LIFE EXTENSION®
The Science of a Healthier Life®
May/June 2023

FEATURE ARTICLES

NEW WAY TO BURN MORE CALORIES

PLUS: Novel Solution for Women's Urinary Issues, Page 24

Just one daily softgel of Super K provides:

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VERIFIED CUSTOMER REVIEW

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VERIFIED CUSTOMER REVIEW

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May/June 2023

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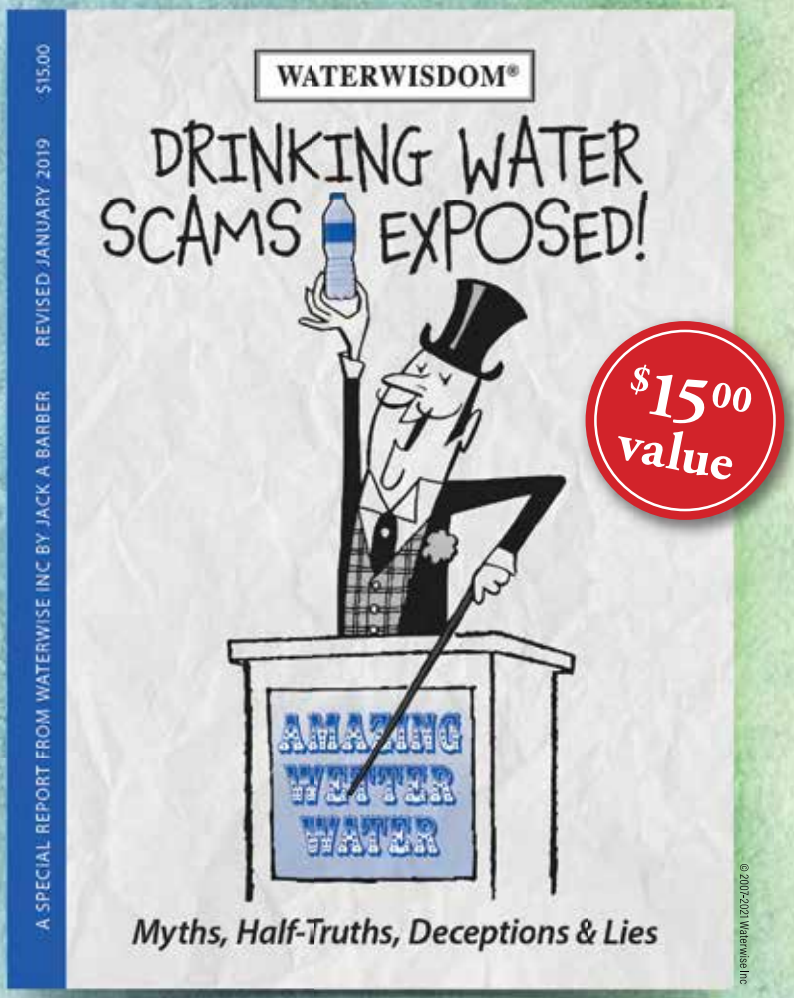

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In the News

Magnesium Intake Linked to Longer Life After Heart Attack

People with a history of heart attack who reported a high intake of **magnesium** had a lower risk of death from cardiovascular disease or any cause during a median follow-up of **12.4 years**, according to a study published in *Frontiers in Cardiovascular Medicine*.*

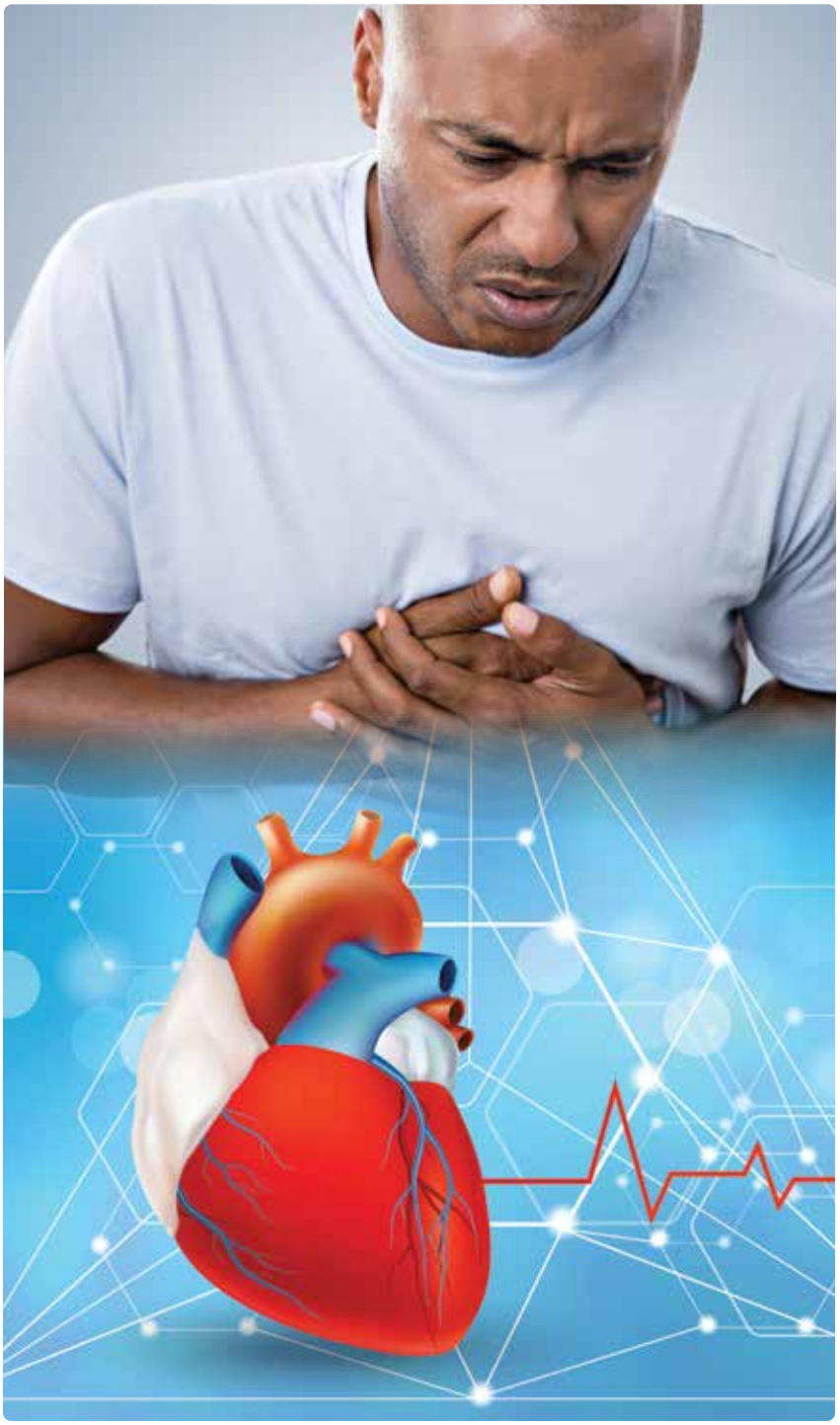
The study included **4,365** men and women, **60-80 years** old, in the Alpha Omega Cohort, an ongoing follow-up of participants in the **40-month** Alpha Omega Trial.

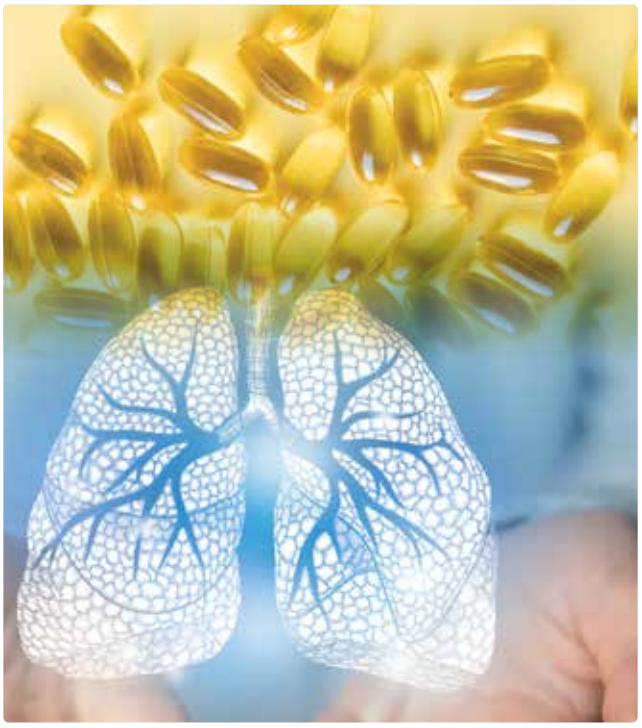
A high magnesium intake, defined as greater than **320 mg** per day, was associated with a **28%** lower risk of dying from cardiovascular disease and a **22%** lower risk of death from any cause compared to a low intake, defined as less than **283 mg**.

The protective effect of magnesium was even stronger in patients who were being treated with diuretic drugs. In this group, the risk of mortality from cardiovascular disease was **45%** lower among those with high magnesium compared to those with low magnesium.

Editor's Note: An adequate intake of magnesium may be important for lowering long-term mortality risk after myocardial infarction, especially in patients treated with diuretics.

* *Front Cardiovasc Med*. 2022 Aug 12;9:936772.





Fish Oil Supplementation Associated with Reduced Risk of COPD

Taking fish oil supplements on a regular basis is associated with a reduced risk of chronic obstructive pulmonary disease, according to a study published in *Clinical Nutrition*.*

COPD, a chronic airway obstruction that leads to irreversible decline in lung function, is accelerated by inflammation. Researchers collected data from **484,414** participants in the UK Biobank, aged **40 – 69 years**.

The individuals answered questionnaires on fish oil supplements used between **2006** and **2010** and were then followed up for an average of **nine** years.

Results showed that habitual fish oil supplementation was associated with a **12%** reduced risk of **COPD**, regardless of a person's genetic predisposition for the condition.

Editor's Note: Several studies have suggested that omega-3 fatty acids may have anti-inflammatory properties. Future studies should further evaluate the mechanisms underlying this relationship to aid efforts to prevent incident **COPD**.

**Clinical Nutrition,* December 2022. https://doi.org/10.1016/j.clnu.2022.10.002

Quercetin Phytosome® Reduces Allergy Symptoms

A clinical trial revealed a decrease in seasonal allergy symptoms among men and women who received **quercetin**, the *European Review of Medical Pharmacology* reported.*

The trial included **66** participants **22–78** years old, with allergic eye and nasal symptoms related to pollen or dust exposure. Half of the participants received **200 mg** of quercetin and the others received a placebo daily for **four weeks**. Quality-of-life questionnaires and other tests evaluating eye and nasal symptoms were administered before and after the treatment period to grade and compare severity of the symptoms.

Among participants who received quercetin, allergy symptoms at the conclusion of the trial, including eye itching, sneezing, nasal discharge, and sleep disorder, were significantly improved compared to the placebo group.

Editor's Note: Quercetin is a flavonoid found in fruits, tea, onions, and herbs. The quercetin phytosome® used in the study is a food-grade bioavailable quercetin formulation.

* *Eur Rev Med Pharmacol Sci*. 2022 Jun;26(12):4331-4345.

Chlorophyllin May Help Improve Inflammatory Bowel Disease, Animal Study Shows

In an animal study published in the *American Journal of Physiology Gastrointestinal and Liver Physiology*, chlorophyllin was shown to improve inflammatory bowel disease, a disease class that encompasses Crohn's disease and ulcerative colitis.*

Chlorophyllin is a derivative of chlorophyll, the green pigment in plants. Researchers induced chronic colitis in a group of mice and supplemented some of the animals' diets with chlorophyllin in an amount reflective of consuming **200 grams** to **400 grams** per day of spinach in humans.

Supplementation with chlorophyllin prevented weight loss and colon shortening, improved stool consistency, decreased blood in the stool, and decreased premature mortality. Treated animals had less intestinal mucosal damage and inflammation.

Editor's Note: These results demonstrate that oral administration of chlorophyllin can significantly impede the biogenesis of experimental colitis.

* *Am J Physiol Gastrointest Liver Physiol*. 2022 Aug 1;323(2):G102-G113.

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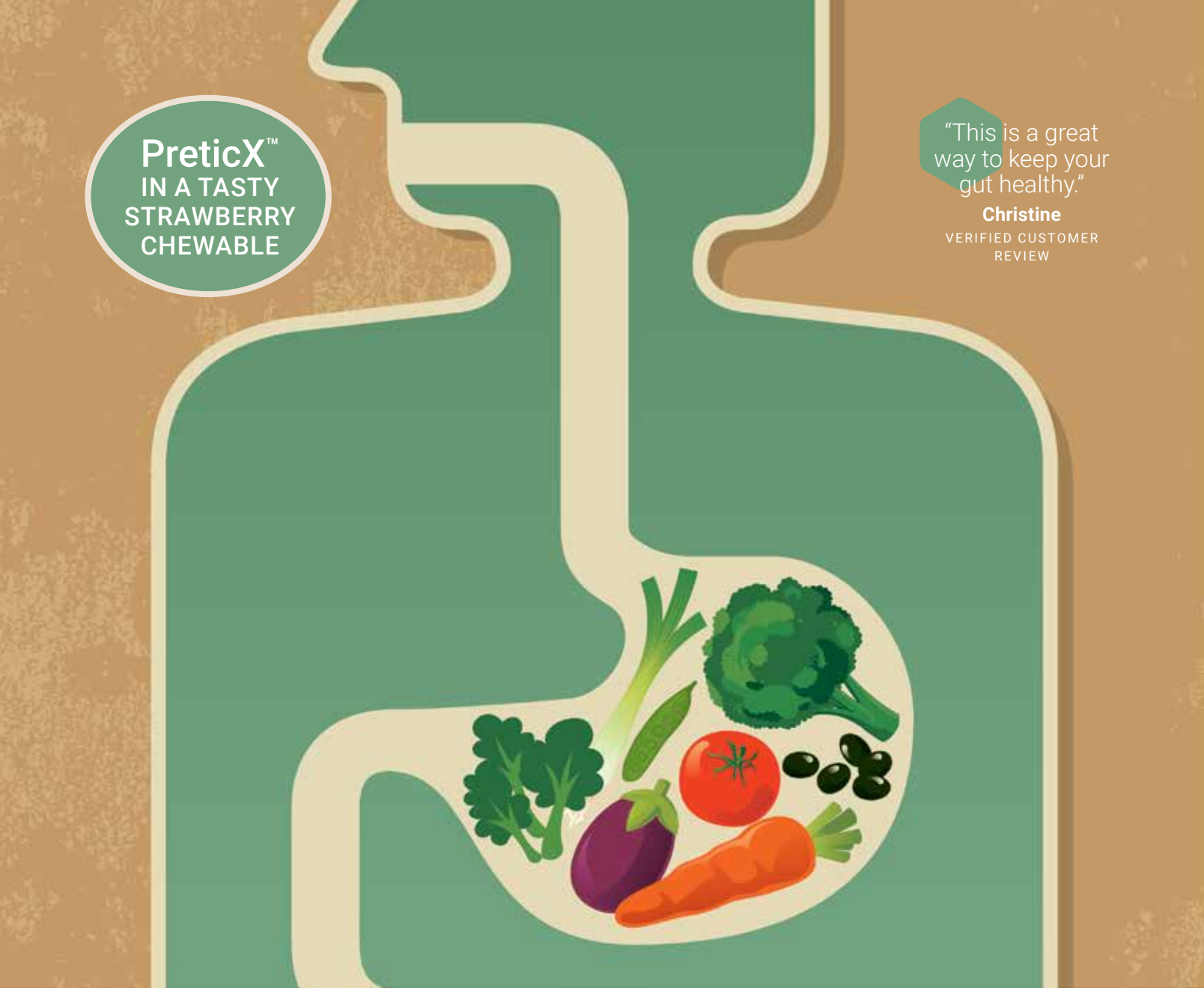

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- With age, our **bifidobacteria** levels decline to as little as **5%**.[1]
- *Increasing* **bifidobacteria** levels *enhances* digestion and carbohydrate metabolism.
- *Strawberry flavored* **FLORASSIST® Prebiotic Chewable** helps restore healthy **bifidobacteria** levels in as little as 14 days using an **XOS** prebiotic.[2]
- **1,000 mg** of **XOS** (xylooligosaccharides) per prebiotic chewable.

References
1. *Front Microbiol.* 2016;7:1204.
2. *Korean J Nutr.* 2007;40(2):154-61.

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DEFEND YOUR HEALTH

VITAMIN D3

Systemic support for immune function, bone health, and already-healthy blood-sugar levels.

"This is a necessary ingredient for my health."

James

VERIFIED CUSTOMER REVIEW

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Selenium promotes the body's production of **glutathione**, a potent cellular antioxidant. It also encourages healthy cell division, thyroid health, and immune function.

