blend twice daily. After 30 days, among patients receiving the extract blend:<sup>5</sup>

- **79%** had a significant reduction in **lower back pain intensity**, compared to **36%** taking the placebo,<sup>28</sup>
- **76.5%** reported improvements in their **ability to function**, compared to **30%** receiving placebo,<sup>28</sup> and
- There was an average **40%** improvement in **bending flexibility**, showing enhanced range of motion, compared to a **17%** improvement in the placebo group.<sup>28</sup>

These findings suggest that the combination of **ginger** and **chaste tree** extracts may offer a safe and effective way to alleviate back pain and improve mobility.

### Summary

Hundreds of millions of people worldwide suffer from **lower back pain**. Many rely on over-the-counter pain relievers to get through the day, but these can have serious side effects.

Researchers combined extracts of **Chinese chaste tree** leaves and **ginger** root, each of which showed potential to reduce inflammation and alleviate pain.

In a clinical trial, the combination of these extracts reduced **lower back pain** for **79%** of subjects, improved **functionality** for **76.5%**, and increased bending **flexibility** by **40%**.

These plant extracts may provide a safe, effective alternative for managing back pain without the risks associated with medications. ●

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



## Plant Extracts Safely Ease Lower Back Pain

- **Lower back pain** affects over **600 million** people globally and contributes to a significant decrease in quality of life.
- Extracts of **Chinese chaste tree** (also known as **five-leaf chaste tree**) and **ginger** have each shown anti-inflammatory and pain-relieving effects.
- In a clinical study, a **combination** of these extracts reduced back pain for **79%** of patients, improved functional activity for **76.5%** of patients, and dramatically increased bending flexibility.
- Together, these plant extracts can provide **pain relief** and better mobility without the side effects and long-term risks of traditional drugs.

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## The Importance of Physical Therapy

An often overlooked yet effective option is **physical therapy**.

While a combination of **plant-based extracts** has been clinically shown to alleviate back pain and loss of function,<sup>28</sup> likely by **reducing inflammation**, **physical therapy** can relieve pain caused by anatomical disorders, such as radiculopathy, and disc degeneration.<sup>29</sup>

**Physical therapy** is perceived to be *the most effective treatment* for back pain. Many individuals achieve relief with two to three sessions per week—with strengthening and stretching interventions to support surrounding muscles, relieving stiffness, improving mobility and helping to prevent future back injuries.<sup>30</sup>

In the long term, physical therapy helps restore movement and prevent the progression of disability in individuals suffering from chronic back pain.<sup>30</sup>

Additionally, physical therapy for back pain is covered by **Medicare** (excluding deductible and co-pay fees).<sup>31</sup>

In short, **physical therapy** serves as a superior first step, while a blend of **Chinese chaste tree** and **ginger** extracts may provide added ongoing support.

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Muvz™ is a trademark of ENovate Biolife. \* *J Back Musculoskelet Rehabil.* 2023 Nov 20. BMR-230197.

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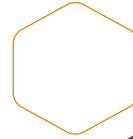
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# What is Capsaicin?

BY LAURIE MATHENA



If you've ever experienced a burning sensation after biting into a red chili pepper, then you've experienced **capsaicin**.

Capsaicin is the compound in red chili peppers that makes them spicy.<sup>1</sup>

But capsaicin causes another type of burning that has caught the attention of scientists.

Capsaicin helps the body burn **calories** even while at rest.<sup>2</sup>

Due to this unique ability, one study showed that capsaicin helped increase weight loss and reduce *body mass index* without any change to diet or exercise.<sup>3</sup>

## Weight Loss Ally

Capsaicin's ability to help support **weight loss** was seen in a **clinical study**.

For this study, 21 overweight people took either **capsaicin (200 mg)** or a **placebo** 30 minutes after breakfast for 28 days.<sup>3</sup> All of the subjects maintained their regular food intake and activity levels during the study period.

Compared to the **placebo** group, those taking **capsaicin** experienced an average of:

- **2.1%** reduction in **body weight** (vs. **0.32%**),
- **4%** decrease in **waist-to-hip ratio** (vs. **1%**), and
- **2.2%** reduction in **body mass index** (vs. **0.3%**).

Overall, the capsaicin group lost approximately **one pound per week**.

