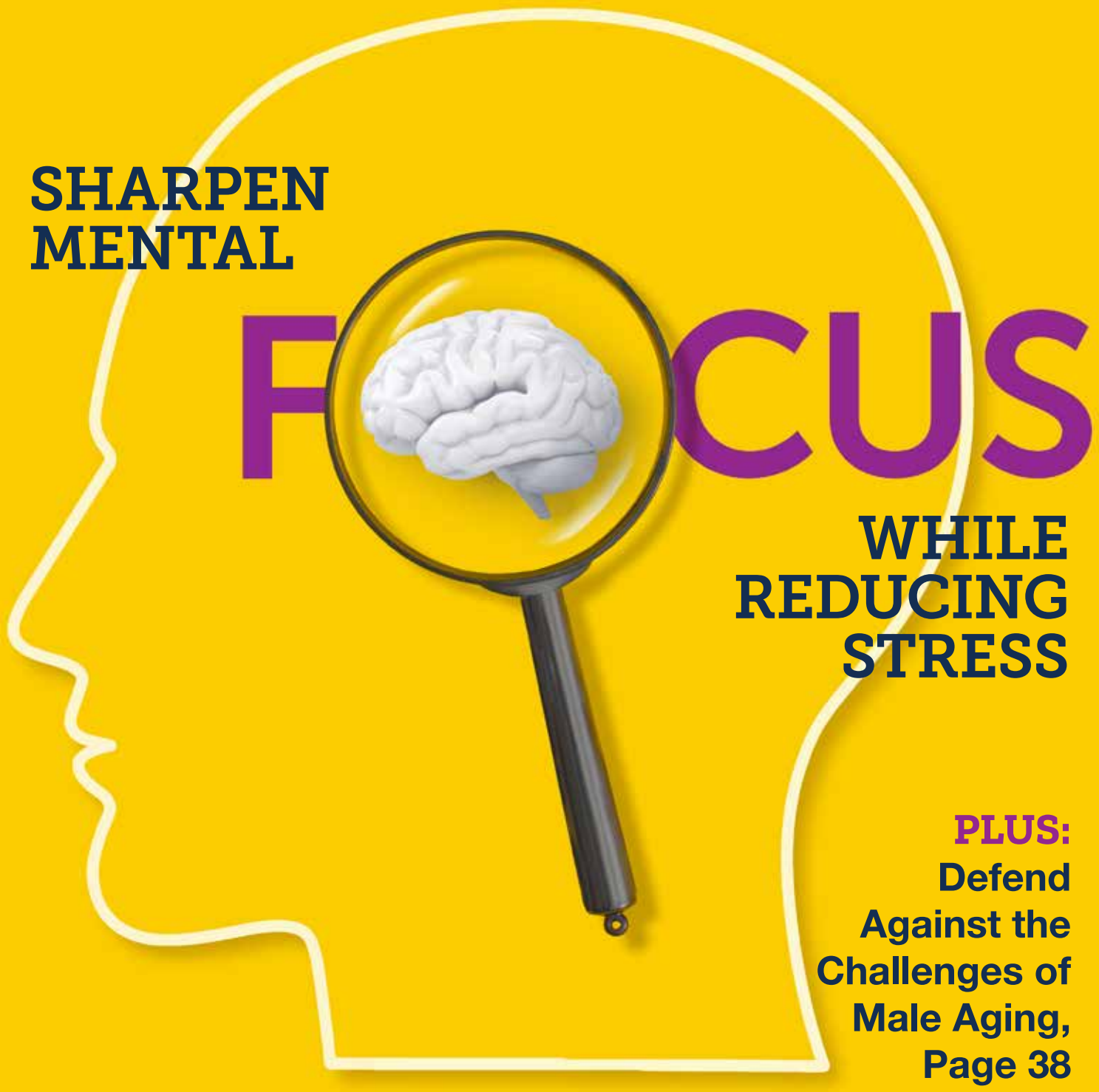
LIFE EXTENSION®
The Science of a Healthier Life®
September/October 2023

FEATURE ARTICLES

SHARPEN MENTAL FOCUS WHILE REDUCING STRESS



PLUS: Defend Against the Challenges of Male Aging, Page 38

NEURO-MAG®
THE SMART MAGNESIUM

SUPPORTS IMPROVEMENT IN OVERALL COGNITIVE ABILITY*

With age, **synapses** that connect our brain cells wither.

Formulated by **MIT** scientists, **Neuro-Mag® Magnesium L-Threonate** has been shown to improve **synaptic density** and other structural components of the brain.

Item #01603

90 vegetarian capsules

Item #02032

93.35 grams of powder

GLUTEN FREE

NON GMO LE CERTIFIED

These products are available at fine health food stores everywhere.

**Gerontology.* 1996;42(3):170-80.

different IS good

Quercetin:

The immune support nutrient

Quercetin is a little bioflavonoid that's making big waves. Quercetin encourages your body's healthy immune response.

And even in the wonderful world of bioflavonoids, our Bio-Quercetin stands out: its phytosome casing makes it 50 times more absorbable than standard quercetin supplements.

Ultra-absorbable, once-daily Bio-Quercetin. Because being different is a good thing.

GLUTEN FREE

1 DAILY

NON GMO LE CERTIFIED

Item #02302

30 vegetarian capsules

This product is available at fine health food stores everywhere.

"Great product."
Jack
VERIFIED CUSTOMER REVIEW

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.

This product is available at fine health food stores everywhere.

GLUTEN FREE
NON GMO LE CERTIFIED

Item #01900
30 vegetarian capsules

Robuvit® is a registered trademark of Horphag Research and the use of this product is under International patent applications.

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

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

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

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

Item #01727

120 capsules

This product is available at fine health food stores everywhere.

Caution: Those taking the anticoagulant drug Coumadin® (warfarin) should use Bone Restore without vitamin K2.

Fruitex B® and OsteoBoron® are registered trademarks of VDF Futureceuticals, Inc. U.S. patent #5,962,049.

GLUTEN FREE

NON GMO LE CERTIFIED

ESTROGEN FREE

COMPREHENSIVE menopause *relief*

Menopause 731™ contains **ERr 731®**, a proprietary extract of **Siberian rhubarb**.

In clinical studies **ERr 731®** provides hormone-free relief for all **11 menopause discomforts** on the Menopause Rating Scale, including:

- **Hot flashes**
- **Night sweats**
- **Irritability**
- **Sleep disturbances**
- **Exhaustion**
- **Sexual function**
- **Joint discomfort**
- **Bladder problems**
- **Vaginal dryness**

GLUTEN FREE · 1 DAILY · NON GMO LE CERTIFIED

Item #02204

30 enteric-coated vegetarian tablets

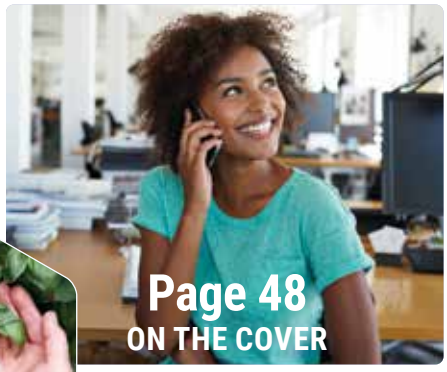
This product is available at fine health food stores everywhere.

ERr 731® is a registered trademark of Chemisch-Pharmazeutische Fabrik Göppingen Carl Müller Apotheker GmbH & Co.

LIFE EXTENSION®
The Science of a Healthier Life®
September/October 2023

CONTENTS

REPORTS



Reduce Stress... Sharpen Mental Focus

Ashwagandha has been shown to clinically *reduce* **stress** by **71%**. When combined with a patented **spearmint**, the two extracts *increased* mental alertness while restoring calm.

LIFE EXTENSION®
The Science of a Healthier Life®
SEPTEMBER/OCTOBER 2023

LIFE EXTENSION (ISSN 1524-198X) September/October 2023 ©2023 is published monthly except bi-monthly in April by LE Publications, Inc. at 3600 West Commercial Blvd., Fort Lauderdale, FL 33309-3338. LE Publications, Inc. All rights reserved. Published 13 times a year. Subscription rate: $40 per year in the United States. US $47 in Canada. US $60 in other countries. Mail subscriptions or address changes to: LE Publications, Inc., P.O. Box 407198, Fort Lauderdale, FL 33340-7198, USA. Or phone us toll-free at: 1-800-841-5433. Canada Subscriptions: Publications mail agreement number 40028967. Return undeliverable Canadian addresses to PO Box 503, RPO West Beaver Creek, Richmond Hill, ON L4B4R6. You will be sent your first issue within six weeks after LE Publications, Inc. receives your subscription fee. Periodicals Postage paid at Fort Lauderdale, FL and at additional mailing offices. POSTMASTER: Send address changes to Life Extension, P.O. Box 407198, Ft. Lauderdale, Florida 33340-7198, USA. Printed in USA. The articles in this magazine are intended for informational purposes only. They are not intended to replace the attention or advice of a physician or other health-care professional. Anyone who wishes to embark on any dietary, drug, exercise, or other lifestyle change intended to prevent or treat a specific disease or condition should first consult with and seek clearance from a qualified health-care professional. LEGAL NOTICE: Health claims contained in articles and advertisements in this publication have not been approved by the FDA with the exception of FDA-approved, qualified health claims for calcium, antioxidant vitamins, folic acid and EPA and DHA omega-3 fatty acids, and selenium as noted where applicable. *Life Extension Magazine®* does not endorse any of the businesses or the products and/or services that may appear in advertisements for non-Life Extension branded products or services contained in it, except to state that they are advertisers who may have paid Life Extension for placement of an advertisement in this publication. Life Extension disclaims any and all responsibilities or warranties as to the accuracy of information contained in advertisements for non-Life Extension branded products or services. For Canadian customers send change of address information and blocks of undeliverable copies to P.O. Box 1051, Fort Erie, ON L2A 6C7.

H_2O Scams Exposed!

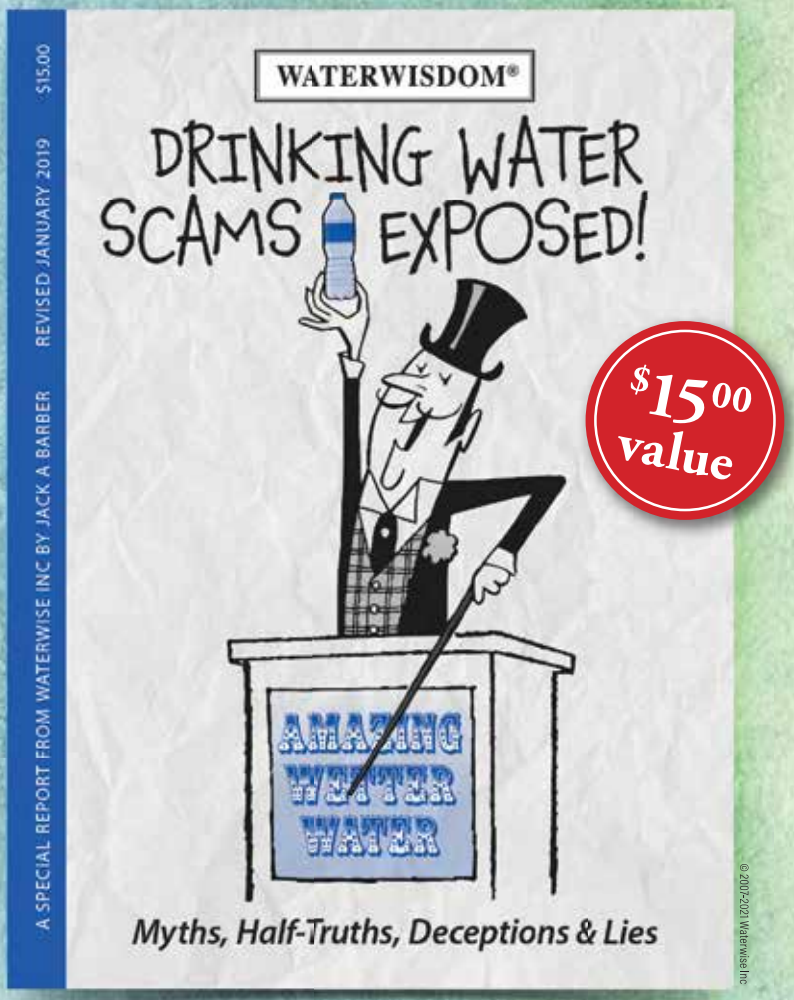
FREE Report

Get the lowdown on bogus water scams… *oxygenated, structured, energized, alkalized and micro-clustered.*

Truth revealed *about distilled, mineral, spring, filtered, bottled, reverse osmosis, well and ordinary "purified" water. Discover the amazing Waterwise system that* ***guarantees you consistent water purity.***

Learn about the wise alternative to buying bottled and ***save 70% or more.***

Drink the purest… ***you should consume about 2,920 glasses*** *(182 gallons) every year— be water-wise!*



Waterwise water purifiers are recommended by: **Dr. Russell Blaylock, Dr. Patricia Bragg, Dr. Ted Broer, Dr. Michael Colgan, Dr. David Klein, Dr. Monte Kline, Dr. Bill Misner, Dr. Keith Nemec, Dr. Scott Senne, Dr. Varah Siedlecki, Dr. David Williams,** *and many more…*

WATERWISE®
Purity Since 1977
Purification Systems

Call: **800-874-9028** Ext 750
Visit: **waterscamsreport.net**

Mail to: Waterwise Inc • PO Box 494000 Leesburg FL 34749

☑ **YES!** *Please rush my* ***FREE*** *Waterwisdom Report & Catalog… No Cost/No Obligation*

NEXT

Name _____

Address _____

City _____ State ____ Zip _____

MEDICAL ADVISORY BOARD

Sandra C. Kaufmann, MD, is a fellowship-trained and board-certified pediatric anesthesiologist as well as the Chief of Anesthesia at the Joe DiMaggio Children's Hospital in Hollywood, Florida. She is the founder of The Kaufmann Anti-Aging Institute and the author of the book The Kaufmann Protocol: Why we Age and How to Stop it (2018). Her expertise is in the practical application of anti-aging research.

Richard Black, DO, is a dedicated nuclear medicine physician practicing as an independent contractor out of Cleveland, Ohio. Dr. Black is board-certified in internal medicine and nuclear medicine, and is licensed to practice medicine in multiple states throughout the United States.

John Boik, PhD, is the author of two books on cancer therapy, *Cancer and Natural Medicine* (1996) and *Natural Compounds in Cancer Therapy* (2001). He earned his doctorate at the University of Texas Graduate School of Biomedical Sciences with research at the MD Anderson Cancer Center, focusing on screening models to identify promising new anti-cancer drugs. He conducted his postdoctoral training at Stanford University's Department of Statistics.

Aubrey de Grey, PhD, is a biomedical gerontologist and Editor-in-Chief of *Rejuvenation Research*, the world's highest-impact, peer-reviewed journal focused on intervention in aging. He received his BA and PhD from the University of Cambridge in 1985 and 2000 respectively. Dr. de Grey is a Fellow of both the Gerontological Society of America and the American Aging Association and sits on the editorial and scientific advisory boards of numerous journals and organizations.

Deborah F. Harding, MD, is founder of the Harding Anti-Aging Center. She is double board-certified in internal medicine and sleep disorder medicine. She also earned the Cenegenics certification in age management medicine. She is a faculty member of the University of Central Florida Medical School.

Steven B. Harris, MD, has participated in groundbreaking hypothermia, cryothermia, and ischemia research. His research interests include antioxidant and dietary-restriction effects in animals and humans.

Peter H. Langsjoen, MD, FACC, is a cardiologist specializing in congestive heart failure, primary and statin-induced diastolic dysfunction, and other heart diseases. A leading authority on coenzyme Q10, Dr. Langsjoen has been involved with its clinical application since 1983. He is a founding member of the executive committee of the International Coenzyme Q10 Association, a fellow of the American College of Cardiology, and a member of numerous other medical associations.

Dipnarine Maharaj MD, MB, ChB, FRCP (Glasgow), FRCP (Edinburgh), FRCPath., FACP, is the Medical Director of the Maharaj Institute of Immune Regenerative Medicine, and is regarded as one of the world's foremost experts on adult stem cells. He received his medical degree in 1978 from the University of Glasgow Medical School, Scotland. He completed his internship and residency in Internal Medicine and Hematology at the University's Royal Infirmary.

L. Ray Matthews, MD, FACS, is a professor of surgery and director of Surgical Critical Care at Morehouse School of Medicine in Atlanta, GA, and a trauma and critical care surgeon at Grady Memorial Hospital. He has published widely and is known as one of the top vitamin D experts. Dr. Matthews has spoken before the U.S. Food and Drug Administration several times, presenting a recent update about clinical research on vitamin D.

Ralph W. Moss, PhD, is the author of books such as *Antioxidants Against Cancer*, *Cancer Therapy*, *Questioning Chemotherapy*, and *The Cancer Industry*, as well as the award-winning PBS documentary *The Cancer War*. Dr. Moss has independently evaluated the claims of various cancer treatments and currently directs The Moss Reports, an updated library of detailed reports on more than 200 varieties of cancer diagnoses.

Michael D. Ozner, MD, FACC, FAHA, is a board-certified cardiologist who specializes in cardiovascular disease prevention. He serves as medical director for the Cardiovascular Prevention Institute of South Florida and is a noted national speaker on heart disease prevention. Dr. Ozner is also author of *The Great American Heart Hoax*,*The Complete Mediterranean Diet* and *Heart Attack Proof*. For more information visit www.drozner.com.

Jonathan V. Wright, MD, is medical director of the Tahoma Clinic in Tukwila, WA. He received his MD from the University of Michigan and has taught natural biochemical medical treatments since 1983. Dr. Wright pioneered the use of bioidentical estrogens and DHEA in daily medical practice. He has authored or co-authored 14 books, selling more than 1.5 million copies.

Xiaoxi Wei, PhD, is a chemist, expert in supramolecular assembly and development of synthetic transmembrane nanopores with distinguished selectivity via biomimetic nanoscience. She has expertise in ion channel function and characterization. She founded X-Therma Inc., a company developing a radical new highway towards non-toxic, hyper-effective antifreeze agents to fight unwanted ice formation in regenerative medicine and reduce mechanical icing.

In the News

Omega-3s May Have Antidepressant Effects

The omega-3 fatty acid EPA has shown benefits for people with **depression**, a study in *Neuropsychopharmacology* reported.*

Chronic inflammation has been linked to the pathophysiology of depressive disorders. The study included 45 people with major depressive disorder and high **C-reactive protein**. Depression symptoms were assessed using the IDS-C30 scale.

Participants received either **one**, **two**, or **four grams** of EPA or a placebo. Plasma omega-3 fatty acids, pro-resolving mediators (SPMSs), and other factors were assessed before and after the 12-week treatment period.

After 12 weeks there was a **50%** reduction in depression scores in the group that received **4 grams** of EPA, compared to a low dose or placebo. The high-dose group also had greater increases in the pro-resolving mediators **18-HEPE** and **13-HDHA** and had significant reductions in **C-reactive protein** blood levels.

Editor's Note: Higher levels of the omega-3 metabolites **18-HEPE** and **13-HDHA** were associated with reduced systemic inflammation and depression symptoms. "This highlights the activation of the resolution of inflammation as a likely mechanism in the treatment of major depressive disorder with omega-3 fatty acid supplementation," the authors concluded.

When treating patients with depression, physicians may consider ordering C-reactive protein blood tests to identify those most in need of higher- dose omega-3 intake.

* *Neuropsychopharmacology.* 2023 48;929-35.

Vitamin E Reduces Rheumatoid Arthritis Symptoms

Supplementing with vitamin E helped reduce joint discomfort, water retention, and stiffness in people with rheumatoid arthritis, according to the findings of a systematic review and meta-analysis published in the *European Journal of Clinical Nutrition*.*

Rheumatoid arthritis is an autoimmune disease that can cause joint stiffness, pain, and other complications, including cardiovascular disease. Researchers selected nine trials that included a total of 39,845 rheumatoid arthritis patients. The trials compared the effects of vitamin E to placebo, other treatments, or external therapy.

Participants who received **vitamin E** experienced significantly greater improvements in joint comfort, tenderness, and swelling than those in the control group.

Editor's Note: "Vitamin E supplements used on a regular basis can help individuals with RA reduce joint discomfort, edema, and stiffness, as well as enhance their overall quality of life," the authors concluded.

* *Eur J Clin Nutr.* 2023 Feb;77(2):166-172.

Supplementing with Vitamin D Lowers Risk of Suicide in Military Veterans

A study of U.S. military veterans found a lower risk of suicide and self-harm among those who supplemented with vitamin D, compared with those who did not, according to a study published in *PLoS One*.*

Information was analyzed from the Veterans Administration's Corporate Data Warehouse for this retrospective cohort study, which included men and women treated with and without vitamin D2 or vitamin D3 from 2010 to 2018. The study compared 169,241 veterans who were prescribed vitamin D2, and 490,885 veterans treated with vitamin D3, with an equal number of control subjects who received neither vitamin.

The researchers found a **45%** lower risk of suicide attempts or self-harm among vitamin D2 users and a **48%** lower risk among those prescribed vitamin D3 compared to veterans who used no vitamin D supplements.

Editor's Note: "As a relatively safe, easily accessible, and affordable medication, supplementation with vitamin D in the VA may hold promise if confirmed in clinical trials to prevent suicide attempts and suicide," according to the researchers.

* *PLoS One*. 2023 Feb 1;18(2):e0279166.

Supplementing with Vitamin D Lowers Risk of Suicide in Military Veterans

A study of U.S. military veterans found a lower risk of suicide and self-harm among those who supplemented with vitamin D, compared with those who did not, according to a study published in *PLoS One*.*

Information was analyzed from the Veterans Administration's Corporate Data Warehouse for this retrospective cohort study, which included men and women treated with and without vitamin D2 or vitamin D3 from 2010 to 2018. The study compared 169,241 veterans who were prescribed vitamin D2, and 490,885 veterans treated with vitamin D3, with an equal number of control subjects who received neither vitamin.

The researchers found a **45%** lower risk of suicide attempts or self-harm among vitamin D2 users and a **48%** lower risk among those prescribed vitamin D3 compared to veterans who used no vitamin D supplements.

Editor's Note: "As a relatively safe, easily accessible, and affordable medication, supplementation with vitamin D in the VA may hold promise if confirmed in clinical trials to prevent suicide attempts and suicide," according to the researchers.

* *PLoS One*. 2023 Feb 1;18(2):e0279166.

Green Tea May Improve Fat Tissue Dysfunction

Women who consumed green tea extract **daily** showed **improvements in** their fat tissue, according to a clinical trial reported in the journal *Nutrients*.*

In a trial of 28 overweight or obese postmenopausal women, study subjects were randomized to receive **150 mg** of **green tea extract** or a placebo daily. The extract contained between **19%** and **25%** catechins and at least **13%** EGCG (the major catechin in green tea).

At the end of the **60-day** trial women who consumed the green tea extract had improvements in indicators of adipose (fat tissue) health, including metabolic health markers, compared to the placebo group.

They also showed improvements in insulin and insulin resistance, waist circumference, and C-reactive protein, a marker of **inflammation**.

Editor's Note: Increased fat deposited around the abdominal organs secrete
proinflammatory chemicals, increasing the risk of metabolic disorders.

* *Nutrients.* 2022 Dec; 14(24): 5209.

Multivitamins Help Maintain Memory in Aging Individuals

Results from two clinical trials indicate that daily multivitamin supplementation can help prevent memory loss and slow cognitive decline among older individuals, the *American Journal of Clinical Nutrition* reported.*

The COcoa Supplement and Multivitamin Outcomes Study (COSMOS), including (COSMOS-Web and COSMOS-Mind) evaluated the effects of multivitamin supplementation on cognitive function.

COSMOS-Mind found that compared to a placebo, supplementing with a daily multivitamin-mineral was associated with better scores for cognition and executive function, and less cognitive decline.

COSMOS-Web included 3,562 men and women who received a multivitamin supplement or a placebo daily for three years. Cognitive assessments were conducted at enrollment and yearly for the remainder of the trial. After one year, as well as on average during the three years of follow-up, participants who received **multivitamins** had better immediate recall compared with the **placebo** group.

Editor's Note: The researchers estimated that, "… the effect of the multivitamin intervention improved memory performance above placebo by the equivalent of 3.1 years of age-related memory change."

* *Am J Clin Nutr.* 2023 May 24.

Lower Folate-B12, *Higher* Homocysteine, and H.*Pylori* Linked with Erectile Dysfunction

A recent clinical study found that *H. pylori* infection may lead to decreased *absorption* of vitamin B12 and folic acid. This led to increased homocysteine levels, which might be associated with erectile dysfunction (ED) in men.*

Among other factors involved in erectile function, *higher* levels of serum homocysteine is associated with poor endothelial functioning which accelerates **atherosclerosis**.

In this observational study, researchers investigated the relationship between homocysteine, folic acid, and vitamin B12.

It was found that *H. pylori* antibodies were *higher* in men with ED as compared to healthy men.

The ED group also had significantly *higher* levels of **homocysteine** and lower levels of B vitamins as compared to healthy men.

Editor's Note: Researchers concluded that *H. pylori* infection eradication or folic acid and B12 supplementation might have certain clinical value in the treatment of vascular ED.

* *Sex Med.* 2023 Mar 1;11(2):qfac018.

Fish Oil Improves Body Composition, Strength, Performance in Older Individuals

A secondary analysis of findings from a clinical trial found improvements in body composition, muscle strength and physical performance among older men and women who consumed a supplement containing **fish oil** compared to a **placebo**.*

The six-month trial included 200 people aged 60 and older. Participants were randomized to receive a **fish oil** supplement that provided **1,340 mg** of **EPA** and **1,007 mg** of **DHA** or a **placebo**.

After six months, there was a significant increase in thigh circumference among those who received fish oil, while waist and hip circumference remained relatively the same.

Total skeletal muscle mass, appendicular skeletal muscle mass, muscle strength (as evaluated by hand-grip strength measurement) and physical performance (demonstrated by the ability to rise from a chair and walk) also improved among fish oil-supplemented participants compared with the placebo group.

Editor's Note: The supplemented group additionally experienced a decrease in serum triglycerides and an increase in HDL cholesterol.