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How CAPSAICIN Burns Body Fat

BY MICHAEL DOWNEY

Sometimes, no matter how much we **diet**, we don't lose significant **weight**.

Many people ask, "Why am I not losing more fat pounds when I am eating less and watching my calories?"

One reason is that the body adapts to lower **calorie** intake by burning less **energy** when we're at rest.[1,2]

Scientists have long searched for a solution to increase **resting energy expenditure**.

A compound derived from **red chili peppers**, called **capsaicin**, does exactly that.[2,3]

The challenge was finding a way for people to take capsaicin at a dose that will yield the desired effect without experiencing stomach irritation.[4]

The solution is an **encapsulation** process that protects the stomach while delivering capsaicin's **thermogenic** properties to the body.

In a **clinical trial**, encapsulated **capsaicin** was shown to promote **weight loss** in just four weeks.[4]

Compared to the **placebo** group, people taking **capsaicin** had greater reductions in **body weight**.[4]

Why Diets Stop Working

One principle of weight gain is simple—energy intake exceeds energy expenditure.[1]

Reducing calorie intake and increasing exercise is usually viewed as the best way to overcome this imbalance.[1,3]

However, a phenomenon known as **adaptive thermogenesis** can limit the success of a calorie-lowering, weight loss program.[2]

Thermogenesis is a body process that converts calories into heat energy. This allows the body to maintain a stable temperature, support healthy metabolism—and control **body weight**.[5]

Adaptive thermogenesis occurs when the body reacts to reduced calorie intake by **lowering** the amount of energy (fat) it burns, particularly when the body is at rest.[1,2]

This makes it harder to lose weight and creates a vicious cycle in which the ***more*** calories are reduced, the ***less*** effect it has on weight loss. It's one reason that dedicated dieters often regain weight.[1,2]

This is where **thermogenesis** comes in.

Augment A Weight Loss Plan

Nutrients that support thermogenesis can help augment an existing weight management program by ***increasing*** the resting energy expenditure, ***burning*** more fat and calories.[6]

One of the most potent, plant-based thermogenic compounds is **capsaicin**. It is the major "thermogenic" compound in **red chili peppers**.[3,4]

Capsaicin increases **resting energy expenditure**, so that more calories are burned even when the body is at rest.

It has long been of interest as a means to *boost* the effects of a **weight loss** program.

Activating Beneficial Brown Fat

Scientists believe capsaicin's thermogenic properties relate to its ability to activate **brown fat**.[3,6-9]

Normal fat is **white fat**, which can be **pro-inflammatory** when accumulated in excess, particularly when it collects in the **abdomen**.

Brown fat, on the other hand, burns energy, often when triggered by cold temperatures. While white fat cells ***store*** excess energy, brown fat cells ***dissipate*** energy as heat.[8,10]

Brown fat tissue is associated with greater calorie burning and protection against obesity and metabolic diseases.[10]

Preclinical studies also show that the presence of **brown fat** is associated with thermogenesis, lower body mass index (BMI), and improved fasting glucose levels.[3,6-8]

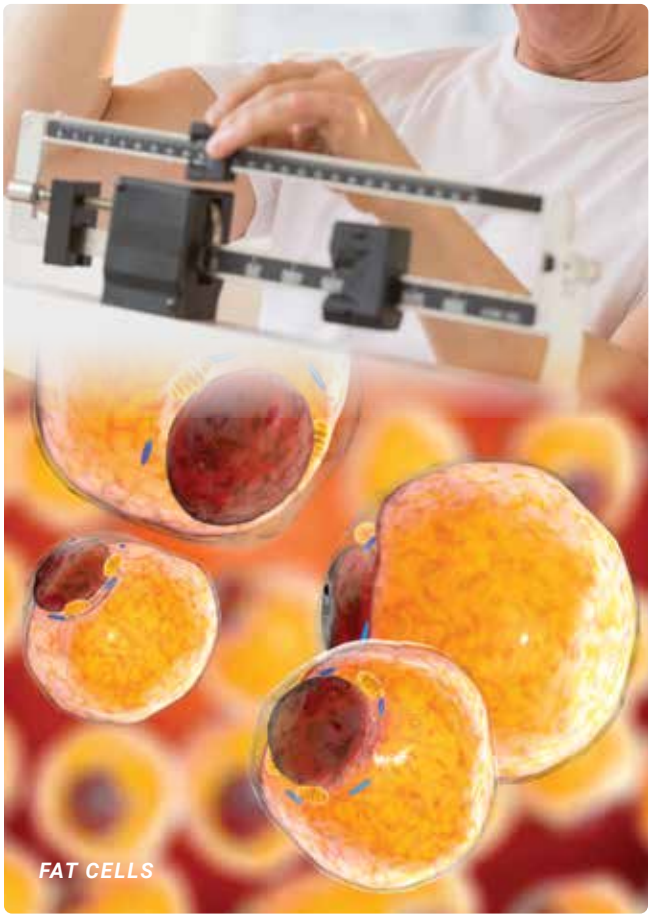
By activating brown fat, **capsaicin** supports weight loss.

Capsaicin's Fat-Reducing Mechanism

Research published in **2021** by **Harvard Medical School** suggests that capsaicin can mimic the effect of cold temperatures in order to activate energy-burning **brown fat** cells.[10]

It appears to do so by activating a protein known as **TRPV1** (**transient receptor potential vanilloid type-1**), which regulates body metabolism and temperature.[3,6,7]

By activating TRPV1, **capsaicin** triggers the body to activate **brown fat cells**, which in turn burn calories through **thermogenesis**.[3,6,7]



WHAT YOU NEED TO KNOW

Boost Your Weight Loss Plan

- **Capsaicin**, a compound derived from red chili pepper, has been shown to increase the body's energy expenditure by promoting the burning of calories, even at rest.
- The stomach discomfort associated with oral ingestion of *unformulated* capsaicin has long discouraged its use.[5] Scientists have developed a formula that provides a safe and tolerable way to obtain its weight loss benefits.
- A human study shows that this new form of capsaicin reduced **body weight**, waist-to-hip ratio, body mass index, and appetite.
- This patented capsaicin formulation can help boost any existing weight loss program.

Protection Against Stomach Irritation

There has long been a problem with taking capsaicin. It is the compound responsible for **red chili peppers'** heat.

Capsaicin can irritate the lining of the digestive tract, causing nausea, diarrhea, and acid reflux.[4,11]

Scientists have devised a solution.

Encapsulating the capsaicin in a patented fiber **hydrogel** *inhibits* the compound's irritating effects and gastrointestinal discomforts.[11]

This allows capsaicin to be safely ingested *and* better absorbed.

Clinical Validation

To test this **capsaicin** formula, researchers enlisted 21 overweight volunteers aged 38 years, on average, for a **placebo-controlled** clinical trial.[4]

Subjects were already moderately active, getting one to five hours of moderate exercise weekly. During the study, they maintained their regular food intake and activities. They also completed two questionnaires about appetite and eating behavior.

One group took **200 mg** of **encapsulated capsaicin** every morning, half an hour after breakfast, while the other received a **placebo**.

After only 28 days, the capsaicin group had:[4]

- An average **2.1% reduction** in **body weight** (compared to **0.32%** for the placebo group),
- A mean **4% decrease** in **waist-to-hip ratio** (vs. **1%** for the placebo group), and
- A **reduction** of **2.2%** in **body mass index** (vs. **0.3%** for the placebo group).

This **2.1%** body weight reduction represents a loss of about **one pound** of weight ***per week***.

The questionnaires revealed that treated subjects reported a significant *reduction* in **uncontrolled eating** and **appetite**.

The encapsulated **capsaicin** was found to be safe, with high tolerability, and was determined to be **well-absorbed** into the blood.

Other Benefits

Capsaicin is associated with effects beyond thermogenesis. Increasing evidence suggests that it may play a role in:[3,7,11-13]

- Regulation of metabolic health,
- Glucose metabolism,
- Cardiovascular health,
- Anti-obesity effects, and
- Reduced mortality risk.

Summary

Studies show that **capsaicin**, derived from red chili peppers, increases resting energy expenditure and boosts the burning of calories.

Researchers have created a unique form of capsaicin by encapsulating it in a plant fiber hydrogel. The result is more thermogenic benefits without the stomach distress of regular capsaicin.[4]

Clinical data show that it can safely promote **weight loss**, lower waist-to-hip ratio and body mass index, and reduce appetite.

This **capsaicin** formulation offers a new way for people to **augment** a **weight loss** program. •

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Not All Capsaicin Is the Same

Capsaicin is derived from red chili pepper. Studies have shown that it is an effective compound to help reduce body weight by promoting energy expenditure.[5,6]

Regular **capsaicin** can cause stomach distress. This has discouraged people from taking advantage of capsaicin's weight loss benefits.

In a recent development, a **patented** process surrounds the capsaicin, using a **fenugreek galactomannan fiber**, which allows for sustained, targeted, and minimally irritating intestinal delivery.

This enhances absorption and **bioavailability**.[4]

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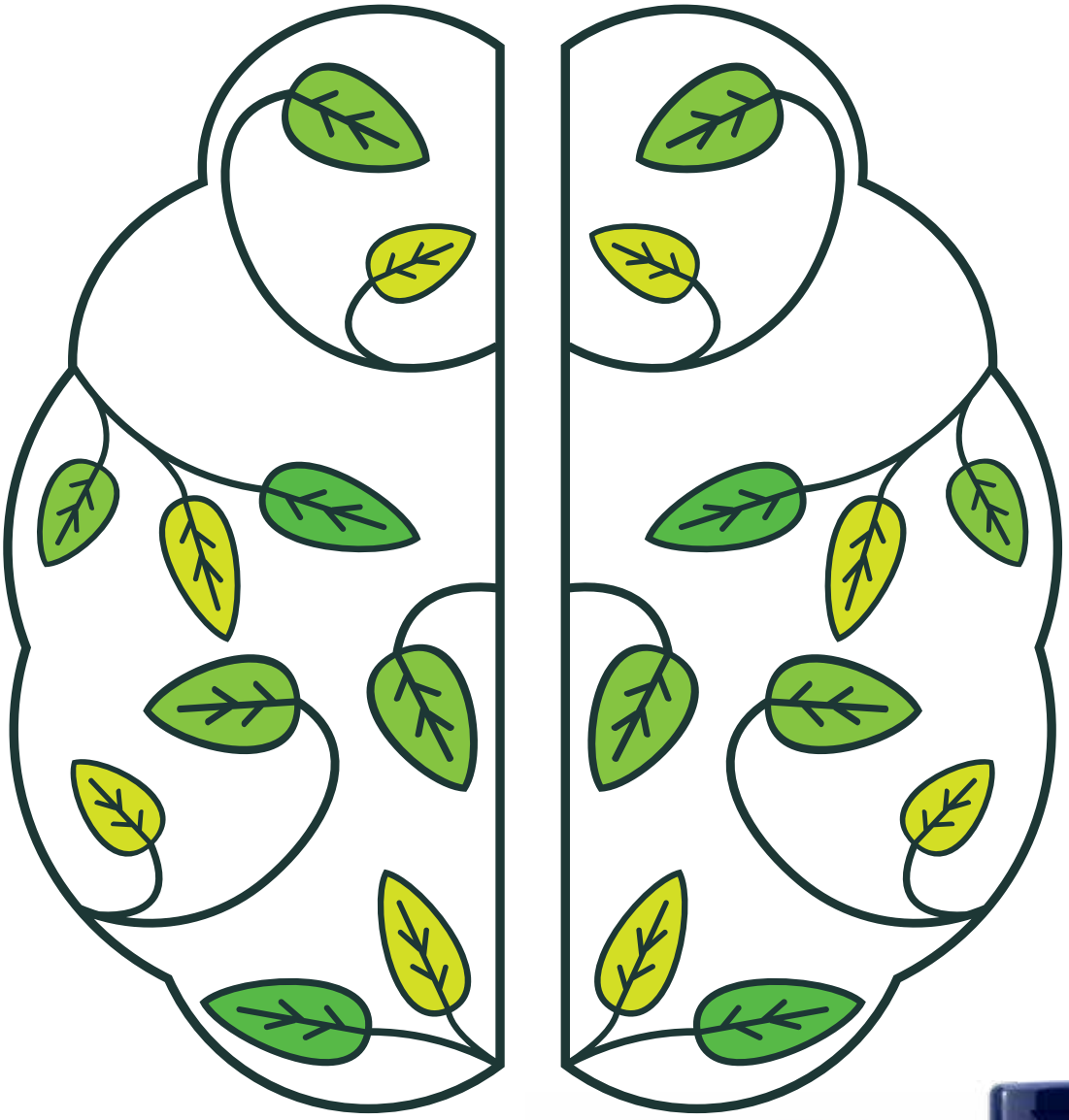

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A Solution for Urinary Symptoms in Women

BY MICHAEL DOWNEY

For many women, frequent trips to the bathroom or needing to get up at night to urinate are a drain on quality of life.[1,2]

Even a good laugh can lead to urinary incontinence.

In an eight-week **clinical trial**, a blend of three **plant extracts** improved urination issues in women as follows:[3]

- Incontinence episodes were **reduced** by **65%**,
- Urinary urgency episodes **decreased** by **57%**,
- Nighttime urination episodes were **reduced** by **43%**, and
- Daytime urination frequency returned to **normal**.

A robust **79%** of women who took the blend reported a significant **benefit**, compared to **17%** who took a **placebo**.

Bladder Problems Worsen with Age

Urinary issues tend to become more common in women as they age. Onset of symptoms is usually observed over the age of 40.[4]

The prevalence and severity of symptoms are greater in women than in men. A population study with 40- to 99-year-old women participants from the U.S., UK, and Sweden revealed that:[5]

- **56%** experience **incontinence**,
- **36%** experience **urinary urgency**,
- **34%** experience **nighttime urination**, and
- **25%** experience **frequent urination**.

The median daytime urinary frequency is 3-4 hours (6-8 times daily).[6] Those afflicted with an overactive bladder have to go to the bathroom more frequently (**>8** times during the day and **>1** time at night).[2]

According to a study, *only* **46%** of symptomatic women have discussed any urinary concerns with their health care provider.[4] Many are self-conscious about these symptoms but assume they are an unavoidable part of aging.[7]

Those who do seek medical advice are often prescribed drugs with **minimal benefits** at best. For example, only about **13%** of participants taking drugs achieve urinary continence, and side effects prompt some patients to discontinue medication.[3]

In contrast, a clinical study found that a blend of **three plant extracts**[3] was well-tolerated by participating women, *improved* urinary symptoms, and significantly *improved* participants' quality of life.

How Does this Herbal Combination Work?

In a rat model of **overactive bladder**, the herbal blend reversed the alterations in various biomarkers in the urine and lining of bladder and muscle, leading to improvement of urinary symptoms in:[7]

- Storage phase (e.g., urgency, frequency, nocturia)
- Voiding/Post-voiding phase (e.g., hesitancy, intermittency, weak stream, dribbling post-voiding)

The researchers suggest that the ability of these **plant extracts** to favorably alter markers of urinary changes in the rat model may explain the clinically significant benefits observed in the **human** study.[7]

Twenty Years in Development

More than **20 years** ago, naturopath and medical herbalist Dr. Tracey Seipel began researching an effective solution to **urinary problems** for her patients.[8] She sifted through the medical literature on **plant compounds** that had been traditionally used to treat bladder issues and gradually began incorporating some into her clinical practice.[3]

Eventually, Dr. Seipel's experiential research allowed her to refine a treatment that included a blend of **three plant extract**s, each with a history of effectiveness and each from a different area of health care:

- **Horsetail** *(Equisetum arvense)* from Western herbal medicine,
- **Lindera** *(Lindera aggregata)* from Chinese medicine, and
- **Three-leaf caper** *(Crateva nurvala)* from Ayurvedic medicine.

Reduced Urinary Symptoms

To validate Dr. Seipel's research on the blend of three plant extracts, scientists designed a randomized, **placebo-controlled** trial.[3]

They enlisted 88 women with an average age of **62 years** who had at **least two** of the following symptoms:

- Daytime urination episodes of **10 or more** a day,
- Incontinence episodes of **one or more** per day,
- Urinary urgency episodes of **two or more** a day, and
- Nighttime urination episodes of **two or more** a night.

HORSETAIL

WHAT YOU NEED TO KNOW

The treatment group took **840 mg** of the extract blend in the form of two capsules once daily. After just **eight weeks**:[3]

- Daytime urination episodes were restored to normal levels, decreasing from an average of ***11.59 times*** a day to an average of just ***7.88 times*** a day.
- Incontinence episodes were reduced by **65%**, from an average of ***3.49 times*** a day to an average of only ***1.21 times*** a day,
- Urinary urgency episodes decreased by **57%**, from an average of ***3.77 times*** a day to an average of just ***1.61 times*** a day, and
- Nighttime urination episodes were reduced by **43%**, from an average of ***3.76 times*** a night to an average of ***2.15 times*** a night.

