

Fight Back Against Chronic Fatigue

# LifeExtension®

The ULTIMATE Source For New Health And Medical Findings From Around The World

LifeExtension.com

December 2017

## How Bone Loss Speeds Aging

Plant Protein  
Reduces  
Muscle Loss

Restore Youthful  
Hair, Skin & Nails

Novel Chewable  
Mineral Lozenge



0 09281 01139 2

**SUZANNE SOMERS**  
*Talks about her health and journey through life  
with husband Alan Hamel*



# PREMIER

PREMIUM REWARDS

MKMKZAV/170801



**FREE**  
Unlimited  
Shipping



**4%**  
Back On  
Purchases

**ALL YEAR LONG**

**\$50 Bonus Credit**

Use now or  
save for later.

**Worry Free**

No auto-enrollment.  
Cancel anytime.

**Join Premier Today!** Only \$49.95 per year

Visit [LifeExtension.com/YourPremier](http://LifeExtension.com/YourPremier) • Call 1-866-542-9357 toll-free  
Use code **YRX703A**

**LifeExtension®**

Premier service is good for a full 12 months from the date of purchase or renewal, and can only be renewed after 6 months from the date of your last Premier purchase or renewal. Redeem LE Dollars to purchase virtually anything we sell, including products, blood tests, sale items, and even shipping fees! At the rate of 1 LE dollar equal to \$1 U.S. Dollar at checkout. FREEunlimited standard delivery (3 to 5 business days) to any mailing address within the 50 U.S. states, excluding U.S. territories. Also includes discounts on non-standard shipping and shipping outside of the U.S. International customers can join Premier for \$59.95 Enjoy all the rewards of Premier.

Volume Twenty Three / Number Twelve • December 2017



### REPORTS

#### 26 RHODIOLA QUICKLY COMBATS FATIGUE

Fatigue is a common complaint heard by physicians. A new study shows that low-cost **rhodiola extract** improves symptoms of fatigue in *less than a week*.

#### 34 CONVENIENT WAY TO MAINTAIN BONE HEALTH

**Osteoporosis** prevention requires sufficient intake of calcium, magnesium, zinc, boron, and vitamin D. Until now, four capsules had to be swallowed each day. A new chocolate **chewable tablet** simplifies skeletal maintenance by providing optimal potencies of **bone-building** nutrients.

#### 54 PEA PROTEIN: A DAIRY-FREE OPTION

Some older adults require *more* protein to avoid frailty and muscle wasting. Organic **pea protein** powder provides a nutrient-dense, low-fat protein that is high in essential amino acids, with excellent digestibility.

#### 64 REBUILD SKIN, HAIR, AND NAILS FROM WITHIN

Oral ingestion of collagen peptides, solubilized keratin, biotin, and silicon can help restore youthful skin, hair, and nails.

#### 75 RESEARCH UPDATE: ASTAXANTHIN AND CANCER

Scientists have discovered that **astaxanthin** may combat **cancer**—including liver, colorectal, lung, and prostate malignancies—through six different mechanisms.



### DEPARTMENTS

#### 17 IN THE NEWS

Coffee drinkers may live longer; curcumin shows promise against zika; brain benefit of blueberries; green tea associated with lower mortality risk; high cholesterol triggers osteoarthritis; latest protocols in *Disease Prevention and Treatment* book.



#### 83 HEALTHY EATING: THE HAPPINESS DIET

Try these four sample recipes from the book *The Happiness Diet*, a guide to meals that not only counter depression, but also target mental clarity, energy, and quality sleep.

#### 89 WELLNESS PROFILE: DANIEL COHN: LIVING THE GOOD LIFE

Wine company CEO Dan Cohn's rigorous work and travel schedule would pose a serious health risk if it weren't for his life routine, philosophy, and supplement program.



#### 95 BOOK REVIEW: THE WHOLE FOODS DIET

Discussing his new book, *The Whole Foods Diet: The Lifesaving Plan for Health and Longevity*, Whole Foods Market cofounder John Mackey explores the link between a plant-based diet and reducing disease and obesity.



#### 99 SUPER FOODS: KALE

**Kale** is one of the most nutrient-dense foods on Earth, boosting anticancer effects, oxidant reduction, and vision protection.



#### ON THE COVER

#### 7 HOW BONE LOSS ACCELERATES AGING

Osteoporosis causes release of **growth factors** that contribute to degenerative illnesses. Maintaining strong bones not only protects against **fractures**, but reduces **vascular, inflammatory** and **malignancy** risks.



#### 47 SUZANNE SOMERS INTERVIEW

In a highly personalized memoir, **Suzanne Somers** reveals her health and career struggles and how she took on the **pharmaceutical industry** to protect women against conventional hormone-replacement **drugs**.

### Connect with Life Extension on the Web!



[Facebook.com/LifeExtension](http://Facebook.com/LifeExtension)

For instant access to special offers and promotions, product news, and exclusive health and wellness information.



[Twitter.com/LifeExtension](http://Twitter.com/LifeExtension)

For up-to-the-minute health tips, breaking industry news, and the latest updates in medical research.

Customer care is available to take your calls  
**24 hours a day, 7 days a week.**

### Visit the Life Extension Nutrition Center Store

- The Most Complete Line of Life Extension Supplements
- Blood Testing and Analysis
- Personal Consultation with Life Extension Product/Wellness Specialist



Nutrition Center of Florida, Inc.  
5990 North Federal Highway,  
Fort Lauderdale, FL 33308-2633 • 954-766-8144

Monday-Friday 9 am-8 pm,  
Saturday 9 am-6 pm, Sunday 11 am-5 pm

### Publisher • LE Publications, Inc.

#### Editorial

Editor-in-Chief • Philip Smith  
Executive Managing Editor • Renee Price  
Medical Editor • Hernando Latorre, MD, MSc  
Senior Copy Editor • Laurie Mathena  
Senior Staff Writer • Michael Downey  
Associate Writer • Garry Messick  
Creative Director • Robert Vergara  
Art Director • Alexandra Maldonado

#### Chief Medical Officer

Steven Joyal, MD

#### Scientific Advisory Board

Örn Adalsteinsson, PhD • Richard Black, DO • John Boik, PhD • Aubrey de Grey, PhD  
Frank Eichhorn, MD • Deborah F. Harding, MD • Steven B. Harris, MD  
Peter H. Langsjoen, MD, FACC • Dipnarine Maharaj, MD • Ralph W. Moss, PhD  
Michael D. Ozner, MD, FACC • Jonathan V. Wright, MD, Xiaoxi Wei, PhD

#### Director of Scientific Affairs

Anita Boddie, PhD, FACP, RDN

#### Contributors

Michael Downey • Garry Messick • Jack H. Raber, Pharm D.  
Susan Rogers • Jon VanZile • Margaret Willington

#### Advertising

Vice President of Marketing • Rey Searles • [rsearles@lifeextension.com](mailto:rsearles@lifeextension.com)  
National Advertising Manager • Leslie Stockton • 404-347-1755

#### Vice President of Sales and Business Development

Ron Antriasian • [rantriasian@lifeextension.com](mailto:rantriasian@lifeextension.com) • 781-271-0089

#### Circulation & Distribution

Life Extension • 3600 West Commercial Blvd., Fort Lauderdale, FL 33309  
Editorial offices: 954-766-8433 • fax: 954-491-5306

#### Customer Service: 800-678-8989

Email: [customerservice@LifeExtension.com](mailto:customerservice@LifeExtension.com)

Wellness specialists: 800-226-2370 • Wellness email: [wellness@LifeExtension.com](mailto:wellness@LifeExtension.com)

At *Life Extension Magazine*® we value your opinion and welcome feedback.