* *Age Ageing.* 2022 Dec 5;51(12):afac274.

Lower Vitamin C Levels Linked to Greater Health Risk for Diabetics

Low serum levels of vitamin C may put adults with pre-diabetes or diabetes at greater risk, a study showed.*

The study analyzed data from 52,150 individuals who participated in NHANES from 1999–2018. Among the participants 6,827 had type II diabetes and 428 had type I diabetes. Data included fasting plasma glucose and A1c levels.

Those whose intake of vitamin C was lower than the estimated average requirement had a **20%** *higher* risk of type II diabetes compared with an intake above the estimated average requirement.

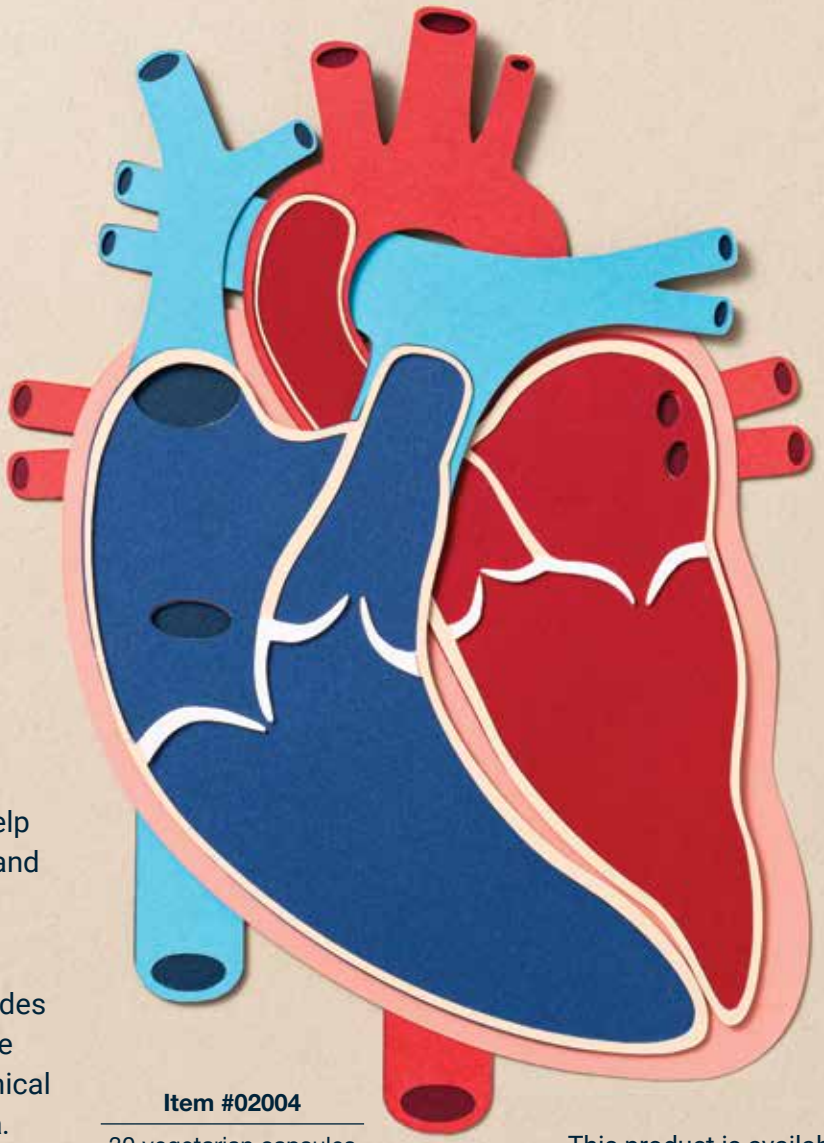
Those who did not use vitamin C supplements had a **28%** greater risk than supplement users.

Low and deficient serum vitamin C levels were associated with fewer years of life in comparison with normal levels.

Editor's Note: Not supplementing with vitamin C was associated with a **25%** greater mortality risk among people with type I diabetes, a **20%** greater risk among those with type II diabetes, and a **24%** greater risk among those without diabetes compared with those who supplemented.

* *Nutrients.* 2022 Sep 21;14(19):3902.

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

30 vegetarian capsules

This product is available at fine health food stores everywhere.

* *Int Angiol.* 2014 Feb;33(1):20-6.

GLUTEN FREE · 1 DAILY · NON GMO LE CERTIFIED

TURN "ON" YOUR CELLULAR ENERGY

OPTIMIZED NAD+

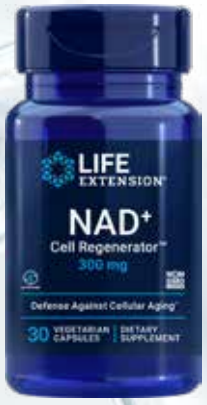
with Cell Regenerator™ and RESVERATROL ELITE™

NAD+ Cell Regenerator™ and Resveratrol Elite™
Item #02348
30 vegetarian capsules

Resveratrol activates longevity proteins called **sirtuins**.

NAD+ enables cellular **sirtuins** to **function**.

Optimized NAD+ Cell Regenerator™ combines **300 mg** of **NIAGEN® nicotinamide riboside** with Ultra-bioavailable ***trans*-resveratrol** and **quercetin**.



NAD+ Cell Regenerator™

NAD+ Cell Regenerator™
Item #02344
300 mg • 30 vegetarian capsules

For those already taking resveratrol, we offer **NAD+ Cell Regenerator™** that provides **300 mg** of **NIAGEN® nicotinamide riboside**.

GLUTEN FREE
NON GMO LE CERTIFIED

These products are available at fine health food stores everywhere.

PROTECT & ENERGIZE Aging Cells

1,000 mg CARNOSINE

800 mg TAURINE

150 mg BENFOTIAMINE

150 mg R-LIPOIC ACID

100 mg VITAMIN B6 (as pyridoxal 5'-phosphate)

10 mg PQQ Pyrroloquinoline quinone

Mitochondrial Energy Optimizer with PQQ
Item #01868 | 120 vegetarian capsules

When **sugar** binds to **proteins** in the body, **glycation** reactions may affect healthy cell **structures**.

Carnosine, **benfotiamine**, and **pyridoxal 5'-phosphate** are powerful nutrients that help inhibit cellular glycation.

PQQ and **R-lipoic acid** promote healthy cell energizing **mitochondria** function.

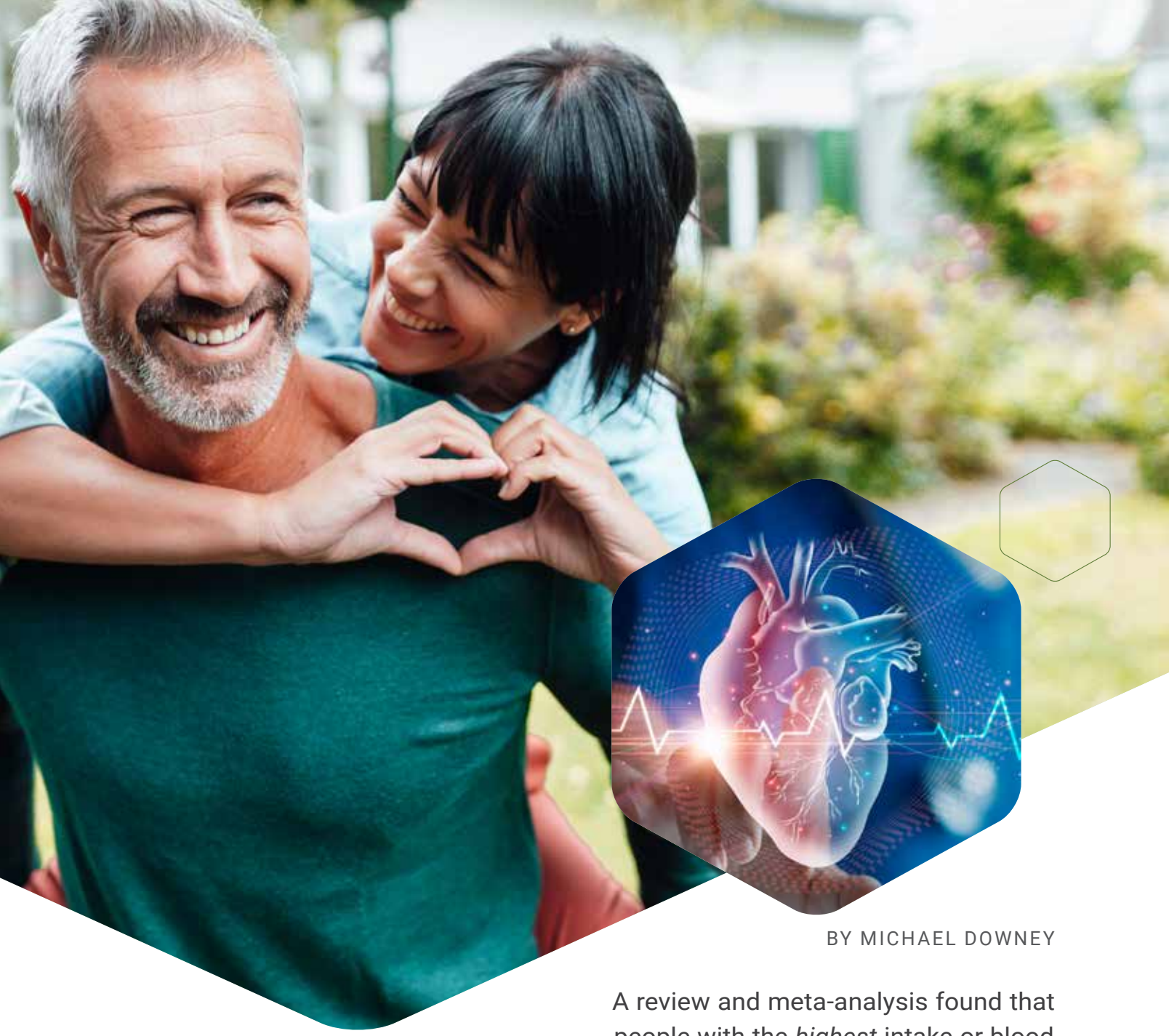
Mitochondrial Energy Optimizer provides a spectrum of nutrients at a fraction of the cost of buying them individually.

This product is available at fine health food stores everywhere.

GLUTEN FREE

NON GMO LE CERTIFIED

How LYCOPENE Protects the Heart



BY MICHAEL DOWNEY

Annual worldwide deaths from **cardiovascular disease** are expected to reach ***23 million*** by 2030.[1]

Searching for ways to support cardiovascular health, scientists have accumulated compelling evidence about **lycopene**.[1-3]

Research shows that lycopene ***reduces*** a wide range of cardiovascular disease risk factors.

A review and meta-analysis found that people with the *highest* intake or blood levels of **lycopene** had a:[4]

- **14%** lower risk of **cardiovascular disease**,
- **26%** lower risk of **stroke**, and a
- **37%** lower risk of **mortality**.

This article describes underlying mechanisms behind lycopene's multi-faceted protective effects.

Lycopene and Heart Disease

Lycopene is a carotenoid pigment known for its potent ***antioxidant*** and ***anti-inflammatory*** effects. It is found in tomatoes, apricots, melons, papayas, grapes, peaches, watermelons, and cranberries.

Lycopene has long been known for its role in promoting prostate health. Now scientists have found that it may also reduce the risk of **cardiovascular disease**.[5]

By working via several mechanisms, lycopene can mitigate factors that drive **aging** and chronic disorders, including **cardiovascular disease**.[1,2]

Lycopene's Vascular Protective Properties

Cardiovascular disease is a multi-factorial process that includes high levels of **oxidative stress** and **inflammation**.[1,6]

Oxidative stress contributes to **endothelial dysfunction** and promotes **inflammation** within arteries that predispose to atherosclerosis.[7]

The resulting formation of **atherosclerotic plaque** can block blood flow or cause clots, triggering a heart attack or stroke.[1]

Chronically high levels of **inflammation** and **oxidative stress** are also believed, in certain circumstances, to contribute to **cardiac hypertrophy**, a thickening of the heart muscle that makes it more difficult for the heart to pump blood.[1]

Lycopene bolsters the body's innate cellular defense mechanisms. It boosts levels of **glutathione**, a potent antioxidant produced in the body, and regenerates other antioxidants, including **vitamins E** and **C**.[1,8]

In preclinical models, **lycopene** has also been shown to increase the activity of multiple **enzymes** that are critical components of our cellular free radical defenses.[9-11]

Through these mechanisms, lycopene may prevent the **DNA damage** that increases the risk of atherosclerosis and cardiovascular disease.[1,2,12,13]

Suppressing Inflammation

Harmful **inflammation** in tissues is considered a root cause of cardiovascular disease.

In cell and animal model studies, lycopene prevents and even *reverses* inflammation by inhibiting synthesis and release of multiple inflammatory cytokines (signaling proteins). It also inhibits **nuclear factor-kappa B** (**NF-kB**), the master regulator of inflammation.[1,14-17]

Various factors can cause heart cells to die off. Lycopene helps *avoid* this cell death. This suppresses harmful changes to the heart's size and shape after a heart attack called ***ventricular remodeling***.[1,2]

Lycopene may also improve **endothelial function**.[1-3] The endothelium (the lining of blood vessels) is critical to healthy blood flow, nutrient exchange, and more.

Researchers hypothesize that the **oxidation** of low-density lipoprotein (LDL), which carries cholesterol into the bloodstream, plays a major role in the buildup of plaque that leads to occlusive **heart attacks** and **strokes**.[1,6,18]

Preclinical studies have shown that **lycopene** may *slow* the progression of atherosclerosis by inhibiting or preventing damaging oxidative processes (such as inhibition of LDL oxidation and proinflammatory activity).[1,2]

In animal studies, lycopene intake reduces *total* cholesterol, **LDL** ("bad") cholesterol, **VLDL** cholesterol (another bad form that helps it build up in arteries), and triglycerides. It also increases beneficial **HDL** cholesterol.[1]

Hypertension (high blood pressure) increases risk of heart disease, heart attack, and stroke.[19] Lycopene delivers an ***antihypertensive*** effect by inhibiting the **angiotensin converting enzyme** (ACE) - an enzyme that causes blood vessels to constrict.[1]

What Human Studies Show

Several studies show cardiovascular benefits in people taking **oral lycopene** or pursuing a diet high in lycopene.

In a trial, male participants were randomized to receive **6 mg** or **15 mg** of **lycopene** or a **placebo**. After eight weeks researchers observed significant **improvement** in **endothelial function** and a reduction in inflammatory markers in the **15 mg** lycopene group, compared to the low-dose or placebo arms of the study. There was also a beneficial increase in **LDL particle size** in the **high-dose** group.[20] (Smaller LDL particle size is more atherogenic than larger.)[21]

In a double blinded clinical trial, 36 statin-treated cardiovascular disease patients and an equal number of healthy volunteers were randomized in a 2:1 treatment allocation ratio to receive **7 mg** lycopene or a placebo for two months. At the end of the trial, a **53%** improvement of vascular function (endothelium-dependent vasodilation) was observed in cardiovascular patients taking lycopene as compared to placebo. No changes were seen in healthy volunteers.[22]

A scientific literature review of human clinical trials found that people consuming foods high in lycopene were protected from **lipid oxidation**, **DNA damage** in cells, and other damage.[23]

Various studies demonstrate that lycopene and a lycopene-rich diet help protect against **cardiovascular disease**,[4,24-29] and more.[30,31]

Cardioprotective Benefits of Lycopene

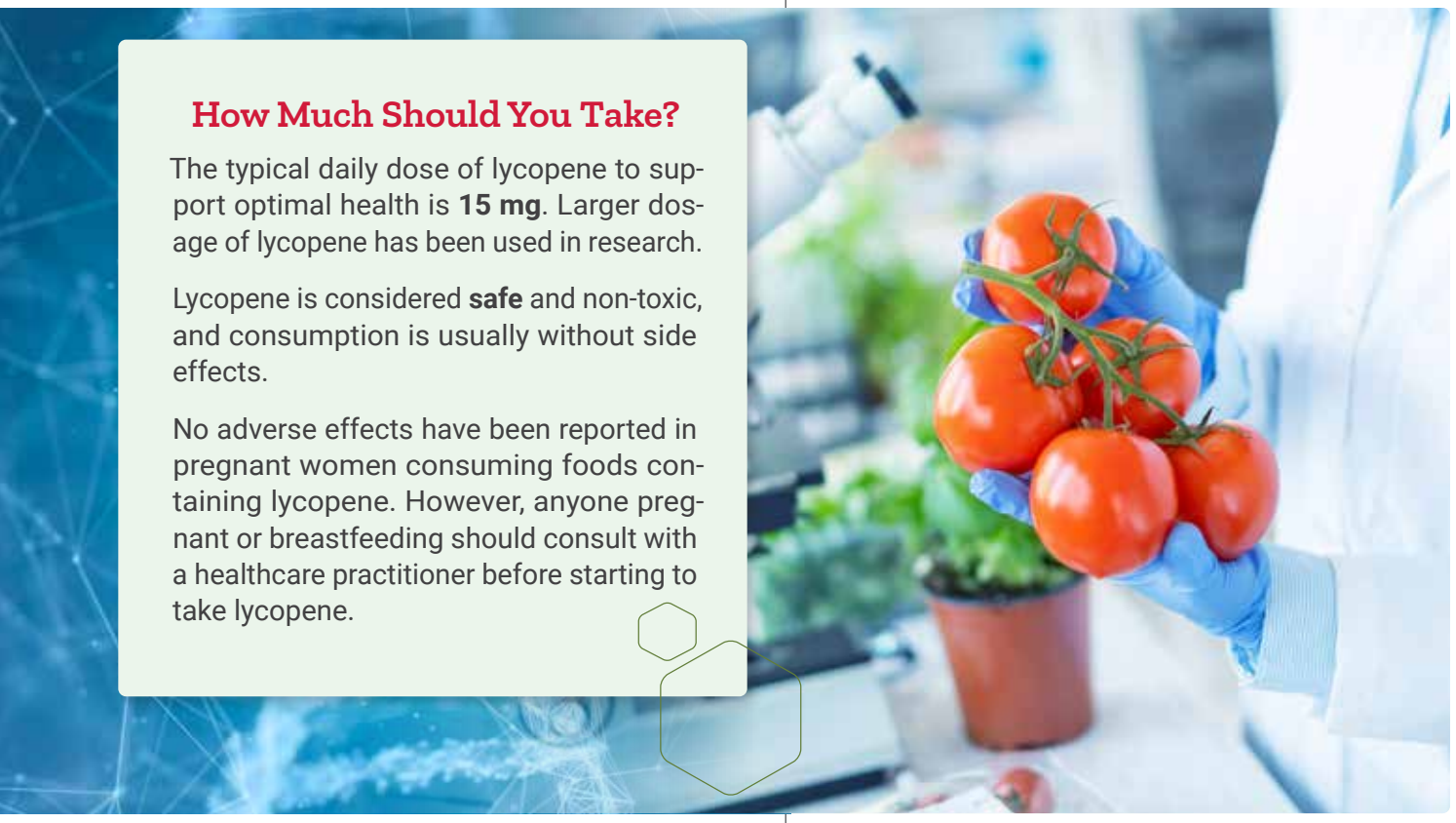
- **Lycopene** is a carotenoid pigment commonly found in tomatoes and watermelon. It is well known for its anti-cancer effects.
- Studies show that lycopene counters or *prevents* a wide range of **cardiovascular disease** risk factors, including atherosclerosis, oxidation of cholesterol, and endothelial dysfunction.
- These cardioprotective effects are believed to be largely attributable to lycopene's **anti-inflammatory** and **antioxidant** activity.
- Review studies found an association between higher lycopene intake or blood levels and a **14%-17%** lower risk of cardiovascular disease, **26%** lower risk of stroke, and **37%** lower risk of mortality.

How Much Should You Take?

The typical daily dose of lycopene to support optimal health is **15 mg**. Larger dosage of lycopene has been used in research.

Lycopene is considered **safe** and non-toxic, and consumption is usually without side effects.

No adverse effects have been reported in pregnant women consuming foods containing lycopene. However, anyone pregnant or breastfeeding should consult with a healthcare practitioner before starting to take lycopene.



A review of **21** studies found that consuming tomato products (a rich source of lycopene) or lycopene supplements was associated with:[25]

- Reductions in **LDL** cholesterol,
- Improvements in **blood vessel** function, and
- Lower **systolic** (top number) blood pressure.

One meta-analysis of 14 human studies showed that lycopene intake was associated with a **17%** reduction in the risk of **cardiovascular disease**.[26]

Another review and meta-analysis demonstrated that people with the highest serum concentration of **lycopene** had a:[4]

- **26%** lower risk of **stroke**,
- **14%** lower risk of **cardiovascular disease**, and
- **37%** lower risk of **mortality**.

In a trial in heart failure patients with a reduced ejection fraction, subjects received either **25 mg** of lycopene for eight weeks or placebo. After two months, both triglyceride levels and flow mediated dilation of arteries improved significantly compared to the control.[32]

Together with its anti-cancer activity, these cardioprotective benefits make lycopene a powerful health-promoting nutrient.

Summary

Research shows that **lycopene** may inhibit many different cardiovascular disease risk factors, including atherosclerosis, endothelial dysfunction, and oxidation of cholesterol.

Scientists have found that greater lycopene intake or bodily levels lowers the risk of **cardiovascular disease** by **14%-17%**[4,26] and reduces stroke risk by **26%**.[4]

References

1. Przybylska S, Tokarczyk G. Lycopene in the Prevention of Cardiovascular Diseases. *Int J Mol Sci.* 2022 Feb 10;23(4).
2. Hsieh MJ, Huang CY, Kiefer R, et al. Cardiovascular Disease and Possible Ways in Which Lycopene Acts as an Efficient Cardio-Protectant against Different Cardiovascular Risk Factors. *Molecules.* 2022 May 18;27(10).
3. Finicelli M, Di Salle A, Galderisi U, et al. The Mediterranean Diet: An Update of the Clinical Trials. *Nutrients.* 2022 Jul 19;14(14).
4. Cheng HM, Koutsidis G, Lodge JK, et al. Lycopene and tomato and risk of cardiovascular diseases: A systematic review and meta-analysis of epidemiological evidence. *Crit Rev Food Sci Nutr.* 2019;59(1):141-58.
5. Khan UM, Sevindik M, Zarrabi A, et al. Lycopene: Food Sources, Biological Activities, and Human Health Benefits. *Oxid Med Cell Longev.* 2021;2021:2713511.
6. Panda P, Verma HK, Lakkakula S, et al. Biomarkers of Oxidative Stress Tethered to Cardiovascular Diseases. *Oxid Med Cell Longev.* 2022 2022/06/24;2022:9154295.
7. Batty M, Bennett MR, Yu E. The Role of Oxidative Stress in Atherosclerosis. *Cells.* 2022 Nov 30;11(23):3843.
8. Bin-Jumah MN, Nadeem MS, Gilani SJ, et al. Lycopene: A Natural Arsenal in the War against Oxidative Stress and Cardiovascular Diseases. *Antioxidants (Basel).* 2022 Jan 26;11(2):232.
9. Bandeira ACB, da Silva RC, Rossoni JVJ, et al. Lycopene pretreatment improves hepatotoxicity induced by acetaminophen in C57BL/6 mice. *Bioorg Med Chem.* 2017 Feb 1;25(3):1057-65.
10. Pinto C, Rodríguez-Galdón B, Cestero JJ, et al. Hepatoprotective effects of lycopene against carbon tetrachloride-induced acute liver injury in rats. *Journal of Functional Foods.* 2013;5(4):1601-10.
11. Karahan I, Atessahin A, Yilmaz S, et al. Protective effect of lycopene on gentamicin-induced oxidative stress and nephrotoxicity in rats. *Toxicology.* 2005 Nov 15;215(3):198-204.
12. Alhmoud JF, Woolley JF, Al Moustafa AE, et al. DNA Damage/Repair Management in Cancers. *Cancers (Basel).* 2020 Apr 23;12(4).
13. Wu L, Sowers JR, Zhang Y, et al. Targeting DNA damage response in cardiovascular diseases: from pathophysiology to therapeutic implications. *Cardiovasc Res.* 2023 May 2;119(3):691-709.
14. Cha JH, Kim WK, Ha AW, et al. Anti-inflammatory effect of lycopene in SW480 human colorectal cancer cells. *Nutr Res Pract.* 2017 Apr;11(2):90-6.
15. Hedayati N, Naeini MB, Nezami A, et al. Protective effect of lycopene against chemical and natural toxins: A review. *Biofactors.* 2019 Jan;45(1):5-23.
16. Joo YE, Karrasch T, Muhlbauer M, et al. Tomato lycopene extract prevents lipopolysaccharide-induced NF-kappaB signaling but worsens dextran sulfate sodium-induced colitis in NF-kappaBEGFP mice. *PLoS One.* 2009;4(2):e4562.
17. Marcotorchino J, Romier B, Gouranton E, et al. Lycopene attenuates LPS-induced TNF-alpha secretion in macrophages and inflammatory markers in adipocytes exposed to macrophage-conditioned media. *Mol Nutr Food Res.* 2012 May;56(5):725-32.
18. Khatana C, Saini NK, Chakrabarti S, et al. Mechanistic Insights into the Oxidized Low-Density Lipoprotein-Induced Atherosclerosis. *Oxid Med Cell Longev.* 2020;2020:5245308.
19. Available at: https://www.cdc.gov/bloodpressure/facts.htm. Accessed June 4, 2021.
20. Kim JY, Paik JK, Kim OY, et al. Effects of lycopene supplementation on oxidative stress and markers of endothelial function in healthy men. *Atherosclerosis.* 2011 Mar;215(1):189-95.
21. Froyen E. The effects of fat consumption on low-density lipoprotein particle size in healthy individuals: a narrative review. *Lipids Health Dis.* 2021 Aug 6;20(1):86.
22. Gajendragadkar PR, Hubsch A, Maki-Petaja KM, et al. Effects of oral lycopene supplementation on vascular function in patients with cardiovascular disease and healthy volunteers: a randomised controlled trial. *PLoS One.* 2014;9(6):e99070.
23. Basu A, Imrhan V. Tomatoes versus lycopene in oxidative stress and carcinogenesis: conclusions from clinical trials. *Eur J Clin Nutr.* 2007 Mar;61(3):295-303.
24. Mozos I, Stoian D, Caraba A, et al. Lycopene and Vascular Health. *Front Pharmacol.* 2018;9:521.
25. Cheng HM, Koutsidis G, Lodge JK, et al. Tomato and lycopene supplementation and cardiovascular risk factors: A systematic review and meta-analysis. *Atherosclerosis.* 2017 Feb;257:100-8.
26. Song B, Liu K, Gao Y, et al. Lycopene and risk of cardiovascular diseases: A meta-analysis of observational studies. *Mol Nutr Food Res.* 2017 Sep;61(9).
27. Petyaev IM. Lycopene Deficiency in Ageing and Cardiovascular Disease. *Oxid Med Cell Longev.* 2016;2016:3218605.
28. Costa-Rodrigues J, Pinho O, Monteiro PRR. Can lycopene be considered an effective protection against cardiovascular disease? *Food Chem.* 2018 Apr 15;245:1148-53.
29. Mordente A, Guantario B, Meucci E, et al. Lycopene and cardiovascular diseases: an update. *Curr Med Chem.* 2011;18(8):1146-63.
30. Zhu R, Chen B, Bai Y, et al. Lycopene in protection against obesity and diabetes: A mechanistic review. *Pharmacol Res.* 2020 Sep;159:104966.
31. Li N, Wu X, Zhuang W, et al. Tomato and lycopene and multiple health outcomes: Umbrella review. *Food Chem.* 2021 May 1;343:128396.
32. Karimian B, Soleimani A, Mohammadsharifi G, et al. Effect of Lycopene Supplementation on Some Cardiovascular Risk Factors and Markers of Endothelial Function in Iranian Patients with Ischemic Heart Failure: A Randomized Clinical Trial. *Cardiol Res Pract.* 2022 2022/10/28;2022:2610145.
33. Devaraj S, Mathur S, Basu A, et al. A dose-response study on the effects of purified lycopene supplementation on biomarkers of oxidative stress. *J Am Coll Nutr.* 2008 Apr;27(2):267-73.