One of the previous drawbacks of taking large amounts of capsaicin was that it irritated the lining of the digestive tract, leading to symptoms such as nausea, vomiting, abdominal pain and burning diarrhea.<sup>4,5</sup>

This made it impractical to utilize capsaicin for its weight loss effects.

Scientists overcame that obstacle by *encapsulating* capsaicin in a patented fiber hydrogel that lessens irritation of the stomach lining.<sup>6</sup>

In the above study, the **encapsulated capsaicin** was found to be safe and well-tolerated.

## Burning Fat at Rest

What's noteworthy about this study is that the subjects taking capsaicin reduced their body weight and BMI without making any changes to their diet or increasing their exercise.<sup>3</sup>

One underlying reason for this phenomenon is because of capsaicin's **thermogenic** properties.

**Thermogenesis** is part of the body's ability to burn nutrient calories for energy, which helps support healthy metabolism and control body weight.<sup>4</sup> Nutrients that support thermogenesis can help enhance a weight management regimen.

Capsaicin is a potent plant-based thermogenic compound.<sup>2,3</sup> By increasing **resting energy expenditure**, capsaicin can help burn more calories, even when *at rest*.<sup>7</sup>

A review of 20 trials involving 563 participants demonstrated that capsaicin increases resting energy expenditure, which causes the body to burn more fat calories at *rest*.<sup>8</sup>

It also led to reductions in abdominal fat tissue, appetite, and energy intake.

This property of capsaicin helps combat a key reason why many calorie-lowering diets fail: a phenomenon called *adaptive thermogenesis*.<sup>7,9,10</sup> This occurs when your body reduces the amount of energy it burns in response to reduced calorie intake.<sup>9-11</sup>

By *increasing* thermogenesis, capsaicin helps support healthy weight loss.

## Beneficial Brown Fat

One reason for these benefits is because capsaicin activates **brown fat**.<sup>2,8,12-14</sup>

Typical fat cells are white and store excess energy.

**Brown fat** is different because instead of storing calories, it *burns* them.<sup>14,15</sup> Preclinical studies have shown that brown fat is associated with thermogenesis,<sup>2,13</sup> lower body mass index,<sup>2</sup> and improved fasting glucose levels.<sup>2,12,15</sup>

By activating brown fat, **capsaicin** could also help reduce the harmful effects of obesity.

In a study of 52,487 people, individuals with brown fat had lower odds of type II diabetes, dyslipidemia, coronary artery disease, congestive heart failure, and hypertension compared to those without brown fat.<sup>15</sup>



## Summary

Capsaicin is the compound in chili peppers that, when consumed, causes a burning sensation, but can increase how many calories the body burns while at rest.

Supplementing with capsaicin has been shown to reduce body weight, body mass index (BMI), and waist-to-hip ratio.

In the past, it was difficult to take advantage of these benefits because regular capsaicin irritates the stomach lining, leading to stomach issues.

A patented process has reduced these concerns by *encapsulating* capsaicin in a fiber hydrogel that minimizes stomach irritation.

These effects make capsaicin a valuable addition to any weight loss program. ■

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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# Seaweed

BY LAURIE MATHENA



The Japanese have the highest life expectancy among people of the G7 countries (United States, United Kingdom, Italy, Germany, France, Canada).<sup>1</sup>

Many factors contribute to the increased longevity of Japanese people, but one possible reason could be their high intake of **seaweed**,<sup>2</sup> which is served in approximately **21%** of their meals.<sup>3</sup>

Seaweed is a type of algae that comes in many varieties, including green, brown, and red,<sup>2</sup> which are made into foods such as kombu, nori, and wakame.<sup>4</sup>

Although the amount of nutrients varies based on the specific variety, most seaweed contains nutrients such as vitamins, minerals, fiber, proteins, as well as protective compounds like polyphenols, carotenoids, and omega-3 fatty acids.<sup>2</sup>

Some types of seaweed—like spirulina<sup>5</sup> and chlorella<sup>6</sup>—contain all nine essential amino acids, making these varieties an excellent plant-based protein.