Please mail your comments to *Life Extension Magazine*,

Attn: Letters to the Editor, PO Box 407198, Fort Lauderdale, FL 33340  
or email us: [LEmagazine@LifeExtension.com](mailto:LEmagazine@LifeExtension.com)

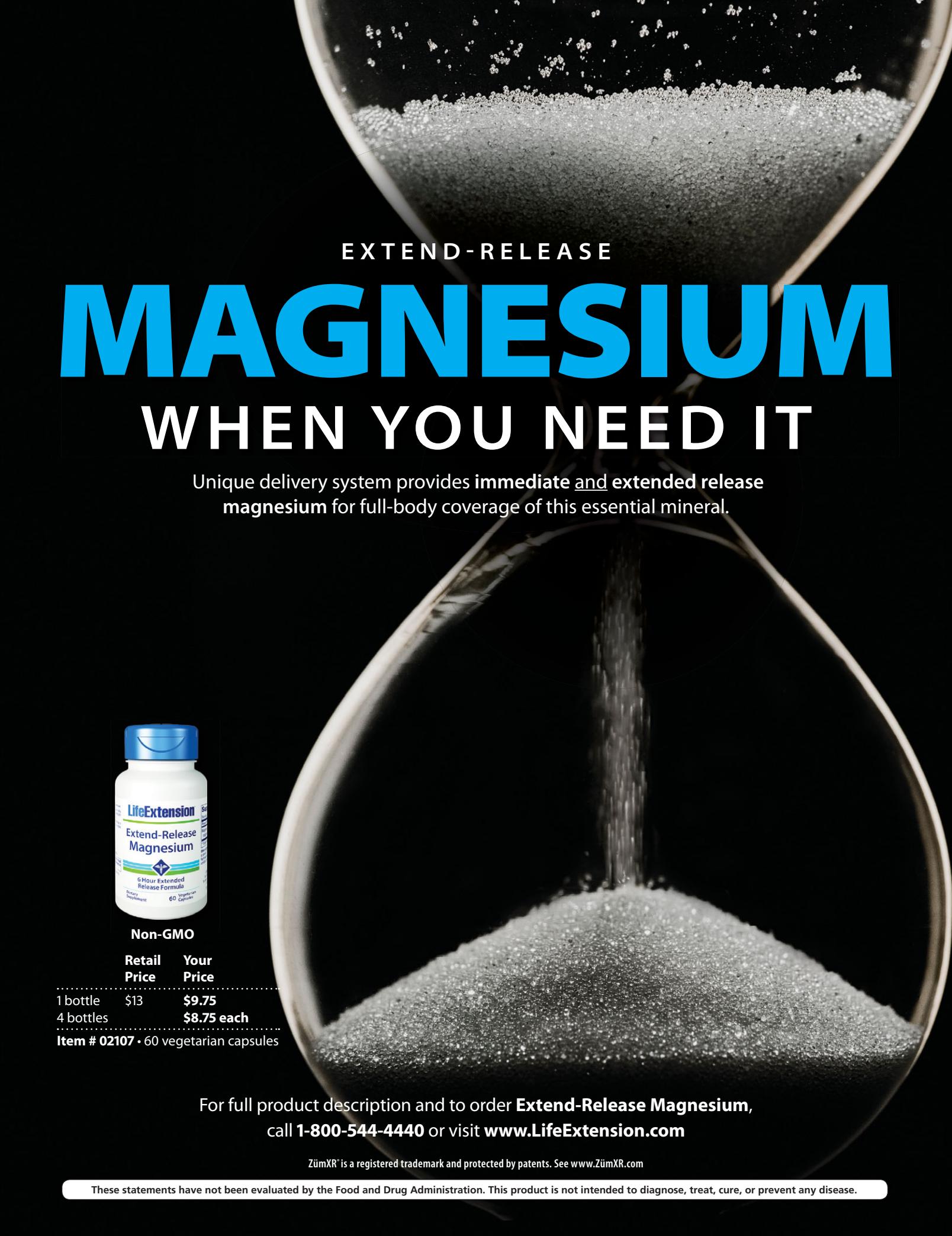


Ratings based on results of the  
2017 ConsumerLab.com  
Survey of Supplement Users.  
More information at  
[www.consumerlab.com/survey2017](http://www.consumerlab.com/survey2017).



NSF  
International  
GMP Registered  
Dietary Supplements

LIFE EXTENSION (ISSN 1524-198X) Vol. 23, No. 12 ©2017 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® 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 Life Extension magazine® 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.



EXTEND-RELEASE

# MAGNESIUM

## WHEN YOU NEED IT

Unique delivery system provides **immediate and extended release** magnesium for full-body coverage of this essential mineral.



**Non-GMO**

Retail Price	Your Price
1 bottle	\$13
4 bottles	\$8.75 each

Item # 02107 • 60 vegetarian capsules

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

ZümXR® is a registered trademark and protected by patents. See [www.ZümXR.com](http://www.ZümXR.com)

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

**Gustavo Tovar Baez, MD**, operates the Life Extension Clinic in Caracas, Venezuela. He is the first physician in Caracas to specialize in anti-aging medicine.

**Ricardo Bernales, MD**, is a board-certified pediatrician and general practitioner in Chicago, IL, focusing on allergies, bronchial asthma, and immunodeficiency.

**Mark S. Bezzek, MD, FACP, FAARM, FAAEM**, is board-certified in internal medicine, emergency medicine, and anti-aging/regenerative medicine. He is the director of Med-Link Consulting, which specializes in bioidentical hormone replacement therapy, natural alternatives, anti-aging, and degenerative diseases. He holds US patents for a multivitamin/mineral supplement, an Alzheimer's/dementia compilation, and a diabetic regimen.

**Thomas F. Crais, MD, FACS**, a board-certified plastic surgeon, was medical director of the microsurgical research and training lab at Southern Baptist Hospital in New Orleans, LA, and currently practices in Sun Valley, ID.

**William Davis, MD**, is a preventive cardiologist and author of *Wheat Belly: Lose the Wheat, Lose the Weight and Find Your Path Back to Health*. He is also medical director of the online heart disease prevention and reversal program, *Track Your Plaque* ([www.trackyourplaque.com](http://www.trackyourplaque.com)).

**Martin Dayton, MD, DO**, practices at the Sunny Isles Medical Center in North Miami Beach, FL. His focus is on nutrition, aging, chelation therapy, holistic medicine, and oxidative medicine.

**John DeLuca, MD, DC**, is a 2005 graduate of St. George's University School of Medicine. He completed his internal medicine residency at Monmouth Medical Center in Long Branch, NJ, in 2008 and is board-certified by the American Board of Internal Medicine. Dr. DeLuca is a Diplomate of the American Academy of Anti-Aging Medicine and has obtained certifications in hyperbaric medicine, pain management, nutrition, strength and conditioning, and manipulation under anesthesia.

**Sergey A. Dzugan, MD, PhD**, was formerly chief of cardiovascular surgery at the Donetsk Regional Medical Center in Donetsk, Ukraine. Dr. Dzugan's current primary interests are anti-aging and biological therapy for cancer, cholesterol, and hormonal disorders.

**Patrick M. Fratellone, MD, RH**, is the founder and executive medical director of Fratellone Associates. He completed his internal medicine and cardiology fellowship at Lenox Hill Hospital in 1994, before becoming the medical director for the Atkins Center for Complementary Medicine.

**Carmen Fusco, MS, RN, CNS**, is a research scientist and clinical nutritionist in New York City who has lectured and written numerous articles on the biochemical approach to the prevention of aging and degenerative diseases.

**Norman R. Gay, MD**, is proprietor of the Bahamas Anti-Aging Medical Institute in Nassau, Bahamas. A former member of the Bahamian Parliament, he served as Minister of Health and Minister of Youth and Sports.

**Mitchell J. Ghen, DO, PhD**, holds a doctorate in holistic health and anti-aging and serves on the faculty of medicine at the Benemerita Universidad Autonoma De Puebla, Mexico, as a professor of cellular hemopoietic studies.

**Gary Goldfaden, MD**, is a clinical dermatologist and a lifetime member of the American Academy of Dermatology. He is the founder of Academy Dermatology of Hollywood, FL, and COSMESIS Skin Care.

**Miguelangelo Gonzalez, MD**, is a certified plastic and reconstructive surgeon at the Miguelangelo Plastic Surgery Clinic, Cabo San Lucas.