STRONG SUPPORT FOR SORE MUSCLES

After Exercise and Everyday Exertion

Benefits of **TART CHERRY** include:[1-5]

- **Rapid muscle recovery after exercise.**
- **Fast relief from the minor aches, discomfort, and stiffness following everyday activities.**

ANTHOCYANINS

Anthocyanins—the powerful flavonoids found in dark-pigmented fruit—have been studied for their many advantages.[6-8]

Tart Cherry with **CherryPURE®** matches the anthocyanin dose used in clinical trials.[2,5]

Life Extension® offers **100%** natural **Tart Cherry with CherryPURE®**.

Item #02023

60 vegetarian capsules

GLUTEN FREE

NON GMO LE CERTIFIED

References

1. *J Int Soc Sports Nutr*. 2010 May 7;7:17.
2. *Scand J Med Sci Sports*. 2010 Dec;20(6):843-52.
3. *J Int Soc Sports Nutr*. 2016;13:26.
4. *J Int Soc Sports Nutr*. 2015;12:14.
5. *Am J Vet Res*. 2009 Jun;70(6):758-63.
6. *Ageing Res Rev*. 2021 Mar;66:101254.
7. *Complement Ther Med*. 2022 Dec;71:102883.
8. *Nutrients*. 2020 May 20;12(5).

This product is available at fine health food stores everywhere.

TAKE A BITE OUT OF YOUR **Appetite**

People who struggle with weight loss often point to several "**Achilles' heels**" that **sabotage their efforts** to keep the pounds off: *eating between meals*, *grazing at night*, and *a constant desire to snack* are among the most common.

The fantastic news is that a proprietary extract of **saffron**, called **Satiereal®**, is *clinically* proven to deal with nearly all these issues. In fact, women involved in **Satiereal®** studies experienced the following amazing results:[1,2]

- 100% reduction in the desire to snack
- 55% fewer instances of eating between meals
- Less hunger
- Moderate weight loss
- More energy
- Better mood

Say goodbye to "kitchen raids" and say hello to **Optimized Saffron with Satiereal®**.

Item #01432
60 vegetarian capsules

References
1. *Nutraveris*. 2006; unpublished study.
2. *Nutr Res.* 2010 May;30(5):305-13.

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

This product is available at fine health food stores everywhere.

GLUTEN FREE

NON GMO LE CERTIFIED

Multi-Action Support for Aging Joints!

Clinically validated ingredients help maintain cartilage and inhibit inflammatory factors to support joint health.

JUST TWO CAPSULES A DAY PROVIDE:

Glucosamine sulfate 2KCl (derived from non-GMO corn)	**1,500 mg**
AprèsFlex® Indian frankincense (*Boswellia serrata*) extract (gum resin) [std. to 20% AKBA$^{\Delta}$]	**100 mg**
NT2 Collagen™ standardized cartilage providing 10 mg total collagen	**40 mg**
Boron (calcium fructoborate as patented FruiteX-B® OsteoBoron®)	**1.5 mg**

NT2 Collagen™ is manufactured by Bioibérica. AprèsFlex® is a registered trademark of PLT Health Solutions-Laila Nutraceuticals LLC. FruiteX-B® and OsteoBoron® are registered trademarks of VDF FutureCeuticals, Inc. U.S. Patent No. 5,962,049.

$^{\Delta}$ 3-O-acetyl-11-ketoB-boswellic acid.

Item #02238

60 capsules

GLUTEN FREE

NON GMO LE CERTIFIED

This product is available at fine health food stores everywhere.

Don't Weight Around

Maintain Optimal Hormone Levels

7-Keto® is a metabolite of **DHEA** ideal for weight management.

Maintaining youthful DHEA levels can help support immune function, circulatory health, mood, libido, and more.

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

Item #02478

60 vegetarian capsules

(Two-month supply)

GLUTEN FREE

NON GMO LE CERTIFIED

This product is available at fine health food stores everywhere.

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

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

OMEGA-3S and Macular Degeneration Risk

BY AL RICHTER

Age-related **macular degeneration** is a *leading cause* of permanent **vision loss** in the elderly.[1]

The risk of developing it, however, can be markedly *lowered*.

Two large meta-analyses of **human** studies found that a *higher* intake of **omega-3 fatty acids** from fish oil is associated with a reduced risk of the development and progression of **macular degeneration**.[2,3]

In one, patients with the *highest* levels of total dietary **omega-3** intake had a ***49% reduction in risk*** of age-related **macular degeneration**.[3]

The Two Types of Macular Degeneration

Age-related macular degeneration can be divided into two types:[4]

- **Dry** macular degeneration results when the cells of the macula grow thin and break down.
- **Wet** macular degeneration occurs when abnormal blood vessels beneath the retina grow and leak, damaging the macula.

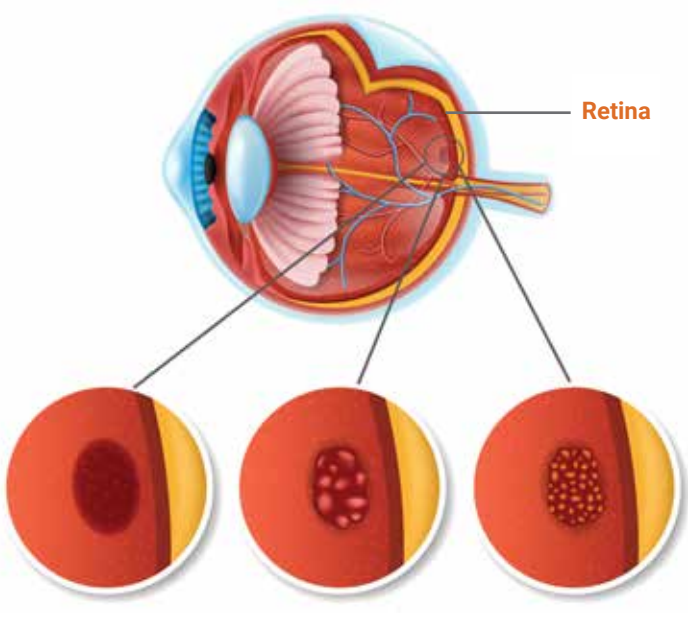
The **wet form** tends to be much more severe and progressive. It is responsible for most of the cases that lead to **blindness**.

How Fish Oil Protects Vision

Age-related macular degeneration is a disease of the **retina**, the layer of nerve cells at the back of the eye that detects light and sends signals to the brain to enable vision.

The **macula** is the part of the retina responsible for sharp, straight-ahead vision.

MACULAR DEGENERATION



When these cells are damaged or lost, **visual acuity** (sharpness) declines. Basic tasks like driving and reading become impossible, and **blindness** can eventually result.[1]

Oxidative stress and inflammation drive the progression of macular degeneration.[5]

Omega-3 fatty acids from fish oil may protect eye health in a few ways.

For one, **omega-3s** are structural components of **cell membranes** in the maculae.[6] They have **anti-inflammatory**,[6] **neuroprotective**,[7,8] and other effects that mitigate the processes that lead to macular degeneration.[9-11]

The **retina** of the eye is an extension of the **optic nerve,** which extends directly from the brain.[12] Omega-3s help shield the retina from age-related degenerative changes that damage these cells.[11,13,14]

Omega-3s and Macular Degeneration Risk

Several epidemiological studies have found that people with the *highest* intake of **omega-3 fatty acids** had the *lowest* risk of developing macular degeneration.[10,15-20] Observational studies have shown that increased dietary intake of omega-3 slows the progression of the disease.[21]

In **2021** and **2022**, the results of two large meta-analyses investigating this topic were published.[2,3]

The first examined data from **21** separate human studies around the world from more than **190,000** individuals. It looked at whether intake of fish oil-derived **omega-3 fatty acids** was predictive of **age-related macular degeneration**.[2]

The results showed that those with the highest intake of fish oils had a **14% lower risk** of *early-stage* age-related macular degeneration and a **29% lower risk** of *late stage* (more severe) macular degeneration.[2]

Further analysis found that for each additional **1,000 mg** of **omega-3** intake per day, the risk for early macular degeneration was lowered by **6%**, and the risk for late macular degeneration was reduced by **22%**.[2]

The researchers also explored whether there was any difference between the two primary fatty acids found in fish oils, **DHA** and **EPA**. They found that *both* DHA and EPA, when analyzed alone, were protective in individuals with the highest intake.[2]

Omega-3s and 'Wet' AMD

The other meta-analysis, published in **2022**, specifically evaluated patients with **wet age-related macular degeneration**.[3] It included data from five studies performed in Japan, the United States, and Europe, in over **12,000** patients.[3]

Even for this more aggressive type of **macular degeneration**, the analysis found that intake of fish oil-derived omega-3 fatty acids was significantly associated with a **reduced risk**.[3]

Patients with the highest levels of total dietary omega-3 intake had a remarkable ***49% reduction in risk*** for wet **macular degeneration**, compared to those with the lowest intake.[3]

Studies in the meta-analysis reported a significant correlation between **total intake** of omega-3 fatty acids and risk for this blinding form of macular degeneration.[3]

Protect Against Vision Loss

- Age-related **macular degeneration** is the most common cause of permanent vision loss in older individuals.
- Two large meta-analyses including hundreds of thousands of subjects show that *higher intake* of **omega-3 fatty acids** from fish oil is associated with *lower risk* for the development and progression of macular degeneration.
- Each of the primary fish oil omega-3s, **DHA** and **EPA**, protects against age-related macular degeneration.

This study also separated DHA and EPA to see if they differed in their protective ability. Both were found to be protective, with the highest consumption of **DHA** predicting a **39%** lower risk of wet macular degeneration and the highest consumption of **EPA** predicting a **32%** lower risk.[3]

These analyses provide evidence that **fish oil** can help protect against macular degeneration and promote eye health.

Summary

Age-related macular degeneration is the most common cause of vision loss in those over 50 years of age.

Two large meta-analyses confirm that a *higher* intake of **omega-3 fatty acids** from fish oil is protective against the development and progression of all forms of age-related macular degeneration.

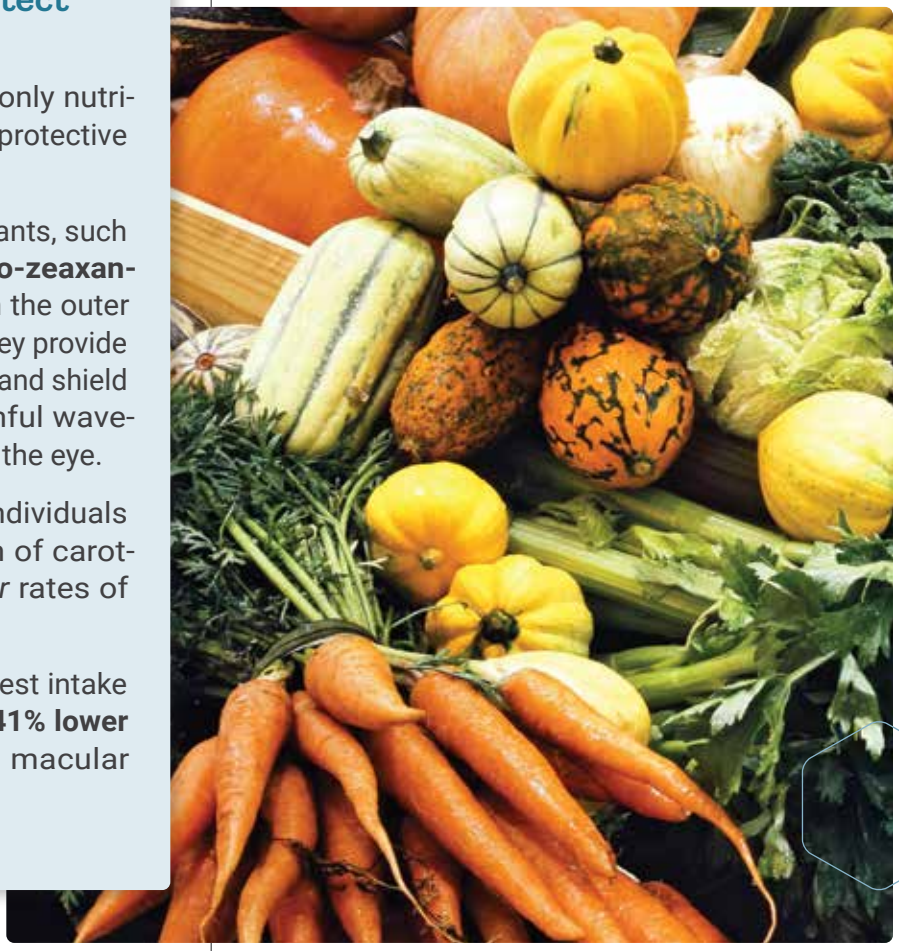
Carotenoids Also Protect the Retina

Omega-3 fatty acids aren't the only nutrients that have been found to be protective against eye disease.

Carotenoid pigments found in plants, such as **lutein**, **zeaxanthin**, and **meso-zeaxanthin** are known to concentrate in the outer membrane of the retina, where they provide structure support to the maculae and shield these delicate cells from harmful wavelengths of light that can damage the eye.

Population studies show that individuals with the *highest* concentration of carotenoids in the retina have *lower* rates of **macular degeneration**.[22,23]

In one study, those with the highest intake of **lutein** and **zeaxanthin** had a **41% lower risk** of developing advanced macular degeneration.[24]



References

1. Ruia S, Kaufman EJ. Macular Degeneration. *StatPearls*. Treasure Island (FL): StatPearls Publishing. Copyright © 2023, StatPearls Publishing LLC.; 2023.
2. Jiang H, Shi X, Fan Y, et al. Dietary omega-3 polyunsaturated fatty acids and fish intake and risk of age-related macular degeneration. *Clin Nutr.* 2021 Dec;40(12):5662-73.
3. Meng XT, Shi YY, Hong-Yan Z. Dietary omega-3 LCPUFA intake in the prevention of neovascular age-related macular degeneration: a systematic review and meta-analysis. *Nutr Hosp*. 2022 Aug 25;39(4):910-5.
4. Available at: https://www.aao.org/eye-health/diseases/amd-macular-degeneration. Accessed June 15, 2023.
5. Jadeja RN, Martin PM. Oxidative Stress and Inflammation in Retinal Degeneration. *Antioxidants (Basel).* 2021 May 17;10(5).
6. Available at: https://www.hsph.harvard.edu/nutritionsource/what-should-you-eat/fats-and-cholesterol/types-of-fat/omega-3-fats/#:~:text=What%20makes%20omega%2D3%20fats,of%20artery%20walls%2C%20and%20inflammation. Accessed June 15, 2023.
7. Dyall SC. Long-chain omega-3 fatty acids and the brain: a review of the independent and shared effects of EPA, DPA and DHA. *Front Aging Neurosci*. 2015;7:52.
8. Lo Van A, Sakayori N, Hachem M, et al. Targeting the Brain with a Neuroprotective Omega-3 Fatty Acid to Enhance Neurogenesis in Hypoxic Condition in Culture. *Mol Neurobiol*. 2019 Feb;56(2):986-99.
9. SanGiovanni JP, Chew EY. The role of omega-3 long-chain polyunsaturated fatty acids in health and disease of the retina. *Prog Retin Eye Res*. 2005 Jan;24(1):87-138.

There are two types of AMD:[4]

Dry AMD:

- Most common (also called atrophic AMD),
- The macula gets thinner with age,
- Three stages: early, intermediate, and late,
- Usually progresses slowly over several years, and
- There are no medical treatment options available for late, dry AMD.

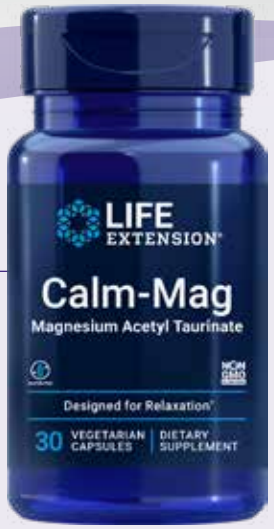
Wet AMD

- Less common (also called advanced neovascular AMD),
- It happens when abnormal blood vessels grow in the back of the eye and damage the macula,
- Usually causes faster vision loss. Any stage of dry AMD can turn into wet AMD—but wet AMD is always late stage, and
- Medical treatment options are available for wet AMD.

10. Souied EH, Aslam T, Garcia-Layana A, et al. Omega-3 Fatty Acids and Age-Related Macular Degeneration. *Ophthalmic Research.* 2015;55(2):62-9.
11. Rezende FA, Lapalme E, Qian CX, et al. Omega-3 supplementation combined with anti-vascular endothelial growth factor lowers vitreal levels of vascular endothelial growth factor in wet age-related macular degeneration. *Am J Ophthalmol*. 2014 Nov;158(5):1071-78.
12. Mahabadi N, Al Khalili Y. Neuroanatomy, Retina. *StatPearls.* Treasure Island (FL): StatPearls Publishing. Copyright © 2023, StatPearls Publishing LLC.; 2023.
13. Satizabal CL, Himali JJ, Beiser AS, et al. Association of Red Blood Cell Omega-3 Fatty Acids With MRI Markers and Cognitive Function in Midlife: The Framingham Heart Study. *Neurology*. 2022 Oct 5;99(23):e2572-82.
14. Prokopiou E, Kolovos P, Georgiou C, et al. Omega-3 fatty acids supplementation protects the retina from age-associated degeneration in aged C57BL/6J mice. *BMJ Open Ophthalmology.* 2019;4(1):e000326.
15. Chong EW, Robman LD, Simpson JA, et al. Fat consumption and its association with age-related macular degeneration. *Arch Ophthalmol*. 2009 May;127(5):674-80.
16. Chua B, Flood V, Rochtchina E, et al. Dietary fatty acids and the 5-year incidence of age-related maculopathy. *Arch Ophthalmol.* 2006 Jul;124(7):981-6.
17. SanGiovanni JP, Chew EY, Agron E, et al. The relationship of dietary omega-3 long-chain polyunsaturated fatty acid intake with incident age-related macular degeneration: AREDS report no. 23. *Arch Ophthalmol.* 2008 Sep;126(9):1274-9.
18. Seddon JM, Rosner B, Sperduto RD, et al. Dietary fat and risk for advanced age-related macular degeneration. *Arch Ophthalmol.* 2001 Aug;119(8):1191-9.
19. Tan JS, Wang JJ, Flood V, et al. Dietary fatty acids and the 10-year incidence of age-related macular degeneration: the Blue Mountains Eye Study. *Arch Ophthalmol.* 2009 May;127(5):656-65.
20. Christen WG, Schaumberg DA, Glynn RJ, et al. Dietary ω-3 fatty acid and fish intake and incident age-related macular degeneration in women. *Arch Ophthalmol*. 2011 Jul;129(7):921-9.
21. Lawrenson JG, Evans JR. Omega 3 fatty acids for preventing or slowing the progression of age-related macular degeneration. *Cochrane Database Syst Rev*. 2015 Apr 9;2015(4):Cd010015.
22. Agron E, Mares J, Clemons TE, et al. Dietary Nutrient Intake and Progression to Late Age-Related Macular Degeneration in the Age-Related Eye Disease Studies 1 and 2. *Ophthalmology.* 2021 Mar;128(3):425-42.
23. Lem DW, Davey PG, Gierhart DL, et al. A Systematic Review of Carotenoids in the Management of Age-Related Macular Degeneration. *Antioxidants (Basel)*. 2021 Aug 5;10(8).
24. Wu J, Cho E, Willett WC, et al. Intakes of Lutein, Zeaxanthin, and Other Carotenoids and Age-Related Macular Degeneration During 2 Decades of Prospective Follow-up. *JAMA Ophthalmol.* 2015 Dec;133(12):1415-24.

with CALM-MAG

A special form of **MAGNESIUM** has been shown to target **stress** where it starts—in the **brain**.



Item #02434

30 vegetarian capsules

Magnesium assists in the maintenance of healthy **cortisol** levels and production of **serotonin**.[1]

Calm-Mag contains **magnesium acetyl-taurinate** which has been shown in preclinical studies to increase **brain tissue** magnesium levels.

In a clinical study of women with a magnesium poor diet,[2] this form of **magnesium**:

- Promoted a **calm**, relaxed state of mind
- Contributed to healthy **mood**

Calm-Mag provides **45 mg** of elemental magnesium in each daily capsule. It may be used with other forms of magnesium.

GLUTEN FREE

NON GMO LE CERTIFIED

This product is available at fine health food stores everywhere.

References:
1. *Nutrients.* 2020 Nov 28;12(12).
2. Synapharm - Company supplied data. 2021.

Optimize **Healthy** Blood-Sugar **Levels**

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

Item #01503

90 vegetarian capsules

"This product is fabulous!"

Shirley

VERIFIED CUSTOMER REVIEW

This product is available at fine health food stores everywhere.

GLUTEN FREE

NON GMO LE CERTIFIED

Crominex®3+, Capros® and PrimaVie® are patent-protected and registered trademarks of Natreon, Inc.

CinSulin® is a registered trademark of Tang-An Medical Ltd.

InSea2® is a registered trademark of InnoVactiv™.

Caution: If you are taking blood glucose lowering medication, consult your healthcare provider before taking this product.

Whole-Body Support

Everything good takes time.

Magnesium is essential for a healthy heart and sturdy bones; it can even support mood health. But most people don't get enough magnesium in their diets.

Our innovative formula delivers both immediate and extended-release magnesium, providing the maximum benefits for the long haul.

"I love that it's extend release."

Carol

VERIFIED CUSTOMER REVIEW

GLUTEN FREE

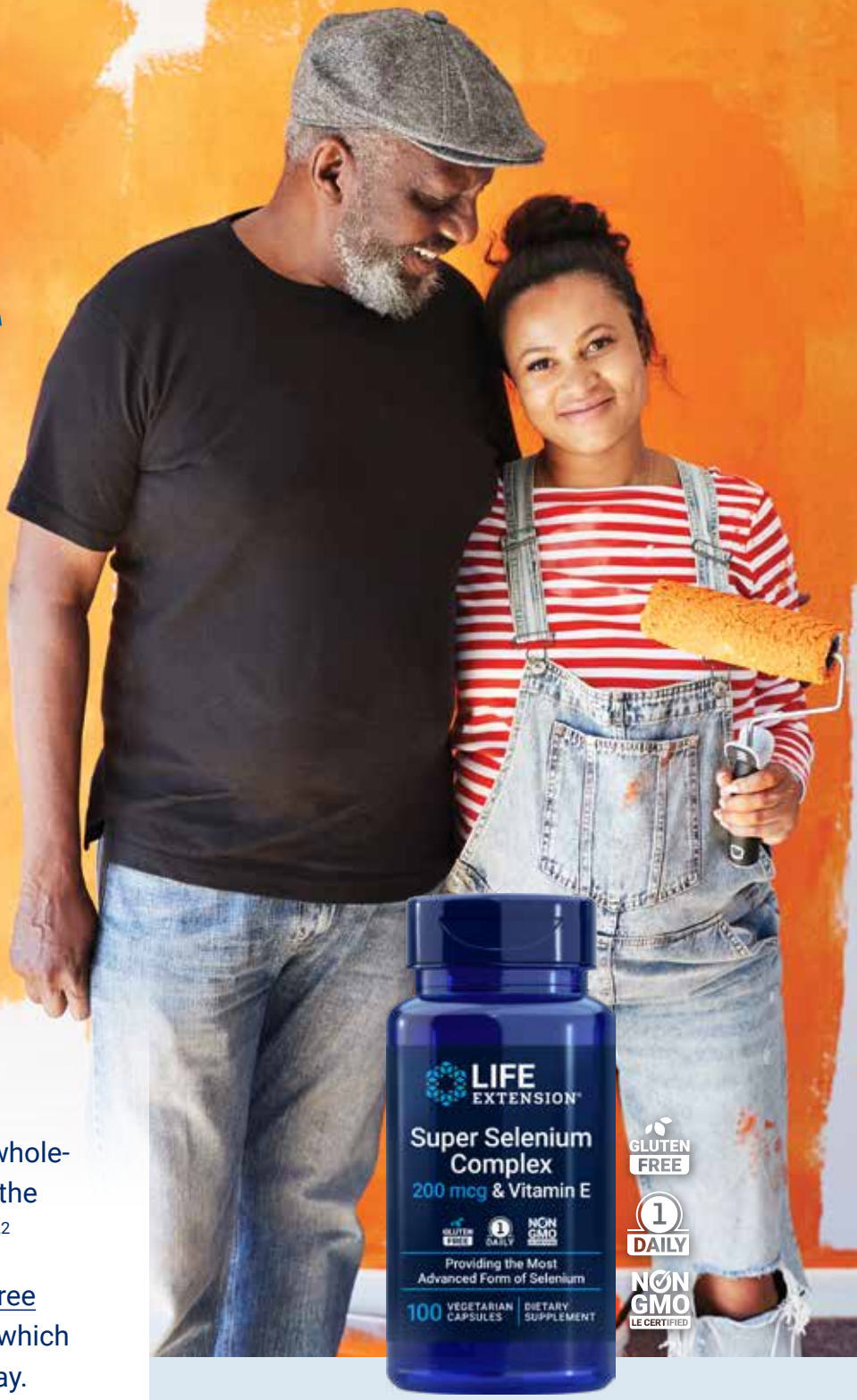
NON GMO LE CERTIFIED

Item #02107

60 vegetarian capsules

This product is available at fine health food stores everywhere.

share a longer life



Linked to Longevity

Selenium has been shown to confer whole-body protection including supporting the heart, brain, and healthy cell division.[1,2]

Super Selenium Complex provides three different forms of selenium—each of which uniquely acts along a different pathway.