One meta-analysis of nine clinical studies concluded that consuming brown seaweed decreased levels of LDL and total cholesterol. The study highlights the role of fucoidans which may regulate lipid metabolism by increasing lipoprotein lipase activity leading to improved lipid profile.<sup>7</sup>

Seaweed contains a compound called *fucoxanthin*, which has been tied to better blood sugar control.<sup>8,9</sup>

A meta-analysis of clinical studies found that consuming brown seaweed significantly improved after-meal blood sugar spikes, HbA1c levels, and homeostatic model assessment of insulin resistance (HOMA-IR).<sup>9</sup>

Seaweed is also one of the highest dietary sources of iodine. Just one serving (about **10 grams**) of dried nori (a type of seaweed that is dried and pressed into sheets) contains **232 mcg** of iodine, which is **155%** of the recommended daily allowance.<sup>4</sup>

Iodine is especially beneficial for thyroid function, which depends on adequate iodine in order to make hormones.<sup>4</sup>

However, *because* of seaweed's high iodine content, individuals with thyroid disorders and school-aged children should limit seaweed intake.<sup>4</sup>

**Seaweed** is a versatile vegetable that can be included in bean dishes, stir fries, and salads, or served on its own as seaweed salad or dried seaweed chips. ■

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**Chris**

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- 02396 Cognitex® Elite

- 02397 Cognitex® Elite Pregnenolone
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- 02006 Dopa-Mind™
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- 01658 Ginkgo Biloba Certified Extract™
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- 00709 Migra-Eeze™
- 01603 Neuro-Mag® Magnesium L-Threonate Caps
- 02032 Neuro-Mag® Magnesium L-Threonate Powder
- 00888 Optimized Ashwagandha
- 01676 PS (Phosphatidylserine) Caps
- 02406 Quick Brain Nootropic™
- 01327 Vinpocetine

**CHOLESTEROL MANAGEMENT**

- 01828 Advanced Lipid Control
- 01910 CHOL-Support™
- 01304 Theaflavins Standardized Extract
- 00372 Vitamin B3 Niacin Capsules

**DIGESTION SUPPORT**

- 02412 Bloat Relief
- 02514 Easy Fiber
- 01736 Effervescent Vitamin C - Magnesium Crystals
- 02021 Enhanced Super Digestive Enzymes
- 02022 Enhanced Super Digestive Enzymes and Probiotics
- 02033 EsophaCool™
- 01737 Esophageal Guardian
- 01706 Extraordinary Enzymes
- 02533 Food Sensitivity Relief with Diamine Oxidase
- 02100 Gastro-Ease™

**ENERGY MANAGEMENT**

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

**EYE HEALTH**

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

**FISH OIL & OMEGAS**

01937	Mega EPA/DHA
02218	Mega GLA Sesame Lignans
01983	Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract • 60 softgels
01988	Super Omega-3 Plus EPA/DHA Fish Oil, Sesame Lignans, Olive Extract, Krill & Astaxanthin
01982	Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract • 120 softgels
01985	Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract • 60 enteric coated softgels
01984	Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract • 120 enteric coated softgels
01986	Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract • 240 softgels
01812	Provinal® Purified Omega-7
01640	Vegetarian DHA

**FOOD**

02008	California Estate Extra Virgin Olive Oil
02170	Rainforest Blend Decaf Ground Coffee
02169	Rainforest Blend Ground Coffee
02171	Rainforest Blend Whole Bean Coffee

**GLUCOSE MANAGEMENT**

01503	CinSulin® with InSea <sup>2</sup> ® and Crominex® 3+
01620	CoffeeGenic® Green Coffee Extract
02122	Glycemic Guard™
00925	Mega Benfotiamine
01803	Tri Sugar Shield®

**HEART HEALTH**

02530	Aged Black Garlic
01066	Aspirin (Enteric Coated)
01842	BioActive Folate & Vitamin B12 Caps
02531	Cardio Peak™
02121	Homocysteine Resist
02508	Omega-3 Fish Oil Gummy Bites
02018	Optimized Carnitine
01949	Super-Absorbable CoQ10 Ubiquinone with <i>d</i> -Limonene • 50 mg, 60 softgels
01951	Super-Absorbable CoQ10 Ubiquinone with <i>d</i> -Limonene • 100 mg, 60 softgels
01929	Super Ubiquinol CoQ10
01427	Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 50 mg, 30 softgels
01425	Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 50 mg, 100 softgels
01437	Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 100 mg, 30 softgels
01426	Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 100 mg, 60 softgels
01431	Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 200 mg, 30 softgels
01733	Super Ubiquinol CoQ10 with PQQ
01859	TMG Liquid Capsules
00349	TMG Powder