Improved Quality of Life

Women taking the plant extract also reported impressive improvements in quality-of-life questionnaires, including a:[3]

- **50% decrease** in overactive bladder,
- **39% decrease** in incontinence, and
- **39% decrease** in urogenital distress.

A remarkable **79%** of women who took the blend reported feeling a ***significant benefit***, compared to **17%** of women in the placebo group.

The extract blend produced these results ***without the side effects*** commonly seen with medications.[3]

Help For Women's Bladder Problems

- **Urinary symptoms** are common in women, especially after age 40. These include frequent urination, urinary incontinence, urinary urgency, and nighttime urination.
- A formula has been developed from extracts of **three** plants with a history of traditional use in addressing bladder disorders: **horsetail**, **lindera**, and **three-leaf caper**.
- In an animal model of overactive bladder, the herbal combination treatment reversed the detrimental shifts in bladder function parameters and in the levels of several tested biomarkers in the bladder epithelium and muscle.
- A placebo-controlled **clinical** trial has validated that this three-extract blend significantly improves urinary symptoms in women *without* harsh side effects.
- After eight weeks, this combination reduced daytime urination frequency to the ***normal level*** and incontinence episodes by **65%**. It also significantly reduced urinary urgency and nighttime urination and improved quality of life.

Summary

Urinary problems are common in women as they age and can impact the quality of their life.

In a clinical study, a blend of extracts from the plants **horsetail**, **lindera**, and **three-leaf caper** was shown to *reduce* daytime urinary frequency, urinary incontinence, urinary urgency, and nighttime urination in women.

These benefits translate into improved quality of life, without the adverse side effects of drugs commonly prescribed for these problems. •

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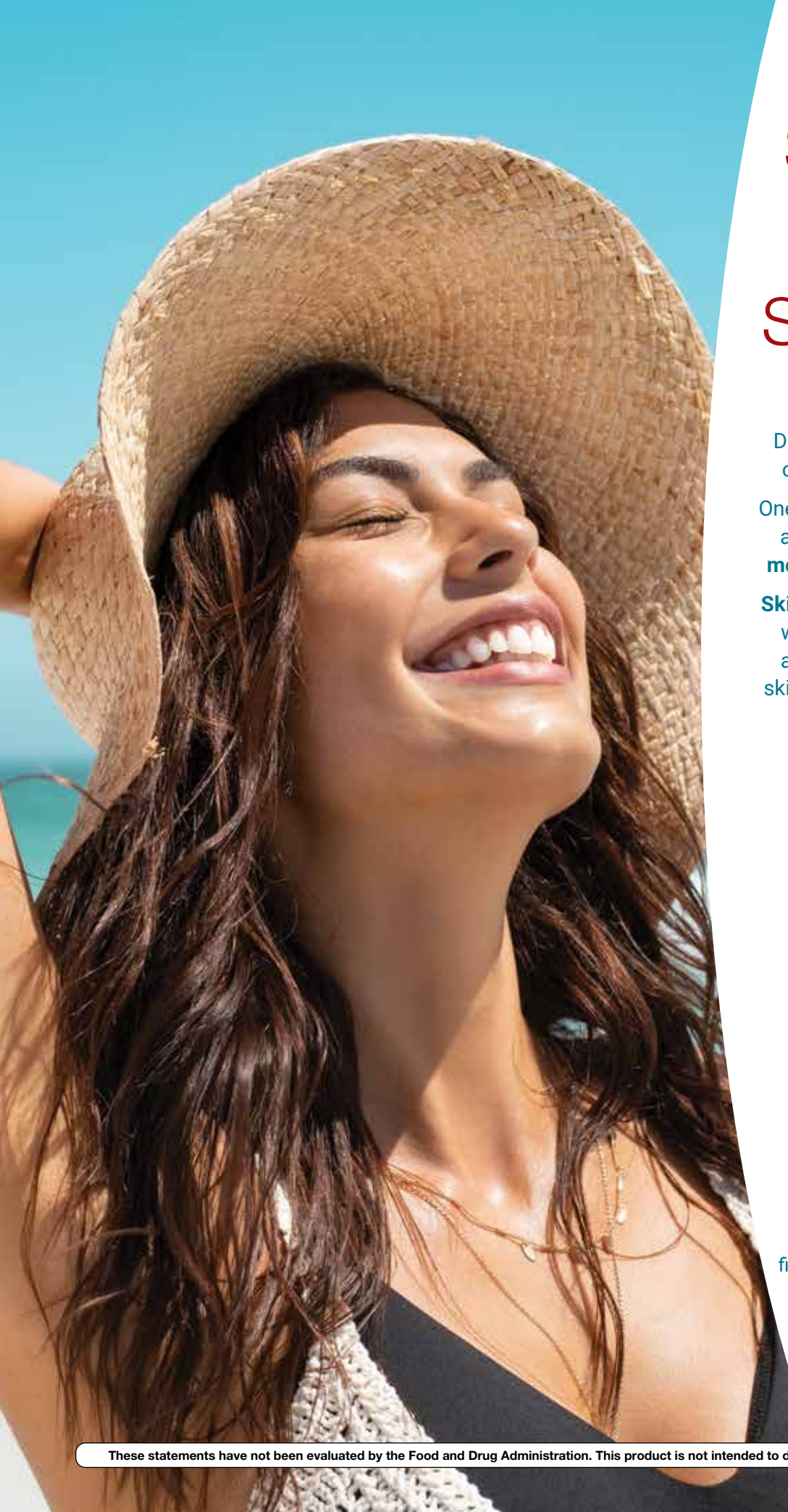
Lower Urinary Tract Symptoms

- **Lower urinary tract symptoms (LUTS)** are divided into storage and voiding/micturition (urination) phases.
- Storage phase involves **overactive bladder (OAB)** and **stress incontinence (SI)**.
- **Overactive bladder (OAB)** is a group of urinary symptoms, defined as having an urgent need to empty the bladder during the day or night, with or without incontinence.
- Median daytime urinary frequency is **3-4** hours **6-8** times daily.[6]
- Those afflicted with an overactive bladder have to go to the bathroom frequently (**>8** times during the day and **>1** time at night), may leak urine into their clothes, and report feeling depressed, stressed, and sleep deprived.
- This could be due to overactivity of the bladder detrusor (a muscle lining the urinary bladder, that manages storage and voiding of urine).[2]
- **Stress incontinence** is another common bladder problem in which women leak urine while sneezing, laughing, or doing other physical activities.
- Voiding symptoms include hesitancy, straining, terminal dribbling, intermittency, and slow, weak and/or interrupted stream.[2]



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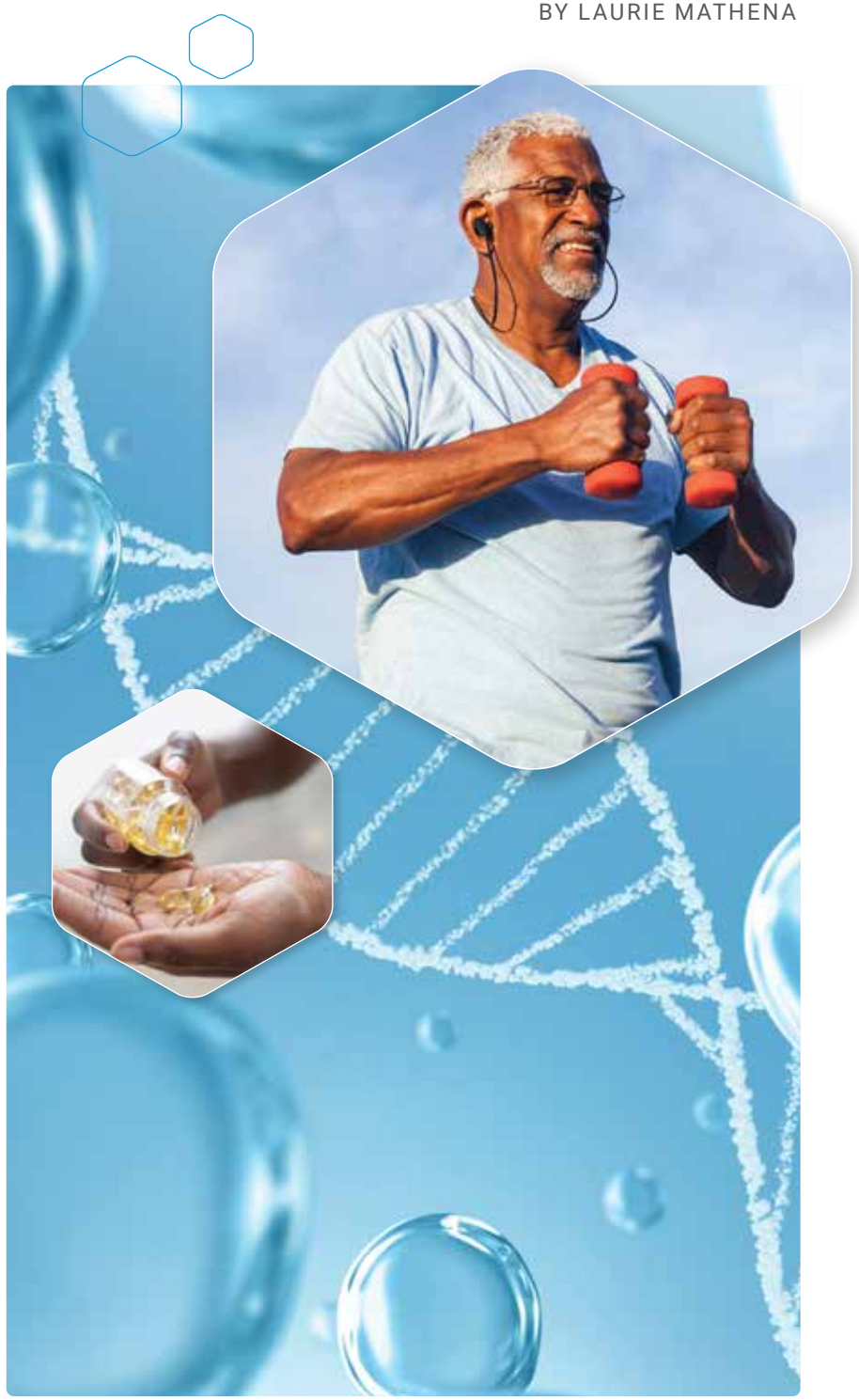
Nutrients for Preventing Frailty

BY LAURIE MATHENA



Starting around age 40, we lose roughly **8%** of muscle mass **per decade**. After age 70, muscle mass decreases by about **15%** per decade.[1]

This drastic decline in muscle mass is called **sarcopenia**. It increases the risk for falls and fractures, hospitalization,[2] and **disability**.[3,4]

Eventually, ***frailty*** can set in, which speeds up passage on the road to lost independence and early death.[5]

Two nutrients have been shown to head off sarcopenia and frailty by ***rebuilding lost muscle mass*** in aging adults.

These can be added to a protein-sufficient diet or protein supplements that contain body-mass-building amino acids.

Maintained Muscle Mass

Beta-hydroxy beta-methylbutyrate, or **HMB**, is a compound created during metabolism of the amino acid **leucine**.[6]

HMB helps decrease muscle breakdown (called **catabolism**) and increase muscle buildup (**anabolism**).[7-11]

HMB levels decline with age, a drop that correlates with diminished muscle mass and strength.[12]

A 2015 meta-analysis found that oral intake of HMB ***preserved muscle mass*** in older adults and may help prevent muscle atrophy.[13]

One study showed that HMB intake could even preserve lean body mass in the face of sustained **bed rest**, a powerful stimulus for sarcopenia.[14]

Improved Exercise Results

HMB has also been shown to help boost **lean body mass** when used with **resistance training**.[15,16]

In one study, a group of 70-year-olds participated in a resistance training exercise program five days a week. During that time, they took **one gram** of **HMB** or a **placebo** three times a day.[15]

After eight weeks, those taking HMB had an **increase** in lean body mass of **1.76 pounds**, while placebo recipients lost **0.44 pounds**—despite exercising five days a week.

This study showed that HMB can augment strength training in older adults.

Vitamin D3 can complement that action by further enhancing muscle strength.

Vitamin D3 Boosts Strength

Sarcopenia, associated with problems with balance and gait, adds to the risk of falling and fractures in older individuals.[17]

Vitamin D3 intake improves **muscle strength** and **performance**.[18,19]

Studies show that it's possible to increase **muscle strength** simply by boosting vitamin D levels.

A controlled trial of 160 postmenopausal women, aged 50-65, found that supplemental vitamin D3 provided significant protection against sarcopenia, as evidenced by an increase in muscle strength and control of progressive loss of muscle mass in the treatment group.[20] Falls can happen because of **inadequate muscle mass** and **poor coordination** or balance.[21]

Vitamin D3 shows promise for combatting *both* factors.

Researchers assigned women to receive either **1,000 IU/day** of vitamin D3 or a placebo. After nine months, those who took vitamin D had a **25.3%** increase in leg muscle strength, while women in the **placebo** group lost **6.8%** of their lean mass.[20]

A meta-analysis of clinical studies suggests that adequate intake of vitamin D not only preserves but also ***improves*** muscle strength.[18] That's an important finding, since loss of overall muscle strength can increase the risk of **mortality.**[22]

The greatest benefits were seen in those who had the lowest vitamin D levels at the beginning of the study (less than **12 ng/mL**) and in older subjects.

Other studies have found that increased vitamin D intake in deficient elderly adults led to improved **balance** and a *decreased* risk of **falls**.[23]

Summary

HMB and vitamin D have been shown to combat **sarcopenia** and help prevent **frailty** by maintaining and boosting muscle mass and performance.

HMB contributes to improvements in strength and lean muscle mass, while **vitamin D3** helps boost muscle strength and improve balance.

Combat Four Underlying Factors of Sarcopenia

There are four primary factors that contribute to sarcopenia. HMB or vitamin D3 mitigates each of these underlying factors:

Factor #1: Skeletal muscle protein imbalance causes muscle to break down faster than it is rebuilt.

HMB exerts pro-anabolic (muscle build-up) and anti-catabolic (anti-breakdown) properties.[9]

Factor #2: Declining sex hormone levels due to aging reduce muscle mass.

Vitamin D supports sex hormone synthesis[24] and muscle contractile strength.[25]

Factor #3: Falling numbers and activity of mitochondria greatly contribute to sarcopenia.[26]

Vitamin D3 signaling improves mitochondrial function and dynamics, which can increase muscle strength.[27]

Factor #4: As muscles break down, levels of pro-inflammatory markers rise.[28]

Vitamin D3 acts as an immune modulating hormone that can suppress inflammation associated with sarcopenia.[29]

A combination of HMB and vitamin D3, along with adequate protein intake, may help maintain optimal muscle mass, strength, and function well into older age. •

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

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Remarkable Life-Expectancy Impact of **Fish Oil**

BY MICHAEL DOWNEY

Readers of ***Life Extension Magazine***® seek **validated** methods to extend their healthy lifespans.

Some experiment with approaches shown in **animal** models to confer benefits…but lack conclusive **human** data.

Most know about the **heart health** benefits of **fish oil**.

Overlooked is compelling evidence showing that *higher* levels of ***omega-3s*** in humans correlate with ***longer life***.

This article summarizes research demonstrating multi-year **overall longevity** outcomes based on **omega-3** blood levels.

Beyond Heart Health

Fish oil is a rich source of **omega-3 fatty acids** that primarily include **EPA** (**eicosapentaenoic acid**) and **DHA** (**docosahexaenoic acid**).

Studies support *higher* intake of omega-3s for the prevention and management of **cardiovascular conditions**.[1-8]

Regular omega-3 intake can lower risk of heart attack and stroke and reduce ***mortality from heart disease***.[5,7-10]

The **pharmaceutical** industry has even created fish oil-derived **drugs** for reducing cardiovascular risks. These drugs, such as Lovaza®, and Vascepa®, are approved by the U.S. Food and Drug Administration (FDA) to reduce risk of cardiovascular events.[11,12]

Fish Consumption and Lifespan

A decade ago, a **16-year** study concluded that a **fish-rich diet** significantly *predicts* **longevity**.

Data on **2,692** senior adults showed that subjects with **high** blood levels of **omega-3 fatty acids** had:[13]

- **2.2 years** of ***longer*** **lifespan**,
- **27%** decrease in **overall mortality** risk, and
- **35%** decrease in **heart disease** mortality risk.

The omega-3 **DHA** was associated with a **40% reduction** in the risk of coronary heart disease death and substantially reduced mortality risk from arrhythmia (irregular heartbeat).[13]

In **2021**, a massive study evaluated **191,558** individuals' data and concluded that weekly intake of **175 grams** (two servings) of **oily fish** was associated with:[14]

- **Lower** risk of **death** among patients with previous **cardiovascular disease**,
- **Lower** risk of **death** from major cardiovascular disease, and
- **Lower** risk of **sudden cardiac death**.