1. **Sodium selenite**
2. **L-selenomethionine**
3. **Selenium-Methyl L-Selenocysteine**

Item #01778

100 vegetarian capsules

Each bottle provides a supply that lasts more than three months.

This product is available at fine health food stores everywhere.

References
1. *Biol Trace Elem Res.* 2004 Oct;101(1):73-86.
2. *Biol Trace Elem Res.* 2011 Sep;142(3):274-83.


Men's
Issues

DEFEND Against the Challenges of Male Aging

BY MICHAEL DOWNEY

As men age, they face certain health challenges, including:[1]

- **Erectile dysfunction** and low libido,
- Decreased **testosterone**, which lowers energy and virility, and
- **Prostate** disorders, which include **urination** problems and **enlarged prostate**.

Decades of research have identified several **plant** and **mineral** compounds, demonstrated to *help* alleviate specific symptoms.

In **human** studies, these ingredients:

- Improved erections in **61.5%** of participants,[2]
- Raised free testosterone levels by more than **48%**,[3]
- Restored a feeling of youthful well-being,[3]
- Improved a measure of strength by nearly **25%**,[3] and
- Relieved urinary symptoms, including nighttime urination.[4,5]

Taken together, these nutrients can safely support a broad range of **sexual**, **hormonal**, and **urinary** health issues that challenge aging men.

Male Sexual Health

Men's sexual health is about more than just erectile function. It also includes sexual desire, response, and satisfaction.

Erectile dysfunction drugs, such as Viagra®, Cialis®, and Levitra®, enhance penile **blood flow**. But the effects are only temporary, and side effects can include skin flushing, visual disturbances, dizziness, and headaches.[6]

Scientists have found an alternate way to improve overall sexual health: an extract of a ginger-like root called **Thai black ginger**. Its scientific name is *Kaempferia parviflora*.

It has long been used in South Asia as an aphrodisiac to enhance male sexual function.[7-9] In preclinical studies, this plant extract gently supported increased blood flow to the **penis** while *also* enhancing **brain responses** to sexual stimuli.[9-12]

In a **human** trial, researchers enlisted healthy, sexually active men with self-reported mild **erectile dysfunction**. None were using medications for this condition.[2]

Each volunteer took **100 mg** of *Kaempferia parviflora* extract daily. The extract was standardized to **5%** of the active compound, **5,7-dimethoxyflavone** (**5,7-DMF**).

After 30 days, **improved erections** were reported by **61.5%** of participants.[2]

Unlike pharmaceuticals, *Kaempferia parviflora* also improved **intercourse satisfaction** and **response time** to erotic stimuli in a human study.[13]

Restoring Testosterone Levels

The hormone **testosterone** is critical to the male reproductive system. But testosterone levels also impact metabolism, energy, muscle strength and mass, mood, and more.[14]

Low levels of free testosterone become increasingly common as men age.[15] Not only does this rob men of energy, virility, and a youthful feeling of general well-being, but it is also associated with age-related chronic conditions, including **heart disease** and **diabetes**.[15,16]

In one meta-analysis, low testosterone was associated with an **increased risk of death** due to cardiovascular disease or any other cause.[17]

Scientists searched for years for ways to safely elevate total and free testosterone levels *without drugs*.

In cell studies, they found that extracts of **pomegranate** and **cacao seed** (from the same beans used to make cocoa and chocolate) each increased testosterone production.[18]

Kaempferia parviflora

WHAT YOU NEED TO KNOW

Support for Sexual, Hormonal, and Urinary Health in Aging Men

- As they age, men experience unique **sexual**, **hormonal**, and **prostate** challenges.
- An extract of *Kaempferia parviflora* improved erectile dysfunction and other aspects of sexual health in human studies.
- A combination of **pomegranate** and **cacao seed** extracts raised testosterone levels and improved mood and strength in clinical studies.
- **Saw palmetto** and its active component, **beta-sitosterol,** are clinically proven to support prostate health and hormonal metabolism, and to reduce urinary problems. Boron and rosemary provide additional support to prostate health.
- These and several other nutrients can help protect against a broad range of these problems of male aging.

In a clinical trial, **pomegranate** and **cacao seed** extracts were tested in men aged 36 to 55 years, who received either a blend of both extracts or a placebo.[3]

After eight weeks, levels of **free testosterone** (the biologically active form) had risen over **48%** in men receiving **400 mg** of the **pomegranate-cacao** blend.[3]

The group receiving the **pomegranate-cacao extracts** showed the following additional effects:[3]

- Improved overall **well-being**,
- **Stress** measures dropped **26%**, and
- Hand grip **strength** increased by almost **25%**.

This study also used the **Aging Males' Symptoms** scale, which includes:[19]

- Joint pain and muscle aches,
- Excessive sweating,
- Sleep problems and exhaustion,
- Anxiety and irritability,
- Depression and feeling burned out, and
- Decrease in libido and other sexual problems.

These symptoms were reduced by **19%** in the **pomegranate-cacao** group.[3]

A similar study enlisted **younger** men, aged 21 to 35. Even at this age, pomegranate and cacao increased **free testosterone** by **25%**. Grip strength and upper-arm circumference also increased.[20]

Luteolin is a flavonoid found in several herbs, fruits, and vegetables. Preclinical studies show that luteolin supports healthy **testosterone** levels and *reduces* its conversion into **estrogen.**[21-23]

Scientists have combined **luteolin** with **pomegranate** and **cacao** extracts for even greater support for **testosterone** levels.

Prostate Protection

Aging men have an exceedingly high risk of **benign prostate enlargement**, which causes urination frequency and difficulties.[1]

Clinical data show that extracts of the **saw palmetto** plant deliver prostate protection.[24-26] Saw palmetto berries are rich in bioactive prostate-protecting compounds, including **beta-sitosterol**.[27]

Saw palmetto benefits the prostate by:[27-29]

- *Inhibiting* enzymes that convert testosterone into dihydrotestosterone (DHT), a hormone that increases prostate growth, and
- Supporting healthy cell division and inflammatory response within the prostate. This reduces **lower urinary tract symptoms**, which include urinary incontinence, needing to urinate too often, or having trouble urinating.

Saw palmetto's effects may be *enhanced* when its active component, **beta-sitosterol**, is extracted and taken with it. It is a compound that is believed to reduce levels of **DHT**.[30]

In an analysis of **18** clinical trials, saw palmetto relieved **lower urinary tract symptoms**, improved urine flow better than a placebo, and significantly reduced **nighttime urination**, known as **nocturia**.[4]

The highest-quality saw palmetto formulas include added **beta-sitosterol**,[5,31,32] and *other* prostate-protecting nutrients.

- The mineral **boron** supports healthy hormonal metabolism,[33] and
- **Rosemary** extract has demonstrated anti-prostate cancer activity in preclinical studies.[34,35]

Summary

Taking **pomegranate-cacao seed** and ***Kaempferia parviflora*** extracts together with other nutrients may provide a comprehensive defense against problems that come with male aging.

Aging men commonly experience **erectile dysfunction**, low libido, low **testosterone** levels, and prostate problems that include **urinary symptoms** and benign prostate hyperplasia.

Several plant extracts and compounds can safely help aging men support erectile, hormonal, and prostate health. •

References

1. Kaufman JM, Lapauw B, Mahmoud A, et al. Aging and the Male Reproductive System. *Endocr Rev.* 2019 Aug 1;40(4):906-72.
2. Stein RA, Schmid K, Bolivar J, et al. Kaempferia parviflora ethanol extract improves self-assessed sexual health in men: a pilot study. *J Integr Med.* 2018 Jul;16(4):249-54.
3. Pandit SL, Yaligar D, Halemane M, et al. A proprietary blend of standardized Punica granatum fruit rind and Theobroma cocoa seed extracts mitigates aging males' symptoms: A randomized, double-blind, placebo-controlled study. *Int J Med Sci.* 2022;19(8):1290-9.
4. Wilt TJ, Ishani A, Rutks I, et al. Phytotherapy for benign prostatic hyperplasia. *Public Health Nutr.* 2000 Dec;3(4A):459-72.
5. Csikós E, Horváth A, Ács K, et al. Treatment of Benign Prostatic Hyperplasia by Natural Drugs. *Molecules.* 2021 Nov 25;26(23).
6. Available at: https://www.health.harvard.edu/mens-health/which-drug-for-erectile-dysfunction#:~:text=The%20most%20common%20side%20effects,hospital%20or%20risk%20permanent%20damage. Accessed May, 11, 2023.
7. Saokaew S, Wilairat P, Raktanyakan P, et al. Clinical Effects of Krachaidum (Kaempferia parviflora): A Systematic Review. *J Evid Based Complementary Altern Med.* 2017 Jul;22(3):413-28.
8. Wattanathorn J, Pangphukiew P, Muchimapura S, et al. Aphrodisiac Activity of Kaempferia parviflora. *American Journal of Agricultural and Biological Sciences.* 2012;7(2):114-20.
9. Chaturapanich G, Chaiyakul S, Verawatnapakul V, et al. Effects of Kaempferia parviflora extracts on reproductive parameters and spermatic blood flow in male rats. *Reproduction.* 2008 Oct;136(4):515-22.
10. Temkitthawon P, Hinds TR, Beavo JA, et al. Kaempferia parviflora, a plant used in traditional medicine to enhance sexual performance contains large amounts of low affinity PDE5 inhibitors. *J Ethnopharmacol.* 2011 Oct 11;137(3):1437-41.
11. Tep-Areenan P, Sawasdee P, Randall M. Possible mechanisms of vasorelaxation for 5,7-dimethoxyflavone from Kaempferia parviflora in the rat aorta. *Phytother Res.* 2010 Oct;24(10):1520-5.
12. Chen D, Li H, Li W, et al. Kaempferia parviflora and Its Methoxyflavones: Chemistry and Biological Activities. *Evid Based Complement Alternat Med.* 2018;2018:4057456.
13. Wannanon P, Wattanathorn J, Tong-Un T, et al. Efficacy assessment of Kaempferia parviflora for the management of erectile dysfunction. *OnLine J. of Biological Sciences.* 2012;12(4):149-55.
14. Nam YS, Lee G, Yun JM, et al. Testosterone Replacement, Muscle Strength, and Physical Function. *World J Mens Health.* 2018 May;36(2):110-22.
15. Kelly DM, Jones TH. Testosterone: a metabolic hormone in health and disease. *Journal of Endocrinology.* 2013 01 Jun. 2013;217(3):R25-R45.
16. Muehlenbein MP, Gassen J, Shattuck EC, et al. Lower testosterone levels are associated with higher risk of death in men. *Evol Med Public Health.* 2023;11(1):30-40.
17. Araujo AB, Dixon JM, Suarez EA, et al. Clinical review: Endogenous testosterone and mortality in men: a systematic review and meta-analysis. *J Clin Endocrinol Metab.* 2011 Oct;96(10):3007-19.

18. Nutraceutical L. Internal Study. A randomized, double blind, placebo controlled study to evaluate the efficacy and safety of a novel herbal composition improving aging males' symptoms. Data on file. 2018.
19. Heinemann LA, Saad F, Zimmermann T, et al. The Aging Males' Symptoms (AMS) scale: update and compilation of international versions. *Health Qual Life Outcomes.* 2003 May 1;1:15.
20. Sreeramaneni PGA, Yalamanchi A, Konda MR, et al. A Proprietary Herbal Blend Containing Extracts of Punica granatum Fruit Rind and Theobroma cocoa Seeds Increases Serum Testosterone Level in Healthy Young Males: A Randomized, Double-Blind Placebo-Controlled Study. *J Diet Suppl.* 2023;20(3):411-27.
21. Li F, Wong TY, Lin SM, et al. Coadministrating luteolin minimizes the side effects of the aromatase inhibitor letrozole. *J Pharmacol Exp Ther.* 2014 Nov;351(2):270-7.
22. Lu DF, Yang LJ, Wang F, et al. Inhibitory effect of luteolin on estrogen biosynthesis in human ovarian granulosa cells by suppression of aromatase (CYP19). *J Agric Food Chem.* 2012 Aug 29;60(34):8411-8.
23. Couture R, Mora N, Al Bittar S, et al. Luteolin modulates gene expression related to steroidogenesis, apoptosis, and stress response in rat LC540 tumor Leydig cells. *Cell Biol Toxicol.* 2020 Feb;36(1):31-49.
24. Hizli F, Uygur MC. A prospective study of the efficacy of Serenoa repens, tamsulosin, and Serenoa repens plus tamsulosin treatment for patients with benign prostate hyperplasia. *Int Urol Nephrol.* 2007;39(3):879-86.
25. Available at: https://www.nccih.nih.gov/health/providers/digest/spotlight-on-saw-palmetto-science. Accessed May, 12, 2023.
26. Sudeep HV, Thomas JV, Shyamprasad K. A double blind, placebo-controlled randomized comparative study on the efficacy of phytosterol-enriched and conventional saw palmetto oil in mitigating benign prostate hyperplasia and androgen deficiency. *BMC Urology.* 2020 2020/07/03;20(1):86.
27. Kwon Y. Use of saw palmetto (Serenoa repens) extract for benign prostatic hyperplasia. *Food Sci Biotechnol.* 2019 Dec;28(6):1599-606.
28. Ishii I, Wada T, Takara T. Effects of saw palmetto fruit extract intake on improving urination issues in Japanese men: A randomized, double-blind, parallel-group, placebo-controlled study. *Food Sci Nutr.* 2020 Aug;8(8):4017-26.
29. Barry MJ, Meleth S, Lee JY, et al. Effect of Increasing Doses of Saw Palmetto Extract on Lower Urinary Tract Symptoms: A Randomized Trial. *JAMA.* 2011;306(12):1344-51.
30. Zamani P, Mokhtari O, Dehghanian F. Identification of Beta-Sitosterol and Stigmasterol as Possible Inhibitors of 5 Alpha-Reductase 1: An In-Silico Study. *Precision Medicine and Clinical OMICS.* 2022;1(1):e121545.
31. Available at: https://www.herbalgram.org/resources/herbalgram/issues/72/table-of-contents/article3033/. Accessed May, 12, 2023.
32. Safarinejad MR. Urtica dioica for treatment of benign prostatic hyperplasia: a prospective, randomized, double-blind, placebo-controlled, crossover study. *J Herb Pharmacother.* 2005;5(4):1-11.
33. Pizzorno L. Nothing Boring About Boron. *Integr Med (Encinitas).* 2015 Aug;14(4):35-48.
34. Petiwala SM, Puthenveetil AG, Johnson JJ. Polyphenols from the Mediterranean herb rosemary (Rosmarinus officinalis) for prostate cancer. *Front Pharmacol.* 2013;4:29.
35. Jaglanian A, Termini D, Tsiani E. Rosemary (Rosmarinus officinalis L.) extract inhibits prostate cancer cell proliferation and survival by targeting Akt and mTOR. *Biomed Pharmacother.* 2020 Nov;131:110717.

DEFEND YOUR HEALTH

"One of my main daily 'go to' supplements."

Lew

VERIFIED CUSTOMER REVIEW

Vitamin D3

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

Item #01713

125 mcg (5000 IU) • 60 softgels

GLUTEN FREE · 1 DAILY · NON GMO LE CERTIFIED

This product is available at fine health food stores everywhere.

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

COMBAT BELLY FAT WITH AMPK

Studies show that *increasing* **AMPK** activity encourages cells to stop storing fat and start *burning* it for energy. So we've created AMPK Metabolic Activator to help trigger AMPK, causing the body to burn unwanted fat—particularly around your abdomen.

"Oh, I love this! I noticed my pants are looser and I can fit in my skinny jeans."

Adela

VERIFIED CUSTOMER REVIEW

Item #02207

30 vegetarian tablets

This product is available at fine health food stores everywhere.

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

GLUTEN FREE · 1 DAILY · NON GMO LE CERTIFIED

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

Low-Cost Biologically Active B COMPLEX

Enzymatically Active Vitamins

BioActive Complete B-Complex provides *enzymatically active* forms of meaningful potencies of each B vitamin.

This includes the ***pyridoxal 5'-phosphate*** form of vitamin B6 shown to protect lipids and proteins against **glycation** *and* the most biologically active form of **folate** called ***5-methyltetrahydrofolate*** **(5-MTHF)**, which is up to **7 times** more bioavailable than folic acid.*

Item #01945

60 vegetarian capsules

GLUTEN FREE

NON GMO LE CERTIFIED

This product is available at fine health food stores everywhere.

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

Reduce Stress While Sharpening MENTAL FOCUS

ASHWAGANDHA

BY MICHAEL DOWNEY

A **2022** survey found that **27%** of Americans reported being so **stressed** most days that they can't **function**.[1]

Stress can leave us mentally lethargic and **foggy**.[2]

When stress becomes **chronic**, it can cause serious ***long-term damage*** and increase risk for heart disease, diabetes, depression, anxiety,[3] and sleep problems.[4]

Searching for solutions, researchers identified a plant extract that decreased feelings of **stress** by **62%-79%**.[5]

Researchers also identified a *spearmint extract* that boosted mental **alertness** and **attention** in two randomized controlled human studies.[6,7]

Together, these **plant extracts** may *lower* **stress** while *increasing* **mental focus**.

The Dangers of Stress

Chronic stress inflicts damage throughout the body.[8]

Untreated, stress can increase risk for:

- Heart disease and stroke,[9,10]
- Obesity,[11]
- Diabetes,[12]
- Osteoporosis,[13]
- Gastrointestinal complaints,[10]
- Mental health, including anxiety, depression,[3] and insomnia,[4] and
- Sexual dysfunction.[14]

One way the body responds to stress is by releasing **cortisol**, a hormone that keeps the stress response ***activated*** during chronic periods of stress.[15]

Research shows that an extract of the **ashwagandha** plant helps the body fight the negative effects of chronic stress.[5,16]

Ashwagandha Lowers Cortisol

Ashwagandha has been used in traditional Indian medicine for over **3,000 years** to promote whole-body health.[16,17]

Chronic stress results in higher levels of **cortisol**, a hormone that helps regulate stress response. Chronically elevated cortisol levels can impact overall quality of life.[15]

Cortisol is regulated by the hypothalamic-pituitary-adrenal (HPA) axis. Normal activation of the HPA axis is necessary for a healthy response to stress. However, chronic stimulation of the HPA axis can lead to an erratic stress response. This can result in constant levels of **cortisol** being released into the body contributing to weight gain, heart disease, impaired memory, and other health problems.[18]

Ashwagandha acts as an **adaptogen**, a substance helping the body deal with physical manifestations of stress, like the release of **cortisol**, while restoring balance.[19]

Research suggests that ashwagandha *inhibits* **cortisol** release.[5,20,21]

Impressive Clinical Results

To validate these effects, scientists designed a randomized, placebo-controlled clinical trial.[5]

They divided **chronically stressed** individuals into four groups.

One group took a **placebo** while the other three took **ashwagandha** root and leaf extract in one of three doses:

- **125 mg** *once* daily,
- **125 mg** *twice* daily (total **250 mg**), or
- **250 mg** *twice* daily (total **500 mg**).

A commonly-used anxiety scale showed that overall **stress** was decreased by **71%** in the group that was given **125 mg** of extract twice daily (**250 mg** total) for 60 days.[5]

After **60 days**, the **125 mg** twice daily (**250 mg** total) group had significantly decreased:[5]

- Serum **cortisol**,
- Serum **C-reactive protein**, a marker of inflammation,
- Pulse rate, and
- Blood pressure.

WHAT YOU NEED TO KNOW

Lower Stress, Boost Alertness

- **Stress** can have devastating impacts on emotional and physical health.
- In a clinical trial, **ashwagandha** extract lowered stress by **71%** and reduced levels of the stress hormone cortisol by **24.2%**.
- Stress can also lead to feelings of mental **fogginess**.
- A patented **spearmint** extract has been clinically shown to *improve* attention, alertness, and reaction times.
- Taken together, these two plant extracts may lower stress and boost mental focus.

All participants taking **ashwagandha**, compared to **placebo**, reported reduced feelings of **stress** and **anxiety** and significant improvements in:[5]

- Fatigue,
- Appetite loss,
- Feelings of "impending doom,"
- Inability to concentrate,
- Irritability,
- Forgetfulness, and
- Sleeplessness.

In the **125 mg** twice daily (**250 mg** total) group, serum **cortisol** decreased by **24.2%**.

Boosting Mental Alertness

Stress can make people feel mentally muddled. Often times, treatments for stress reduce alertness and induce drowsiness.[22]

Researchers turned to **spearmint**, which has been used traditionally to improve **alertness** and **memory.**[23]

They found a spearmint extract that uses a water process extraction method to preserve the high polyphenol content in this herb.

This polyphenol-rich **spearmint extract**[23] contains a minimum of ***14.5% rosmarinic acid*** and a combination of ***24% total polyphenols*** that was shown to:

- Increase **alertness** and vigor,[23] and
- Improve working and spatial working memory, two aspects of **short-term memory**.[23]

In this human study, subjects with age-associated memory impairment who took **900 mg** of this specific **spearmint** extract for **90 days** had, compared to a placebo, a roughly **15%** improvement in working memory and a **9%** improvement in spatial working memory. This suggests **enhanced mental alertness**.[23]

In an open-label pilot trial, healthy adults taking **900 mg** of **spearmint** significantly improved their attention and concentration just **2.25 hours** after a single dose, demonstrating *swift* cognitive benefits.[24]

Clinically Validating Spearmint

To elaborate on these findings, scientists conducted two randomized, placebo-controlled trials.[6,7]

In one study, healthy, active individuals aged 18-50 years took **900 mg** of **spearmint** extract or a placebo daily.

Volunteers were tested using a high-tech, 360-degree platform surrounded by towers with multiple lights. Subjects had to lunge to make hand or foot contact with targets on the towers as software counted the "hits."[7]

This test measures reaction times when sudden changes in direction or speed are needed. It also measures choice reaction times—an indicator of the cognitive, more than the physical, aspects of reactive agility.

Those taking the **spearmint** extract had significant improvements in "hits" after just **30 days**, showing ***enhanced mental agility***.[7]

Improvements in Attention

Another placebo-controlled trial enlisted healthy, active volunteers aged 18-50 who took **900 mg** of **spearmint** extract or a placebo daily.[6]

This time, cognition was assessed by computerized **cognitive tests**.

After 30 days, the **spearmint** group had an **8.8%** increase in **sustained attention** as compared to placebo. After 90 days, **11%** improvement was reported.[6]

No significant changes in sleep, mood, or quality of life were found, demonstrating that this spearmint extract does not disrupt these aspects of life.[6]

Combining this **spearmint** extract with **ashwagandha** may help reduce stress and increase alertness, with no potential side effects.

Summary

Stress reduces quality of life and increases risk of chronic disease.

In clinical trials, **ashwagandha** lowered feelings of stress and reduced cortisol levels.

Mental **fogginess**, which may be stress-related, can impair cognition.