**HORMONE BALANCE**

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

**IMMUNE SUPPORT**

02302	Bio-Quercetin®
02410	Black Elderberry + Vitamin C
02433	Echinacea Elite
01961	Enhanced Zinc Lozenges
02425	Immune Packs with Vitamin C & D, Zinc and Probiotic
02005	Immune Senescence Protection Formula™
01681	Lactoferrin (Apolactoferrin) Caps
02426	Mushroom Immune with Beta Glucans
01903	NK Cell Activator™
01394	Optimized Garlic
01309	Optimized Quercetin
01811	Peony Immune
01708	Reishi Extract Mushroom Complex
01906	Standardized Cistanche
01561	Zinc Lozenges

**INFLAMMATION HEALTH SUPPORT**

01639	5-LOX Inhibitor with AprèsFlex®
02324	Advanced Curcumin Elite™ Turmeric Extract, Ginger & Turmerones
01709	Black Cumin Seed Oil
02310	Black Cumin Seed Oil and Curcumin Elite™
02467	Curcumin Elite™ Turmeric Extract 30 veg capsules
02407	Curcumin Elite™ Turmeric Extract 60 veg capsules
01804	Cytokine Suppress® with EGCG
02223	Pro-Resolving Mediators
56886	Restore Activ Joint Muscle & Tissue
01203	Specially-Coated Bromelain
00407	Super Bio-Curcumin® Turmeric Extract

**JOINT SUPPORT**

02238	ArthroMax® Advanced NT2 Collagen™ & AprèsFlex®
00965	Fast-Acting Joint Formula
02430	Fast Acting Relief
00522	Glucosamine/Chondroitin Capsules
02420	Glucosamine Sulfate
02424	Joint Mobility
01600	Krill Healthy Joint Formula
02529	Lower Back Relief
00451	MSM (Methylsulfonylmethane)
02231	NT2 Collagen™

**KIDNEY & BLADDER SUPPORT**

- 00862 Cran-Max® Cranberry Whole Fruit Concentrate
- 01424 Optimized Cran-Max®
- 01921 Uric Acid Control
- 01209 Water-Soluble Pumpkin Seed Extract

**LIVER HEALTH & DETOXIFICATION**

- 01922 Advanced Milk Thistle • 60 softgels
- 01925 Advanced Milk Thistle • 120 softgels
- 02240C Anti-Alcohol Complex
- 01651 Calcium D-Glucarate
- 01571 Chlorophyllin
- 02402 FLORASSIST® Liver Restore™
- 02521 Glutathione
- 01541 Glutathione, Cysteine & C
- 01393 HepatoPro
- 01608 Liver Efficiency Formula
- 01522 Milk Thistle • 60 veg capsules
- 01534 N-Acetyl-L-Cysteine
- 01884 Silymarin
- 02361 SOD Booster

**LONGEVITY & WELLNESS**

- 00457 Alpha-Lipoic Acid
- 01625 AppleWise
- 02414 Bio-Fisetin®
- 01214 Blueberry Extract
- 01438 Blueberry Extract and Pomegranate
- 02270 DNA Protection Formula
- 02431 Essential Youth - L-Ergothioneine
- 02119 GEROPROTECT® Ageless Cell™
- 02415 GEROPROTECT® Autophagy Renew
- 02401 GEROPROTECT® Stem Cell
- 02211 Grapeseed Extract
- 02527 Healthy Aging Powder
- 00954 Mega Green Tea Extract (decaffeinated)
- 00953 Mega Green Tea Extract (lightly caffeinated)
- 01513 Optimized Fucoidan with Maritech® 926
- 02230 Optimized Resveratrol Elite™
- 01637 Pycnogenol® French Maritime Pine Bark Extract
- 02210 Resveratrol Elite™
- 02301 Senolytic Activator®
- 01208 Super R-Lipoic Acid
- 01919 X-R Shield

**LUNG HEALTH**

- 02512 Healthy Lungs

**MEN'S HEALTH**

- 02209 Male Vascular Sexual Support
- 00455 Mega Lycopene Extract
- 02306 Men's Bladder Support
- 02515 Men's Vitality Packs
- 01789 PalmettoGuard® Saw Palmetto and Beta-Sitosterol
- 01790 PalmettoGuard® Saw Palmetto/Nettle Root Formula and Beta-Sitosterol
- 01373 Prelox® Enhanced Sex for Men
- 01940 Super MiraForte with Standardized Lignans
- 02500 Testosterone Elite
- 01909 Triple Strength ProstaPollen™
- 02029 Ultra Prostate Formula