Longevity Benefits for High-Risk Patients

These and other findings prompted studies on intake of **fish oil**.

A prospective study assessed **fish oil** intake and mortality among people with **cardiometabolic multimorbidity**.[15] This refers to having at least two of the chronic diseases, diabetes, stroke, or heart disease, which translates to exponentially *higher* mortality risk.[16]

Fish oil use by these patients was associated with a **17% lower** risk of **all-cause mortality**. Cardiovascular disease mortality risk was also reduced.

Taking fish oil at **age 45** was associated with ***adding 1.66 years to life expectancy.***[15]

Longevity Benefits in the General Population

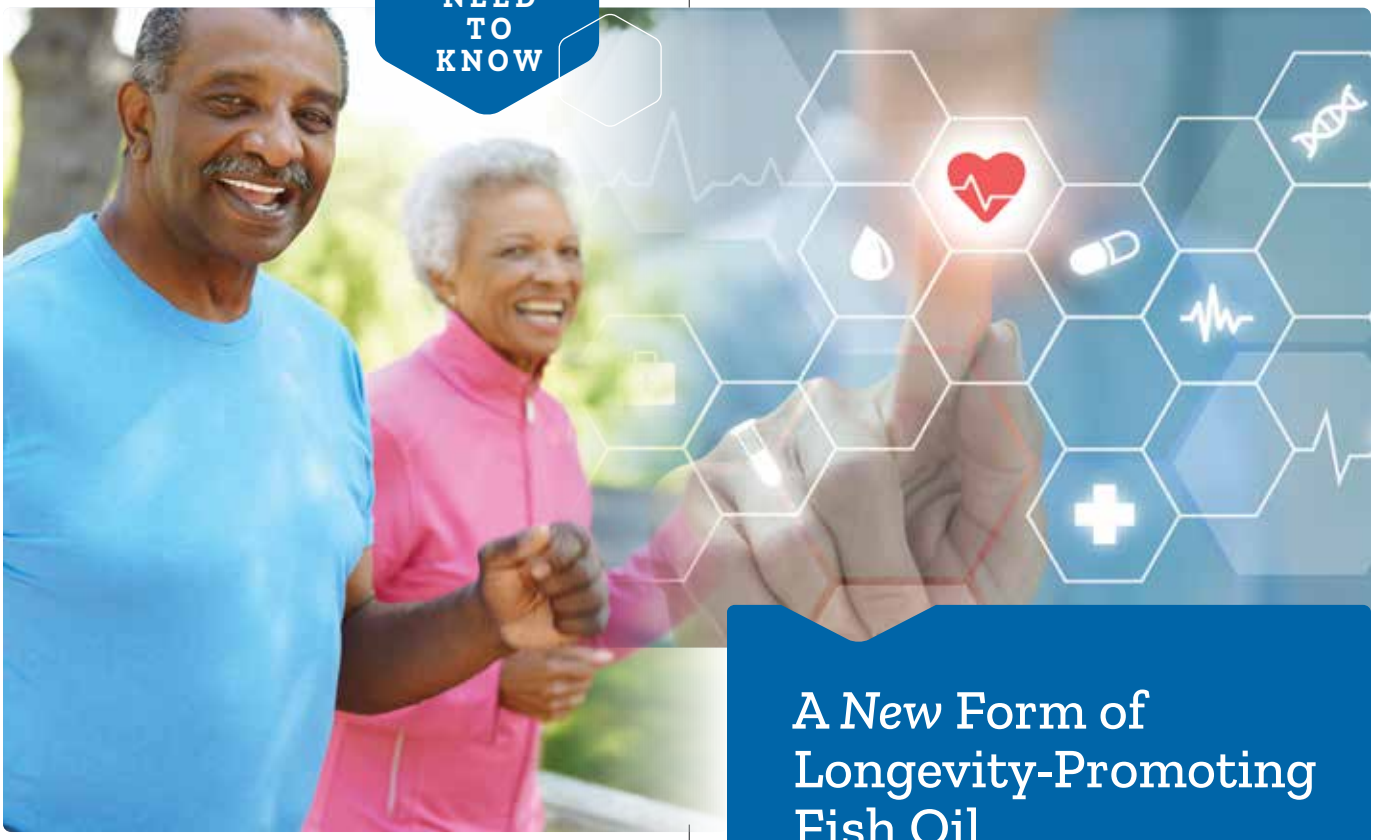
A *second* study using the UK Biobank cohort examined a whopping **502,536** volunteers aged 40-69 who live in the United Kingdom.[10]

Analysis showed that regular **fish oil** intake was associated with significantly **reduced**:

- **All-cause mortality**,
- **Cardiovascular disease mortality**,
- **Heart attack incidence**, and
- **Cardiovascular events**.

These associations were *independent* of numerous risk factors, including sex, age, ethnicity, body mass index, produce consumption, smoking, alcohol use, exercise, and various comorbidities.

WHAT YOU NEED TO KNOW



Amazingly, even *cold-water fish consumption* didn't change the benefits found for *fish oil supplements* to these outcomes.[10]

Another, earlier study looked at associations between *higher* blood levels of **omega-3 fatty acids** and **mortality,** using data from the **Framingham Heart Study**, one of the world's longest-running human studies.[17]

Those with the *highest* omega-3 blood levels, compared to the lowest, had an astonishing ***34% lower risk of death from any cause***.[17]

Lifespan Increase in Laboratory Model

Beyond the **human** lifespan studies discussed so far, laboratory researchers are discovering even greater longevity effects of omega-3s.

For over a century, researchers have used the fruit fly to study aging biology.[18] This fly has a short lifespan, so that effects can be observed in a fairly short amount of time, plus its **genome** is **60%** identical to **humans**.[19]

Scientists used the fruit fly in a study of the lifespan effects of omega-3 intake. Adding **EPA** and **DHA** to the flies' diets increased their median **lifespan** by **14.6%**.[20]

A *New* Form of Longevity-Promoting Fish Oil

- The heart benefits of **fish oil** are well-established, and recent studies provide compelling evidence of fish oil's potent **longevity** effects.
- Human data reveal that higher intake of fish or fish oil may add **years** to lifespan.
- An animal model showed that **EPA** and **DHA** supplementation increased lifespan by **14.6%**. That same percentage applied to humans would mean **11.5 years additional survival**.
- One recent study estimates that a dietary **lack** of **omega-3** oil may *shorten lifespan as much as smoking*.
- Innovative technology has allowed scientists to pack high amounts of fish oil into sugar-free, **chewable** forms for an alternative way to promote **longer life**.

If the average human lifespan were extended by a similar percentage, that would be an additional ***11.5 years of life***.[21]

This study shows that in a widely studied model organism, ***fish oil supplementation*** resulted in a marked **longevity increase**. This type of controlled intervention data in a time-tested biological model adds weight to the case, based on population data, for an enhancement of longevity from **fish oil** supplements.

Broad Benefits of Fish Oil

Recent data offer strong indications that the benefits of higher **fish oil** and **omega-3** fatty acid intake go beyond improving longevity and heart health.

Brain

- High omega-3 intake in midlife was found to maintain **brain** white matter integrity in old age.[26]
- Omega-3 lowered postpartum symptoms of **depression** compared to placebo.[27]
- Omega-3 significantly improved depression symptoms in pregnant and postpartum women.[28]

Insulin Resistance

- Omega-3 supplementation decreased fasting blood glucose as well as insulin resistance, compared to placebo.[29]
- Fish oil or oily fish intake was associated with a lower risk of **type II diabetes**.[30]

Sarcopenia

- Omega-3 intake promoted **muscle mass**[31] and **strength**[32] in older adults.
- There is emerging evidence for beneficial effects of omega-3 fats in this muscle-wasting disease.[33]

A Fish Oil-Longevity Explanation

One researcher has investigated possible explanations for this fish oil-longevity association by examining the role of **bioactive lipids**—a group that includes **EPA** and **DHA**—in age-related disease.[22]

This review noted that the body derives several healthy fats, including **EPA** and **DHA**, from dietary intake of **alpha-linolenic** acid found most abundantly in plant foods.

Alpha-linolenic acid is converted to **EPA/DHA** in the body by the action of enzymes known as ***desaturases***.[22]

Desaturase activity *declines* with age. As a result, aging cells can become deficient in various bioactive lipids, including **EPA** and **DHA**, potentially contributing to aging and metabolic abnormalities.

This scientist concluded that direct oral intake of bioactive lipids such as **EPA** and **DHA** may aid "***in the prevention, postponing, or even reversing of some of the aspects of aging***."[22,23]

Low Fish Oil Intake Shortens Life Similar to Smoking

How much impact might **fish oil** have on lifespan?

A recent study analyzed **Framingham Heart Study** data for individuals in their mid-sixties and concluded that:[24]

- **Smoking** was associated with a life expectancy **reduction** of ***4.73 years***, while
- The lowest body levels of **omega 3**, compared to the highest, were associated with a life expectancy **reduction** of ***4.74 years***.

In other words, for people in their 60s, low levels of **omega-3**s are as much of a risk for early mortality as smoking, based on these data.

Alternative to Softgels

Seeking ways to improve compliance with **fish oil** intake recommendations, Norwegian scientists spent **10 years** developing a *new* option for those who don't like softgels or capsules.

They created a water and protein matrix containing *tiny* droplets of fish oil, allowing for a higher nutrient load in a smaller space.[25] The result is a "gummy bite" that is small, tasty and sugar-free.

The smaller droplets also provide more surface area, enhancing breakdown by digestive **enzymes** in the body.[25]

For those who don't like to swallow **capsules**, this innovative technology packs **high-dose fish oil** into gummy bites.

Summary

Higher **fish oil** intake has long been shown to prevent and manage **cardiovascular conditions**.

Recent evidence links *higher* fish or fish oil intake, and higher blood levels of omega-3 fatty acids from fish, with **increased longevity** as well.

The highest **omega-3** blood levels were linked to a **34% lower** risk of ***death from any cause***.

Innovative technology has been used to produce a tasty, sugar-free, tropical fruit-flavored, gummy-bite form of fish oil for those who don't like swallowing softgels. •

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What's Behind the Fish Oil-Longevity Link

Scientists are still exploring *how* higher **fish oil** intake may lead to greater longevity. Emerging research provides a glimpse into at least some of the possible connections:

- A healthy level of omega-3 fatty acids can reduce and help resolve **chronic inflammation**.[34-37] This helps lower the risk for most age-related—***and potentially life-shortening***—chronic diseases, including cancer, obesity, diabetes, and dementia.
- A study of patients with chronic kidney disease found that omega-3 intake resulted in **longer telomeres** within white blood cells. Telomeres are the longevity-associated chromosomal "clocks" that shorten as we age.[38]
- Omega-3 fatty acids are precursors of signaling compounds known as **endocannabinoids**.[39] The endocannabinoid system is involved in regulation of appetite, pain sensation, mood, and memory.[40]
- Blood levels of DHA and total omega-3 fatty acids have been found to be significantly correlated, in middle-aged and elderly women, with diversity in the **gut microbiome**, the intestinal community of microbes.[41] Greater diversity is nearly always associated with greater disease resistance and better health.

How Can You Test Omega-3 Levels?

The best way to know if you are getting enough **omega-3 fatty acids** is to test your blood levels. The **Omega-3 Index** is a finger-stick blood test that can measure the *percentage* of omega-3 fatty acids in your red blood cells.

Ideally, your **Omega-3 Index score** should be greater than **6.8%**. The typical Japanese Omega-3 Index score is above **8.0%**, which may help account in part for the **five-year longer life expectancy** in Japan compared to the United States.[24]

To order the at-home Omega-3 Index test, call **1-800-544-4440** or visit www.LifeExtension.com.

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MJ

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- Support breathing capacity
- Help protect lungs from environmental factors[1]
- Promote lung function[2-4]

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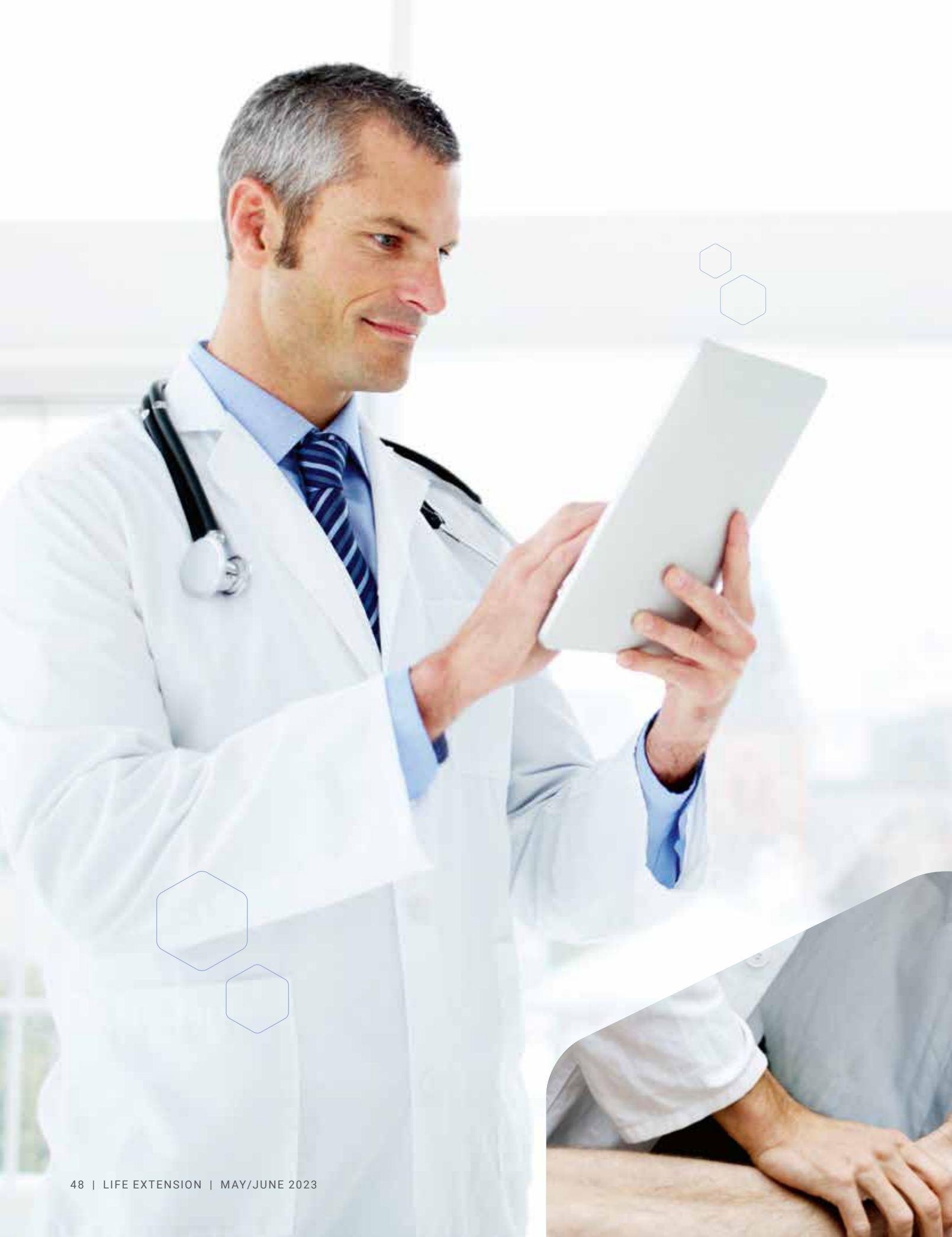


Protect Peripheral Nerves with Lipoic Acid

BY JACK ROSS

Over 20 million Americans are estimated to have some form of **peripheral neuropathy,** a nerve disease that can lead to pain, numbness, and weakness, most often in the hands, feet, and legs.

Peripheral neuropathy has different causes, with **diabetes** and blood vessel problems notable among them.[1]

As it worsens, **diabetic peripheral neuropathy** may lead to the development of foot ulcers and the need for foot or leg amputations.[2] People with peripheral neuropathy also have higher rates of **overall mortality**.[3]

But there's good news. A nutrient called **lipoic acid** has been successfully used for the treatment of diabetic neuropathy in Germany for decades.[4,5]

Clinical trials in people suffering from **diabetic neuropathy** show that **lipoic acid** can reduce **pain** and other symptoms,[6-9] and may help prevent progression of nerve damage.[9]

What Is Peripheral Neuropathy?