A water-processed **spearmint** extract improved reaction time, alertness, and sustained attention in clinical studies. •

References

1. Available at: https://www.apa.org/news/press/releases/2022/10/multiple-stressors-no-function. Accessed June 1, 2023.
2. Gavelin HM, Neely AS, Dunas T, et al. Mental fatigue in stress-related exhaustion disorder: Structural brain correlates, clinical characteristics and relations with cognitive functioning. *Neuroimage Clin*. 2020;27:102337.
3. Mariotti A. The effects of chronic stress on health: new insights into the molecular mechanisms of brain-body communication. *Future Sci OA.* 2015 Nov;1(3):FSO23.
4. Kalmbach DA, Anderson JR, Drake CL. The impact of stress on sleep: Pathogenic sleep reactivity as a vulnerability to insomnia and circadian disorders. *J Sleep Res.* 2018 Dec;27(6):e12710.
5. Auddy B, Hazra J, Mitra A, et al. A Standardized Withania Somnifera Extract Significantly Reduces Stress-Related Parameters in Chronically Stressed Humans: A Double-Blind, Randomized, Placebo-Controlled Study. *Indian J Psychol Med*. 2008.
6. Falcone PH, Nieman KM, Tribby AC, et al. The attention-enhancing effects of spearmint extract supplementation in healthy men and women: a randomized, double-blind, placebo-controlled, parallel trial. *Nutr Res.* 2019 Apr;64:24-38.
7. Falcone PH, Tribby AC, Vogel RM, et al. Efficacy of a nootropic spearmint extract on reactive agility: a randomized, double-blind, placebo-controlled, parallel trial. *J Int Soc Sports Nutr.* 2018 Dec 12;15(1):58.
8. Available at: https://www.mayoclinic.org/healthy-lifestyle/stress-management/in-depth/stress/art-20046037. Accessed May 4, 2023.
9. Available at: https://www.heart.org/en/healthy-living/healthy-lifestyle/stress-management/stress-and-heart-health. Accessed June 5, 2023.
10. Yaribeygi H, Panahi Y, Sahraei H, et al. The impact of stress on body function: A review. *EXCLI J*. 2017;16:1057-72.
11. van der Valk ES, Savas M, van Rossum EFC. Stress and Obesity: Are There More Susceptible Individuals? *Curr Obes Rep*. 2018 Jun;7(2):193-203.
12. Sharma K, Akre S, Chakole S, et al. Stress-Induced Diabetes: A Review. *Cureus*. 2022 Sep;14(9):e29142.
13. Azuma K, Adachi Y, Hayashi H, et al. Chronic Psychological Stress as a Risk Factor of Osteoporosis. *J UOEH*. 2015 Dec 1;37(4):245-53.
14. Kalaitzidou I, Venetikou MS, Konstadinidis K, et al. Stress management and erectile dysfunction: a pilot comparative study. *Andrologia*. 2014 Aug;46(6):698-702.
15. Thau L, Gandhi J, Sharma S. Physiology, Cortisol. *StatPearls*. Treasure Island (FL): StatPearls Publishing Copyright © 2023, StatPearls Publishing LLC.; 2023.
16. Mikulska P, Malinowska M, Ignacyk M, et al. Ashwagandha (Withania somnifera)-Current Research on the Health-Promoting Activities: A Narrative Review. *Pharmaceutics.* 2023 Mar 24;15(4).
17. Mandlik Ingawale DS, Namdeo AG. Pharmacological evaluation of Ashwagandha highlighting its healthcare claims, safety, and toxicity aspects. *J Diet Suppl.* 2021;18(2):183-226.
18. Stephens MA, Wand G. Stress and the HPA axis: role of glucocorticoids in alcohol dependence. *Alcohol Res*. 2012;34(4):468-83.
19. Available at: https://www.intelligentlabs.org/ashwagandha-king-of-adaptogens/. Accessed June 5, 2023.
20. Bhattacharya SK, Muruganandam AV. Adaptogenic activity of Withania somnifera: an experimental study using a rat model of chronic stress. *Pharmacol Biochem Behav.* 2003 Jun;75(3):547-55.
21. Lopresti AL, Smith SJ, Malvi H, et al. An investigation into the stress-relieving and pharmacological actions of an ashwagandha (Withania somnifera) extract: A randomized, double-blind, placebo-controlled study. *Medicine (Baltimore).* 2019 Sep;98(37):e17186.
22. Available at: https://www.nhs.uk/mental-health/conditions/generalised-anxiety-disorder/treatment/. Accessed June 12, 2023.
23. Herrlinger KA, Nieman KM, Sanoshy KD, et al. Spearmint Extract Improves Working Memory in Men and Women with Age-Associated Memory Impairment. *J Altern Complement Med.* 2018 Jan;24(1):37-47.
24. Nieman KM, Sanoshy KD, Bresciani L, et al. Tolerance, bioavailability, and potential cognitive health implications of a distinct aqueous spearmint extract. *Functional Foods in Health and Disease*. 2015 05/30;5(5):165-87.

GLUTEN FREE

NON GMO LE CERTIFIED

Good Things Come in Pairs

- **THE CHALLENGE:** How to fit meaningful potencies into one easy-to-swallow capsule?
- **THE RESULT: Two-Per-Day...** a diverse array of bioactive nutrients.

Two-Per-Day Multivitamin Tablets	Two-Per-Day Multivitamin Capsules
Item #02315	**Item #02314**
120 tablets	120 capsules

Each bottle provides a two-month supply.

TWO-PER-DAY Multivitamin provides:

Vitamin A (beta-carotene, and acetate)	**5,000 IU**
Vitamin D3 (cholecalciferol)	**2,000 IU**
Vitamin C (ascorbic acid, calcium and niacinamide ascorbates)	**470 mg**
Vitamin E (D-alpha tocopheryl succinate, D-alpha tocopherol)	**67 mg**
Vitamin E (gamma, delta, alpha, beta tocopherols)	**20 mg**
Vitamin B1 (thiamine HCl)	**75 mg**
Vitamin B2 (riboflavin 5'-phosphate)	**50 mg**
Vitamin B3 (niacinamide, niacinamide ascorbate)	**50 mg**
Vitamin B5 (D-calcium pantothenate)	**50 mg**
Vitamin B6 (pyridoxine HCl, pyridoxal 5'-phosphate)	**75 mg**
Folate (5-MTHF)	**680 mcg DFE**
Vitamin B12 (methylcobalamin)	**300 mcg**
Biotin	**300 mcg**
Iodine (potassium iodide)	**150 mcg**
Magnesium (magnesium oxide)	**100 mg**
Zinc (zinc citrate, L-OptiZinc® zinc mono-L-methionine sulfate)	**25 mg**
Manganese (manganese citrate, gluconate)	**2 mg**
Chromium [Crominex® 3+ chromium stabilized with Capros® amla extract (fruit), PrimaVie® Shilajit]	**200 mcg**
Molybdenum (amino acid chelate)	**100 mcg**
Inositol	**50 mg**
Alpha lipoic acid	**25 mg**
Bio-Quercetin phytosome (providing 5 mg quercetin in an absorption-enhancing phosphatidylcholine complex)	**15 mg**
Marigold extract [std. to 5 mg *trans*-lutein, 155 mcg *trans*-zeaxanthin]	**11.12 mg**
Apigenin	**5 mg**
Boron (amino acid chelate)	**3 mg**
Lycopene [LycoBeads® natural tomato extract (fruit)]	**1 mg**
Selenium [as sodium selenite, SelenoExcell® high selenium yeast, Se-methyl L-selenocysteine]	**200 mcg**

These products are available at fine health food stores everywhere.

Liposomal Hydrogel™

VITAMIN C

"I feel better about my immune system with it."

Mary

VERIFIED CUSTOMER REVIEW

Buffered **ascorbate** encased in two **plant extracts** (liposomes plus hydrogel fenugreek) increases blood (plasma) exposure nearly **seven times** more compared to an equivalent dose of regular vitamin C.

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

Just **one** vegetarian tablet daily provides **around-the-clock** vitamin C support.

Item #02501

60 vegetarian tablets

GLUTEN FREE

NON GMO LE CERTIFIED

This product is available at fine health food stores everywhere.

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

A **DELICIOUS** WAY TO **IMPROVE SLEEP**

Sweet DREAMS

Item #02503

60 vegetarian gummies

**Not a low calorie food.*

People often crave something tasty to chew on before **bedtime**.

This **strawberry-flavored gummy** allows for adjustable melatonin dosing—all depending on how many gummies are ingested!

Clinical studies show that **melatonin** supports revitalizing **sleep** in five ways.[1-3]

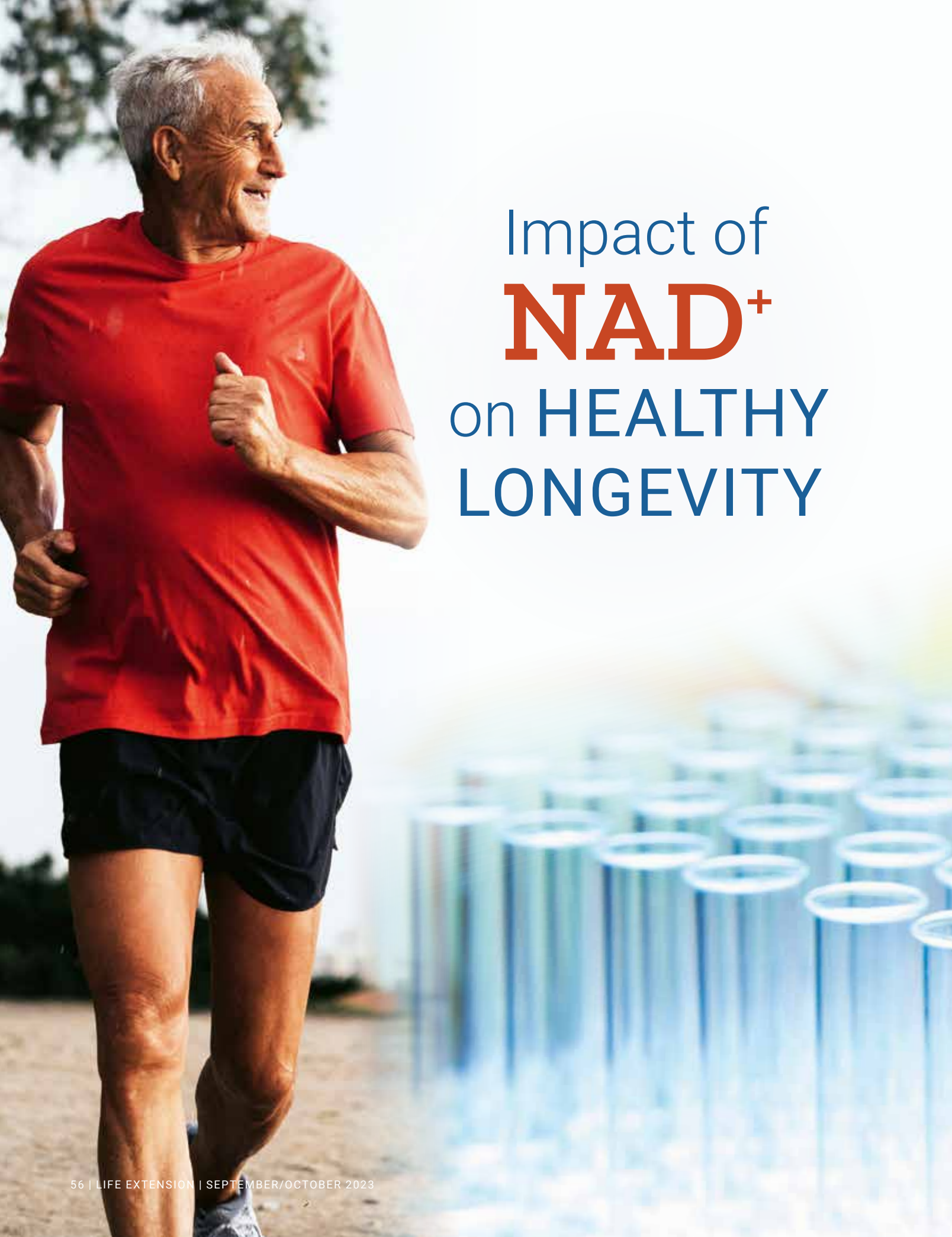
Each **gummy** provides **3 mg** of **melatonin**.

GLUTEN FREE · NON GMO LE CERTIFIED · SUGAR FREE*

This product is available at fine health food stores everywhere.

1. *Sleep Med Rev.* 2005 Feb;9(1):41-50. 2. *Lancet.* 1995 Aug 26;346(8974):541-4. 3. *Neurol Res.* 2017 Jun;39(6):559-65.

For occasional sleeplessness.



Impact of NAD+ on HEALTHY LONGEVITY

BY STEVEN LAWRENCE

NAD⁺ is found in *every living cell*, from bacteria to **humans**.[1]

It is required for many reactions that provide **energy** and for essential processes such as repairing **DNA**.[2-4]

The problem is that levels of NAD⁺ decline as we age.[5]

A nutrient called **nicotinamide riboside** has been shown to boost cellular NAD⁺.

Preclinical studies show that this could support brain,[6-8] heart,[8] and metabolic health.[8-10]

In organisms ranging from yeast to worms to mice, replenishing **NAD⁺** with **nicotinamide riboside** has been found to extend lifespan.[11-14]

In one study, elderly mice given **nicotinamide riboside** experienced a **5%** increase in lifespan.[14]

For an average American, a **5%** lifespan extension might mean ***four additional years*** of life.[15]

A review published in **2022** describe the systemic effects of **NAD⁺** metabolism on cellular aging processes.[2]

NAD+ and Cellular Function

NAD+ (nicotinamide adenine dinucleotide) is a coenzyme that is essential to sustaining healthy life.[16]

It is critical for the basic metabolism and energy supply of all cells. It is required for the normal function of over **300** proteins, including many vitally important ones.[3]

For example, **sirtuins** are a group of proteins that regulate cellular repair and defenses and help maintain cellular health.

Low **sirtuin activity** is tied to **accelerated aging** and risk for age-related issues. Preclinical studies have shown that *boosting* sirtuin function rejuvenates cells, repairs damage to DNA, and much more.[5,16,17]

Sirtuins ***require NAD+*** to function.[16] For this reason, cells need an ongoing supply of NAD+ at all times to **function** optimally.

Nicotinamide Riboside Raises NAD+ Levels

NAD+ production drops significantly with advancing age.[5,18]

A study using human skin samples from people across a wide age range found that **NAD+** levels had declined markedly in people **aged 30-50**, compared to infants from birth to the age of one year.

In the study subjects over **age 50**, NAD+ levels in skin were reduced by more than **87%** compared to the infants'.[19]

This decline in NAD+ leads to deteriorating cellular health. **Sirtuins** and other cell protectors that rely on NAD+ cannot **function** properly with insufficient **NAD+** and cannot offer the defenses that sirtuins provide in youth.[16]

There's a way to ***boost NAD+*** back to healthier levels.

Scientists discovered that a form of vitamin B3 called **nicotinamide riboside** acts as a **NAD+ precursor** when taken orally.[11,13,14]

It is readily taken up by cells, which use it to produce *more* NAD+ and improve body levels of NAD+.[20,21]

In humans, oral supplementation of **nicotinamide riboside 250 mg** a day titrated up to **1,000 mg** twice daily was found to raise NAD+ levels by ***2- to 7-fold***.[22]

Benefits of Boosting NAD+

Ample NAD+ levels can contribute to many different areas of health, as suggested by preclinical studies, including:

- **Genetic Health.** Damage to **DNA** can cause rapid aging and chronic diseases. By supporting sirtuins and other enzymes, NAD+ helps bolster cellular defenses to prevent this damage and even ***repair existing DNA damage***. It also protects the function of **telomeres**, caps at the ends of chromosomes that are associated with longer life.[3,8,16,17,23]

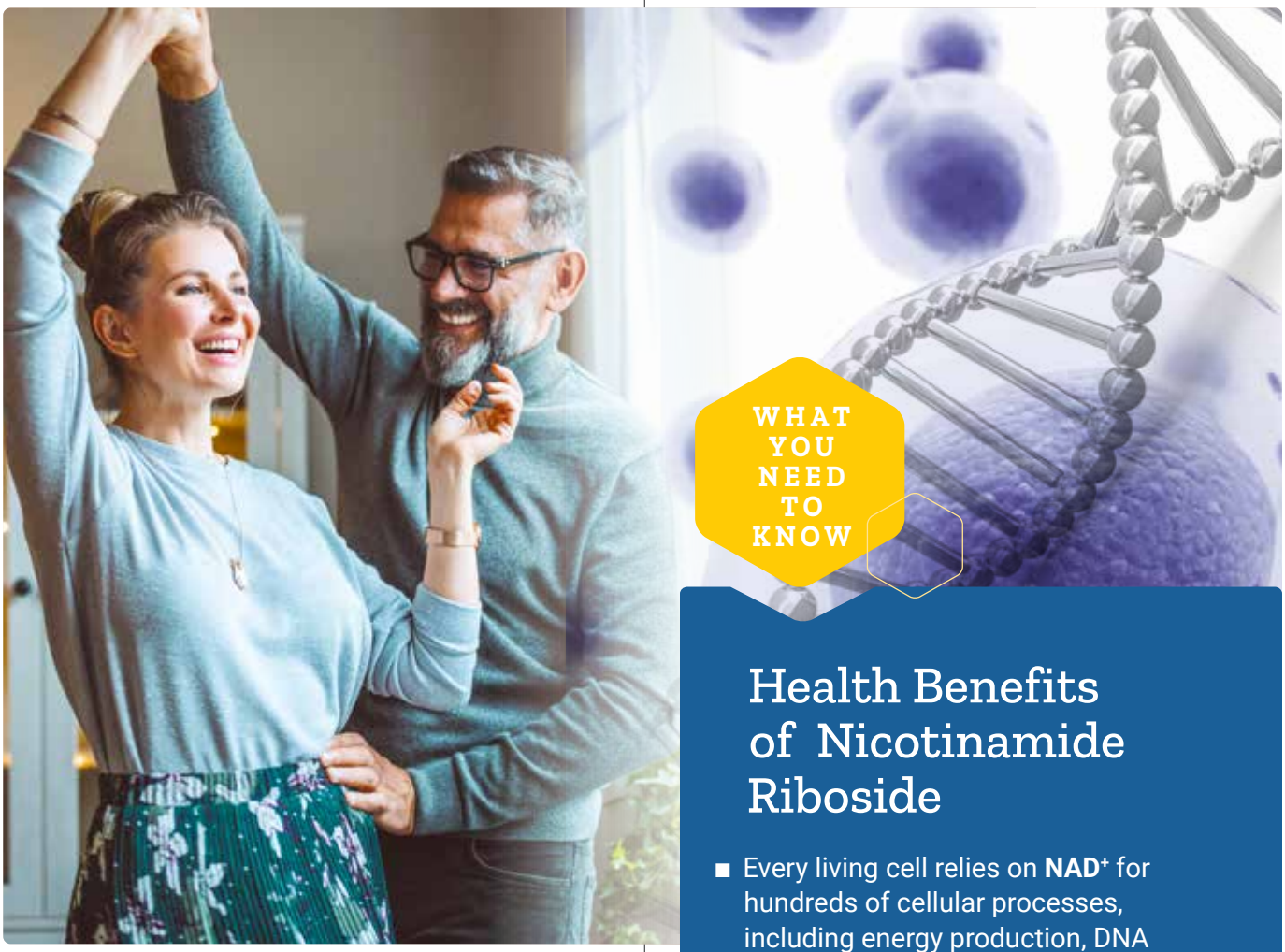
NAD+ and Resveratrol Work Together

Resveratrol is a polyphenol found in red wine and various plants. It has well-documented benefits that help prevent age-related disease and slow the aging process.[38]

One of the key ways resveratrol works is by **activating** life-extending cellular **sirtuins**.[39-42]

Because sirtuins require **NAD+** to function, resveratrol's benefits cannot be maximized without *also* ensuring ample NAD+ levels.

Taken together, **resveratrol** and **nicotinamide riboside** can boost each other's benefits.



- **Energy Metabolism.** NAD+ plays a central role in breaking down nutrients to supply energy to cells. Without it, cells suffer energy failure and cannot survive.[2-4]

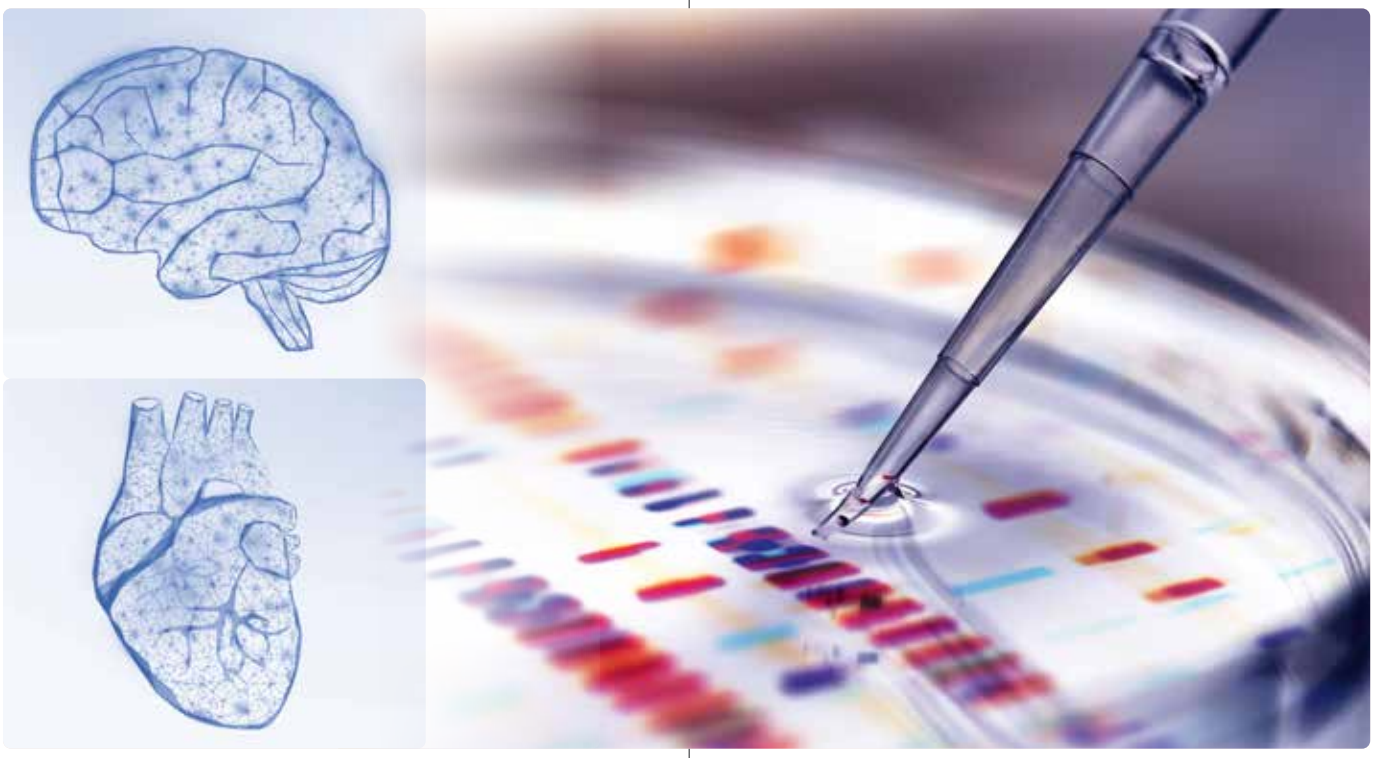
- **Cellular Protection.** Oxidative stress and chronic inflammation have both been tied to virtually *every* age-related disease. Maintaining adequate NAD+ combats both, inhibiting inflammation while aiding cellular antioxidant defenses.[17,24]

- **Stem Cell Health.** Healthy stem cells help maintain youthful tissue function, replacing old, damaged cells with healthy new ones. In animal model studies, both NAD+ and sirtuins have been found to improve stem cell health.[14,25-27]

WHAT YOU NEED TO KNOW

Health Benefits of Nicotinamide Riboside

- Every living cell relies on **NAD+** for hundreds of cellular processes, including energy production, DNA repair, and sirtuin activity.
- NAD+ levels drop with age. Boosting NAD+ has been shown to protect cellular health, prevent age-related chronic disease, and extend lifespan in model organisms.
- **Nicotinamide riboside** is a NAD+ precursor that can be taken orally and raises NAD+ levels in humans and animal models.
- By boosting NAD+ levels, nicotinamide riboside has demonstrated the ability in preclinical studies to support **longevity**, improve organ function, and reduce risk for age-related chronic disease.



Nicotinamide Riboside Promotes Longevity

Scientists have consistently found in preclinical studies that NAD+-boosting **nicotinamide riboside** is capable of improving overall health, including the brain,[28,29] heart,[30-32] and blood vessels.[33]

For example, in rodent studies, **nicotinamide riboside**:[28,31]

- Reverses cognitive deficits and improves memory in models of **Alzheimer's disease**,[28]
- Helps prevent the development of **heart failure**,[31] and
- Improves metabolism and helps prevent **weight gain**.[28]

A range of preclinical models have demonstrated that increasing nicotinamide riboside NAD+ levels can ***extend lifespan***.[11-14]

Yeast grown with nicotinamide riboside have an extended lifespan.[11] In worms, lifespan is extended at least **10%**.[13]

Giving **nicotinamide riboside** to mice that were the human equivalent of **70** years old[14] extended their lives by about **5%**.

A **5%** extended lifespan in a person might mean gaining nearly ***four additional years*** of life based on today's average U.S. human life expectancy of roughly **76** years.[15]

Clinical Trials

Impressed by animal studies showing benefits for boosting NAD+, scientists began conducting **clinical studies** with **nicotinamide riboside** to see if it translates to humans. Here is a sampling of human trials:

- A double blinded phase 1 clinical trial of newly diagnosed Parkinson's disease patients received **1,000 mg** or placebo for 30 days. Participants receiving nicotinamide riboside showed an increase in brain NAD+ levels and mild improvement of clinical symptoms.[34]
- In a double-blind, crossover trial, aged men received **1,000 mg** nicotinamide riboside per day for 21 days. After 21 days, elevated levels of NAD+ in muscles of participants in the intervention group were seen. Nicotinamide riboside also reduced levels of circulating inflammatory cytokines.[35]

- In a clinical trial of 30 participants with clinically stable heart failure and reduced ejection fraction, a **1,000 mg** twice daily dose of nicotinamide riboside was well tolerated and resulted in boosting blood levels of NAD+ to approximately double the level at baseline and reduced white blood cell expression of markers of systemic inflammation.[36]

- In a double blind, crossover study, 12 young and 12 aged individuals were randomized to receive nicotinamide riboside or placebo. Two hours before and after the supplementation, blood and urine samples were collected. At that time muscle fatigue and strength were assessed. Nicotinamide riboside supplementation showed increased NAD+ levels. Interestingly, supplementation improved physical performance *only* in **elderly** subjects.[37] The conclusion from this finding indicates that declining NAD+ levels due to age can be replenished with nicotinamide riboside supplementation, resulting in improved exercise performance.

Summary

NAD+ is a crucial compound in every living cell.

It is involved in the basic energy supply all cells need to thrive. It is also required for cellular regulators like **sirtuins** to help protect against rapid aging.

NAD+ levels drop dramatically with age, contributing to accelerated aging.

Nicotinamide riboside is a NAD+ precursor. Taken orally, it quickly boosts cellular NAD+ levels.