**Garry F. Gordon, MD, DO**, is a Payson, AZ-based researcher of alternative approaches to medical problems that are unresponsive to traditional therapies. He is president of the International College of Advanced Longevity Medicine.

**Richard Heifetz, MD**, is a board-certified anesthesiologist in Santa Rosa, CA, specializing in the delivery of anesthesia for office-based plastic/cosmetic surgery, chelation therapy, and pain management.

**Roberto Marasi, MD**, is a psychiatrist in Brescia and in Piacenza, Italy. He is involved in anti-aging strategies and weight management.

**Maurice D. Marholin, DC, DO**, is a licensed chiropractic physician and board-certified osteopathic family physician. While training at the University of Alabama, he completed Fellowships in Clinical Nutrition and Behavioral Medicine. He is currently in private practice in Clermont, FL.

**Prof. Francesco Marotta, MD, PhD**, of Montenapoleone Medical Center, Milan, Italy, is a gastroenterologist and nutrigenomics expert with extensive international university experience. He is also a consulting professor at the WHO-affiliated Center for Biotech & Traditional Medicine, University of Milano, Italy and hon. res. professor, Human Nutrition Dept, TWU, USA. He is the author of over 130 papers and 400 congress lectures.

**Philip Lee Miller, MD**, is founder and medical director of the Los Gatos Longevity Institute in Los Gatos, CA.

**Michele G. Morrow, DO, FAAFP**, is a board-certified family physician who merges mainstream and alternative medicine using functional medicine concepts, nutrition, and natural approaches.

**Filippo Ongaro, MD**, is board-certified in anti-aging medicine and has worked for many years as flight surgeon at the European Space Agency. He is considered a pioneer in functional and anti-aging medicine in Italy where he also works as a journalist and a writer.

**Herbert Pardell, DO, FAAIM**, practices internal medicine at the Emerald Hills Medical Center in Hollywood, FL. He is a medical director of the **Life Extension Foundation**.

**Lambert Titus K. Parker, MD**, an internist and a board-certified anti-aging physician, practices integrative medicine from a human ecology perspective with emphasis on personalized brain health, biomarkers, genomics and total health optimization. He serves as the Medical Director of Integrative Longevity Institute of Virginia, a 501(c)3 Non-Profit Medical Research Institute. He also collaborates on education and research for Hampton Roads Hyperbaric Therapy.

**Ross Pelton, RPh, PhD, CCN**, is scientific director for Essential Formulas, Inc.

**Patrick Quillin, PhD, RD, CNS**, is a clinical nutritionist in Carlsbad, CA, and formerly served as vice president of nutrition for Cancer Treatment Centers of America, where he was a consultant to the National Institutes of Health.

**Allan Rashford, MD**, graduated from the University of Iowa Medical School. Upon completing medical training, he became chief of medicine at St. Francis Hospital in South Carolina, and he was later named president of the Charleston Medical Society.

**Marc R. Rose, MD**, practices ophthalmology in Los Angeles, CA, and is president of the Rose Eye Medical Group. He is on the staff of Pacific Alliance Medical Center, Los Angeles, and other area hospitals.

**Michael R. Rose, MD**, a board-certified ophthalmologist with the Rose Eye Medical Group in Los Angeles, CA, is on the staff of the University of Southern California and UCLA.

**Ron Rothenberg, MD**, is a full clinical professor at the University of California San Diego School of Medicine and founder of California HealthSpan Institute in San Diego, CA.

**Roman Rozencwajg, MD**, is a pioneer in research on melatonin and aging. He practices in Montreal, Canada, as research associate at Montreal General Hospital, Department of Medicine, McGill University.

**Michael D. Seidman, MD, FACS**, is the director of skull base surgery and wellness for the Adventist Health System in Celebration, FL.

**Ronald L. Shuler, BS, DDS, CCN, LN**, is involved in immunoncology for the prevention and treatment of cancer, human growth hormone secretagogues, and osteoporosis. He is board-certified in anti-aging medicine.

**Paul Wand, MD**, Fort Lauderdale, FL, is a clinical neurologist with special expertise in treating and reversing diabetic peripheral neuropathy and brain injuries from various causes.

# Scientific Advisory Board



**Örn Adalsteinsson, PhD**, is chairman of the **Life Extension**® Scientific Advisory board. He holds a master's and doctorate from the Massachusetts Institute of Technology (MIT). He has specialized in human therapeutics including vaccines, monoclonal antibodies, product development, nutraceuticals, formulations, artificial intelligence, hormones, and nutritional supplementation. He has also authored articles and contributed to peer-reviewed publications and served as an editor for the *Journal of Medicinal Food*.



**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 obtained 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 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.



**Frank Eichhorn, MD**, is a urologist specializing in prostate cancer for 10 years. He has a private practice in Bad Reichenhall, Germany, and is prostate cancer consultant at the Urologische Klinik Castringius, Planegg, Munich. In his integrative approach to prostate cancer he works together with an international network of experts to improve treatment outcomes for prostate cancer patients with a special focus on natural and translational medicine.



**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 new University of Central Florida Medical School.



**Steven B. Harris, MD**, is president and director of research at Critical Care Research, a company that grew out of 21st Century Medicine in Rancho Cucamonga, CA. Dr. Harris participates 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), FRCPPath., FACP**

Dr. Dipnarine Maharaj is the Medical Director of the South Florida Bone Marrow Stem Cell Transplant Institute 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.



**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](http://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 over 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.



# 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 (the metabolically active form, shown to protect lipids and proteins against **glycation** reactions) and the most biologically active form of **folate** called **5-methyltetrahydrofolate (5-MTHF)**, which is up to **7 times** more bioavailable than folic acid.<sup>1</sup>



## BioActive Complete B-Complex

Item #01945 • 60 vegetarian capsules

	Retail Price	Your Price
1 bottle	\$12	<b>\$9</b>
4 bottles		<b>\$8 each</b>

For full product description and to order

**BioActive Complete B-Complex**, call

**1-800-544-4440** or visit [www.LifeExtension.com](http://www.LifeExtension.com)

**Non-GMO**

**Reference**

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



# How Bone Loss Accelerates Aging

BY WILLIAM FALOON

When people think about **osteoporosis**, they assume it refers **only** to decreased **bone density** and increased **fracture risk**.

The reality is far worse.

As skeletal mass is lost, bone-derived **growth factors** are released that may contribute to **atherosclerosis**,<sup>1,2</sup> **inflammation**,<sup>3,4</sup> **calcification**,<sup>5,6</sup> and **cancer**.<sup>7-9</sup>

Osteoporosis is mostly associated with **women**, but it also occurs in **men**. In both men and women, it lays the groundwork for chronic age-related illnesses. These pathologies almost always develop before bone loss is detected.

Maintaining skeletal integrity is a lifelong process that involves the dissolving of old bone and precise restoration by laying down minerals such as **calcium**.

In the absence of bone-building **nutrients** and **hormones**, growth factors that should remain in **bone** are instead released into the **blood** where they create systemic havoc.