**MINERALS**

- 01661 Boron
- 02107 Extend-Release Magnesium
- 01677 Iron Protein Plus
- 02403 Lithium
- 01459 Magnesium Caps
- 01682 Magnesium (Citrate)
- 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
- 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

**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
- 01432 Optimized Saffron
- 02511 Thermo Weight Control
- 02509 Waistline Control™

**WOMEN'S HEALTH**

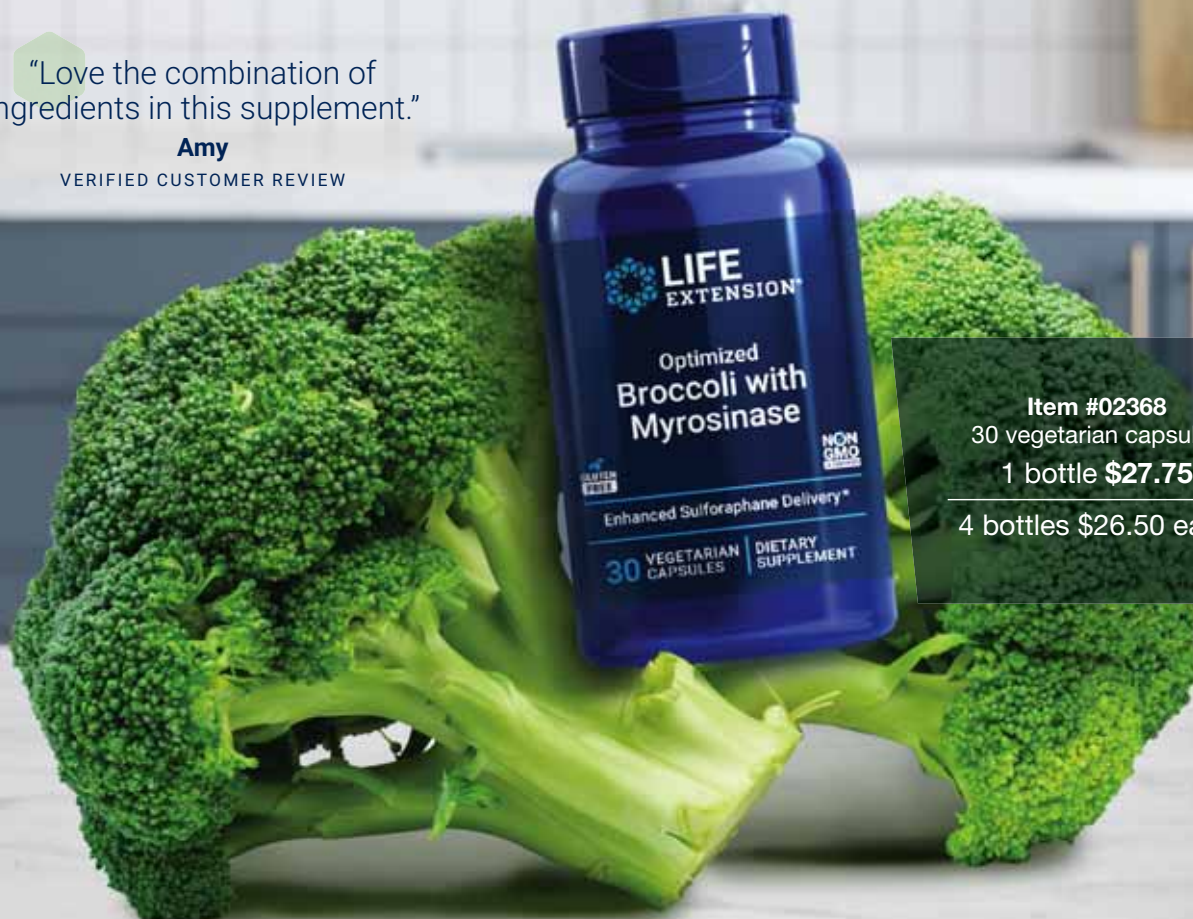
- 01942 Breast Health Formula
- 02537 Daily PMS Relief
- 02534 Estrogen Balance Elite
- 01894 Estrogen for Women
- 02204 Menopause Relief
- 02319 Prenatal Advantage
- 02536 Sexual Health for Her
- 01649 Soy Isoflavones
- 02513 Women's Bladder Support

# RELEASE...THE POWER OF BROCCOLI

“Love the combination of ingredients in this supplement.”