In preclinical studies, nicotinamide riboside is tied to improved organ function and **longer life**. •

References

1. Chini CCS, Tarrago MG, Chini EN. NAD and the aging process: Role in life, death and everything in between. *Mol Cell Endocrinol.* 2017 Nov 5;455:62-74.
2. Chu X, Raju RP. Regulation of NAD(+) metabolism in aging and disease. *Metabolism.* 2022 Jan;126:154923.
3. Covarrubias AJ, Perrone R, Grozio A, et al. NAD(+) metabolism and its roles in cellular processes during ageing. *Nat Rev Mol Cell Biol.* 2021 Feb;22(2):119-41.
4. Reiten OK, Wilvang MA, Mitchell SJ, et al. Preclinical and clinical evidence of NAD(+) precursors in health, disease, and ageing. *Mech Ageing Dev.* 2021 Oct;199:111567.
5. Johnson S, Imai SI. NAD (+) biosynthesis, aging, and disease. *F1,000Res.* 2018;7:132.
6. Gong B, Pan Y, Vempati P, et al. Nicotinamide riboside restores cognition through an upregulation of proliferator-activated receptor-gamma coactivator 1alpha regulated beta-secretase 1 degradation and mitochondrial gene expression in Alzheimer's mouse models. *Neurobiol Aging.* 2013 Jun;34(6):1581-8.
7. Campbell JM. Supplementation with NAD(+) and Its Precursors to Prevent Cognitive Decline across Disease Contexts. *Nutrients.* 2022 Aug 7;14(15).
8. Cercillieux A, Ciarlo E, Canto C. Balancing NAD(+) deficits with nicotinamide riboside: therapeutic possibilities and limitations. *Cell Mol Life Sci.* 2022 Aug 2;79(8):463.
9. Yoshino J, Baur JA, Imai SI. NAD(+) Intermediates: The Biology and Therapeutic Potential of NMN and NR. *Cell Metab.* 2018 Mar 6;27(3):513-28.
10. Canto C, Houtkooper RH, Pirinen E, et al. The NAD(+) precursor nicotinamide riboside enhances oxidative metabolism and protects against high-fat diet-induced obesity. *Cell Metab.* 2012 Jun 6;15(6):838-47.
11. Belenky P, Racette FG, Bogan KL, et al. Nicotinamide riboside promotes Sir2 silencing and extends lifespan via Nrk and Urh1/Pnp1/Meu1 pathways to NAD+. *Cell.* 2007 May 4;129(3):473-84.
12. Fang EF, Scheibye-Knudsen M, Brace LE, et al. Defective mitophagy in XPA via PARP-1 hyperactivation and NAD(+)/SIRT1 reduction. *Cell.* 2014 May 8;157(4):882-96.
13. Mouchiroud L, Houtkooper RH, Moullan N, et al. The NAD(+)/Sirtuin Pathway Modulates Longevity through Activation of Mitochondrial UPR and FOXO Signaling. *Cell.* 2013 Jul 18;154(2):430-41.
14. Zhang H, Ryu D, Wu Y, et al. NAD(+) repletion improves mitochondrial and stem cell function and enhances life span in mice. *Science.* 2016 Jun 17;352(6292):1436-43.
15. Available at: https://www.cdc.gov/nchs/pressroom/nchs_press_releases/2022/20220831.htm. Accessed June 12, 2023.
16. Imai S, Guarente L. NAD+ and sirtuins in aging and disease. *Trends Cell Biol.* 2014 Aug;24(8):464-71.
17. Grabowska W, Sikora E, Bielak-Zmijewska A. Sirtuins, a promising target in slowing down the ageing process. *Biogerontology.* 2017 Aug;18(4):447-76.
18. Zhou CC, Yang X, Hua X, et al. Hepatic NAD(+) deficiency as a therapeutic target for non-alcoholic fatty liver disease in ageing. *Br J Pharmacol.* 2016 Aug;173(15):2352-68.
19. Massudi H, Grant R, Braidy N, et al. Age-associated changes in oxidative stress and NAD+ metabolism in human tissue. *PLoS One.* 2012;7(7):e42357.
20. Martens CR, Denman BA, Mazzo MR, et al. Chronic nicotinamide riboside supplementation is well-tolerated and elevates NAD(+) in healthy middle-aged and older adults. *Nat Commun.* 2018 Mar 29;9(1):1286.
21. Trammell SA, Schmidt MS, Weidemann BJ, et al. Nicotinamide riboside is uniquely and orally bioavailable in mice and humans. *Nat Commun.* 2016 Oct 10;7:12948.
22. Airhart SE, Shireman LM, Risler LJ, et al. An open-label, non-randomized study of the pharmacokinetics of the nutritional supplement nicotinamide riboside (NR) and its effects on blood NAD+ levels in healthy volunteers. *PLoS One.* 2017;12(12):e0186459.
23. Amano H, Sahin E. Telomeres and sirtuins: at the end we meet again. *Mol Cell Oncol.* 2019;6(5):e1632613.
24. Xie N, Zhang L, Gao W, et al. NAD(+) metabolism: pathophysiologic mechanisms and therapeutic potential. *Signal Transduct Target Ther.* 2020 Oct 7;5(1):227.
25. Igarashi M, Miura M, Williams E, et al. NAD(+) supplementation rejuvenates aged gut adult stem cells. *Aging Cell.* 2019 Jun;18(3):e12935.
26. Moon J, Kim HR, Shin MG. Rejuvenating Aged Hematopoietic Stem Cells Through Improvement of Mitochondrial Function. *Ann Lab Med.* 2018 Sep;38(5):395-401.
27. Yang Q, Cong L, Wang Y, et al. Increasing ovarian NAD(+) levels improve mitochondrial functions and reverse ovarian aging. *Free Radic Biol Med.* 2020 Aug 20;156:1-10.
28. Xie X, Gao Y, Zeng M, et al. Nicotinamide ribose ameliorates cognitive impairment of aged and Alzheimer's disease model mice. *Metab Brain Dis.* 2019 Feb;34(1):353-66.
29. Fang EF. Mitophagy and NAD(+) inhibit Alzheimer disease. *Autophagy.* 2019 Jun;15(6):1112-4.
30. Matasic DS, Brenner C, London B. Emerging potential benefits of modulating NAD(+) metabolism in cardiovascular disease. *Am J Physiol Heart Circ Physiol.* 2018 Apr 1;314(4):H839-H52.
31. Diguet N, Trammell SAJ, Tannous C, et al. Nicotinamide Riboside Preserves Cardiac Function in a Mouse Model of Dilated Cardiomyopathy. *Circulation.* 2018 May 22;137(21):2256-73.
32. Lloret A, Beal MF. PGC-1alpha, Sirtuins and PARPs in Huntington's Disease and Other Neurodegenerative Conditions: NAD+ to Rule Them All. *Neurochem Res.* 2019 Oct;44(10):2423-34.
33. Toropova YG, Pechnikova NA, Zelinskaya IA, et al. Nicotinamide riboside has protective effects in a rat model of mesenteric ischaemia-reperfusion. *Int J Exp Pathol.* 2018 Dec;99(6):304-11.
34. Brakedal B, Dolle C, Riemer F, et al. The NADPARK study: A randomized phase I trial of nicotinamide riboside supplementation in Parkinson's disease. *Cell Metab.* 2022 Mar 1;34(3):396-407 e6.
35. Elhassan YS, Kluckova K, Fletcher RS, et al. Nicotinamide Riboside Augments the Aged Human Skeletal Muscle NAD(+) Metabolome and Induces Transcriptomic and Anti-inflammatory Signatures. *Cell Rep.* 2019 Aug 13;28(7):1717-28 e6.
36. Wang DD, Airhart SE, Zhou B, et al. Safety and Tolerability of Nicotinamide Riboside in Heart Failure With Reduced Ejection Fraction. *JACC Basic Transl Sci.* 2022 Dec;7(12):1183-96.
37. Dolopikou CF, Kourtzidis IA, Margaritelis NV, et al. Acute nicotinamide riboside supplementation improves redox homeostasis and exercise performance in old individuals: a double-blind cross-over study. *Eur J Nutr.* 2020 Mar;59(2):505-15.
38. Zhou DD, Luo M, Huang SY, et al. Effects and Mechanisms of Resveratrol on Aging and Age-Related Diseases. *Oxid Med Cell Longev.* 2021;2021:9932218.
39. Gomes BAQ, Silva JPB, Romeiro CFR, et al. Neuroprotective Mechanisms of Resveratrol in Alzheimer's Disease: Role of SIRT1. *Oxid Med Cell Longev.* 2018;2018:8152373.
40. Higashida K, Kim SH, Jung SR, et al. Effects of resveratrol and SIRT1 on PGC-1alpha activity and mitochondrial biogenesis: a reevaluation. *PLoS Biol.* 2013 Jul;11(7):e1001603.
41. Huang JP, Hsu SC, Li DE, et al. Resveratrol Mitigates High-Fat Diet-Induced Vascular Dysfunction by Activating the Akt/eNOS/NO and Sirt1/ER Pathway. *J Cardiovasc Pharmacol.* 2018 Nov;72(5):231-41.
42. Kim EN, Lim JH, Kim MY, et al. Resveratrol, an Nrf2 activator, ameliorates aging-related progressive renal injury. *Aging (Albany NY).* 2018 Jan 11;10(1):83-99.

When it comes to heart health.

Go Green.

Those who drink green tea enjoy better **cardiovascular health**.[1]

Mega Green Tea Extract provides more of the health-promoting polyphenol **EGCG** than the equivalent of several cups of green tea.

Item #00954 or **Item #00953**

100 vegetarian capsules

NON GMO LE CERTIFIED GLUTEN FREE

These products are available at fine health food stores everywhere.

Essential Youth with L-Ergothioneine

The 'Longevity' Amino Acid

L-ergothioneine is an amino acid found in **mushrooms**.

Cell-based studies suggest that **L-ergothioneine** may support healthy longevity by:

- Protecting ***mitochondrial* DNA** function[1]
- Delaying ***telomere*** shortening[2]
- Supporting **DNA function** in cells subjected to UV exposure[3]

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

One daily capsule provides as much ***L-ergothioneine*** as 2 to 5 cups of white button mushrooms.[4,5]

Item #02431

30 vegetarian capsules

GLUTEN FREE

NON GMO LE CERTIFIED

This product is available at fine health food stores everywhere.

References

1. *Cell Death Differ.* 2010 Jul;17(7):1134-40.
2. *J Diet Suppl.* 2020 Dec 7:1-14.
3. *Free Radic Biol Med*. 2009 Apr 15;46(8):1168-76.
4. *FEBS Lett.* 2018 Oct;592(20):3357-66.
5. *Food Chem.* 2017 Oct 15;233:429-33.

Clinically studied dosages!

Life Extension offers Gummy Science™: science-based gummies that fight belly fat, protect eyes, smooth skin, and help you sleep.

Each Gummy Science™ formula is gluten free, non-GMO and **sugar-free*** —so get sweet nutritional benefits, with none of the guilt.

These products are available at fine health food stores everywhere.

*Not a low-calorie food. Gummy Science™ Melatonin (item #02503): For occasional sleeplessness. Gummy Science™ Mediterranean Weight Management (item #02506):

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

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

Body-Wide Benefits of TART CHERRY

BY PATRICIA WEISER, PHARMD

Studies have found **tart cherries** not only help athletes with exercise endurance[1] but also help with muscle recovery after exercise.[2] Over the last few years, researchers have discovered many other potential benefits.

Also known as sour cherries, **tart cherries** are rich in **antioxidant** and **anti-inflammatory** compounds, including polyphenols, and anthocyanins.[3-5] These may protect against diseases and promote health.

Clinical and preclinical research has shown that tart cherry extract can help reduce inflammation, preserve bone density, and boost cognition. There is even preclinical research indicating it could prolong lifespan.

Reducing Inflammation

Chronic inflammation drives the development of many diseases of aging, including type II diabetes, arthritis, cancer, and heart disease.[6]

Tart cherry extract has been shown in both preclinical and clinical studies to lower multiple biomarkers of inflammation, most notably C-reactive protein (CRP).[3,7]

A systematic review and meta-analysis of 10 randomized controlled trials found that consuming tart cherry juice or powder led to significant decreases in the inflammatory biomarker **C-reactive protein**.[7]

One of the studies in the analysis, a trial in older adults, found that consuming **480 mL** of **tart cherry juice** daily for 12 weeks reduced C-reactive protein levels by **25%**, compared to those who did not consume tart cherry.[8]

Protecting Bone Health

Osteoporosis, a disease characterized by bone loss and increased fracture risk, is especially common among older women.[9]

Bone loss occurs when ***resorption*** (loss of bone tissue) occurs at a faster pace than bone ***formation***. This imbalance can result from changes that occur during aging, such as hormone shifts in **menopause** and increased **inflammation**.[9]

A 90-day randomized trial in women aged 65-80 found that consuming about **500 mL** of tart cherry juice per day resulted in a significant decrease in a biomarker of bone resorption compared to baseline.[10]

A preclinical cell-based study confirmed that tart cherry extract exhibits properties that would inhibit bone breakdown.[11]

Improved Cognition

Two separate randomized controlled trials have shown that supplementation with tart cherry juice improved cognitive performance.[12,13]

In one controlled clinical trial in middle-aged adults, those taking **1-ounce** tart cherry concentrate twice daily for three months had significant improvements in accuracy on tests of **cognitive function** compared to those who took a placebo. Supplementation with the tart cherry extract also resulted in greater alertness and less mental fatigue.[12]

Another randomized controlled trial in healthy *older* adults with normal cognitive function found that those assigned to consume 2.3 oz of tart cherry juice concentrate daily for 12 weeks (mixed in enough water to make 2 cups of liquid) improved on tests of **cognitive abilities**, including memory, task speed, and overall performance.[13]

There is even preclinical evidence to suggest that tart cherry could potentially alter the course of **Alzheimer's disease**. In a mouse model of Alzheimer's, scientists supplied a combination of **tart cherry extract** along with omega-3 fatty acids and monounsaturated fat (similar to what is in olive oil). This treatment led to reduced memory deficits, which were associated with decreased brain cell loss and reduced deposits of **beta-amyloid**, a protein that accumulates in the brains of those with Alzheimer's disease.[14]

Promoting Longevity

Oxidative stress and dysfunction of **mitochondria** (the "powerhouses" of cells) are both linked to aging.[15] In a study in roundworms, tart cherry extract *enhanced* mitochondrial function and *reduced* oxidative stress.

In this study, roundworms given **tart cherry extract** had a ***longer average lifespan*** than untreated worms,[5] suggesting potential longevity benefits of tart cherry extract.

Summary

Tart cherry extract has been shown to reduce inflammation and oxidative stress, which translates to health benefits throughout the body.

Recent research shows that tart cherry can reduce inflammation, protect against bone breakdown, improve cognitive function, and may promote longevity. •

References

1. Gao R, Chilibeck PD. Effect of Tart Cherry Concentrate on Endurance Exercise Performance: A Meta-analysis. *J Am Coll Nutr*. 2020 Sep-Oct;39(7):657-64.
2. O'Connor E, Mündel T, Barnes MJ. Nutritional Compounds to Improve Post-Exercise Recovery. *Nutrients*. 2022 Nov 29;14(23).
3. Mansoori S, Dini A, Chai SC. Effects of tart cherry and its metabolites on aging and inflammatory conditions: Efficacy and possible mechanisms. *Ageing Res Rev*. 2021 Mar;66:101254.
4. Moosavian SP, Maharat M, Chambari M, et al. Effects of tart cherry juice consumption on cardio-metabolic risk factors: A systematic review and meta-analysis of randomized-controlled trials. *Complement Ther Med*. 2022 Dec;71:102883.
5. Jayarathne S, Ramalingam L, Edwards H, et al. Tart Cherry Increases Lifespan in Caenorhabditis elegans by Altering Metabolic Signaling Pathways. *Nutrients*. 2020 May 20;12(5).
6. Available at: https://www.health.harvard.edu/staying-healthy/understanding-acute-and-chronic-inflammation#:~:text=The%20longer%20you%20are%20overweight,Crohn's%20disease%20and%20ulcerative%20colitis. Accessed May, 19, 2023.
7. Gholami A, Amirkalali B, Baradaran HR, et al. The beneficial effect of tart cherry on plasma levels of inflammatory mediators (not recovery after exercise): A systematic review and meta-analysis on randomized clinical trials. *Complement Ther Med.* 2022 Sep;68:102842.
8. Chai SC, Davis K, Zhang Z, et al. Effects of Tart Cherry Juice on Biomarkers of Inflammation and Oxidative Stress in Older Adults. *Nutrients*. 2019 Jan 22;11(2).
9. Sozen T, Ozisik L, Basaran NC. An overview and management of osteoporosis. *Eur J Rheumatol.* 2017 Mar;4(1):46-56.
10. Dodier T, Anderson KL, Bothwell J, et al. U.S. Montmorency Tart Cherry Juice Decreases Bone Resorption in Women Aged 65-80 Years. *Nutrients*. 2021 Feb 7;13(2).
11. Thomas A, South S, Vijayagopal P, et al. Effect of Tart Cherry Polyphenols on Osteoclast Differentiation and Activity. *J Med Food.* 2020 Jan;23(1):56-64.
12. Kimble R, Keane KM, Lodge JK, et al. Polyphenol-rich tart cherries (Prunus Cerasus, cv Montmorency) improve sustained attention, feelings of alertness and mental fatigue and influence the plasma metabolome in middle-aged adults: a randomised, placebo-controlled trial. *Br J Nutr.* 2022 Feb 3;128(12):1-12.
13. Chai SC, Jerusik J, Davis K, et al. Effect of Montmorency tart cherry juice on cognitive performance in older adults: a randomized controlled trial. *Food Funct.* 2019 Jul 17;10(7):4423-31.
14. Bowers Z, Maiti P, Bourcier A, et al. Tart Cherry Extract and Omega Fatty Acids Reduce Behavioral Deficits, Gliosis, and Amyloid-Beta Deposition in the 5xFAD Mouse Model of Alzheimer's Disease. *Brain Sci.* 2021 Oct 27;11(11).
15. Giorgi C, Marchi S, Simoes ICM, et al. Mitochondria and Reactive Oxygen Species in Aging and Age-Related Diseases. *Int Rev Cell Mol Biol.* 2018;340:209-344.

BREATHE EASY

Lung health is adversely impacted by aging and environmental exposure.

Healthy Lungs contains **four** plant-derived compounds to support **optimal lung** function:[1]

- ***Boswellia serrata***[1,2]
- **Indian Bael fruit**[1,2]
- **Saffron**[3,4]
- **Andrographolide**[1]

Studies have shown these nutrients can:

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

Item #02512

30 vegetarian capsules

This product is available at fine health food stores everywhere.

References: 1. PLT Study. 2022. Unpublished. Data on file. *2. Phytother Res.* 2018 Jan;32(1):140-50. *3. Respir Res.* 2019 Feb 22;20(1):39. *4. Respir Med.* 2018 Dec;145:28-34.

GLUTEN FREE | 1 DAILY | NON GMO LE CERTIFIED

TAP THE POWER OF N-ACETYL-L-CYSTEINE

TO SUPPORT IMMUNE FUNCTION

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

NAC supports healthy levels of ***glutathione,*** helps promote a healthy **inflammatory response** and protects cells from **oxidative stress**.

This product is available at fine health food stores everywhere.

GLUTEN FREE

NON GMO LE CERTIFIED

Item #01534

600 mg • 60 capsules

SUPER K

A Healthy Kick for Heart & Bones

Just one daily softgel of Super K provides:

Vitamin K1	**1,500 mcg**
Vitamin K2 (MK-4)	**1,000 mcg**
Vitamin K2 (*trans* MK-7)	**100 mcg**

Item #02334

90 softgels

Each bottle lasts for three months.

GLUTEN FREE · 1 DAILY · NON GMO LE CERTIFIED

This product is available at fine health food stores everywhere.

Protect Against Occlusive Arterial Plaque

BY MICHAEL DOWNEY

Atherosclerosis can lead to heart attacks and strokes…the top *causes of death* worldwide.[1]

Two **plant extracts** have been shown to inhibit the development and worsening of **atherosclerosis** and to reduce ***unstable*** plaque, the most dangerous form.

Placebo-controlled clinical studies reveal that when these extracts are combined, they work better than separately.

In one study, participants taking the two extracts experienced **95%** less **progression** of plaque, compared to a control group receiving standard care.[2]

Another study showed the extract blend led to an **82% reduction** in major cardiovascular events, including **heart attack** and **stroke**.[3]

Arterial Plaque

Atherosclerosis is a chronic, inflammatory vascular disease that involves plaque buildup on the inner walls of arteries, narrowing the opening and making the arteries stiff and inflexible.[4]

These plaques can be unstable and rupture.[5]

Atherosclerosis initiates and progresses for *decades* before symptoms develop.[4,5] Conventional **risk factors** include:[6]

- Aging,
- Family history of cardiovascular disease,
- Abnormal lipid levels, including elevated LDL ("bad") cholesterol, high triglycerides, and low HDL ("good") cholesterol,
- High blood pressure,
- Elevated blood sugar,
- Obesity and sedentary lifestyle,
- Poor diet, and
- Smoking.

The process of plaque formation involves inflammation, necrosis, fibrosis, and calcification.[7]

When atherosclerotic plaques rupture, or when a blood clot (thrombus) forms on jagged plaque, the result can be catastrophic arterial occlusions. These blockages, either partial or complete, can cause a **heart attack** or an ischemic **stroke**.[8]

Two plant extracts have been shown to *inhibit* atherosclerosis: ***Centella asiatica*** and **French maritime pine bark**.

Centella Asiatica

Centella asiatica (also known as **gotu kola**) is a plant native to Asia. It has long been used in traditional medicine for various disorders and wound treatment.[9]

Centella contains compounds called **triterpenes**, which are believed to inhibit plaque by their anti-inflammatory activity.[10] Triterpenes also stabilize more dangerous **soft plaque** by improving the synthesis of **collagen**,[10-13] which holds soft plaque in place.[11,14,15]

Centella also reduces the adhesion of ***monocytes***, immune cells that promote atherosclerosis.[15,16]

In a clinical study of patients with soft plaque, taking **60 mg** of *Centella asiatica* extract three times daily for 12 months resulted in no **increase** in plaque size, compared to a **23%** increase in a **placebo** group.[11]

The extract also produced a **63%** more **firm** plaque, which is associated with less rupture risk.[11]

Pine Bark

French maritime pine bark contains compounds known as ***procyanidins*** and ***phenolic acids***.[17,18]

In multiple clinical studies, these compounds have been shown to slow atherosclerosis progression,[18] an effect that may result, in part, from reduced expression of inflammatory signaling molecules that contribute to plaque formation.[19,20]

In a clinical study of patients with coronary artery disease, those taking **200 mg** of **French maritime pine bark** extract daily for eight weeks had increased **flow-mediated dilation** (a measure of beneficial arterial widening) by **32%**. There were *no* significant changes in the **placebo** group.[21]

WHAT YOU NEED TO KNOW

Reduce Heart Attack and Stroke Risk

- **Atherosclerosis**, plaque in the arteries, frequently leads to strokes or heart attacks. It is the leading cause of death worldwide.
- Extracts of **French maritime pine bark** and ***Centella asiatica*** safely target this dangerous condition.
- Clinical studies show that, taken *together*, these extracts slow, and even **reverse** plaque accumulation, while boosting the stability of dangerous soft plaque to help prevent a deadly rupture.
- In a clinical study, this dual extract blend led to **7.4 times** lower progression of the disease.

Combined Effects

The effects of these extracts were even more impressive when they were combined.

In one clinical study, individuals aged 45 to 60 whose plaques were a relatively *mild* **class** IV all received diet and lifestyle counseling. Participants were also randomized into six groups to receive either:

- **Lifestyle counseling**,
- **Lifestyle counseling** plus **100 mg** of **aspirin**,
- **Lifestyle counseling** plus **50 mg** of standardized French maritime **pine bark**,
- **Lifestyle counseling** plus **100 mg** of standardized French maritime **pine bark**,
- **Lifestyle counseling** plus **100 mg** standardized French maritime **pine bark** with **100 mg** aspirin, or
- **Lifestyle counseling** plus **100 mg** of **French maritime pine bark** extract with **100 mg** of ***Centella asiatica*** extract.

The percentage of plaques that worsened to **class** V, blocking ***more than 50%*** of an artery, was:[2]

- **21.3%** in those receiving only lifestyle and diet counseling, but only
- **1.1%** in those receiving the dual extracts (**pine bark + Centella asiatica**).

Scientists gave the same dosages to a group of patients with **class** V plaques (more than **50%** blockage of at least one major artery). After 42 months, the percentage of subjects whose plaques progressed to **class** VI, which involves **symptoms** such as numbness, tingling, or chest pain, was:[22]

- **48.0%** in those who received lifestyle counseling only, and
- **6.5%** in subjects receiving pine bark and *Centella asiatica*.

The extract blend led to **7.4 times** lower progression of the disease over the study period of 42 months. In addition, cardiovascular events (hospitalization, chest pain, heart attack, or stroke) occurred in **4.4%** of the combination extract group, as compared to **16%** in the standard care group.[22]

Additional Clinical Validation

In two more clinical trials, scientists used a combination of **150 mg** of **French maritime pine bark** extract and **450 mg** of ***Centella asiatica*** extract daily, along with **100 mg** of **aspirin**, which is often recommended for those with atherosclerosis.[3,23]

In one of these studies, patients with atherosclerotic plaque were monitored for three years. All subjects received standard diet, lifestyle, and exercise counseling. A control group received no additional treatment, a second group was given *only* **aspirin**, and a third received **aspirin** plus the **dual-extract blend**.[3]

Plaque progression was observed in **5.3%** of those in the **dual-extract** group, but it was found in over **20%** of the two groups that did not receive the extracts. Major **cardiovascular events** (such as heart attack or stroke requiring hospitalization), occurred in:[3]

- **22%** of the control group, but
- Less than **4%** of those taking the extracts and aspirin.

Another study investigated **calcification** of coronary arteries. Participants were randomized into three groups to receive either:

- Standard counseling and **100 mg** of aspirin daily,
- Standard counseling with **150 mg** of French pine bark extract, or
- Standard counseling with **150 mg** of French pine bark and **450 mg** of *Centella* extract daily.[23]

After 12 months, the number of calcifications:[23]

- ***Increased*** by **35%** in those receiving counseling and aspirin, but
- ***Decreased*** by **10%** in those taking **150 mg** of French pine bark and **450 mg** of *Centella* extract.

Enhanced Plaque Stability

Some plaques are worse than others.

In a six-month clinical study of patients with **atherosclerotic plaques**, mild hypertension, and elevated cholesterol, subjects were divided into a lifestyle counseling group, a group that received the two herbal extracts, and a group that received both. Ultrasound imaging was used to assess plaque stability.[24]

In patients receiving only lifestyle counseling, plaque stability did not change significantly over six months.