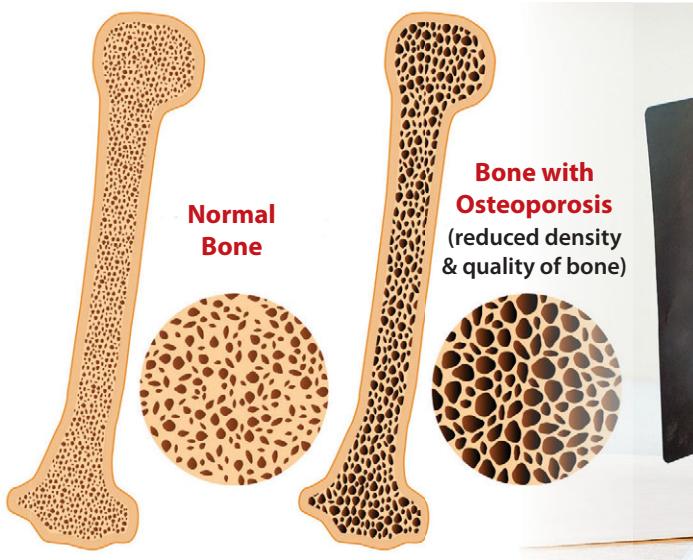
Osteoporosis in **men** is underestimated. In the setting of newly diagnosed **prostate cancer**, evidence of significant **bone loss** has been observed virtually **100%** of the time.<sup>10-15</sup> Prostate cancer-cell propagation increases in response to **growth factors** released as bone remodels.<sup>7,16</sup>

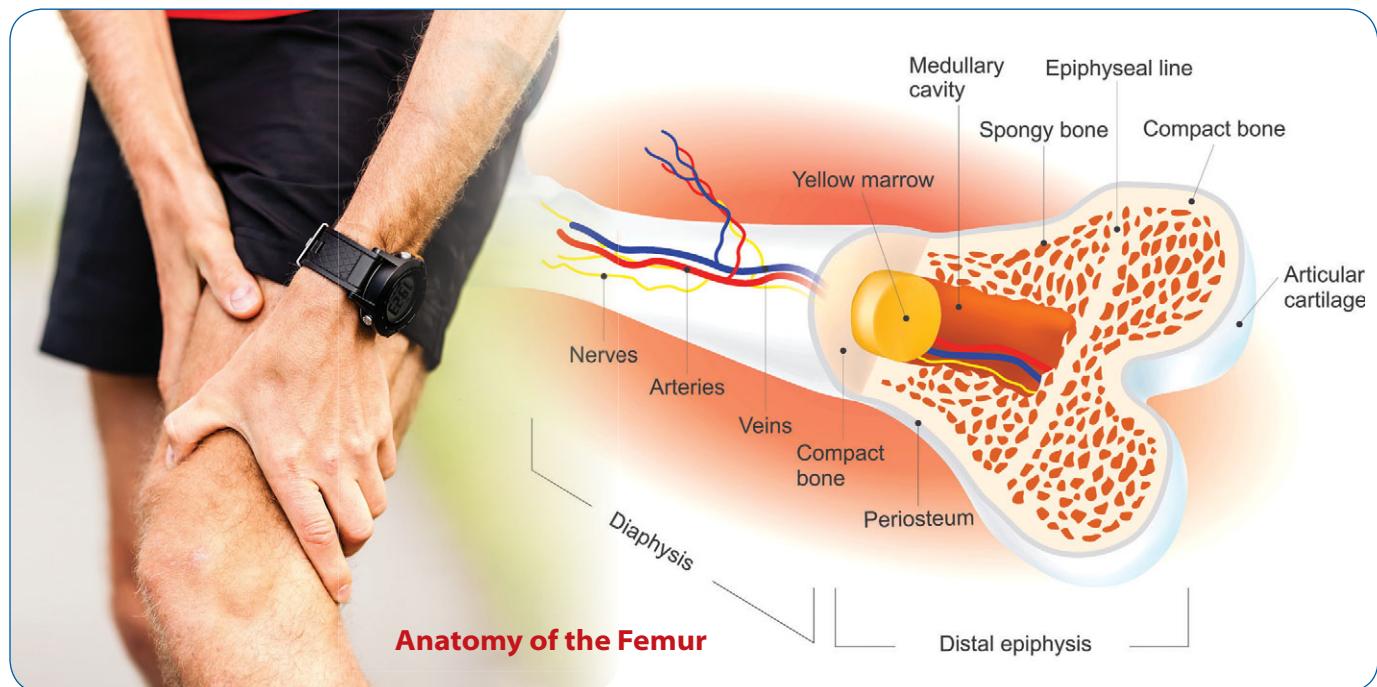
When osteoporotic **fractures** occur in older men, death rates are higher than women with fractures.<sup>17,18</sup>

Awareness of **osteoporosis risk** motivates health-conscious women (and some men) to proactively protect against bone loss.

For those who want to reduce their intake of encapsulated **minerals**, a chewable tablet now provides **optimal** potencies with a natural chocolate-flavor taste.

This issue of ***Life Extension Magazine***<sup>®</sup> describes hidden causes of **bone loss** that can be rectified with lifestyle changes, hormone/mineral balance, and avoidance of bone-depleting drugs.





People may lose **bone mass** at any age, and it is a common part of normal degenerative processes.

Documented methods exist to slow and reverse bone loss.

As bone density declines, inflammatory cytokines are released into the blood such as **interleukin-6, tumor necrosis factor-alpha**, and **interleukin 1**.<sup>19-21</sup>

These **pro-inflammatory** factors may accelerate **vascular** disease and **dementia** while shortening overall longevity.<sup>22-26</sup> It is important to note that inflammation, aging and cancer are interrelated.

**Bone** contains **growth factors** that are needed to maintain skeletal density. When bone breaks down, these **growth factors** are released into the blood where they can fuel **cancer** cell propagation.<sup>10,11</sup>

**Testosterone** plays an important role in maintaining bone density in men.<sup>27,28</sup> Women rely more on **estrogen** and **progesterone**.<sup>29,30</sup>

Both sexes can benefit from **DHEA**, a hormone that converts to **estrogen** and **testosterone** in a highly individualistic manner.<sup>31</sup>

What's important to understand is that **bone** is not static. Our skeleton comprises energized tissues that are rich in **bone-derived growth factors**.

Keeping these **growth factors** in bone and out of soft tissues is essential for healthy longevity.

## Overlooked Role of Magnesium

When **Life Extension®** was founded 37 years ago, most dietary supplements designed to prevent **osteoporosis** contained only **calcium** and a little **vitamin D**.

We argued that **magnesium** was also important to maintain aging bones.

A large volume of evidence now substantiates the role **magnesium** plays in bone health.<sup>32-36</sup>

A study published in **2017** produced compelling findings show-

ing that low serum magnesium concentration is **independently** associated with an increased risk of **fractures** in middle-aged Caucasian men.<sup>37</sup>

For this study, researchers evaluated 2,200 men over a median follow-up of **25.6** years. They found that **men** in the lowest quartile of serum **magnesium** had a **two-fold increased** risk of **bone fractures**, compared to those in the highest quartile. This study found that **63.4%** of those fractures involved the femur—the major weight-bearing bone of the lower extremity.

Of 22 men in this study with above-normal **magnesium** levels at baseline, none experienced a **fracture**.

What's revealing here is that only **1%** of men had above-normal **magnesium** serum levels. This may indicate how widespread **magnesium deficiency** is in the general population.

The researchers who conducted this study commented that it would be difficult for aging people to obtain optimal blood

magnesium levels via **diet**. They suggested using **supplements** to ensure *higher* magnesium blood levels.

When looking at the data showing magnesium's multiple benefits, it makes sense to ensure one is obtaining optimal amounts of this **mineral** that is deficient in most American diets.

## Osteoporosis Runs Rampant

**Bone fractures** are a leading cause of disability and ill health among the aging population.<sup>37</sup> Fracture incidence worsens as more people are prescribed bone-robbing **drugs** in the face of epidemic **nutrient** deficiencies.

In American white women over age 50, roughly **four in ten** will experience a hip, spine or wrist **fracture** sometime during the remainder of their lives. Lifetime risk of fractures will increase for all ethnic groups as people live longer.<sup>38</sup>

By **2020**, one of every two Americans over age 50 is expected to have, or be at risk of developing, **osteoporosis** of the hip. Even more will be at risk of developing osteoporosis at any skeletal site.<sup>38</sup>

The high prevalence of osteoporosis in **women** has caused many **men** to be complacent about their bone health.

We at **Life Extension** have observed clinical data indicating that **bone loss** is associated with **coronary artery blockage**, **carotid artery/aortic valve stenosis** and/or **prostate cancer**.<sup>39-47</sup>

In other words, as **bone mass** breaks down and releases its contents into the blood, there is systemic **ossification** (bone formation) of **soft tissues** and wide-

spread **inflammation**, along with **bone-derived growth factors** acting as biological fuel for **cancer cell** proliferation.

So in a nutshell, maintaining and restoring youthful **bone density** reduces not only **fractures** but also risk of the most common degenerative disorders.

## You Don't Have to be a Victim!

Data on **osteoporosis** incidence is frightening. One should find comfort that they have the ability to **improve** bone health at any age.