Amy

VERIFIED CUSTOMER REVIEW



Item #02368  
30 vegetarian capsules  
1 bottle \$27.75

4 bottles \$26.50 each

GLUTEN  
FREE

NON  
GMO  
LE CERTIFIED

VEGETARIAN  
LE CERTIFIED

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

Mature broccoli provides relatively little **sulforaphane precursor** compared to broccoli sprouts. Cooking further depletes the sulforaphane precursor.<sup>2,4</sup>

**Optimized Broccoli with Myrosinase** improves conversion of the precursor into **sulforaphane**, and its absorption into the bloodstream.<sup>2,5,6</sup>

Each capsule of this product contains:

- **Glucoraphanin**—a sulforaphane *precursor*—found in broccoli seed extract that is standardized to a high concentration of glucoraphanin.<sup>3,4</sup>
- **Myrosinase**, an enzyme found in mustard seed that converts **glucoraphanin** to **sulforaphane**.<sup>2-6</sup>
- **Vitamin C**, a cofactor for the myrosinase enzyme for more efficient *enzymatic conversion*.<sup>7</sup>

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

#### References

1. *Crit Rev Food Sci Nutr.* 2023 5 2:1-19.

2. *PLoS One.* 2015;10(11):e0140963.

3. *Phytother Res.* 2021 10;35(10):5440-5458.

4. *J Oral Maxillofac Pathol.* 2020 May-Aug;24(2):405.

5. *Mol Nutr Food Res.* 2018 Sep;62(18):e1700980.

6. *Supplier Internal Data. Data on File.* 2023.

7. *Biochem J.* 1999 8 1;341 (Pt 3):725-32.

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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.

# Feel Like a Kid Again



If you experience general fatigue, it may be due to the decline of NAD<sup>+</sup>, an important coenzyme found in every cell.

NAD<sup>+</sup> facilitates the production of ATP, which your body uses for fuel.

**NAD<sup>+</sup> Cell Regenerator™** formulas help maintain *healthy* levels of NAD<sup>+</sup>.

## **NAD<sup>+</sup> Cell Regenerator™ and Resveratrol Elite™**

Nicotinamide riboside (300 mg), bioavailable resveratrol and other cell-energizing nutrients in one capsule.

Item #02348 • 30 veg. caps.  
\*

## **NAD<sup>+</sup> Cell Regenerator™**

300 mg of nicotinamide riboside per capsule.

Item #02344 • 30 veg. caps.  
\*



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

NIAGEN® is a registered trademark of ChromaDex, Inc., Patents see: [www.ChromaDexPatents.com](http://www.ChromaDexPatents.com)  
NAD<sup>+</sup> Cell Regenerator™ has met ConsumerLab.com standards for ingredient and product quality for Nicotinamide Riboside in independent testing. More information at [www.consumerlab.com](http://www.consumerlab.com).



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

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.



# LIFE EXTENSION®

The Science of a Healthier Life®

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IN THIS EDITION OF *LIFE EXTENSION MAGAZINE*®



## 7 **MAGNESIUM DISORDERS**

A *New England Journal of Medicine* review described the role of **magnesium** for health maintenance and **delays** in recognizing its benefits.



## 20 **SUPPORT VAGINAL HEALTH**

Two strains of **probiotics** help **balance** a woman's **vaginal microbiome** for improved gynecological health.



## 32 **HIGH RISK OF LOW MAGNESIUM**

**Low magnesium** may be responsible for **increased** incidences of cardiovascular, skeletal, cognitive, and other age-related disorders.



## 44 **PRENATAL NUTRITION**

Commercial **prenatal vitamin** formulas often overlook critical nutrients for a **baby's brain** and **eye** development.



## 56 **RELIEF FOR BACK PAIN**

In a **clinical trial** of two plant extracts, **79%** of back pain sufferers enjoyed **reduced pain** in **30 days**.



## 67 **WHAT IS CAPSAICIN?**

**Capsaicin**, from red chili peppers, helps the body **burn calories**, even at rest. In a **clinical study**, those taking capsaicin *lost* about **one pound per week**.

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