But in patients receiving **150 mg** of **French maritime pine bark** extract and **450 mg** of ***Centella asiatica*** extract daily, the plaque stability index ***doubled***. This means their plaques were *less* likely to rupture and induce catastrophic clotting.[24]

Plaque size and number also **decreased** significantly in treated individuals.

Summary

Plaque accumulation in arteries is the signature characteristic of atherosclerosis, the underlying cause of most heart attacks and strokes.

Scientists have identified **two** plant extracts that target atherosclerosis and its consequences.

A blend of **French maritime pine bark** and ***Centella asiatica*** extracts has been shown to slow plaque growth, while boosting stability of deadly soft plaque, to help prevent a rupture.

This dual extract blend reduced progression of arterial plaque by as much as **95%** in a clinical study.

When used together, these extracts have been shown to help slow the development and progression of atherosclerosis, when combined with therapeutic lifestyle modification. •

References

1. Fan J, Watanabe T. Atherosclerosis: Known and unknown. *Pathol Int.* 2022 Mar;72(3):151-60.
2. Belcaro G, Dugall M, Hosoi M, et al. Pycnogenol(R) and Centella Asiatica for asymptomatic atherosclerosis progression. *Int Angiol*. 2014 Feb;33(1):20-6.
3. Belcaro G, Cesarone MR, Scipione C, et al. Delayed progression of atherosclerosis and cardiovascular events in asymptomatic patients with atherosclerotic plaques: 3-year prevention with the supplementation with Pycnogenol(R)+Centellicum(R). *Minerva Cardioangiol*. 2020 Feb;68(1):15-21.
4. Otsuka F, Yasuda S, Noguchi T, et al. Pathology of coronary atherosclerosis and thrombosis. *Cardiovasc Diagn Ther.* 2016 Aug;6(4):396-408.
5. Wohlschlaeger J, Bertram S, Theegarten D, et al. [Coronary atherosclerosis and progression to unstable plaques : Histomorphological and molecular aspects]. *Herz.* 2015 Sep;40(6):837-44.
6. Available at: https://www.ncbi.nlm.nih.gov/books/NBK535419/. Accessed 06/12/2023.
7. Shi X, Gao J, Lv Q, et al. Calcification in Atherosclerotic Plaque Vulnerability: Friend or Foe? *Front Physiol.* 2020;11:56.
8. Available at: https://www.nhlbi.nih.gov/health/atherosclerosis. Accessed 06/12/2023.
9. Gohil KJ, Patel JA, Gajjar AK. Pharmacological Review on Centella asiatica: A Potential Herbal Cure-all. *Indian J Pharm Sci.* 2010 Sep;72(5):546-56.
10. Sun B, Wu L, Wu Y, et al. Therapeutic Potential of Centella asiatica and Its Triterpenes: A Review. *Front Pharmacol.* 2020;11:568032.
11. Incandela L, Belcaro G, Nicolaides AN, et al. Modification of the echogenicity of femoral plaques after treatment with total triterpenic fraction of Centella asiatica: a prospective, randomized, placebo-controlled trial. *Angiology*. 2001 Oct;52 Suppl 2:S69-73.
12. Incandela L, Cesarone MR, Cacchio M, et al. Total triterpenic fraction of Centella asiatica in chronic venous insufficiency and in high-perfusion microangiopathy. *Angiology*. 2001 Oct;52 Suppl 2:S9-13.
13. Bylka W, Znajdek-Awiżeń P, Studzińska-Sroka E, et al. Centella asiatica in cosmetology. *Postepy Dermatol Alergol*. 2013 Feb;30(1):46-9.
14. Cesarone MR, Belcaro G, Nicolaides AN, et al. Increase in echogenicity of echolucent carotid plaques after treatment with total triterpenic fraction of Centella asiatica: a prospective, placebo-controlled, randomized trial. *Angiology*. 2001 Oct;52 Suppl 2: S19-25.
15. Razali NNM, Ng CT, Fong LY. Cardiovascular Protective Effects of Centella asiatica and Its Triterpenes: A Review. *Planta Med*. 2019 Nov;85(16):1203-15.
16. Ivanov V, Ivanova S, Kalinovsky T, et al. Plant-derived micronutrients suppress monocyte adhesion to cultured human aortic endothelial cell layer by modulating its extracellular matrix composition. *J Cardiovasc Pharmacol.* 2008 Jul;52(1):55-65.
17. D'Andrea G. Pycnogenol: a blend of procyanidins with multifaceted therapeutic applications? *Fitoterapia.* 2010 Oct;81(7):724-36.
18. Robertson NU, Schoonees A, Brand A, et al. Pine bark (Pinus spp.) extract for treating chronic disorders. *Cochrane Database Syst Rev.* 2020 Sep 29;9(9):Cd008294.
19. Gu JQ, Ikuyama S, Wei P, et al. Pycnogenol, an extract from French maritime pine, suppresses Toll-like receptor 4-mediated expression of adipose differentiation-related protein in macrophages. *Am J Physiol Endocrinol Metab*. 2008 Dec;295(6):E1390-400.
20. Luo H, Wang J, Qiao C, et al. Pycnogenol attenuates atherosclerosis by regulating lipid metabolism through the TLR4-NF-kappaB pathway. *Exp Mol Med.* 2015 Oct 23;47(10):e191.
21. Enseleit F, Sudano I, Periat D, et al. Effects of Pycnogenol on endothelial function in patients with stable coronary artery disease: a double-blind, randomized, placebo-controlled, cross-over study. *Eur Heart J.* 2012 Jul;33(13):1589-97.
22. Belcaro G, Ippolito E, Dugall M, et al. Pycnogenol(R) and Centella asiatica in the management of asymptomatic atherosclerosis progression. *Int Angiol.* 2015 Apr;34(2):150-7.
23. Hu S, Belcaro G, Cesarone MR, et al. Central cardiovascular calcifications: supplementation with Pycnogenol(R) and Centellicum(R): variations over 12 months. *Minerva Cardioangiol.* 2020 Feb;68(1):22-6.
24. Belcaro G, Cornelli U. Variations in Echogenicity in Carotid and Femoral Atherosclerotic Plaques with Pycnogenol + Centella Asiatica Supplementation. *Int J Angiol.* 2017 Jun;26(2):95-101.

MAINTAIN YOUTHFUL

Homocysteine Levels

FOR BRAIN, HEART, AND HEARING HEALTH

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

GLUTEN FREE

1 DAILY

NON GMO LE CERTIFIED

Item #02121

60 vegetarian capsules

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

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

°DEF (Dietary Folate Equivalents)

This product is available at fine health food stores everywhere.

Comprehensive EYE HEALTH Formula

MacuGuard® Ocular Support provides:

- **Lutein**, ***trans*-zeaxanthin**, and **meso-zeaxanthin** help maintain structural integrity of the **macula** and **retina**.[1-5]
- **Saffron** has been shown to help support **vision** as demonstrated by doctors' eye exams.[1]
- **Alpha-carotene** further helps support **macular density**.[1]

MacuGuard® Ocular Support with Saffron & Astaxanthin

Item #01993

60 softgels

MacuGuard® Ocular Support with Saffron

Item #01992

60 softgels

These products are available at fine health food stores everywhere.

GLUTEN FREE

1 DAILY

NON GMO LE CERTIFIED

(Each bottle lasts for two months.)

MacuGuard® Ocular Support is available with or without astaxanthin.

References

1. *JAMA Ophthalmol.* 2015;133(12):1415-24.
2. *Nutrients.* 2013 April;5(4):1169-85.
3. *Nutrition.* 2011 Sep;27(9):960-6.
4. *Free Radic Biol Med.* 2012;53(6):1298-307.
5. *J Ophthalmol.* 2015;2015:523027.

HIGHLY PURIFIED

Fish Oil

Super Omega-3 provides components found in **Mediterranean diets**, including **sesame lignans** to enhance the health benefits of fish oil.

SUPER OMEGA-3 PLUS

EPA/DHA Fish Oil, Sesame Lignans, Olive Extract, Krill & Astaxanthin

(**2,520 mg** of **EPA + DHA** in four softgels)

Item #01988

120 softgels

SUPER OMEGA-3

EPA/DHA Fish Oil, Sesame Lignans & Olive Extract

(**2,400 mg** of **EPA + DHA** in four softgels)

Item #01982

120 softgels

IFOS™ certification mark is a registered trademark of Nutrasource Diagnostics, Inc. These products have been tested to the quality and purity standards of the IFOS™ program conducted at Nutrasource Diagnostics, Inc.

These products are available at fine health food stores everywhere.

GLUTEN FREE

NON GMO LE CERTIFIED

"An essential part of my supplement plan."

Larry

VERIFIED CUSTOMER REVIEW

Item #00455

90 softgels

Boost the Body's Defenses

Lycopene, extracted from tomatoes, is a potent and powerful antioxidant.

Lycopene can help strengthen the body's defense systems on a cellular level.

This product is available at fine health food stores everywhere.

GLUTEN FREE

NON GMO LE CERTIFIED

Lyc-O-Mato® is a registered trademark of Lycored Corp.

Cistanche Promotes Healthy Aging

BY LAURIE MATHENA

Cistanche is a medicinal herb that has been used in traditional Chinese medicine to support many different functions, including **brain health**.[1-3]

More recently, scientists have identified *Cistanche's* potential for fighting cancer, reversing bone loss, and even *boosting lifespan*.

Together, this research adds to the growing body of evidence that oral intake of *Cistanche* could promote **healthier aging**.[4-6]

Optimizing Immune Function

Maintaining healthy immune function is one of the best ways to enhance health and longevity.[7]

Immune function begins to malfunction as we age. Called *immune senescence*, this dysfunction increases the risk of **infections** and **cancer**, while also reducing the effectiveness of **vaccines**.[8]

One prime cause of the immune dysfunction suffered by the elderly is a marked *decrease* in **naïve T cells**[9-11] and functional **natural killer cells**,[11,12] along with an increase in pro-inflammatory cytokines.[11]

In human cell studies, and also in animal studies, *Cistanche* has been shown to target these aspects of **immune senescence**:[4,13]

- It *increased* **naïve T cells** and **natural killer (NK) cells**, and
- *Decreased* the pro-inflammatory cytokine **interleukin 6**.

An animal study demonstrated that injection of a *Cistanche extract along with a seasonal influenza vaccine* helped improve the ***immune response*** to the vaccine. The addition of the Cistanche extract resulted in more **rapid antibody production** and more effective T-cell response to the flu antigens.[14]

This indicates that *Cistanche* extract has the potential to increase the immune response to an influenza vaccine.

Finally, there's evidence from preclinical studies that *Cistanche* may have anti-inflammatory activity[15] that could support proper immune system function.[6,13]

Potent Cognitive Protection

While *Cistanche* has been studied in multiple preclinical settings for its potential immune health benefits, a **human** study revealed that it could be an unsung hero for *brain* health as well.

In a placebo-controlled pilot study, 26 men and women with moderate **Alzheimer's disease** were randomized to three groups. Two treatment groups received either *Cistanche* extract capsules or Donepezil (prescription medication to improve cognition in Alzheimer's patients), the third group received a placebo. The *Cistanche* treatment group took **300 mg** of *Cistanche* **three times daily** for nearly a year.[16]

Compared to the untreated group, those taking *Cistanche* had significantly lower levels of certain **inflammatory factors** in the fluid surrounding their brain and spinal cord.

Cistanche also appeared to protect the brain from *shrinkage*.

In the untreated subjects, **hippocampus** volume shrank by **4.2%**. This is concerning, since this area of the brain plays a key role in **cognition**, **memory**, and **learning**.

The *Cistanche* group, on the other hand, had no change in the volume of their hippocampus.

Consistent with these findings, the *Cistanche* group performed significantly better on **cognitive tests** at the end of the study.[16]

These benefits could be due in part to a beneficial polyphenol in *Cistanche* called **echinacoside**.[13,17] In a rat model of Alzheimer's, **echinacoside** and other bioactive components of *Cistanche* were found to pass through the blood-brain barrier.[2]

That is where *Cistanche's anti-inflammatory* activity helps protect against the damaging effects of **neuroinflammation**.[18]

Cancer-Fighting Potential

Preclinical research suggests *Cistanche* has activity against numerous types of cancer. Studies have demonstrated that *Cistanche*:

- Inhibits growth of **breast cancer** cells,[19]
- Inhibits growth of **colorectal cancer** cells,[13] and
- Induces apoptosis and cell cycle arrest in **esophageal cancer** cells.[20]

In **hepatocellular carcinoma**, the most common type of liver cancer, a mouse study showed that *Cistanche* increased levels of cancer-fighting CD8+ T cells, inhibited the growth of **liver cancer** cells, and greatly improved the rodents' **survival rate**.[21] Another rat study showed *Cistanche* inhibited hepatocellular carcinoma cell growth in a dose-dependent manner.[22]

In an impressive lab study, *Cistanche* inhibited the growth of colon cancer cells by **60%** *within just 72 hours* of treatment. This included primary and metastatic colon cancer cells.[23]

Longevity Effects

Cistanche has been shown to significantly boost **lifespan** in fruit flies and roundworms. Scientists use these species because their short lifespan allows them to quickly test lifespan effects of a compound.

In one study, when adult fruit flies were given *Cistanche* extract for 20 days, it extended their average **lifespan** by as much as **18.9%**.[5]

In another study, the **echinacoside** found in *Cistanche* increased the average **lifespan** of roundworms by **13.64%**, compared to an untreated group.[24]

Cistanche has also been shown to boost the secretion of growth hormone in rat pituitary cells. This could impact lifespan since growth hormone declines with age.[25]

Latest Studies

Research continues to reveal new and diverse benefits of *Cistanche*. In just the past six years alone, animal studies and preclinical research studies have revealed *Cistanche's* potential ability to:

- Reverse bone loss and improve bone density,[6,13,26]
- Improve insulin resistance and promote healthy blood sugar levels,[6]
- Treat or prevent depression,[27]
- Lower cholesterol,[6]
- Combat physical fatigue,[3,6,13,28]
- Support reproductive health,[6,13,28]
- Alleviate constipation,[6,13,28] and
- Reduce the severity of cataracts.[6,13,28]

Summary

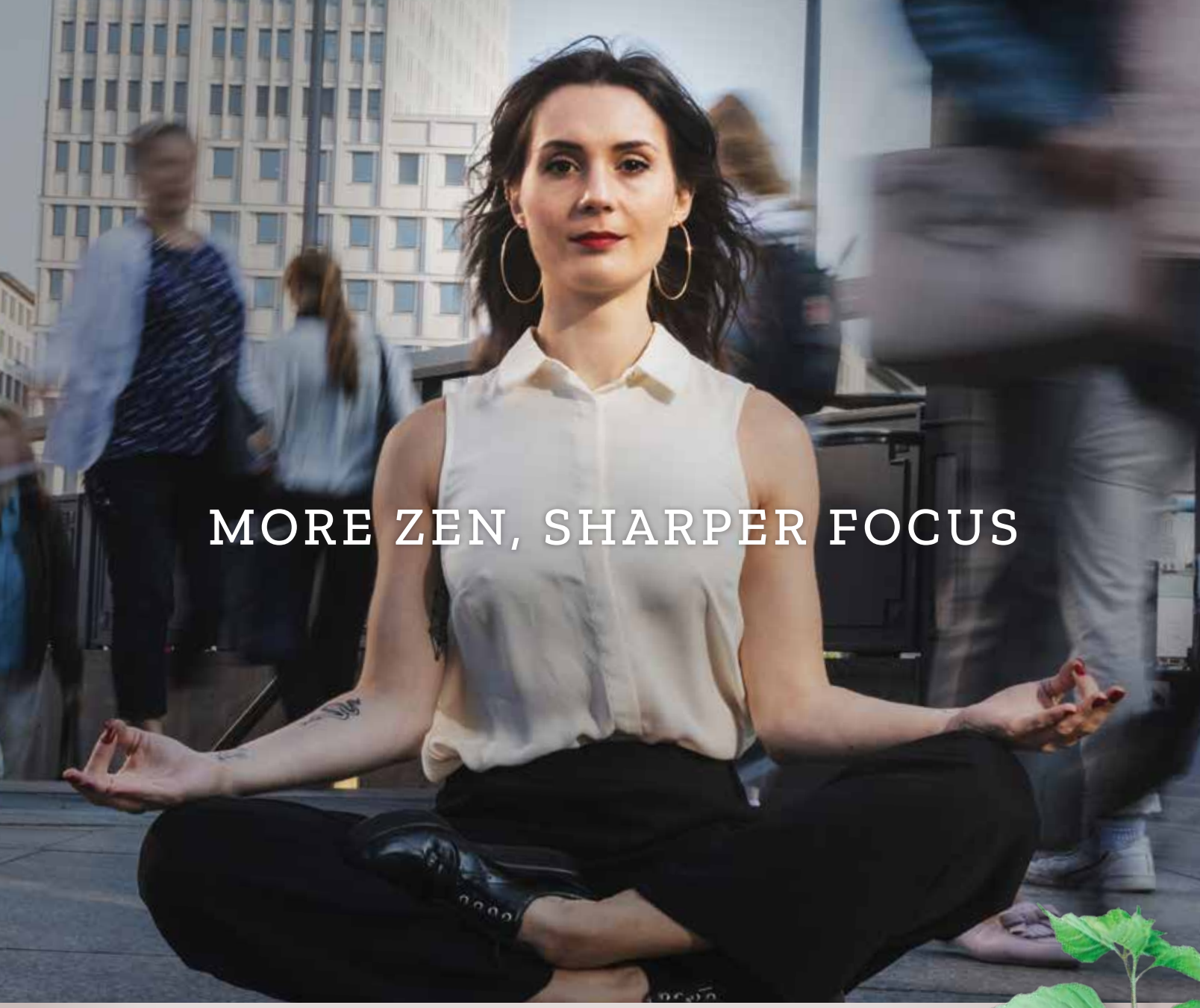
Extracts of the herb ***Cistanche*** contain bioactive compounds that could support immune function, protect brain health, help fight cancer, reverse bone loss, and more.

Exciting studies also show the potential of *Cistanche* to impact longevity factors and increase lifespan.

Together, this research adds to the growing body of evidence that oral intake of *Cistanche* may promote healthier aging. •

References

1. Gu C, Yang X, Huang L. Cistanches Herba: A Neuropharmacology Review. *Front Pharmacol.* 2016 Sep 20;7:289.
2. Chao CL, Huang HW, Huang HC, et al. Inhibition of Amyloid Beta Aggregation and Deposition of Cistanche tubulosa Aqueous Extract. *Molecules*. 2019 Feb 14;24(4).
3. Wu L, Xiang T, Chen C, et al. Studies on Cistanches Herba: A Bibliometric Analysis. *Plants (Basel).* 2023 Mar 1;12(5):1098.
4. Zhang K, Ma X, He W, et al. Extracts of Cistanche deserticola Can Antagonize Immunosenescence and Extend Life Span in Senescence-Accelerated Mouse Prone 8 (SAM-P8) Mice. *Evid Based Complement Alternat Med.* 2014;2014:601383.
5. Lin WY, Yao C, Cheng J, et al. Molecular pathways related to the longevity promotion and cognitive improvement of Cistanche tubulosa in Drosophila. *Phytomedicine.* 2017 Mar 15;26:37-44.
6. Wang N, Ji S, Zhang H, et al. Herba Cistanches: Anti-aging. Aging Dis. 2017 Dec;8(6):740-59.
7. Available at: https://www.nih.gov/news-events/nih-research-matters/immune-system-profiles-extremely-long-lived-people. Accessed June 27, 2023.
8. Aiello A, Farzaneh F, Candore G, et al. Immunosenescence and Its Hallmarks: How to Oppose Aging Strategically? A Review of Potential Options for Therapeutic Intervention. *Front Immunol.* 2019;10:2247.
9. Ferrando-Martinez S, Ruiz-Mateos E, Hernandez A, et al. Age-related deregulation of naive T cell homeostasis in elderly humans. *Age (Dordr).* 2011 Jun;33(2):197-207.
10. Minato N, Hattori M, Hamazaki Y. Physiology and pathology of T-cell aging. *International Immunology.* 2020;32(4):223-31.
11. Bulut O, Kilic G, Domínguez-Andrés J, et al. Overcoming immune dysfunction in the elderly: trained immunity as a novel approach. *International Immunology.* 2020;32(12):741-53.
12. Beli E, Duriancik DM, Clinthorne JF, et al. Natural killer cell development and maturation in aged mice. *Mech Ageing Dev.* 2014 Jan;135:33-40.
13. Fu Z, Fan X, Wang X, et al. Cistanches Herba: An overview of its chemistry, pharmacology, and pharmacokinetics property. *J Ethnopharmacol.* 2018 Jun 12;219:233-47.
14. Zhao B, Lian J, Wang D, et al. Evaluation of aqueous extracts of Cistanche deserticola as a polysaccharide adjuvant for seasonal influenza vaccine in young adult mice. *Immunol Lett.* 2019 Sep;213:1-8.
15. Wang H, Li Y, Bian Y, et al. Potential hepatoprotective effects of Cistanche deserticola Y.C. Ma: Integrated phytochemical analysis using UPLC-Q-TOF-MS/MS, target network analysis, and experimental assessment. *Front Pharmacol.* 2022;13:1018572.
16. Li N, Wang J, Ma J, et al. Neuroprotective Effects of Cistanches Herba Therapy on Patients with Moderate Alzheimer's Disease. *Evid Based Complement Alternat Med.* 2015;2015:103985.
17. Piwowarczyk R, Ochmian I, Lachowicz S, et al. Phytochemical parasite-host relations and interactions: A Cistanche armena case study. *Sci Total Environ*. 2020 May 10;716:137071.
18. Zhou XL, Xu MB, Jin TY, et al. Preclinical Evidence and Possible Mechanisms of Extracts or Compounds from Cistanches for Alzheimer's Disease. *Aging Dis.* 2019 Oct;10(5):1075-93.
19. Tang C, Gong L, Lvzi X, et al. Echinacoside inhibits breast cancer cells by suppressing the Wnt/beta-catenin signaling pathway. *Biochem Biophys Res Commun*. 2020 May 21;526(1):170-5.
20. Fu C, Li J, Aipire A, et al. Cistanche tubulosa phenylethanoid glycosides induce apoptosis in Eca-109 cells via the mitochondria-dependent pathway. *Oncol Lett.* 2019 Jan;17(1):303-13.
21. Li J, Li J, Aipire A, et al. Phenylethanoid Glycosides from Cistanche tubulosa Inhibits the Growth of B16-F10 Cells both in Vitro and in Vivo by Induction of Apoptosis via Mitochondria-dependent Pathway. *J Cancer*. 2016;7(13):1877-87.
22. Yuan P, Li J, Aipire A, et al. Cistanche tubulosa phenylethanoid glycosides induce apoptosis in H22 hepatocellular carcinoma cells through both extrinsic and intrinsic signaling pathways. *BMC Complement Altern Med*. 2018 Oct 12;18(1):275.
23. A A-M. Cistanche tubulosa induces reactive oxygen species-mediated apoptosis of primary and metastatic human colon cancer cells. *Journal of Applied Pharmaceutical Science.* 2017;7:39-45.
24. Chen W, Lin HR, Wei CM, et al. Echinacoside, a phenylethanoid glycoside from Cistanche deserticola, extends lifespan of Caenorhabditis elegans and protects from Abeta-induced toxicity. *Biogerontology.* 2018 Feb;19(1):47-65.
25. Wu CJ, Chien MY, Lin NH, et al. Echinacoside Isolated from Cistanche tubulosa Putatively Stimulates Growth Hormone Secretion via Activation of the Ghrelin Receptor. *Molecules.* 2019 Feb 17;24(4).
26. Zhang B, Yang LL, Ding SQ, et al. Anti-Osteoporotic Activity of an Edible Traditional Chinese Medicine Cistanche deserticola on Bone Metabolism of Ovariectomized Rats Through RANKL/RANK/TRAF6-Mediated Signaling Pathways. *Front Pharmacol.* 2019;10:1412.
27. Wang D, Wang H, Gu L. The Antidepressant and Cognitive Improvement Activities of the Traditional Chinese Herb Cistanche. *Evid Based Complement Alternat Med*. 2017;2017:3925903.
28. Lei H, Wang X, Zhang Y, et al. Herba Cistanche (Rou Cong Rong): A Review of Its Phytochemistry and Pharmacology. *Chem Pharm Bull (Tokyo).* 2020;68(8):694-712.



MORE ZEN, SHARPER FOCUS

Ashwagandha Plus Calm & Focus *reduces* stress while increasing **alertness** and **focus**.

Each capsule contains:

- Standardized **ashwagandha** root and leaf extract clinically shown to decrease feelings of **stress** by **71%**.[1]
- Patented polyphenol-rich **spearmint** extract clinically shown to *improve* **alertness** and sustained **attention**.[2-4]

Item #02519

60 vegetarian capsules

GLUTEN FREE

NON GMO LE CERTIFIED

References:

1. *J Amer Nutraceutical Assoc.* 2008;11:1.
2. *J Altern Complement Med.* 2018 Jan;24(1):37-47.
3. *J Int Soc Sports Nutr.* 2018 Dec 12;15(1):58.
4. *Nutr Res.* 2019 Apr;64:24-38.

This product is available at fine health food stores everywhere.

PreticX®
IN A TASTY
STRAWBERRY
CHEWABLE

RESTORE YOUTHFUL Gut BALANCE

With Strawberry Flavored FLORASSIST® Prebiotic Chewable

- With age, **bifidobacteria** levels decline to as little as **5%**, creating gut imbalance.[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 **XOS** prebiotic.[2]
- **1,000 mg** of **XOS** (xylooligosaccharides) per prebiotic chewable.

Item #02203

60 vegetarian chewable tablets

This product is available at fine health food stores everywhere.

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

Blueberry Extract

Blueberries provide health-boosting benefits shown to:

- Enhance heart health
- Maintain brain function
- Sustain healthy blood-sugar levels already within normal range
- Improve movement and coordination

Blueberry extract is *more potent* than the whole berry, providing greater metabolic support throughout the body and without the excess sugar of raw fruit.