Peripheral neuropathy is a general term for disease of the nerves outside the brain and spinal cord.[10]

Peripheral neuropathies, diabetic[2,11] or non-diabetic, often begin in the feet, and often progress up the leg over time.[1,12]

Among other conditions that affect nerves, the most common culprit is **high blood sugar**, which is why people with type II diabetes have the *highest* rates of neuropathy.[2,13]

Estimates of the prevalence of peripheral neuropathy in diabetics range as high as **70%**.[1]

In adults *without* diabetes, peripheral neuropathy occurs much less frequently than in those with diabetes.[13] Alcohol abuse,[13] some chemotherapy drugs,[13] hereditary diseases, vitamin B12 deficiency, and other health conditions can contribute to or cause its development.[1,14]

Peripheral neuropathy often results in loss of function, numbness, tingling, and extreme pain.[12]

Eventually, it may result in loss of balance.[10] Diabetic neuropathy may result in difficulty walking and increased risk of falls.[5]

Diabetic neuropathy is the major cause of diabetic **foot ulcers** and **infections**, which can lead to leg **amputations**.[2,13] A large, clinical study showed lower-limb amputation rates in those with **diabetes** were **15 times** higher than in non-diabetics.[15]

Neuropathy in diabetics can also affect nerves that control heart and blood vessels, causing abnormalities of heart rate and blood vessel function. **Cardiac autonomic neuropathy** can be associated with a high risk of arrhythmias, and sudden cardiac death.[16,17]

One large study found that peripheral neuropathy is an independent predictor of *higher* **overall mortality**.[3]

Lipoic Acid Defends Nerves

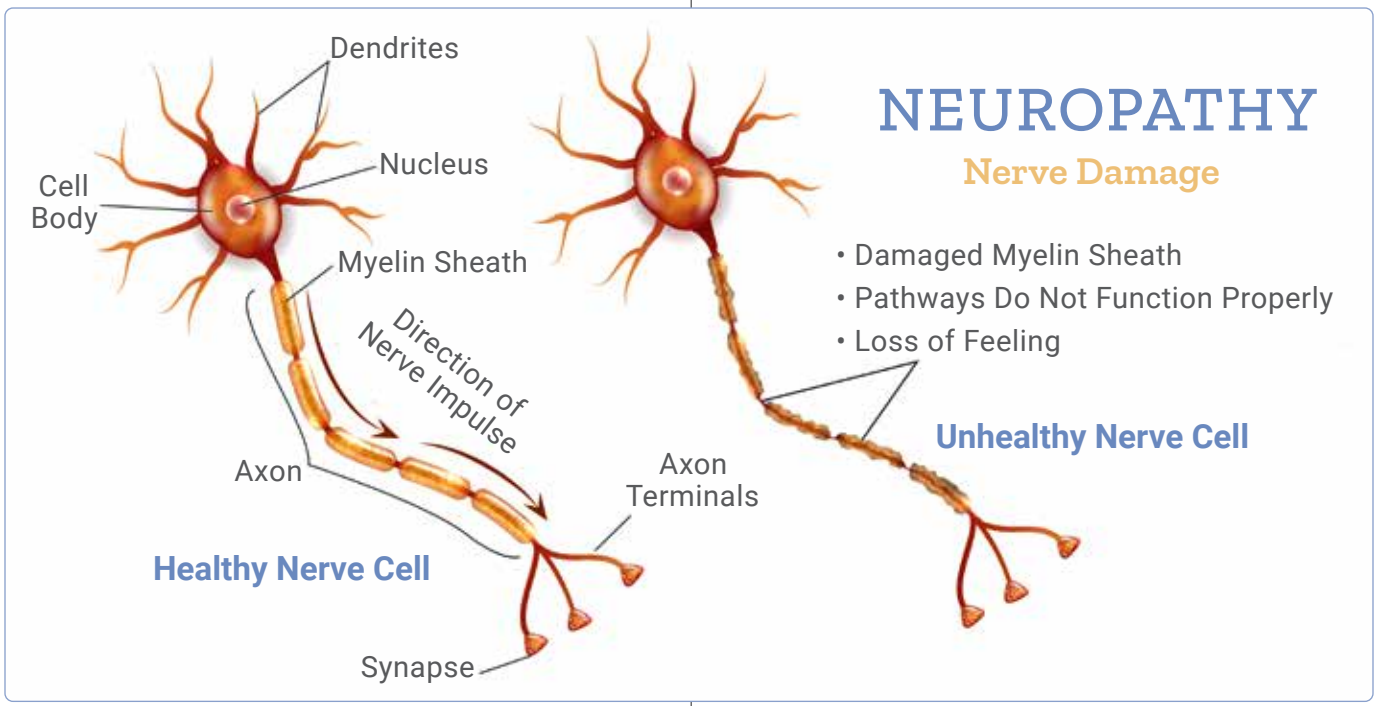
Lipoic acid is a compound produced in the body and also found in small amounts in some vegetables and animal products, particularly organ meats.[18]

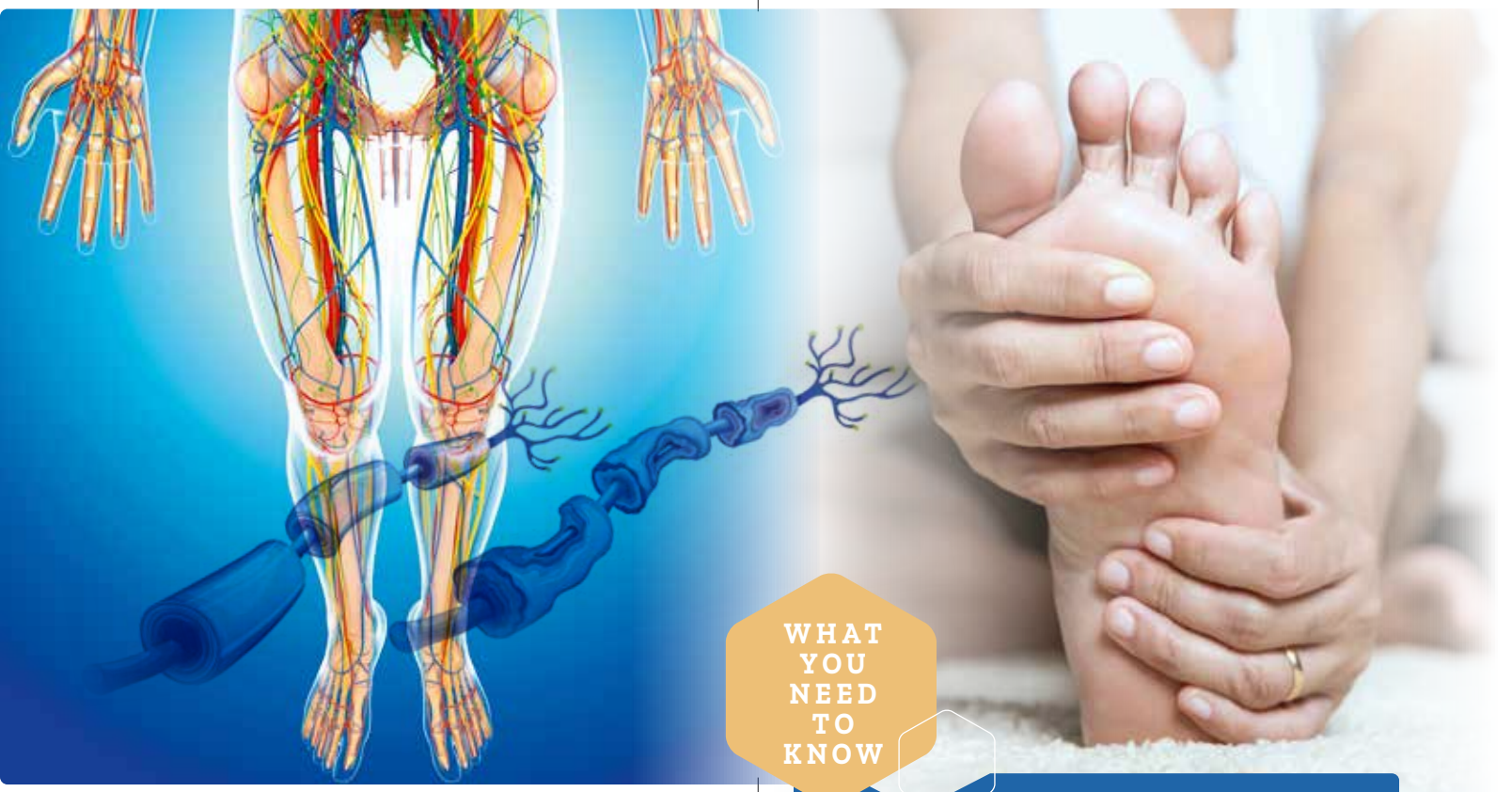
It plays an essential role in turning glucose and other nutrients into energy.[19] It enhances glucose uptake,[20] and plays a role in modulating **insulin sensitivity**.[21]

It is also a potent **antioxidant** that helps fight oxidative stress. It even helps regenerate several *other* antioxidants.[12,22]

One review reported that lipoic acid can help decrease pain signals by blocking channels on pain-sensing nerve cells.[5]

Lipoic acid has been licensed and used in the management of **diabetic peripheral neuropathy** for decades in Germany.[5]





WHAT YOU NEED TO KNOW

Get Relief from Peripheral Nerve Pain

- **Peripheral neuropathy** is a common condition marked by loss of sensation, tingling, numbness, and pain in the peripheral nerves.
- The most common cause is high blood sugar, seen in **type II diabetes**, but people without diabetes can also suffer from peripheral neuropathy.
- Peripheral neuropathy is associated with an increased risk of overall mortality.
- The nutrient **lipoic acid** can help relieve peripheral neuropathy symptoms, including pain and numbness, and may also improve nerve function.

Easing Pain and Improving Function

Scientists have conducted many clinical trials of **lipoic acid** for diabetic peripheral neuropathy.[6-9,18]

Nerve conduction studies, which measure how efficiently electrical signals move through a nerve, have shown that lipoic acid can **improve nerve function**. Nerve conduction velocities that were previously slowed were boosted with lipoic acid use.[8]

Additional benefits have been identified in other trials.

For example, a clinical study in diabetics found that lipoic acid not only improved peripheral neuropathy scores, it also significantly decreased feelings of **depression**.[9] Diabetics are two to three times more likely than non-diabetics to have depression.[23]

Another clinical study found that **50%** of subjects felt their **quality of life** and **overall health** condition was "very much better" or "much better" following 40 days of lipoic acid supplementation.[6]

Studies have shown that lipoic acid led to improvements in potentially deadly **cardiac autonomic neuropathy** as well.[8,24]

Lipoic acid use has also been associated with improvements in body mass index,[5,8,25] cholesterol levels,[6] and markers of blood glucose control.[8,24]

Summary

Peripheral neuropathy is a common condition that causes numbness, tingling, pain, and loss of function in the peripheral nerves. In diabetics, it is associated with an increased risk of amputations, falls, and death.

Lipoic acid has been used to treat diabetic peripheral neuropathy in Germany for decades.

Clinical studies show that it can lead to significant reductions in pain, numbness, and other symptoms. •

Two Forms of Lipoic Acid

Lipoic acid occurs in two different forms: R-lipoic acid and S-lipoic acid.

Most production methods result in a mixture of these forms.[18,26]

The "**S**" form is not very biologically active. The "**R**" form is the biologically active component (and the kind produced by the body) that is responsible for lipoic acid's phenomenal antioxidant effect.[18,26]

A lipoic acid formula that provides **100%** R-lipoic acid can be readily used by the body, maximizing its health benefits.

Animal and human studies demonstrate that R-lipoic acid provides clinical benefits with ***much greater biological activity***.[18,26,27]

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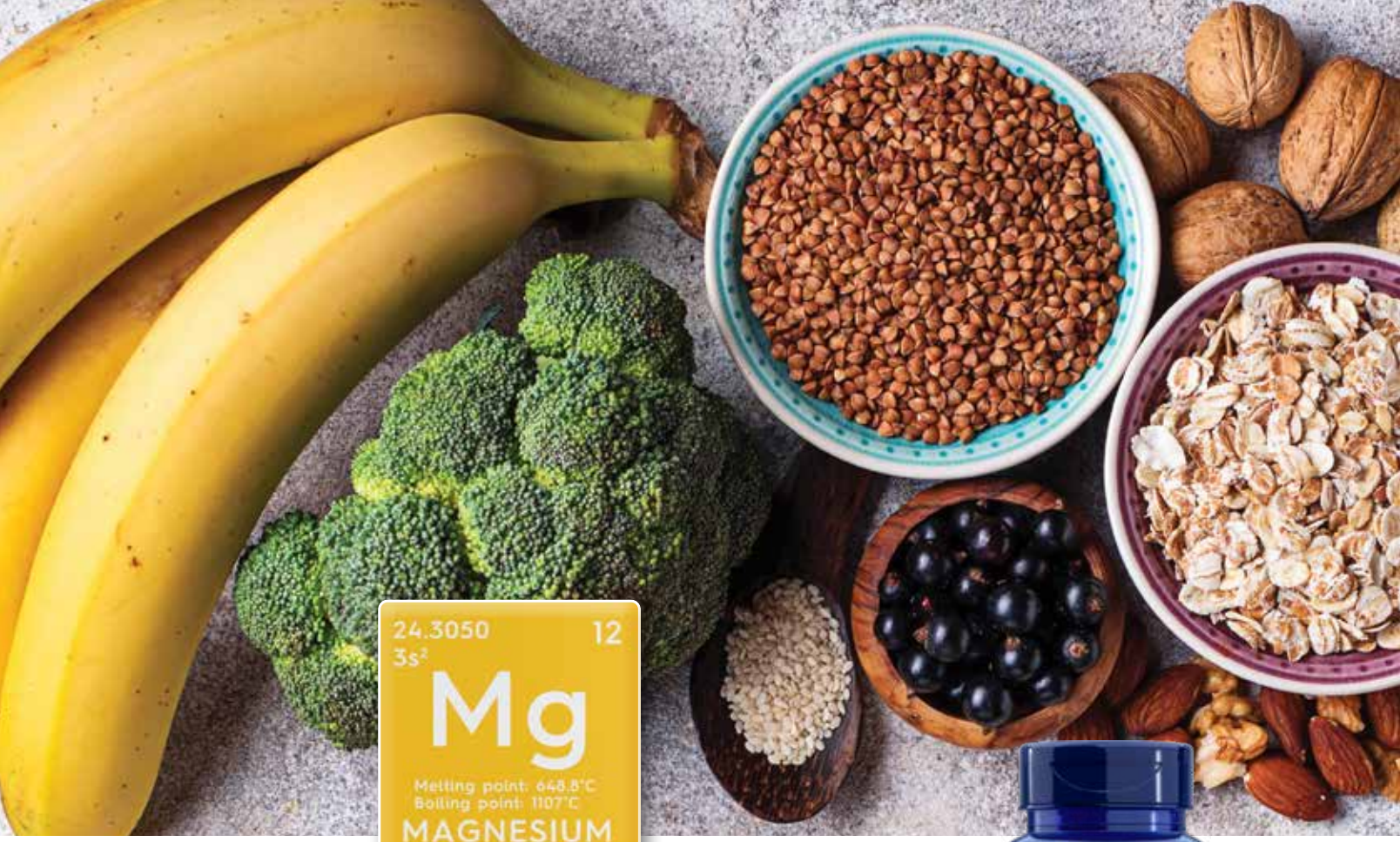

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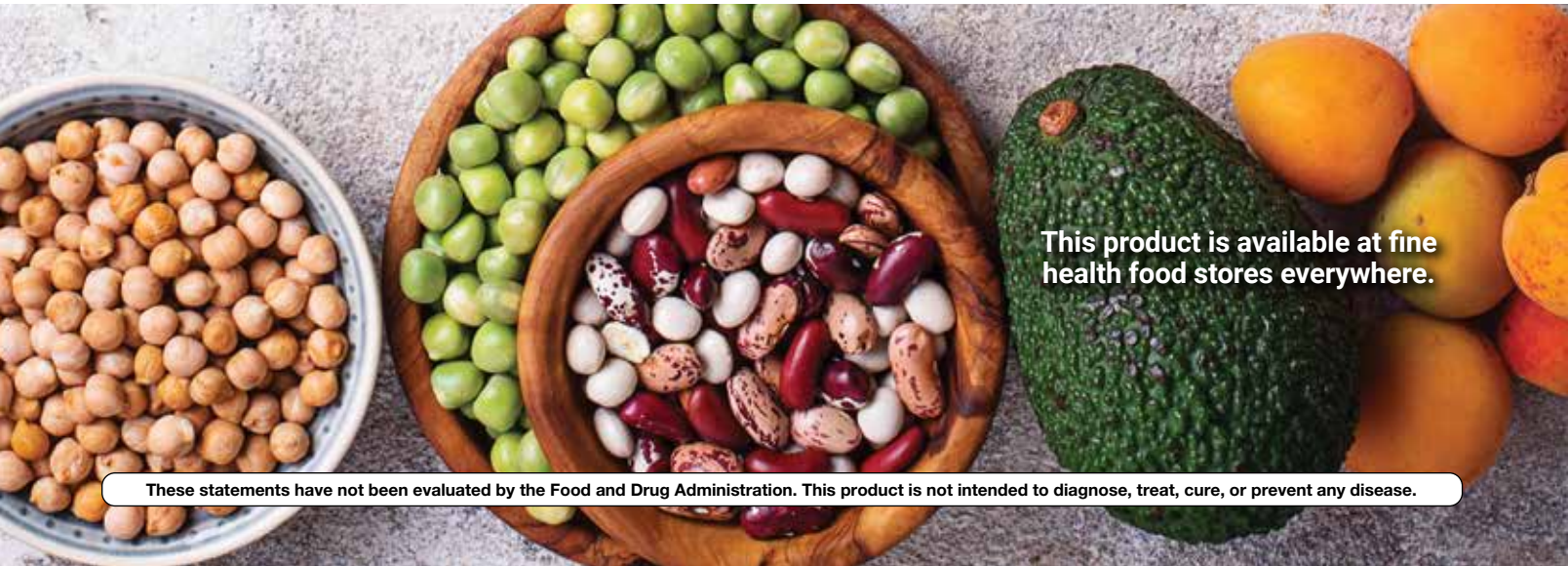

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Lactoferrin's Cell Regenerative Effects

BY GREGORY E. BIGFORD, PHD, MSBA

Lactoferrin is a multi-functional protein known for its ability to support **immunity**.