Bone loss is exacerbated in those who ingest excess phosphates (such as those found in soda beverages), consume too

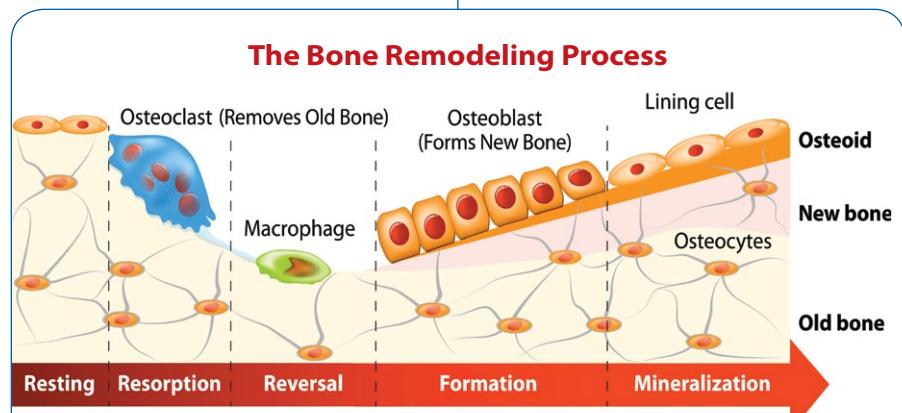
much alcohol, and/or smoke cigarettes.<sup>48-54</sup>

**Thyroid** or **parathyroid** disorders can cause **bone density loss**,<sup>55-57</sup> as can **sex hormone** deficits (estrogen, testosterone, progesterone, DHEA).<sup>29,58-61</sup>

Loss of bone mass is attributed to **mineral deficiencies** such as boron, magnesium and calcium.<sup>37,62-64</sup>

**Vitamin K2** is essential to keep **calcium** in **bone** and out of **soft tissues** like **arteries** and **heart valves**.<sup>65-69</sup>

Those taking any **drug** that causes bone mass loss should be particularly vigilant. We describe common **bone-depleting drugs** in the osteoporosis article appearing on page 34 of this month's issue.



## Bone Is Living Tissue

Lay people often mistakenly think of bone as calcified rock that slowly erodes with aging.

In reality, your bones "remodel" through a lifelong process where old bone tissue is removed from the skeleton and new bone tissue formed.<sup>70,71</sup>

An imbalance in the regulation of bone "remodeling" results in disorders such as osteoporosis.<sup>71</sup>

Bone tissue is removed by osteoclasts, and new bone tissue is formed by osteoblasts. Both processes utilize the signaling cytokines **transforming growth factor-beta** (TGF- $\beta$ ) and **insulin-like growth factor** (IGF).<sup>72,73</sup>

When bone breaks down, it releases **TGF-B** and **IGF** into the **blood** where these **growth factors** can fuel **cancer** cell proliferation.<sup>74,75</sup>

## New Way to Take Bone-Building Minerals

There are a number of well-designed formulas that provide calcium, magnesium and other nutrients for bone health. To obtain optimal potencies, consumers usually have to swallow about four capsules a day.

**Minerals** don't taste bad the way B-vitamins and some amino acids do.

That prompted us to combine optimal potencies of **calcium, magnesium, boron** and other nutrients to create a pleasant-tasting **chewable chocolate tablet**.

I was surprised when I tried this **mineral tablet** because it

tasted as good as sugar-free chocolate I've used in the past.

Just two of these nice-tasting tablets provide the same potencies of nutrients as are found in **four** capsules of popular bone-building formulas.

No one should risk complications of **osteoporosis** when there are **low-cost** options available, with robust published scientific data to support efficacy.