This product is available at fine health food stores everywhere.

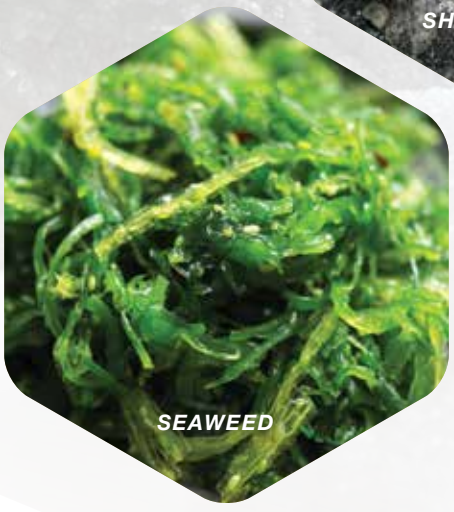
Item #01214

60 vegetarian capsules

GLUTEN FREE

NON GMO LE CERTIFIED

SAFELY MANAGE BLOOD SUGAR LEVELS



BY ERIN DAVIS, MS, RDN, CDCES

Over **11%** of Americans have type II diabetes and **38%** have prediabetes.[1]

Prediabetes is a serious health condition, in which blood sugar is higher than normal but lower than the diabetic threshold.[2]

Some people argue that the term "**prediabetes**" be abolished.

That's because elevated **glucose levels** can increase the risk of vascular disease, eye conditions, nerve damage, dementia, and kidney disease before full-blown **type II diabetes** manifests.[3]

But diabetes can be ***prevented*** by reducing blood glucose levels before they get too high.[4]

Unfortunately, **glucose-lowering** drugs are usually prescribed only after diabetes has been diagnosed.

It doesn't have to be this way. Scientists have discovered several plant-derived ingredients and minerals that can safely reduce **blood glucose levels** and improve **insulin sensitivity**.

Promote Healthy Glucose Levels

Insulin is a hormone responsible for regulating glucose. With age,[5] poor diet, or a sedentary lifestyle, **insulin resistance**—the inability to properly use insulin—can develop.[6]

Insulin resistance can lead to elevated **blood glucose** levels and **type II diabetes**.[6]

In people with **prediabetes**, lowering blood sugar can reduce the risk of developing diabetes.[7] In those who are *already* diabetic, managing glucose levels can reduce the risk of developing **diabetic complications**.[8]

Improving diet and increasing physical activity can help control glucose levels.[6,9] Scientists have also identified several plant-derived ingredients that promote **healthy blood glucose levels**.

They include:

- Cinnamon,
- Chromium,
- Amla,
- Shilajit, and
- Iodine-rich seaweed.

Cinnamon Reduces Glucose

Researchers have found that a water-soluble form of **cinnamon** can help lower **blood sugar**.

Cinnamon polyphenols help activate our cells' glucose detection systems, which helps them maintain already-healthy blood glucose levels.[10,11]

Findings of a meta-analysis and systematic review of 16 clinical trials suggest the efficacy of cinnamon supplementation in supporting blood sugar levels, and healthy lipid profile.[12]

In a **clinical study** of people with elevated blood glucose, participants were randomized to receive **500 mg** of water-soluble extract of cinnamon or a placebo. After two months results showed:[11]

- Lowered fasting insulin and glucose (lower insulin indicates improved glucose control),
- Reduced total cholesterol and **LDL** ("bad") cholesterol, and
- Improved insulin sensitivity.

Another clinical study enrolled participants with type II diabetes. Participants were randomized into four groups, two intervention groups (with BMI greater than 27 and less than 27) and two placebo (with BMI greater than 27 and less than 27).

Both intervention groups received **500 mg** of cinnamon bark powder for three months. After three months, results showed that cinnamon improved body fat percentage, body mass index, and lipid profiles in people with type II diabetes. Results were more promising in patients with higher BMI at baseline.[13]

A preclinical study showed that water-soluble cinnamon extract increased the production of **glucose transport molecules** known as GLUT4. These allow cells to take up glucose from the blood when insulin is present.[14,15]

Without enough effective GLUT4 transporters, blood glucose can *increase*, causing insulin resistance and potentially damage to the tissues.[16,17]

Additional preclinical research revealed that cinnamon may activate and increase the production of metabolic sensors called PPARs,[18] which mimic the action of some antidiabetic drugs.[18,19] Increased expression of PPARs promotes **insulin sensitivity**, improving glucose uptake and lowering blood sugar.[20]

Chromium Fights High Glucose

Chromium is a trace mineral.[21,22] Cell and animal study model studies suggest that chromium might improve insulin sensitivity.[23]

In one observational study, lower levels of chromium were associated with diabetes and **prediabetes**.[24]

A systematic review and meta-analysis of 25 randomized controlled trials of chromium supplementation in people with diabetes found that oral chromium significantly:[25]

- Improved blood sugar levels,
- Lowered **HbA1c** (average blood glucose),
- Raised **HDL** ("good") cholesterol, and
- Lowered triglycerides.

It has been proposed that chromium may work by activating **GLUT4** and enhancing **insulin transport** of glucose into the cells, improving response to elevated blood glucose levels.[26]

An observational study concluded that the odds of having type II diabetes were lower in those that had consumed supplements with chromium.[27]

In a human trial of diabetics whose blood sugar parameters were insufficiently maintained on prescription medication, participants were randomized to receive, daily, **200 mcg** of **chromium** combined with the natural product **shilajit** and the ayurvedic herb **amla**, or a **placebo**, in addition to medication. After 60 days, the treatment group had significant **improvements** in fasting and post-prandial glucose levels, compared to placebo.[28]

Shilajit's Properties

A Himalayan nutrient that has been used for centuries, **shilajit** is rich in **fulvic acid**. Fulvic acid is an organic compound that may contribute to shilajit's medicinal properties.[29,30]

Shilajit has traditionally been used to manage **diabetes**[30] and gastrointestinal conditions (such as gastritis, and ulcers),[30-32] and muscular strength.[33]

Preclinical data reveal that shilajit may also reduce **insulin resistance**.[34]

In a clinical trial, 90 diabetic patients were randomized to receive **500 mg** of shilajit twice daily or a placebo. After three months improvements in the blood sugar levels were observed.[35]

Promote Healthy Glucose Levels

- As people age, many develop insulin resistance and elevated glucose, often leading to prediabetes and **type II diabetes**.
- A water-soluble **cinnamon** extract has been shown to reduce blood glucose and increase insulin sensitivity.
- The mineral **chromium** has been shown to improve fasting blood sugar and **HbA1c** (average blood glucose) levels.
- **Amla** and **shilajit** each have demonstrated antioxidant, anti-inflammatory, and glucose-lowering effects.
- Iodine-rich **brown seaweed** can stop the conversion of starches into glucose, lowering blood sugar and increasing insulin sensitivity.
- These ingredients can help maintain healthy glucose levels and prevent the damage elevated glucose can do.

Amla's Benefits for Diabetes

Amla, also known as Indian gooseberry, is an herb that has been shown to lower **blood glucose** in animals and humans with diabetes.[36,37]

A source of bioactive compounds, **amla** has been shown to have **antimicrobial** and **anti-inflammatory properties**.[38]

In people with type II diabetes, one study showed that, compared to a placebo, taking a combination of **chromium**, **amla**, and **shilajit** with current medication resulted in better fasting and post-meal glucose levels.[28]

Seaweed Aids Glucose Control

Seaweed is an excellent source of **iodine**,[39] a trace element that is vital to metabolic control and thyroid hormone synthesis.[40] Clinical studies have shown that consuming **brown seaweed** can reduce glucose levels.[41]

Seaweed is thought to work by **blocking enzymes** required for the conversion of starches into glucose in the gastrointestinal tract, resulting in less glucose being absorbed into the bloodstream.[42,43]

Clinical trials have shown that **brown seaweed extract** can:[44-46]

- Lower fasting glucose,
- Increase insulin sensitivity,
- Lower HbA1c levels, and
- Improve post-meal cognitive function.

In one preclinical study, brown seaweed was found to improve diet-induced metabolic diseases, such as **diabetes**, and reduce insulin resistance.[47]

A systematic review and meta-analysis of **human trials** was conducted to assess the effects of brown seaweed on plasma glucose levels. The participants were either at high risk of diabetes, had diabetes, or had healthy blood glucose levels. It was concluded that brown seaweed and its extracts positively affect plasma glucose levels and have the potential for managing high blood sugar.[41]

Seaweed, amla, shilajit, chromium, and cinnamon can help support healthy glucose levels, protecting against the damage of high blood sugar.

Summary

The elevated glucose levels seen in **prediabetes** and **diabetes** increase the risk for heart disease, dementia, nerve damage, and kidney disease.

Cinnamon, **chromium**, **amla**, **shilajit**, and **seaweed** can help *reduce* high glucose levels, potentially preventing complications related to high blood sugar.

Anyone can benefit from maintaining healthy blood glucose levels, even people without diabetes or prediabetes. •

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

References

1. Available at: https://www.cdc.gov/diabetes/data/statistics-report/. Accessed May 16, 2023.
2. Cai X, Zhang Y, Li M, et al. Association between prediabetes and risk of all cause mortality and cardiovascular disease: updated meta-analysis. *BMJ.* 2020 Jul 15;370:m2297.
3. Mouri M, Badireddy M. Hyperglycemia. *StatPearls*. Treasure Island (FL): StatPearls Publishing Copyright © 2023, StatPearls Publishing LLC.; 2023.
4. Shubrook JH, Chen W, Lim A. Evidence for the Prevention of Type 2 Diabetes Mellitus. *J Am Osteopath Assoc*. 2018 Nov 1;118(11):730-7.
5. Shou J, Chen PJ, Xiao WH. Mechanism of increased risk of insulin resistance in aging skeletal muscle. *Diabetol Metab Syndr*. 2020;12:14.
6. Available at: https://www.cdc.gov/diabetes/basics/insulin-resistance.html#:~:text=Insulin%20is%20a%20key%20player,broken%20down%20into%20blood%20sugar. Accessed May 16, 2023.
7. Available at: https://www.cdc.gov/diabetes/basics/prediabetes.html#:~:text=If%20you%20have%20prediabetes%2C%20losing,for%20developing%20type%202%20diabetes. Accessed May 16, 2023.
8. Available at: https://www.cdc.gov/chronicdisease/programs-impact/pop/diabetes.htm#:~:text=Keeping%20diabetes%20under%20control%20through,and%20nerve%20disease%20by%2040%25. Accessed May 16, 2023.
9. American Diabetes Association Professional Practice C. 5. Facilitating Behavior Change and Well-being to Improve Health Outcomes: Standards of Medical Care in Diabetes-2022. *Diabetes Care*. 2022 Jan 1;45(Suppl 1):S60-S82.
10. Kizilaslan N, Erdem NZ. The Effect of Different Amounts of Cinnamon Consumption on Blood Glucose in Healthy Adult Individuals. *Int J Food Sci.* 2019;2019:4138534.
11. Anderson RA, Zhan Z, Luo R, et al. Cinnamon extract lowers glucose, insulin and cholesterol in people with elevated serum glucose. *J Tradit Complement Med.* 2016 Oct;6(4):332-6.
12. Zhou Q, Lei X, Fu S, et al. Efficacy of cinnamon supplementation on glycolipid metabolism in T2DM diabetes: A meta-analysis and systematic review. *Front Physiol.* 2022;13:960580.
13. Zare R, Nadjarzadeh A, Zarshenas MM, et al. Efficacy of cinnamon in patients with type II diabetes mellitus: A randomized controlled clinical trial. *Clin Nutr.* 2019 Apr;38(2):549-56.
14. Cao H, Polansky MM, Anderson RA. Cinnamon extract and polyphenols affect the expression of tristetraprolin, insulin receptor, and glucose transporter 4 in mouse 3T3-L1 adipocytes. *Arch Biochem Biophys.* 2007 Mar 15;459(2):214-22.

15. Silva ML, Bernardo MA, Singh J, et al. Cinnamon as a Complementary Therapeutic Approach for Dysglycemia and Dyslipidemia Control in Type 2 Diabetes Mellitus and Its Molecular Mechanism of Action: A Review. *Nutrients.* 2022 Jul 5;14(13).
16. Singh VP, Bali A, Singh N, et al. Advanced glycation end products and diabetic complications. *Korean J Physiol Pharmacol.* 2014 Feb;18(1):1-14.
17. Vargas E PV, Carrillo Sepulveda MA. Physiology, Glucose Transporter Type 4. *StatPearls Publishing.* 2022.
18. Sheng X, Zhang Y, Gong Z, et al. Improved Insulin Resistance and Lipid Metabolism by Cinnamon Extract through Activation of Peroxisome Proliferator-Activated Receptors. *PPAR Res*. 2008;2008:581348.
19. Miyazaki Y, Mahankali A, Matsuda M, et al. Improved glycemic control and enhanced insulin sensitivity in type 2 diabetic subjects treated with pioglitazone. *Diabetes Care*. 2001 Apr;24(4):710-9.
20. Medagama AB. The glycaemic outcomes of Cinnamon, a review of the experimental evidence and clinical trials. *Nutr J.* 2015 Oct 16;14:108.
21. Sciencees NAo. *Geochemistry and the Environment: Volume I: The Relation of Selected Trace Elements to Health and Disease*. Washington, DC: The National Academies Press; 1974.
22. Available at: https://www.merckmanuals.com/home/disorders-of-nutrition/minerals/chromium-deficiency. Accessed May 16, 2023.
23. Available at: https://lpi.oregonstate.edu/mic/minerals/chromium. Accessed May 16, 2023.
24. Chen S, Jin X, Shan Z, et al. Inverse Association of Plasma Chromium Levels with Newly Diagnosed Type 2 Diabetes: A Case-Control Study. *Nutrients.* 2017 Mar 17;9(3).
25. Suksomboon N, Poolsup N, Yuwanakorn A. Systematic review and meta-analysis of the efficacy and safety of chromium supplementation in diabetes. *J Clin Pharm Ther*. 2014 Jun;39(3):292-306.
26. Hua Y, Clark S, Ren J, et al. Molecular mechanisms of chromium in alleviating insulin resistance. *J Nutr Biochem.* 2012 Apr;23(4):313-9.
27. McIver DJ, Grizales AM, Brownstein JS, et al. Risk of Type 2 Diabetes Is Lower in US Adults Taking Chromium-Containing Supplements. *J Nutr.* 2015 Dec;145(12):2675-82.
28. Biswas T, Polley G, Pandit S, et al. Effects of adjunct therapy of a proprietary herbo-chromium supplement in type 2 diabetes: A randomized clinical trial. *Int J Diab Dev Ctries*. 2010;30(3):153-61.
29. Stohs SJ. Safety and efficacy of shilajit (mumie, moomiyo). *Phytother Res.* 2014 Apr;28(4):475-9.
30. Yaqoob Z. Review on Shilajit Used in Pakistani Traditional Medicine. *Mod J Med Biol*. 2021.
31. Agarwal SP, Khanna R, Karmarkar R, et al. Shilajit: a review. *Phytother Res.* 2007 May;21(5):401-5.
32. Schepetkin IA, Xie G, Jutila MA, et al. Complement-fixing activity of fulvic acid from Shilajit and other natural sources. *Phytother Res.* 2009 Mar;23(3):373-84.
33. Keller JL, Housh TJ, Hill EC, et al. The effects of Shilajit supplementation on fatigue-induced decreases in muscular strength and serum hydroxyproline levels. *J Int Soc Sports Nutr.* 2019 Feb 6;16(1):3.
34. Ghezelbash B, Shahrokhi N, Khaksari M, et al. Protective Roles of Shilajit in Modulating Resistin, Adiponectin, and Cytokines in Rats with Non-alcoholic Fatty Liver Disease. *Chin J Integr Med.* 2022 Jun;28(6):531-7.
35. Gupta V, Keshari BB, Tiwari SK, et al. A comparative study of Shilajatu and Asanadi Ghana Vati in the management of Madhumeha w.s.r. to type-2 diabetes mellitus. *Ayu.* 2016 Apr-Jun;37(2):120-4.
36. D'Souza J J, D'Souza P P, Fazal F, et al. Anti-diabetic effects of the Indian indigenous fruit Emblica officinalis Gaertn: active constituents and modes of action. *Food Funct.* 2014 Apr;5(4):635-44.
37. Kapoor MP, Suzuki K, Derek T, et al. Clinical evaluation of Emblica Officinalis Gatertn (Amla) in healthy human subjects: Health benefits and safety results from a randomized, double-blind, crossover placebo-controlled study. *Contemp Clin Trials Commun*. 2020 Mar;17:100499.
38. Khalid M, Sofi SA, Makroo HA, et al. Insight about the biochemical composition, postharvest processing, therapeutic potential of Indian gooseberry (amla), and its utilization in development of functional foods-A comprehensive review. *J Food Biochem*. 2022 Mar 27:e14132.
39. Available at: https://ods.od.nih.gov/factsheets/Iodine-HealthProfessional/#h3. Accessed 03/29/2023,
40. Song E, Park MJ, Kim JA, et al. Impact of urinary iodine concentration on blood glucose levels and blood pressure: a nationwide population-based study. *Eur J Nutr.* 2022 Sep;61(6):3227-34.
41. Vaughan K, Ranawana V, Cooper D, et al. Effect of brown seaweed on plasma glucose in healthy, at-risk, and type 2 diabetic individuals: systematic review and meta-analysis. *Nutr Rev.* 2022 Apr 8;80(5):1194-205.
42. Lordan S, Smyth TJ, Soler-Vila A, et al. The alpha-amylase and alpha-glucosidase inhibitory effects of Irish seaweed extracts. *Food Chem*. 2013 Dec 1;141(3):2170-6.
43. Zhang J, Tiller C, Shen J, et al. Antidiabetic properties of polysaccharide- and polyphenolic-enriched fractions from the brown seaweed Ascophyllum nodosumThis article is one of a selection of papers published in this special issue (part 2 of 2) on the Safety and Efficacy of Natural Health Products. *Can J Physiol Pharmacol.* 2007;85(11):1116-23.
44. Paradis ME, Couture P, Lamarche B. A randomised crossover placebo-controlled trial investigating the effect of brown seaweed (Ascophyllum nodosum and Fucus vesiculosus) on postchallenge plasma glucose and insulin levels in men and women. *Appl Physiol Nutr Metab.* 2011 Dec;36(6):913-9.
45. Derosa G, Cicero AFG, D'Angelo A, et al. Ascophyllum nodosum and Fucus vesiculosus on glycemic status and on endothelial damage markers in dysglicemic patients. *Phytother Res*. 2019 Mar;33(3):791-7.
46. Haskell-Ramsay CF, Jackson PA, Dodd FL, et al. Acute Post-Prandial Cognitive Effects of Brown Seaweed Extract in Humans. *Nutrients.* 2018 Jan 13;10(1).
47. Murakami S, Hirazawa C, Ohya T, et al. The Edible Brown Seaweed Sargassum horneri (Turner) C. Agardh Ameliorates High-Fat Diet-Induced Obesity, Diabetes, and Hepatic Steatosis in Mice. *Nutrients.* 2021 Feb 8;13(2).

Health Support
Tailor-Made For Men

Men need nutrition that's custom-fitted to support sexual health, testosterone levels, and even prostate and urinary function.

The new **Men's Vitality Packs** do just that, providing 30 servings of Male Vascular Sexual Support, Testosterone Elite†, and PalmettoGuard® Saw Palmetto and Beta-Sitosterol formulas in convenient, individual daily-dose packs.

Men's Vitality Packs: tailor-made nutrition for men.

Item #02515

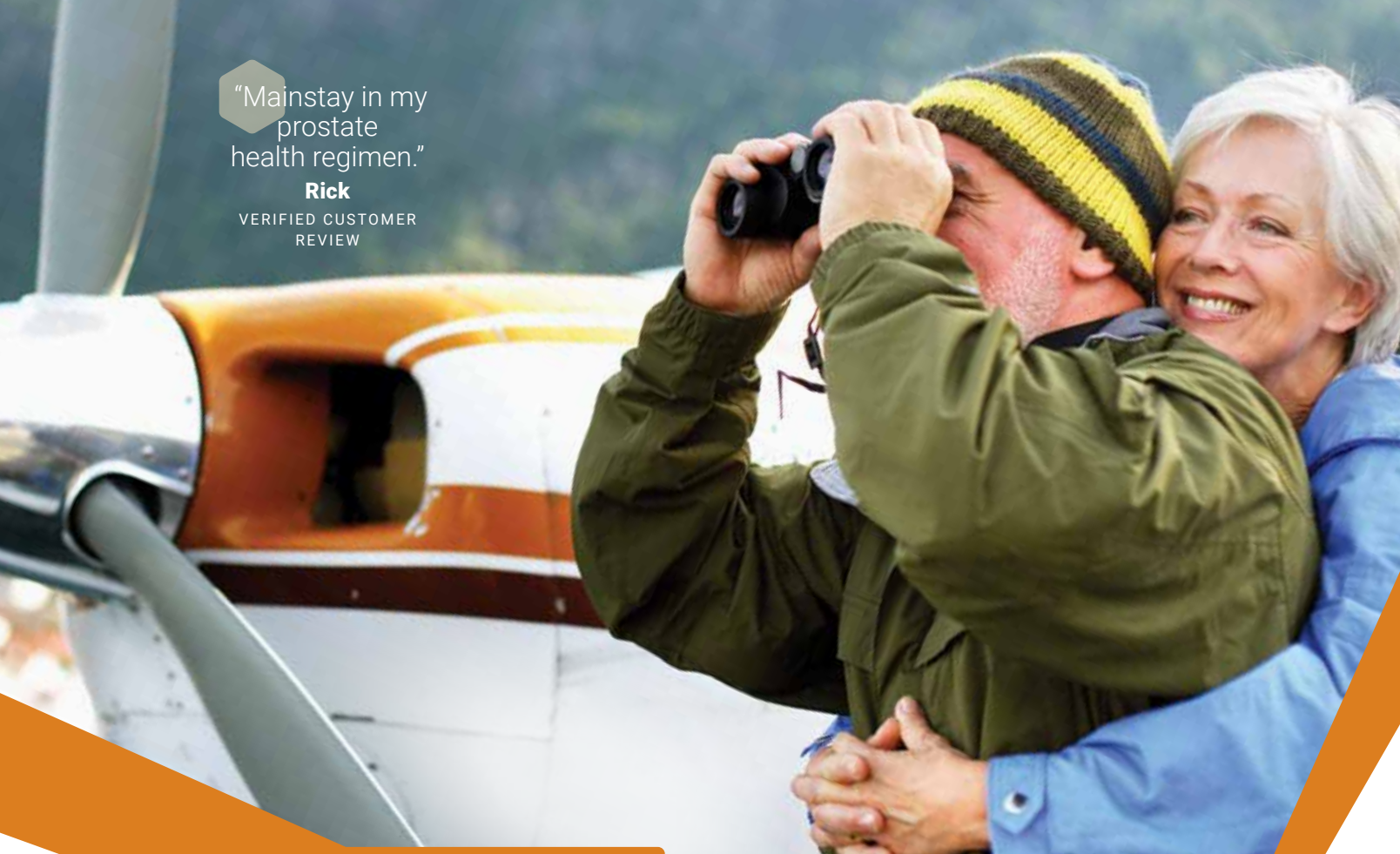
1 box of 30 packets

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

GLUTEN FREE

NON GMO LE CERTIFIED

This product is available at fine health food stores everywhere.



Prostate HEALTH

The best way to keep YOU in the picture.

Ultra Prostate Formula was created to help maintain prostate health. It contains a dozen ingredients to:

- Support healthy urination
- Promote healthy prostate function
- Support healthy prostate cell division

Ultra Prostate Formula is our most comprehensive *standardized*-ingredient prostate-health supplement.

Item #02029

60 softgels

GLUTEN FREE

NON GMO LE CERTIFIED

This product is available at fine health food stores everywhere.

45 Times Greater Bioavailability

CURCUMIN

These products are available at fine health food stores everywhere.

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

Item #02407

500 mg • 60 vegetarian capsules

Same 500 mg potency of patented **turmeric** and **fenugreek blend** with added benefits of **ginger** and other **turmeric** actives.

Item #02324

500 mg curcumin + gingerol • 30 softgels

GLUTEN FREE

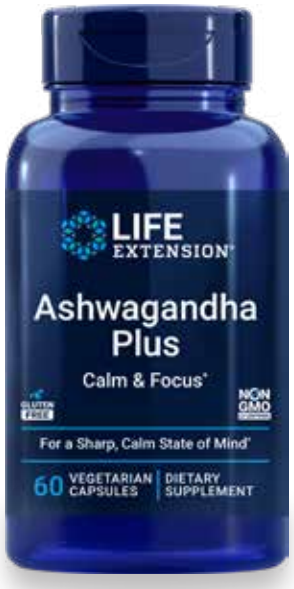
NON GMO LE CERTIFIED

NEW PRODUCTS

More zen, sharper focus

To stay on top of the game, we need focus. But how does one keep an eye on the prize in a world filled with distractions? Stay calm under pressure and tackle the day with **Ashwagandha Plus Calm & Focus**.

Item #02519
60 vegetarian capsules



The calming ashwagandha in this formula helps dial down distractions, while spearmint helps power up focus and attention.

Don't get caught up in the hustle. Stay cool under pressure and focus on what is important with Ashwagandha Plus Calm & Focus.

GLUTEN FREE NON GMO LE CERTIFIED

Item #01828
60 vegetarian capsules

GLUTEN FREE NON GMO LE CERTIFIED

Heart Health Should Be on **Everyone's Mind**

Nourish a healthy heart by being proactive about cholesterol and triglyceride levels.

Advanced Lipid Control contains 500 mg of amla, an extract of Indian gooseberry which helps maintain already healthy cholesterol as well as triglyceride levels.

Amla also helps inhibit inflammation to support heart health, promotes healthy endothelial function, and helps fight oxidative stress in your cardiovascular system.

Add Advanced Lipid Control to your heart-healthy regimen today.

LIFE EXTENSION®

The Science of a Healthier Life®

PO BOX 407198
FORT LAUDERDALE, FLORIDA 33340-7198

IN THIS EDITION OF **LIFE EXTENSION MAGAZINE®**