Research in preclinical[1-5] and clinical settings[6,7] reveals how **lactoferrin** helps prevent growth of **microbes**, including bacteria and viruses, in healthy cells.

A recent clinical trial in **Japan** found that this protein has properties that can help mitigate **infectious diseases** including summer colds.[8]

Emerging preclinical data suggest that **lactoferrin** can also help promote cellular **regeneration**.[3] In other words, it has potential to help the body heal and repair itself.

What is Lactoferrin?

Lactoferrin is a protein primarily found in milk, tears, nasal fluids, saliva, and secretions from gastro-intestinal, and reproductive tissues.[1,9]

It is also found in blood plasma,[9] immune cells such as neutrophils,[10] and macrophages.[1] It helps facilitate **immune responses** against pathogens such as bacteria, parasites, fungi, and viruses.[1]

Lactoferrin Against Viral Illnesses

Lactoferrin is present in our body and is a factor in the body's defense against infections.

It strengthens the immune system by blocking the direct viral invasion of cells.[11]

One unusual feature of **lactoferrin** is the diversity of viruses it can shield against. It possesses robust **antiviral** activity against viruses that cause the **common cold** and **flu**, gastroenteritis, hepatitis B and C, herpes simplex, Epstein-Barr virus, and more.[4,11]

Lactoferrin also has *indirect* antiviral effects. It helps the body fight against a virus by **activating immune** defenses. It boosts the activity and number of **natural killer** cells.[1,12,13] Viruses replicate inside cells. Natural killer cells can recognize abnormal cells, including those infected by viruses, and destroy them. This can help prevent the spread of a virus in the body.

Lactoferrin also stimulates the production of other antiviral compounds, including the signaling proteins known as **interferons**.[2,8,11]

Lactoferrin may also help block the ability of viruses to **reproduce** even if they're already inside cells.[11] This helps limit the spread of the virus, potentially reducing the severity of the resulting illness.

While some lactoferrin is produced in the body, oral intake can boost its levels.

In more recent years, scientists have conducted research into its potential ability to help the body repair damaged tissues and cells.

Regenerative Properties

Inflammation and **oxidative stress** can severely harm cells, leading to deterioration of body systems and chronic disease.

Preclinical studies have shown lactoferrin's **anti-inflammatory** and **antioxidant** properties help protect against that damage.[14] It works by stimulating anti-inflammatory molecules,[2,13] inhibiting pro-inflammatory molecules,[2,15,16] and scavenging free radicals[14,17-19] to reduce oxidative stress.[20-23]

Lactoferrin also has *direct* properties of **regeneration** and **repair**. It can:

- Bind and interact with **DNA** to protect genetic material against damage,[14]
- Promote healthy cell division,[24] and
- Spur **differentiation** of stem cells (when stem cells mature and develop into specialized cell types).[25,26]

Together, these actions may help the body repair itself and even ***reverse*** some of the damage that comes with aging.

Bone Benefits

Much of the research on lactoferrin's regenerative qualities has focused on **bone health**.

Studies have found that lactoferrin can promote proliferation of *bone-forming* cells known as **osteoblasts** and the differentiation of stem cells into **bone cells**.[3,27] Preclinical studies have shown it can also activate bone-building signals that normally halt with age.[28-30]

This could be important for people with **osteoporosis**, in which bones become brittle and prone to fractures.[31] Osteoporosis is alarmingly common, affecting **30%** of women aged 50 or older, **77%** of women over 80, **16%** of men 50 or older, and **46%** of men over 80.[32]

In a randomized placebo-controlled human trial, women aged 45 to 60 years, who were at high risk for osteoporosis, were given **125 mg** per day of **lactoferrin** (enriched with an enzyme from milk called ribonuclease) for **180** days. In those who received the lactoferrin, there was a significant reduction in bone resorption and an increase in bone formation.[33]

One of the side effects of bisphosphonates (drugs to prevent bone loss) is osteonecrosis (in which bone dies due to low blood flow).

In a study of people with bisphosphonate-induced **osteonecrosis**, a lactoferrin-saturated dressing was applied directly to wounds after surgical removal of dead bone. **Bone healing** and **wound closure** were complete in just ***one to two weeks***, compared with ***two to three months*** under usual treatment.[34]

Other studies have shown that lactoferrin inhibits the process of bone *breakdown*.[3,35] Lactoferrin may also be able to offset bone degeneration and promote regenerative processes, preserving **bone mass** and improving bone architecture.[36]

Another human study shows lactoferrin supplementation to be beneficial in people with periodontal disease [37]

WHAT YOU NEED TO KNOW

The Regenerative Power of Lactoferrin

- **Lactoferrin** is a milk protein often consumed as a dietary supplement to support immune health.
- Research shows that lactoferrin is active against a wide assortment of pathogens.
- It works by helping to block viral invasion of cells and by amplifying the immune system's power to eliminate viral infection from the body.
- Early research has shown that lactoferrin can promote cellular and tissue **regeneration** and repair, processes that help the body reverse damage.
- Preclinical research shows that lactoferrin has **anti-cancer** effects.
- Research suggests that lactoferrin may spur the formation of new blood vessels, helping restore blood flow to damaged tissue.

Repairing Cartilage and Tendons

Like bone, **cartilage** tends to wear down with age, leading to pain and stiffness at the joints. **Osteoarthritis**, the most common type of arthritis,[38] and **disc degenerative disease** both involve the progressive deterioration and degradation of vertebral discs and cartilage.[39]

A **lactoferrin-derived peptide** has shown promise in addressing these degenerative processes. In preclinical studies, it was found to inhibit inflammatory mediators and break down processes in joint cartilage[40-42] and discs.[42,43]

Tendons are fibrous tissues that attach muscle to bone. In an animal model, a **lactoferrin-derived peptide** was effective in enhancing tendon repair after injuries that result in loss of functional mobility.[44]

A human trial in patients undergoing tendon repair surgery found that injection of the same peptide into the surgical site led to a significant improvement in **function** and **mobility**.[45]

Wound Healing

Lactoferrin has also shown great potential as a wound-healing agent.

In a clinical trial in diabetic patients, a population prone to chronic skin ulcers, application of a gel that incorporated a synthetic form of lactoferrin resulted in **reduced neuropathic ulcer size**.[46]

In cell and animal models of **burn wounds,** a plant-derived lactoferrin that is identical to human lactoferrin stimulated skin cell function and wound healing.[47]

In preclinical studies, direct application of lactoferrin also accelerates the wound-healing process in the **cornea** of the eye,[48,49] and the mucous lining of airways.[50]

Emerging Applications

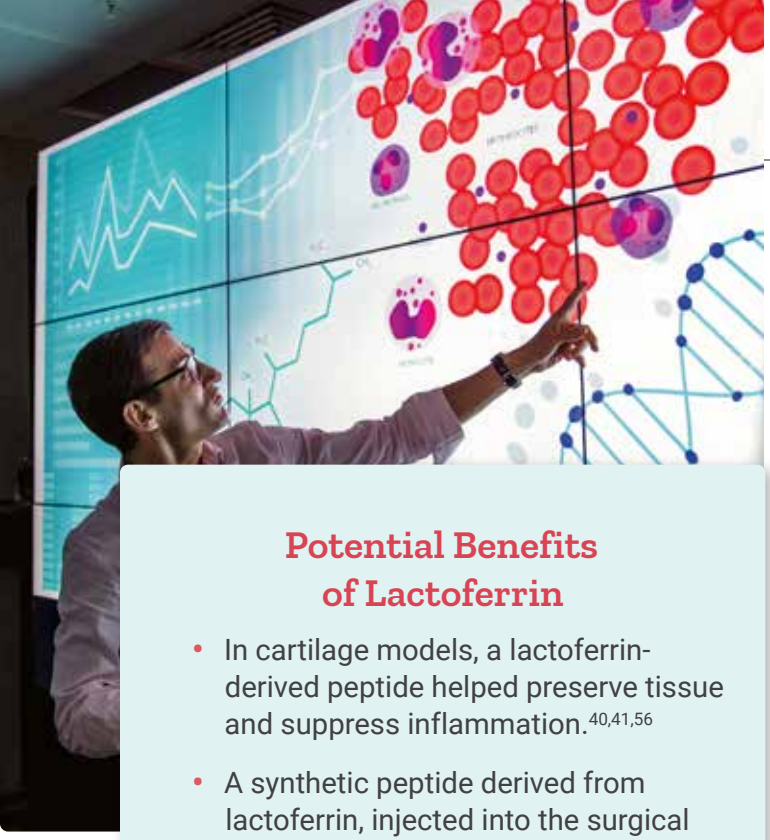
A review published in **2021** noted lactoferrin's ability to modulate growth, proliferation, and differentiation of **stem cells** into **osteoblasts**.

The review also indicated the potential of lactoferrin in supporting **angiogenesis** (formation of new blood vessels).[3] Blood vessel development is a vital step in regenerative medicine as it enables the restoration of blood flow to damaged tissues.[51]

"Talactoferrin" is a recombinant protein, a synthetic drug form of human lactoferrin. Preclinical studies of **skin wounds** show that talactoferrin can increase the **healing rate** and decrease the healing time of the wound.[52]

Lactoferrin has also shown **anti-cancer** effects, contributing to cell-cycle arrest and cell death in cancerous cells.[53,54] In an animal study, lactoferrin in conjunction with other factors substantially suppressed **prostate tumor** growth in mice.[55]

More clinical research remains to be done, but lactoferrin holds great promise in helping the body repair itself and in promoting overall health.



Potential Benefits of Lactoferrin

- In cartilage models, a lactoferrin-derived peptide helped preserve tissue and suppress inflammation.[40,41,56]
- A synthetic peptide derived from lactoferrin, injected into the surgical site in human tendon repair surgery, resulted in improved sensory and mobility recovery.[45]
- In a rodent, as well as a bone cell model, it promoted healthy bone metabolism and structure.[29,57]
- The same lactoferrin-derived peptide promoted preservation of intervertebral disc cells.[43]
- In a clinical trial, a topically applied gel made with a synthetic lactoferrin drug promoted significantly greater healing of diabetic neuropathic ulcers.[46]
- In laboratory and animal models, direct application of lactoferrin aided in healing the corneal tissue that forms the surface of the eye.[48,49]
- In a preclinical study, a plant-derived lactoferrin that is identical to human lactoferrin stimulated skin cell function and wound healing.[47]
- Evidence from preclinical studies indicates it may possess various anti-cancer effects.[1,12,54]

Supplementing with Lactoferrin

Lactoferrin has a wide range of benefits. A typical dose of lactoferrin is **300 mg** once or twice daily.

Taken orally, lactoferrin is readily absorbed and can play an important role in bolstering defenses against viral illnesses.

Summary

Many people consume **lactoferrin** for immune support. A significant amount of preclinical research has shown that various forms of this protein, or its derivatives, may also aid the body's **regenerative processes**, helping to repair damage to bone, cartilage, and tendons, speed the healing of wounds, and more.

These and other effects hold great promise for our approach to osteoporosis, arthritis, and other degenerative disorders. ●

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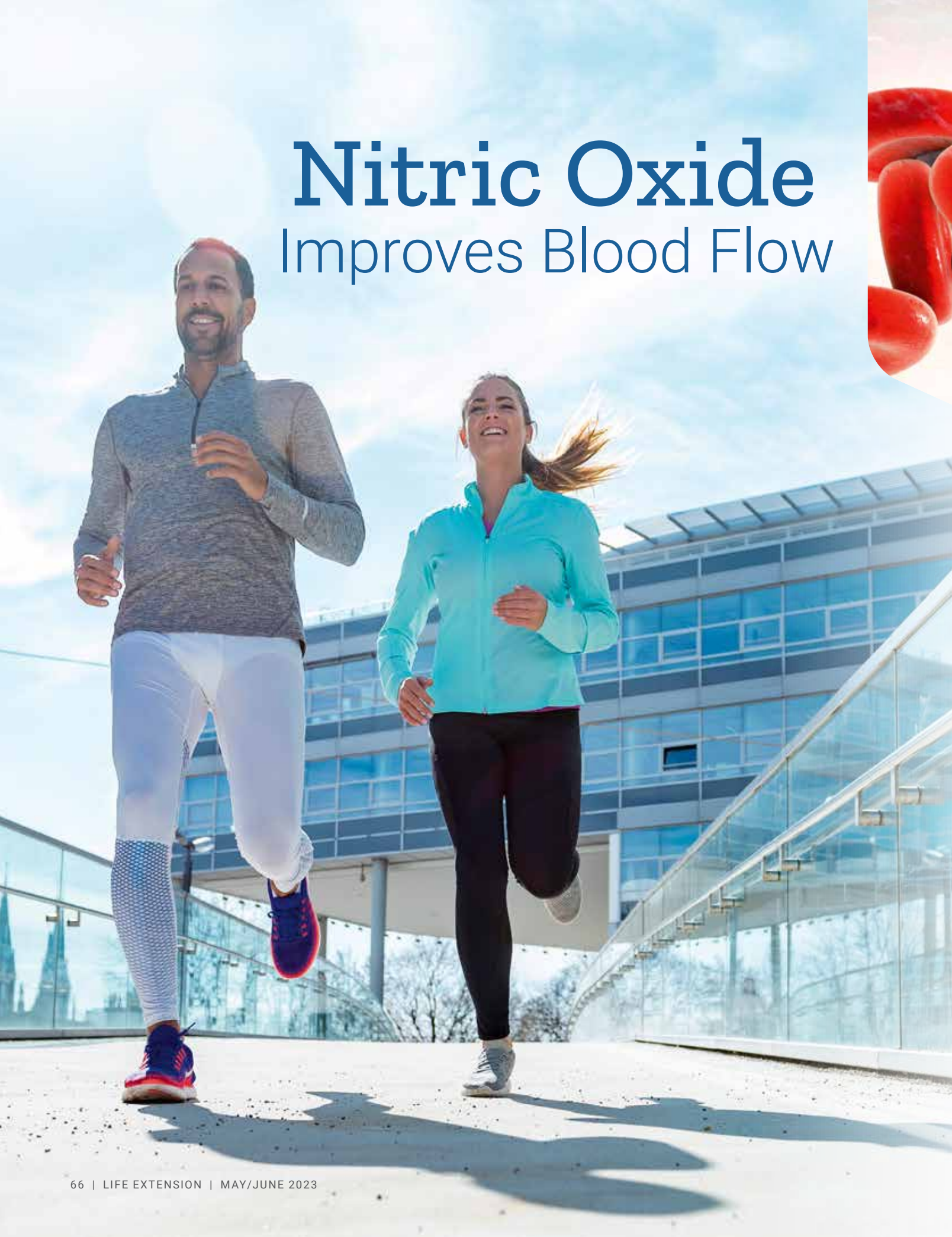


BY CHANCELLOR FALOON

Nitric oxide plays a major role in the *dilation* of blood vessels.

It is vital for maintaining healthy **blood flow**,[1] **blood pressure,**[2] and **platelet function**.[1]

The problem is that internal **nitric oxide** production *decreases* with age.[3,4]

Low nitric oxide is associated with an increased risk of **cardiovascular diseases,**[4] **cognitive decline**, and **dementia**.[4,5]

Nitric oxide has a short half-life. It gets metabolized and quickly eliminated from the bloodstream.[6]

Aronia berry and a long-acting form of **L-arginine** each work to boost and sustain *higher* **nitric oxide** production.

Importance of Nitric Oxide

Nitric oxide is produced by nearly every cell in the body.[7,8] It's needed to dilate **blood vessels**, allowing them to open up to increase blood flow.[9]

When we exercise[9,10] or travel to higher altitudes,[11] our bodies release *more* nitric oxide to relieve blood vessel constriction.[10]

Nitric oxide is also produced in our nasal cavity when we breathe through our nose. This helps to combat **viruses** and **bacteria**.[12,13]

The 1998 **Nobel Prize in Physiology or Medicine** was awarded to scientists who discovered its role in maintaining **cardiovascular health**.[14,15]

With age, nitric oxide levels decline. This can result in **endothelial dysfunction**, when these cells lining the inner walls of arteries don't work properly.[4] Blood vessels can't widen when needed, *reducing* blood flow.