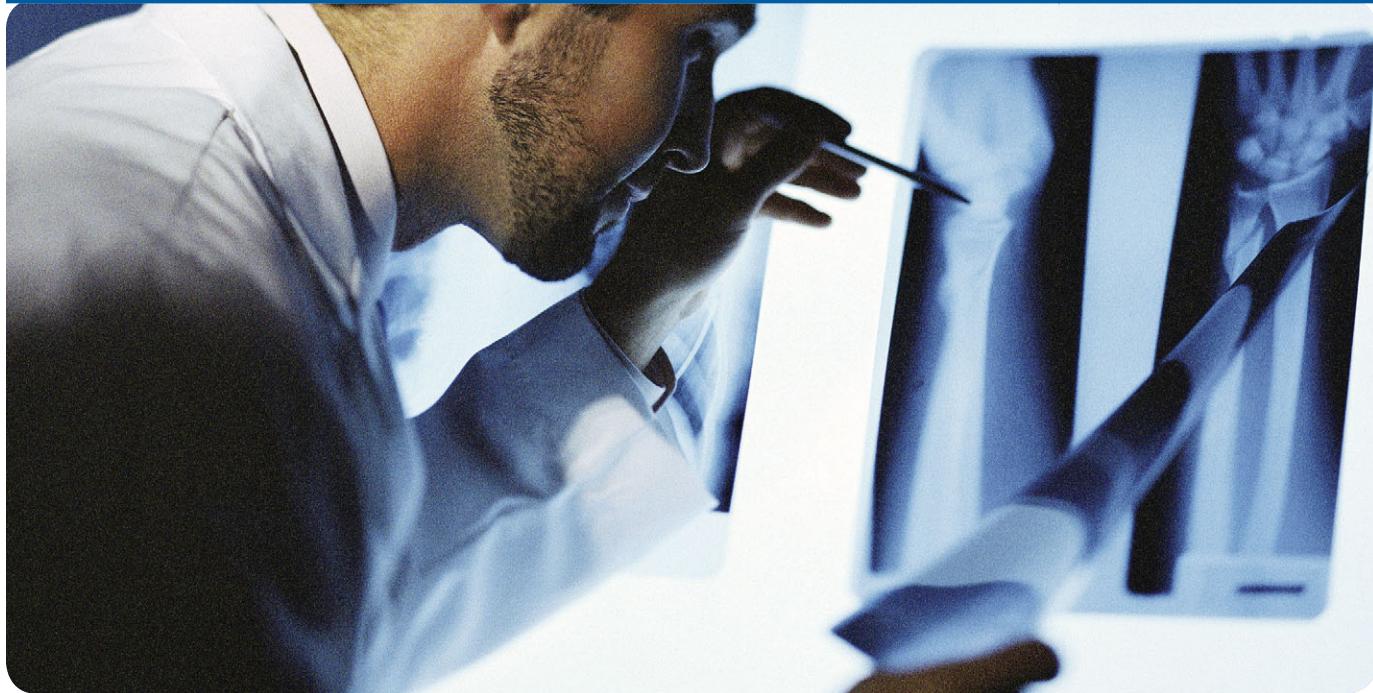
For longer life,



William Faloon, Co-Founder  
Life Extension Buyers Club

## References

1. Hamerman D. Osteoporosis and atherosclerosis: biological linkages and the emergence of dual-purpose therapies. *Ojm*. 2005;98(7):467-84.
2. Toma I, McCaffrey TA. Transforming growth factor-beta and atherosclerosis: interwoven atherogenic and atheroprotective aspects. *Cell Tissue Res*. 2012;347(1):155-75.
3. Lerner UH. Inflammation-induced bone remodeling in periodontal disease and the influence of post-menopausal osteoporosis. *J Dent Res*. 2006;85(7):596-607.
4. Bussard KM, Venzon DJ, Mastro AM. Osteoblasts are a major source of inflammatory cytokines in the tumor microenvironment of bone metastatic breast cancer. *J Cell Biochem*. 2010;111(5):1138-48.
5. Danilevicius CF, Lopes JB, Pereira RM. Bone metabolism and vascular calcification. *Braz J Med Biol Res*. 2007;40(4):435-42.
6. Pal SN, Clancy P, Golledge J. Circulating concentrations of stem-cell-mobilizing cytokines are associated with levels of osteoprogenitor cells and aortic calcification severity. *Circ J*. 2011;75(5):1227-34.
7. Reis ST, Pontes-Junior J, Antunes AA, et al. Tgf-beta1 expression as a biomarker of poor prognosis in prostate cancer. *Clinics (Sao Paulo)*. 2011;66(7):1143-7.
8. Kingsley LA, Fournier PGJ, Chirgwin JM, et al. Molecular Biology of Bone Metastasis. *Molecular Cancer Therapeutics*. 2007;6(10):2609-17.
9. Yin JJ, Selander K, Chirgwin JM, et al. TGF-beta signaling blockade inhibits PTHrP secretion by breast cancer cells and bone metastases development. *J Clin Invest*. 1999;103(2):197-206.
10. Roodman GD. Mechanisms of bone metastasis. *Discov Med*. 2004;4(22):144-8.
11. Farhat GN, Taioli E, Cauley JA, et al. The association of bone mineral density with prostate cancer risk in the Osteoporotic Fractures in Men (MrOS) Study. *Cancer Epidemiol Biomarkers Prev*. 2009;18(1):148-54.
12. Israeli RS. Managing bone loss and bone metastases in prostate cancer patients: a focus on bisphosphonate therapy. *Rev Urol*. 2008;10(2):99-110.
13. Berruti A, Dogliotti L, Terrone C, et al. Changes in bone mineral density, lean body mass and fat content as measured by dual energy x-ray absorptiometry in patients with prostate cancer without apparent bone metastases given androgen deprivation therapy. *J Urol*. 2002;167(6):2361-7; discussion 7.
14. So A, Chin J, Fleshner N, et al. Management of skeletal-related events in patients with advanced prostate cancer and bone metastases: Incorporating new agents into clinical practice. *Can Urol Assoc J*. 2012;6(6):465-70.



15. Saad F, Olsson C, Schulman CC. Skeletal morbidity in men with prostate cancer: quality-of-life considerations throughout the continuum of care. *Eur Urol*. 2004;46(6):731-39; discussion 9-40.

16. Available at: [https://s3.amazonaws.com/curetoday/media/u02/data/htdocs/media/downloads/documents/BoneHealth\\_PG\\_rev\\_b.pdf](https://s3.amazonaws.com/curetoday/media/u02/data/htdocs/media/downloads/documents/BoneHealth_PG_rev_b.pdf). Accessed September 12, 2017.

17. Center JR, Nguyen TV, Schneider D, et al. Mortality after all major types of osteoporotic fracture in men and women: an observational study. *Lancet*. 1999;353(9156):878-82.

18. Kamel HK. Male osteoporosis: new trends in diagnosis and therapy. *Drugs Aging*. 2005;22(9):741-8.

19. Lacativa PG, Farias ML. Osteoporosis and inflammation. *Arq Bras Endocrinol Metabol*. 2010;54(2):123-32.

20. Omoigui S. The Interleukin-6 inflammation pathway from cholesterol to aging – Role of statins, bisphosphonates and plant polyphenols in aging and age-related diseases. *Immunity & Ageing*. 2007;4(1):1.

21. Ginaldi L, Di Benedetto MC, De Martinis M. Osteoporosis, inflammation and aging. *Immunity & Ageing*. 2005;2(1):14.

22. Engelhart MJ, Geerlings MI, Meijer J, et al. Inflammatory proteins in plasma and the risk of dementia: the rotterdam study. *Arch Neurol*. 2004;61(5):668-72.

23. Sprague AH, Khalil RA. Inflammatory cytokines in vascular dysfunction and vascular disease. *Biochem Pharmacol*. 2009;78(6):539-52.

24. Sundelof J, Kilander L, Helmersson J, et al. Systemic inflammation and the risk of Alzheimer's disease and dementia: a prospective population-based study. *J Alzheimers Dis*. 2009;18(1):79-87.

25. Franceschi C, Capri M, Monti D, et al. Inflammaging and anti-inflammaging: a systemic perspective on aging and longevity emerged from studies in humans. *Mech Ageing Dev*. 2007;128(1):92-105.

26. Varadhan R, Yao W, Matteini A, et al. Simple biologically informed inflammatory index of two serum cytokines predicts 10 year all-cause mortality in older adults. *J Gerontol A Biol Sci Med Sci*. 2014;69(2):165-73.

27. Spry NA, Galvao DA, Davies R, et al. Long-term effects of intermittent androgen suppression on testosterone recovery and bone mineral density: results of a 33-month observational study. *BJU Int*. 2009;104(6):806-12.

28. Available at: <http://www.medscape.com/viewarticle/846022>. Accessed September 12, 2017.

29. Scheven BA, Damen CA, Hamilton NJ, et al. Stimulatory effects of estrogen and progesterone on proliferation and differentiation of normal human osteoblast-like cells in vitro. *Biochem Biophys Res Commun*. 1992;186(1):54-60.

30. Seifert-Klauss V, Prior JC. Progesterone and bone: actions promoting bone health in women. *J Osteoporos*. 2010;2010:845180.

31. Labrie F, Luu-The V, Labrie C, et al. DHEA and its transformation into androgens and estrogens in peripheral target tissues: intracrinology. *Front Neuroendocrinol*. 2001;22(3):185-212.

32. Tucker KL, Hannan MT, Chen H, et al. Potassium, magnesium, and fruit and vegetable intakes are associated with greater bone mineral density in elderly men and women. *Am J Clin Nutr*. 1999;69(4):727-36.

33. Carpenter TO, DeLucia MC, Zhang JH, et al. A randomized controlled study of effects of dietary magnesium oxide supplementation on bone mineral content in healthy girls. *J Clin Endocrinol Metab*. 2006;91(12):4866-72.

34. Matias CN, Santos DA, Monteiro CP, et al. Magnesium intake mediates the association between bone mineral density and lean soft tissue in elite swimmers. *Magnes Res*. 2012;25(3):120-5.

35. Rude RK, Singer FR, Gruber HE. Skeletal and hormonal effects of magnesium deficiency. *J Am Coll Nutr*. 2009;28(2):131-41.

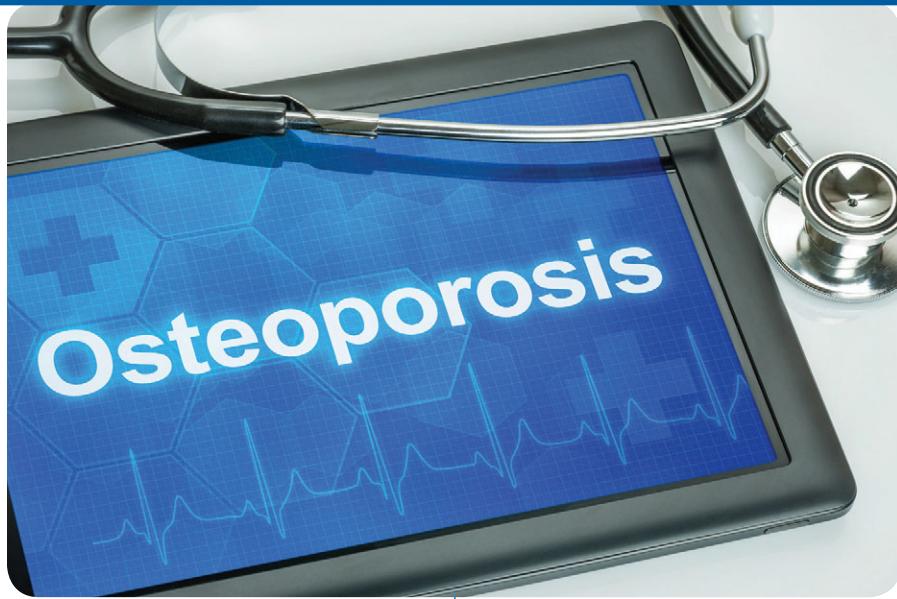
36. Saito N, Tabata N, Saito S, et al. Bone mineral density, serum albumin and serum magnesium. *J Am Coll Nutr*. 2004;23(6):701s-3s.

37. Kunutsor SK, Whitehouse MR, Blom AW, et al. Low serum magnesium levels are associated with increased risk of fractures: a long-term prospective cohort study. *Eur J Epidemiol*. 2017.