That can lead to high blood pressure, atherosclerosis, abnormal clotting, and increased risk of **heart attacks**, **strokes**, and **sudden cardiac death**.

Endothelial dysfunction also increases the risk of **dementia** and **cognitive dysfunction**.[3,16,17]

Long-Acting Form of L-Arginine

For the body to produce nitric oxide, no compound is more important than the amino acid **L-arginine**. It is the direct **precursor** nutrient that blood vessels use to make **nitric oxide**.

In a clinical trial, patients with high blood pressure were given either a placebo or a single dose of **L-arginine**. Measurements were taken of **flow-mediated dilation**, how much a blood vessel **dilates** (widens) in response to an increase in blood flow.

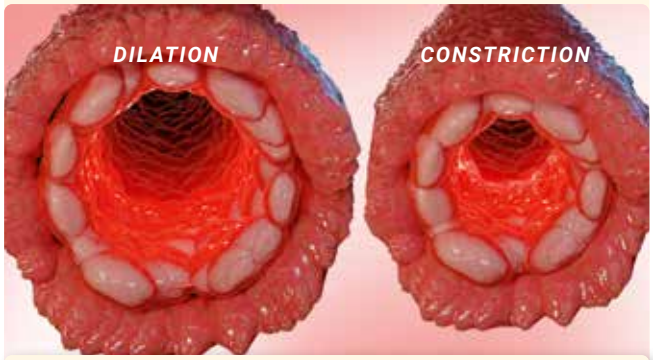
Participants who received the placebo had no change. But those given **L-arginine** had an average improvement in flow-mediated dilation from **1.7%** to **5.9%**.[18]

Considering that each **1%** improvement in flow-mediated dilation correlates with a **12%** lower risk of cardiovascular events, this suggests a potential **50%** reduction in risk for cardiovascular events.[19,20]

A drawback with L-arginine has been that it takes about an hour to take effect and it does not stay in the bloodstream for long.[21]

But scientists have developed a more **bioavailable** (more enters circulation and can have an effect) form of L-arginine called **inositol-stabilized arginine silicate**. It works within just **15 minutes** and sustains L-arginine levels for up to **six hours**.[21,22]

Flow-Mediated Dilation



Flow-mediated dilation is the change in diameter of blood vessels in response to increased blood flow (such as exercise or high blood pressure).

It can assess vascular function and cardiovascular risk in an individual.

Research indicates that for every **1%** increase in brachial artery flow-mediated dilation, the risk of cardiovascular events is reduced by **0.87%.**

Inositol-stabilized arginine silicate appears to keep L-arginine levels *higher* for longer periods because it inhibits the enzyme **arginase**, which breaks down L-arginine.[23]

This stabilized L-arginine form has demonstrated clinical benefits that standard L-arginine hasn't been shown to achieve.

In three recent randomized, controlled trials, **inositol-stabilized arginine silicate** improved working memory, processing speed, concentration, and other measurements of **cognition** in young adults.[24-26]

Effects of Aronia Berry

Aronia berries are native to North America and resemble cranberries. They have been thought of as a superfood due to their high content of vitamin C, **anthocyanins**, and other polyphenols.[27]

Research indicates that low flow-mediated dilation of blood vessels is associated with a high risk of cardiovascular events.[20] Research also suggests that **aronia berries** boost nitric oxide production by increasing the activation of an *enzyme* that converts **L-arginine** into endothelial **nitric oxide**.[28]

In a randomized, controlled trial, a daily intake of **500 mg** of aronia whole fruit berry and extract powder for 12 weeks resulted in a **1.2%** improvement in **flow-mediated dilation** compared to placebo.[29] This corresponds to a nearly **11% reduction** in the risk for cardiovascular events.[19]

In another clinical trial, 101 adults aged 40-60 years old were randomized to receive aronia berry extract or a placebo for **24 weeks**.

Cognitive function was assessed using tests including the **grooved pegboard test**, in which pegs must be precisely rotated to match a slot before they can be inserted.[30] This measures **psychomotor speed**, the ability to quickly think and then perform a motor action.

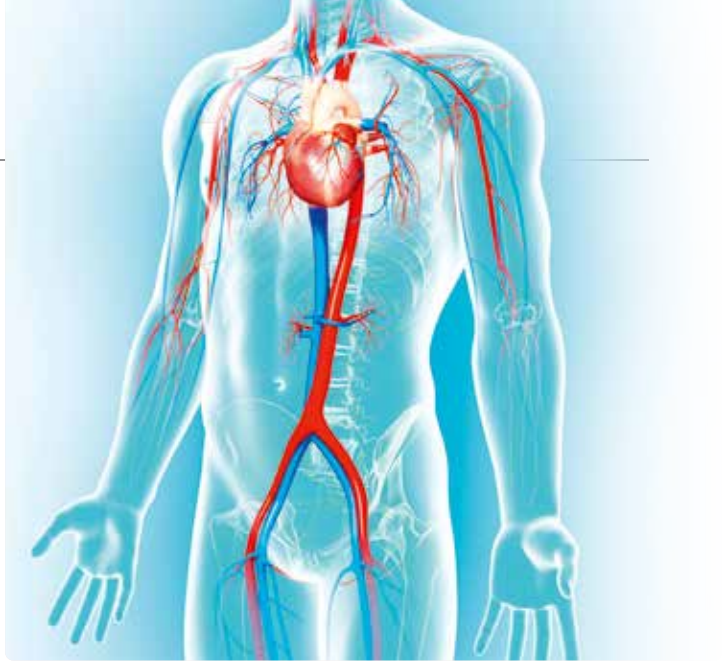
The results showed that those who received **aronia berry extract** daily had significantly *higher* scores on the test after just **six weeks** than those taking a placebo.

Taking **aronia** extract along with the new form of **L-arginine** may lead to even greater levels of nitric oxide production, maximizing the cardiovascular and cognitive benefits.

WHAT YOU NEED TO KNOW

Keeping Blood Vessels Healthy

- The endothelium is a layer of cells lining the inside of blood vessels. It produces **nitric oxide**, a molecule that signals the vessel to dilate, allowing blood to flow through.
- With age, nitric oxide production tends to decline, contributing to **endothelial dysfunction**. This can increase the risk of heart attacks, strokes, cognitive decline, and dementia.
- **L-arginine** is a precursor the body needs to make nitric oxide. A new form, **inositol-stabilized arginine silicate**, improves its bioavailability and supports higher levels in the bloodstream for a longer time.
- **Aronia berries** help activate the enzyme that converts L-arginine into nitric oxide.
- Taking oral L-arginine improves blood vessel dilation enough to correlate with a **50%** reduction in risk for **cardiovascular events**. It also improves several measures of cognition.
- In a clinical study, **aronia berry extract** also improved blood vessel dilation and significantly boosted scores on a test of cognitive function.
- Taking these two ingredients **together** may significantly boost nitric oxide production, reducing the risk for cardiovascular events and enhancing cognitive function.



Summary

Nitric oxide is needed to maintain the health of blood vessels. As production in the body decreases with age, the risk of **cardiovascular diseases** and **cognitive deficits** rises.

L-arginine and **aronia berry extract** have each been shown to *increase* nitric oxide production.

Research suggests that aronia berry increases the activation of an *enzyme* that converts the amino acid L-arginine into nitric oxide.

Clinical trials have shown that taking each has benefits for both **cardiovascular** and **cognitive** health.

Taking both together may result in ideal levels of nitric oxide production in the body for aging individuals. •

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What is D-Ribose?

BY LAURIE MATHENA

Normal aging results in a decline in muscle mass and energy production.[1,2]

This energy *deficit* has an impact on heart health, cognitive function, and lifespan.[2]

D-ribose helps restore **energy** production in the body.[3]

It is a building block of adenosine triphosphate (ATP), the energy source for every cell.[4]

By supporting the production of ATP, **D-ribose** can help replenish the metabolic energy needed by all cells, including those in major organs such as the **heart** and **brain**.[3]

ATP, Energy, and D-Ribose

Energy in the body is produced in the form of adenosine triphosphate, ATP.

This takes place in mitochondria (powerhouse in each cell). ATP is the primary energy source for most biochemical and physiological processes, such as growth, movement and homeostasis.[5]

Mitochondrial function declines with age[5,6] and other health conditions, such as heart failure, among others.[3] This results in loss of ATP production and decreased energy levels.[3]

Hope for Heart Failure

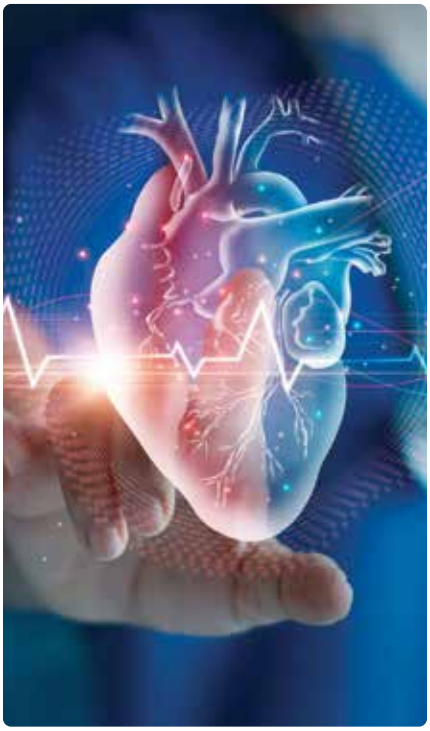
Heart failure means the heart muscle is failing to pump enough blood to meet the body's metabolic requirements.

In heart failure, D-ribose production falls in heart muscle cells.[3,7]

This leads to a *decrease* in **ATP** production, resulting in cellular energy deficiency in the muscle cells of the organs that need energy the most.[7]

Taking **oral D-ribose** can help create new ATP molecules and *restore* cardiac energy levels.[7,8]

Clinical trials have shown that D-ribose taken orally can ***improve*** **heart function** in heart failure patients.[9-11]



Lifestyle Modifications to Fight Fatigue[18]

A constant feeling of tiredness or weakness is called fatigue. It can affect anyone, and most adults will experience fatigue at some point in their life. Some lifestyle modifications that may help:

- Exercise: even a 15-minute walk can give you an energy boost.
- Lose weight if overweight.
- Get optimal sleep.
- Relieve stress: meditate, work out, do yoga, listen to music, have social support.
- Limit alcohol and caffeine intake.
- Stay hydrated.

People with heart failure taking D-ribose were shown to improve **blood flow** through the heart and body *and* boost the exchange of oxygen and CO2 through the lungs, leading to improvements in breathing parameters.

Another study showed the ability of D-ribose to reduce symptoms and improve quality of life in **heart failure** patients.[10]

In a review of studies in animals and humans, D-ribose has been shown to increase **ATP production** in heart muscle cells and improve cardiac function.

In clinical trials D-ribose enhanced cardiac function and improved quality of life in patients with heart failure.[7]

Fibromyalgia

There is evidence that **defective production of ATP** is the one potential culprit behind **fibromyalgia** (a condition that causes pain throughout the body)[12] and chronic fatigue syndrome.[13,14]

In an open-label, early study, patients with fibromyalgia or chronic fatigue syndrome took **5 grams** of **D-ribose** three times daily until they reached a total of **280 grams**.[14]

The participants reported significant improvement in all five categories on a standard questionnaire: energy, sleep, mental clarity, pain intensity, and well-being.

On average, patients reported a stunning **45%** increase in self-reported energy levels.

Restless Leg Syndrome

Restless leg syndrome is a disorder causing discomfort and pain in the legs. This condition progresses with age and often leads to insomnia. Disordered energy metabolism has been suggested as one possible cause of **restless leg syndrome**.

Based on that observation, researchers gave individuals with restless leg syndrome **5 grams** of **D-ribose**, three times per day. Remarkably, daytime symptoms were **completely eliminated**, and nighttime symptoms were *significantly reduced*.[15]

Exercise Performance

D-ribose is a building block of ***ATP***.[3] It may help speed muscle recovery after high-intensity exercise.

- In a double-blind cross-over study of 26 athletes, subjects were given either a dextrose sugar control or **10 grams** of D-ribose for two days. This was followed by three additional days of supplementation. During these three days, both groups underwent 60 minutes per day of high-intensity exercise. After five days, significant improvement in exercise performance and lower perceived exercise exertion were observed in the D-ribose group, compared to the **placebo** arm of the study.[16]
- In a study of healthy, active individuals, supplying fatigued muscle cells with D-ribose quickly restored **ATP levels** to normal.[17]

Summary

By restoring the body's ability to produce energy, **D-ribose** leads to improved function for organs such as the heart and muscles.

D-ribose intake is especially valuable for **heart failure** patients and has been shown to produce meaningful improvements in cardiovascular function.

Because **high doses** of **D-ribose** are needed, most people find it more efficient to take **5 grams** or more each day in a neutral-tasting **powder** form. •

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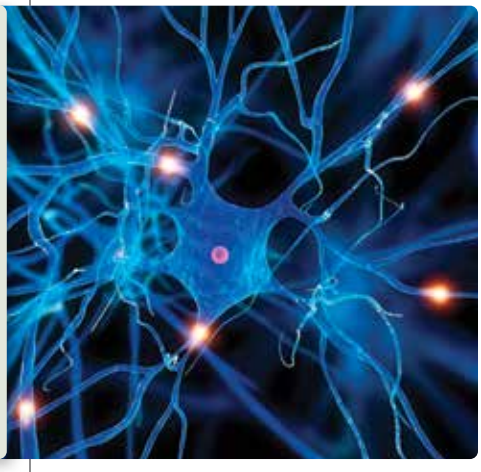
What is ATP (adenosine triphosphate)?[3,4]

- ATP is a molecule carrying energy, found in every cell of the body; it is vital for energy production.
- It has a nitrogenous base (adenine), and a sugar (ribose), attached to three phosphate molecules.
- Cells need energy to perform cellular functions, such as growth, nerve impulse propagation, and muscle cell contraction.
- The energy is stored in phosphate bonds of ATP and is released when these bonds are broken by chemical processes.



Keep Your ENERGY UP

Occasional feelings of fatigue happen to everyone.

Scientists have found that an extract of **French oak wood** contains compounds that fight fatigue ***at the cellular level***.*

Energy Renew contains a proprietary extract of French oak wood that can help promote healthy energy levels.

Item #01900

30 vegetarian capsules

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* *J Agric Food Chem*. 2014 Jan 15;62(2):443-53.

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Maintain Endothelial Plaque Stability with Arterial Protect

ARTERIAL PROTECT can help stabilize endothelial plaque and promote healthy blood flow throughout the body.*

Just one capsule a day provides the patented French Maritime **pine bark extract** used in clinical studies along with ***gotu kola***.

Item #02004
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1 DAILY
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* *Int Angiol.* 2014 Feb;33(1):20-6.

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A tasty way to get your omega-3s

Fish oil is well known to support **heart** and **brain** health.[1,2]

Few know that **human** population studies show a correlation between **fish oil** and *longer* **lifespans**.[1-3]

Thanks to a novel technology, **Omega-3 Fish Oil Gummy Bites** are available that melt in your mouth.

These tasty **gummy bites** can serve as an alternative or addition to fish oil softgels.

These new **Omega-3 Fish Oil Gummy Bites** pack the same **EPA/DHA** into a concentrated form to provide a small and delicious **tropical fruit-flavored** sugar-free* **gummy bite**.[4] No fishy aftertaste.

Item #02508

36 gummy bites

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**Not a low-calorie food.*

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New Study Demonstrates Significant PAIN RELIEF

BY MICHAEL DOWNEY

Some nutrients can reduce existing inflammation, while others may help resolve inflammation.

Winding down the flow of inflammation at its source is vital to maintain healthy, functional tissues.[1]

Compounds that actively promote the resolution of inflammation are known as **specialized pro-resolving mediators** or **SPMs**.[2]

A clinical study published in **2022** demonstrates that taking **SPM precursors** along with bioavailable **curcumin** deliver significant relief of pain and discomfort.[3]

In just 30 days, the combination significantly reduced:

- **Total** pain,
- Pain **intensity**, and
- Pain **severity**.

After 60 days, a remarkable **79%** of participants had an improvement in **total pain**.

New Human Study

Curcumin, a compound found in the **turmeric** plant, is well-established as a particularly powerful **anti-inflammatory** and an important nutrient to reduce inflammation.[4,5]

Specialized pro-resolving mediators (SPMs) are compounds produced in the body that resolve inflammation, helping return inflamed tissues back to their healthy state.[2]

Scientists wondered whether combining **SPM precursors** with **curcumin** might more thoroughly reduce inflammation *and* thus have an impact on **pain**.