38. Available at: <https://www.ncbi.nlm.nih.gov/books/NBK45515/>. Accessed September 13, 2017.

39. Farhat GN, Strotmeyer ES, Newman AB, et al. Volumetric and areal bone mineral density measures are associated with cardiovascular disease in older men and women: the health, aging, and body composition study. *Calcif Tissue Int*. 2006;79(2):102-11.

40. Tanko LB, Bagger YZ, Christiansen C. Low bone mineral density in the hip as a marker of advanced atherosclerosis in elderly women. *Calcif Tissue Int*. 2003;73(1):15-20.



41. Kiel DP, Kauppila LI, Cupples LA, et al. Bone loss and the progression of abdominal aortic calcification over a 25 year period: the Framingham Heart Study. *Calcif Tissue Int.* 2001;68(5):271-6.

42. Broussard DL, Magnus JH. Coronary heart disease risk and bone mineral density among U.S. women and men. *J Womens Health (Larchmt).* 2008;17(3):479-90.

43. Barenholz EI, Berman M, Kukreja SC, et al. Osteoporosis and coronary atherosclerosis in asymptomatic postmenopausal women. *Calcif Tissue Int.* 1998;62(3):209-13.

44. Pfister R, Michels G, Sharp SJ, et al. Inverse association between bone mineral density and risk of aortic stenosis in men and women in EPIC-Norfolk prospective study. *Int J Cardiol.* 2015;178:29-30.

45. Galvao DA, Spry NA, Taaffe DR, et al. Changes in muscle, fat and bone mass after 36 weeks of maximal androgen blockade for prostate cancer. *BJU Int.* 2008;102(1):44-7.

46. Neubecker K, Adams-Huet B, Farukhi IM, et al. Predictors of fracture risk and bone mineral density in men with prostate cancer on androgen deprivation therapy. *J Osteoporos.* 2011;2011:924595.

47. Kim SH, Kim YM, Cho MA, et al. Echogenic carotid artery plaques are associated with vertebral fractures in postmenopausal women with low bone mass. *Calcif Tissue Int.* 2008;82(6):411-7.

48. Fung TT, Arasaradnam MH, Grodstein F, et al. Soda consumption and risk of hip fractures in postmenopausal women in the Nurses' Health Study. *Am J Clin Nutr.* 2014;100(3):953-8.

49. Vartanian LR, Schwartz MB, Brownell KD. Effects of soft drink consumption on nutrition and health: a systematic review and meta-analysis. *Am J Public Health.* 2007;97(4):667-75.

50. Berg KM, Kunins HV, Jackson JL, et al. Association between alcohol consumption and both osteoporotic fracture and bone density. *Am J Med.* 2008;121(5):406-18.

51. Porter SE, Hanley EN, Jr. The musculoskeletal effects of smoking. *J Am Acad Orthop Surg.* 2001;9(1):9-17.

52. Wyshak G, Frisch RE. Carbonated beverages, dietary calcium, the dietary calcium/phosphorus ratio, and bone fractures in girls and boys. *J Adolesc Health.* 1994;15(3):210-5.

53. Mazariegos-Ramos E, Guerrero-Romero F, Rodriguez-Moran M, et al. Consumption of soft drinks with phosphoric acid as a risk factor for the development of hypocalcemia in children: a case-control study. *J Pediatr.* 1995;126(6):940-2.

54. Hannan MT, Felson DT, Dawson-Hughes B, et al. Risk factors for longitudinal bone loss in elderly men and women: the Framingham Osteoporosis Study. *J Bone Miner Res.* 2000;15(4):710-20.

55. Lewiecki EM, Miller PD. Skeletal effects of primary hyperparathyroidism: bone mineral density and fracture risk. *J Clin Densitom.* 2013;16(1):28-32.

56. Williams GR. Actions of thyroid hormones in bone. *Endokrynol Pol.* 2009;60(5):380-8.

57. Zaidi M, Davies TF, Zallone A, et al. Thyroid-stimulating hormone, thyroid hormones, and bone loss. *Curr Osteoporos Rep.* 2009;7(2):47-52.

58. Fink HA, Ewing SK, Ensrud KE, et al. Association of testosterone and estradiol deficiency with osteoporosis and rapid bone loss in older men. *J Clin Endocrinol Metab.* 2006;91(10):3908-15.

59. Kung AW. Androgen and bone mass in men. *Asian J Androl.* 2003;5(2):148-54.

60. Riggs BL, Khosla S, Melton LJ, 3rd. A unitary model for involutional osteoporosis: estrogen deficiency causes both type I and type II osteoporosis in postmenopausal women and contributes to bone loss in aging men. *J Bone Miner Res.* 1998;13(5):763-73.

61. Villareal DT, Holloszy JO, Kohrt WM. Effects of DHEA replacement on bone mineral density and body composition in elderly women and men. *Clin Endocrinol (Oxf).* 2000;53(5):561-8.

62. Pizzorno L. Nothing Boring About Boron. *Integr Med (Encinitas).* 2015;14(4):35-48.

63. Zofkova I, Nemcikova P, Matucha P. Trace elements and bone health. *Clin Chem Lab Med.* 2013;51(8):1555-61.

64. Sunyecz JA. The use of calcium and vitamin D in the management of osteoporosis. *Ther Clin Risk Manag.* 2008;4(4):827-36.

65. Wallin R, Schurgers L, Wajih N. Effects of the blood coagulation vitamin K as an inhibitor of arterial calcification. *Thromb Res.* 2008;122(3):411-7.

66. Zittermann A. Effects of vitamin K on calcium and bone metabolism. *Curr Opin Clin Nutr Metab Care.* 2001;4(6):483-7.

67. Geleijnse JM, Vermeer C, Grobbee DE, et al. Dietary intake of menaquinone is associated with a reduced risk of coronary heart disease: the Rotterdam Study. *J Nutr.* 2004;134(11):3100-5.

68. Jie KS, Bots ML, Vermeer C, et al. Vitamin K intake and osteocalcins levels in women with and without aortic atherosclerosis: a population-based study. *Atherosclerosis.* 1995;116(1):117-23.

69. Beulens JW, Bots ML, Atsma F, et al. High dietary menaquinone intake is associated with reduced coronary calcification. *Atherosclerosis.* 2009;203(2):489-93.

70. Hadjidakis DJ, Androulakis, II. Bone remodeling. *Ann N Y Acad Sci.* 2006;1092:385-96.

71. Feng X, McDonald JM. Disorders of bone remodeling. *Annu Rev Pathol.* 2011;6:121-45.

72. Xiao W, Wang Y, Pacios S, et al. Cellular and Molecular Aspects of Bone Remodeling. *Front Oral Biol.* 2016;18:9-16.

73. Allori AC, Sailon AM, Warren SM. Biological basis of bone formation, remodeling, and repair-part I: biochemical signaling molecules. *Tissue Eng Part B Rev.* 2008;14(3):259-73.

74. Hiraga T, Myoui A, Hashimoto N, et al. Bone-derived IGF mediates cross-talk between bone and breast cancer cells in bony metastases. *Cancer Res.* 2012;72(16):4238-49.

75. Chiechi A, Wanng DL, Stayrook KR, et al. Role of TGF-beta in breast cancer bone metastases. *Adv Biosci Biotechnol.* 2013;4(10c):15-30.



# Tap the Power of **N-Acetyl-L-Cysteine** To Boost Glutathione Levels

**N-acetyl-L-cysteine** supports healthy levels of **glutathione**, a molecule utilized by all cells for protection against free radical damage and attacks from foreign compounds.

## N-Acetyl-L-Cysteine

Item #01534 • 60 vegetarian capsules

	Retail Price	Your Price
1 bottle	\$14	<b>\$10.50</b>
4 bottles		<b>\$9.25 each</b>

### Non-GMO

**Caution:** Those who supplement with NAC should drink six to eight glasses of water daily in order to prevent cysteine renal stones. Cysteine renal stones are rare but do occur.

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



# GIVE YOUR BONES A BOOST



Bone Restore combines skeletal-strengthening nutrients in a four capsule per day formula.