A **2022** open-label **clinical** pilot study recruited healthy male and female adults with mild to moderate pain.[3]

Every day for 60 days, 29 participants were asked to take:

- One softgel containing **500 mg** of a marine oil enriched with **three SPM precursors**, and
- One capsule containing **500 mg** of a highly bioavailable (absorbable) **curcumin**.

Participants completed **three** well-known questionnaires used to measure pain, quality of life, and overall health:

- Short-Form McGill Pain Questionnaire (**SF-MPQ**),
- Short-Form 36 Health Survey (**SF-36**), and
- Medical Symptoms Questionnaire (**MSQ**).

Compelling Results

The results of the study were published in *Translational Medicine Communications*, a peer-reviewed medical journal.

The **SF-MPQ** (Short-Form McGill Pain Questionnaire) responses showed significant *improvements* in all aspects of the questionnaire within **30 days**, especially in:[3]

- **Total** pain,
- Pain **intensity**, and
- Pain **severity**.

The **SF-36** (Short-Form 36 Health Survey) questionnaire showed significant *improvements* in:[3]

- **Four** aspects of physical health, especially **pain** and **physical function**, and
- Perceived health change.

The **MSQ** (Medical Symptoms Questionnaire) results showed:[3]

- Significant *reduction* in **joint/muscle pain**.

An impressive **62%** of participants had an improved **total pain** score at **30 days**, and **79%** of participants showed improvement in **total pain** at **60 days**.

No adverse events were reported.[3]

This strongly suggests that taking **SPM precursors** with a bioavailable form of **curcumin** delivers significant relief of **pain** and discomfort associated with inflammation.

Difference Between Anti-Inflammatories and SPMs

Curcumin and **SPM precursors** target inflammation in completely different ways.

Curcumin and other **anti-inflammatories** work to reduce body inflammation levels.

This is helpful but not enough to completely restore health, since inadequate resolution can lead to chronic inflammation, excessive tissue damage, and dysregulation of tissue healing, and may also lead to fibrosis.[6]

Hence, inflammation needs to be resolved, to get tissues back to their healthy, functional state.

Resolution of inflammation is a complex, active process guided by specific signaling compounds produced in the body.[7,8] Among these compounds are **specialized pro-resolving mediators**.

How SPMs Resolve Inflammation

SPM precursors are predominantly derived from **EPA** and **DHA**, the **omega-3** fatty acids found in fish oil.

The **precursors** needed to produce SPMs in the body include:[9]

- **18-HEPE** (18-hydroxyeicosapentaenoic acid),
- **17-HDHA** (17-hydroxydocosahexaenoic acid), and
- **14-HDHA** (14-hydroxydocosahexaenoic acid).

The marine-blend softgels used in the **2022** study provided a total of **300 mcg** of these three SPM precursors.[3]

These precursors are converted in the body into three different types of SPMs: **resolvins**, **protectins**, and **maresins**.[3,10]

These make up the bulk of the SPMs that target **inflammation**. They do so through three mechanisms:[10-12]

- ***Removing*** dead and dying cells, helping to clean up the aftermath of inflammatory cascades,
- ***Restoring*** inflammation balance by decreasing pro-inflammatory mediators and increasing **anti-inflammatory** compounds, and
- ***Renewing*** damaged tissue by promoting cellular **regeneration**.

WHAT YOU NEED TO KNOW

Targeting Inflammation to Stop Pain

- **Inflammation** is a major risk factor for age-related disease and degenerative disorders. It is also a source of pain.
- **Curcumin** is a well-known anti-inflammatory, working to *reduce* inflammation.
- Other compounds called **specialized pro-resolving mediators** (**SPMs**) *resolve* inflammation, shutting off inflammation and returning tissues to a healthy state.
- A new clinical trial shows that combining a highly bioavailable **curcumin** with marine oil enriched with **SPM precursors** significantly reduces subjective levels of **pain** and **discomfort**.

Evidence for Curcumin and SPM Benefits

Before researchers tested the *combined* effects of SPM precursors and curcumin, many studies had shown that each had benefits alone.

SPMS

Animal data showed promising results from the use of **SPMs**, including improvements in obesity-related **osteoarthritis**[13] and in inflammation-induced **neuropathic pain**.[14]

A clinical trial found that oral intake of **omega-3s** *increased* SPM levels in the body by **229%** and significantly lowered levels of the inflammatory marker **C-reactive protein**.[15]

Another clinical study showed that taking marine oil enriched with a combination of **SPM precursors** (including **18-HEPE**, **17-HDHA**, and **14-HDHA**) increased SPM levels and helped **resolve** inflammation.[16]

CURCUMIN

Curcumin is known for the **curcuminoids** and polyphenols found in the **turmeric** plant.[17]

A meta-analysis of eight human trials involving 606 patients found that curcuminoids significantly reduced pain severity from a variety of causes, including arthritis and muscle soreness.[18]

Another review paper concluded that curcumin was safe and has significant **anti-inflammatory** activity.[5]

Combining SPM precursors with a powerful anti-inflammatory like curcumin targets inflammation in multiple ways and results in clear pain reduction.

Summary

Curcumin is a powerful **anti-inflammatory** that reduces existing inflammation.

Specialized pro-resolving mediators (**SPMs**) help *resolve* inflammation, guiding tissues back to their healthy state.

A new **human** study shows that *combining* marine oil enriched with **SPM precursors** with a highly bioavailable **curcumin** improves subjective measures of **pain** and discomfort associated with inflammation. ●

Building a Better Curcumin

Due to poor **bioavailability**, a large portion of curcumin taken orally never gets into the bloodstream or reaches tissues.

In a major advance, scientists combined **curcumin** with a fiber called **galactomannan** that protects curcumin in the gut.

Clinical research demonstrates that taking the curcumin-galactomannan combination results in blood levels of free curcuminoids that are over **45-times greater** than in those who take pure curcumin alone.[19]

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Sweet DREAMS

Fast-Acting Liquid Melatonin is a popular way to achieve more rapid sleep onset.

The nice-tasting, citrus-vanilla flavor enables convenient "drop" dosing of ***Fast-Acting Liquid Melatonin*** each night or when needed.

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3 mg • Net Wt. 2 fl. oz (59 ml)

For occasional sleeplessness.

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Promote Healthy *Muscle Strength* at any Age

STAY STRONG & YOUNG

Muscle Strength & Restore Formula provides ingredients that can enhance **muscle strength** while helping inhibit age-related muscle decline. It contains:

- **HMB** (Beta-**h**ydroxy beta-**m**ethyl**b**utyrate): increases and preserves muscle mass in adults of all ages.
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Mix one scoop with approximately **8 oz**. of cold water or other beverage, preferably a protein shake, and drink once daily or as recommended by a health practitioner.

"Taking this product along with my daily exercise routine has proven to be very beneficial in building and maintaining my muscles."

Kip

VERIFIED CUSTOMER REVIEW

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

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60 vegetarian capsules

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A Bodyguard *for Your* Brain

People tend to live longer in areas where lithium is abundant in the drinking water.*

Lithium is a low-cost mineral that functions in several ways to support cognition and overall brain health.

Protect healthy cognition with lithium—it's like a bodyguard for your brain!

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1000 mcg • 100 vegetarian capsules

Each bottle lasts 100 days.

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

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Reduce ANXIETY to Improve Health

BY STEVE PAGE, OT/L, PHD, MS, MOT

Anxiety affects **6.8 million** adults or **3.1%** of the U.S. population.[1]

It's estimated that **hundreds of millions** of people worldwide experience **anxiety**.[2]

The situation has become so bad that the U.S. Preventive Services Task Force recently recommended that all adults under age 64 be screened for **anxiety**.[3]

Anxiety is a reaction to stress.[4]

Stress and **anxiety** don't just make us *feel* miserable, persistent stress can have a drastic impact on an individual's health.

One way the body responds to stressful situations is by producing the hormone **cortisol**, which allows the body to stay on high alert.[5]

Poor regulation of cortisol, however, is associated with disorders that decrease **quality of life** and increase mortality risks.

Fortunately, researchers have identified safe ways to *modulate* cortisol levels and anxiety.

When Excess Cortisol Makes You Sick

Stress is often caused by events—environmental, emotional, or physical.[6]

One of the normal ways for the body to respond to stress and **anxiety** is by releasing the hormone **cortisol** from the adrenal glands.[5]

Cortisol is one of the main hormones responsible for keeping the stress response activated. This is why cortisol is thought of as a *chronic stress* hormone.[7]

In people with **anxiety** disorders, cortisol levels may be higher than in the rest of the population.

Chronic stress that results in improper cortisol balance can lead to a wide range of serious health problems.[8,9]

In a study of hip-fracture patients, cortisol elevation was associated with low function of natural killer cells in the **immune system**.[10] Elevated cortisol has also been associated with susceptibility to infections.[11] Dysregulation of cortisol has also been associated with poor inflammatory response[12,13] and with *increased* rates of major cardiovascular,[14] and metabolic diseases.[12] They even suffer from higher rates of overall **mortality**.[11,14]

Plant-Based Solutions

People with anxiety disorders are routinely prescribed antidepressants or other medications. In 2020 alone, prescriptions for **anti-anxiety medications** jumped by **34%**.[15] While medications may help, not all patients tolerate them, they don't work for everyone, and some can even be addictive.[16]

Researchers have identified specific **plant extracts** that have been **shown clinically** to safely reduce elevated cortisol *and* feelings of anxiety and stress.

Lychee-Green Tea Blend

Lychee is a fruit commonly consumed throughout Eastern Asia,[17,18] as a fruit and for medicinal purposes.[19]

Lychee fruit is rich in **polyphenols**,[20] compounds recognized for their role in biological activities, most notably for the ability to reduce inflammation, fight oxidative stress and prevent cell damage.[21-23]

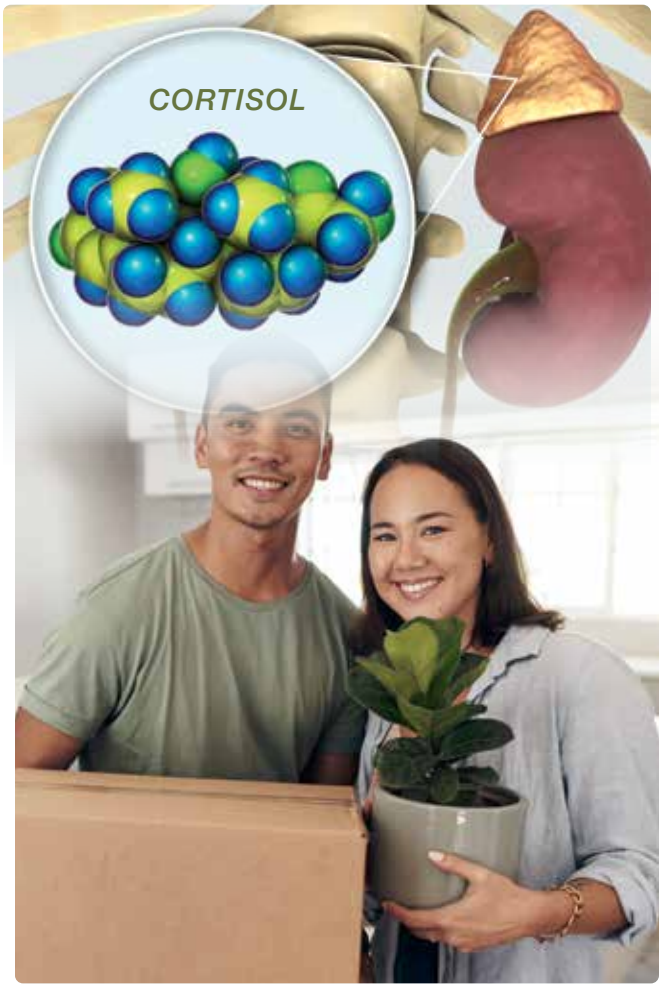
Most **lychee** products sold today contain **long-chain polyphenols**, which are not easily absorbed in the intestinal tract. When combined with green tea, the **lychee-green tea blend** was shown to provide a low molecular size extract that is far more **bioavailable** than ordinary lychee extract alone.

The polyphenol content measured in the blood after using this blend was ***three times higher*** than the amount after using **lychee** extract alone.[24]

In one controlled study, this **lychee-green tea** blend significantly reduced **cortisol** levels compared to baseline. Healthy young men were assigned to take either **100 mg** of the **lychee-green tea** blend or a **placebo** daily. After four weeks, those who received the extract blend had significant reductions in blood **cortisol** levels, as well as in the inflammatory cytokines **IL-1beta** and **IL-6**.[25]

In a human trial, **100 mg** of **lychee-green tea** blend was given twice daily to 10 healthy individuals, for 10 days, followed by exercise under low oxygen conditions, to induce stress. They found that the rate at which cortisol and the inflammatory markers increased was significantly slower among subjects given the extracts compared to placebo.[26]

By reducing cortisol and inflammation, this blend may help prevent much of the damage stress and anxiety can do.



WHAT YOU NEED TO KNOW

Plant Extracts Combat Chronic Stress

- One way our body responds to anxiety and stress is by producing the hormone **cortisol**.
- Chronically elevated cortisol levels weaken the immune system and increase risk of chronic disease and death.
- **Lychee-green tea** blend has been clinically shown to significantly reduce cortisol and markers of inflammation.
- A mix of extracts of two tree barks, ***Magnolia officinalis*** and ***Phellodendron amurense***, safely and effectively reduced cortisol levels in clinical trials. It also reduced feelings of stress, anger, depression, and fatigue.
- Combining a **lychee-green tea** blend with ***Magnolia-Phellodendron*** bark extracts may optimize their power to ease anxiety, reduce cortisol levels, and prevent the **long-term damage** caused by stress.

Magnolia and Phellodendron Bark

Two **tree bark extracts** have also been shown to reduce cortisol levels.

For centuries, the bark of the ***Magnolia officinalis*** tree (it grows in high altitudes in Eastern Asia) has been used to combat a variety of conditions,[27] including anxiety, depression, and stress.[28,29]

An extract from the bark of another tree, ***Phellodendron amurense***, has been used in traditional Chinese medicine and has been shown to reduce biological markers of stress in animals.[30]

To test whether a **combination** of **Magnolia** and **Phellodendron** extracts would reduce cortisol levels, researchers gave either **250 mg** of a **bark extract** mixture or a **placebo** two times daily to people with moderate to high stress levels. After four weeks, *only* those taking the bark extracts had significantly lower **cortisol** levels *and* significant reductions in **stress**, **anger**, **depression**, and **fatigue**.[31]

In two other studies, researchers gave participants either a placebo or **250 mg** of **magnolia** and **phellodendron** bark extracts three times daily.

- Overweight premenopausal women aged 20-50 who reported consistently high anxiety levels, reported significantly decreased anxiety symptoms after six weeks.[30]
- In a similar group of women with above-average anxiety associated with eating, prevention of weight gain was observed after six weeks in the treatment group as compared to placebo recipients, who gained weight during the trial.[32]

The anti-anxiety benefits of **Magnolia bark** extract extend beyond cortisol. In cell and animal studies, compounds found in *Magnolia officinalis* have been shown to interact with receptors in the brain in ways that would be expected to benefit **mood** and psychological well-being.[33]

For example, **serotonin**—sometimes nicknamed the "happy hormone"—is key in regulating stress, depression, and mood. *Magnolia* may help to *increase* **serotonin** levels as seen in animal models and lab studies.[34,35]

Combining these **bark extracts** with the **lychee-green tea** blend may maximize their cortisol-lowering effects, helping to reduce the harm done by anxiety and stress.

Summary

Chronic anxiety undermines physical, mental, and emotional health. The excessive **cortisol** secretion that accompanies unremitting stress can weaken immunity and increase risk of infections, chronic disease, and death.

Lychee-green tea blend is highly absorbable and has been shown in two clinical studies to lower the stress hormone cortisol.

Extracts of ***Magnolia officinalis*** and ***Phellodendron amurense*** bark have shown the ability to reduce cortisol levels and anxiety, helping to protect against the damage chronic stress can do.

A blend of these compounds offers one approach to reduce excess cortisol levels, which may counteract some of the harmful effects inflicted by chronic stress. •

What is Cortisol?

- Cortisol is a hormone produced by the adrenal glands located at the top of the kidneys.[5]
- It helps regulate numerous bodily functions, including the stress response, metabolism, immune function, and inflammatory response.[5]
- It peaks in the early morning, then gradually declines to its lowest level around midnight.[36]
- Chronic stress disrupts this daily rhythm.[36]
- Many studies show the average cortisol levels gradually increase in older adults as they age.[37]
- *Chronically elevated cortisol* levels are associated with higher blood glucose, high blood pressure, weakened immunity, muscle loss, and low bone mass[11,14] that can impact quality of life.

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How to Measure Your Stress and Cortisol Levels

Sometimes stress is so constant that we learn to live with it.

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Periodic testing can give you a picture of your stress, and your progress, over time.

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