	Retail Price	Your Price
1 bottle	\$22	\$16.50
4 bottles		\$14.25 each

Item #01726 • 120 capsules

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

Fruitex B® and OsteoBoron® are registered trademarks of VDF Futureceuticals, Inc. U.S. patent #5,962,049. DimaCal® and TRAACS® are registered trademarks of Albion Laboratories, Inc. Malate is covered by U.S. patent 6,706,904 and patents pending.

# Bone-Building NUTRIENTS In a Tasty CHEWABLE TABLET



Just two of the new **Bone Restore Chewable Tablets** provide:

Calcium	700 mg
Magnesium	300 mg
Silicon	5 mg
Boron	3 mg
Zinc	2 mg
Manganese	1 mg
Vitamin D3	1000 IU

Note: Recent recommendations for supplemental **calcium** dosing are around **700 mg** based on typical amounts of **dietary** calcium consumed.

To obtain enough **calcium** and other bone-building nutrients requires swallowing four **capsules** a day.

You can now ingest these potencies with two **Chewable Chocolate Tablets** of the new **Bone Restore**.

You'll be pleasantly surprised how good these **Chocolate Chewables** taste.

**ITEM # 02123** • 60 chewable tablets • **Non-GMO** • Retail price \$22 • **Your price \$16.50** • 4 bottles \$14.25 each

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

Chew tablets before swallowing. Keep out of reach of children. Do not exceed recommended dose.

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.



7-Times Better  
Absorption

# Super Bio-Curcumin®



**Super Bio-Curcumin®**  
Item #00407 • 60 vegetarian capsules

	Retail Price	Your Price
1 bottle	\$38	<b>\$28.50</b>
4 bottles		<b>\$26.25 each</b>
Non-GMO		



**Advanced Bio-Curcumin® with  
Ginger & Turmerones**  
Item #01924 • 30 softgels

	Retail Price	Your Price
1 bottle	\$30	<b>\$22.50</b>
4 bottles		<b>\$20.25 each</b>
Non-GMO		



**Super Bio-Curcumin®** features a patented extract from turmeric root that absorbs up to **7 times** better than standard curcumin. This product is ideal for those seeking to support normal cell-cycle growth and healthy inflammatory response.

**Advanced Bio-Curcumin®** contains the same optimal potency of **curcumin** with the added benefits of **ginger** and additional **turmeric** extracts.

Suggested dose for either **Super Bio-Curcumin®** formula is one capsule daily.

For full product description and to order

**Super Bio-Curcumin® or Advanced Bio-Curcumin® with Ginger & Turmerones,**  
call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

Bio-Curcumin® and BCM-95® are registered trademarks of Dolcas-Biotech, LLC. U.S. Patent Nos. 7,883,728, 7,736,679 and 7,879,373.

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.

## Coffee Drinkers May Live Longer

The largest study of its kind to date has revealed an association between drinking approximately three cups of **coffee** per day and a lower risk of mortality from any cause during an average follow-up period of 16.4 years.\*

The study included 521,330 men and women who were enrolled in the *European Prospective Investigation into Cancer and Nutrition* study. Over an average 16.4-year follow-up, there were 41,693 deaths. Among men whose intake of coffee was among the top **25%**, the risk of all-cause mortality over follow-up was **12%** lower than those who did not drink coffee, and for women, the risk was **9%** lower.

Mortality from digestive diseases was **59%** lower for men in the top **25%** and **40%** lower for women.

Women who consumed the highest amount of coffee also benefitted from a **22%** lower risk of circulatory disease mortality and a **30%** lower risk of cerebrovascular disease mortality compared to nondrinkers.

**Editor's Note:** In a subset of subjects, an association was observed between higher coffee intake and lower liver enzyme levels, and for women, an association was also observed with lower C-reactive protein, lipoprotein(a) and glycated hemoglobin levels. "We found that drinking more coffee was associated with a more favorable liver function profile and immune response," observed lead author Dr. Marc Gunter of the International Agency for Research on Cancer. "This, along with the consistency of the results with other studies in the U.S. and Japan gives us greater confidence that coffee may have beneficial health effects."

\* *Ann Intern Med.* 2017 Aug 15;167(4):236-247.



## Curcumin Shows Promise Against Zika

An article in *Antiviral Research* reports that **curcumin**, a compound occurring in the spice turmeric, acts against Zika and chikungunya, two mosquito-borne viruses.\*

Cells were pretreated with curcumin or its analogs prior to infection with chikungunya or Zika. Researchers Bryan C. Mounce and colleagues observed a decrease in the viruses in association with pretreatment with curcumin in comparison with untreated controls. Curcumin was more effective when administered prior to or at the time of infection than after infection.

The compound, when directly administered to the viruses, reduced their infectiousness.

The team determined that curcumin interfered with the binding of enveloped viruses to cell surfaces. The data suggest that curcumin does not destroy viral particles, but alters their membranes, and that curcumin could affect host lipid membranes involved in viral infection.

**Editor's Note:** "Altogether curcumin holds significant promise in the treatment of enveloped virus infection, including outbreak viruses such as Zika virus and chikungunya virus," the authors conclude.

\* *Antiviral Res.* 2017 Mar 24;142:148-157.



## Blueberry Brain Benefit

A randomized, double-blind trial has revealed increased neural response in men and women who supplemented with freeze-dried **blueberry powder** for 16 weeks.\*

Participants between the ages of 68 and 92 with mild cognitive impairment who did not have dementia or other neurologic conditions received either a placebo powder or a powder that provided the equivalent of a half cup of whole blueberries, taken twice daily for 16 weeks. Functional magnetic resonance imaging (fMRI) administered during a task involving working memory was conducted before and after the treatment period to evaluate changes in the brain.

Compared to functional magnetic resonance imaging results at the beginning of the study, participants whose diets were supplemented with **blueberry** powder had significant *increases* in activity in three regions of the brain after treatment, while the placebo group experienced a small region of decreased activation.

**Editor's Note:** Those who received blueberry also experienced improvement in one aspect of memory accuracy. The authors remark that the findings support the hypothesis that flavonoid compounds such as those found in blueberries contribute to improved vascular function.

\* *Nutr Neurosci.* 2017 Feb 21:1-9

## Green Tea Associated With Lower Mortality Risk

An analysis of two ongoing prospective studies conducted in China found an association between regular consumption of **green tea** and a lower risk of cardiovascular and all-cause mortality during a median follow-up period of 8.3 years for men and 14.2 years for women.\*

The analysis included 51,920 men enrolled in the Shanghai Men's Health Study, established in 2002 to 2006, and 64,034 participants in the Shanghai Women's Health Study, established from 1997 to 2000.

During the follow-up periods, 2,741 deaths were documented among the men and 3,776 fatalities occurred among the women. Compared to non-green tea drinkers, there was a **5%** lower adjusted risk of mortality from any cause in association with drinking green tea regularly, and an **11%** lower risk among green tea drinkers who never smoked.

**Editor's Note:** When deaths from cardiovascular disease were examined, the reduction in risk over follow-up was **14%** lower for regular consumers of green tea.

\**J Epidemiol.* 2017 Jan;27(1):36-41.

## High Cholesterol Triggers Osteoarthritis

Besides its harmful cardiovascular effects, **high cholesterol** may also prompt mitochondrial oxidative stress, according to recent research.\* This can kill cartilage cells, leading to **osteoarthritis**.

The study provided innovative proof-of-concept of the possible use of oxidant reducers to target mitochondria as a means of treating osteoarthritis.

"Our team has already begun working alongside dietitians to try to educate the public about healthy eating and how to keep cholesterol levels at a manageable level that won't damage joints," said researcher Indira Prasadam, PhD.

For the study, researchers used two animal models: one consisted of mice with altered genes that led to them having hypercholesterolemia (high cholesterol), the other was made up of unaltered rats. Both animal models were fed either a control normal diet or a high cholesterol diet. Surgery was then performed on the rodents to create a condition analogous to human knee injuries that lead to osteoarthritis.

Both animal models on the high cholesterol diet had worse osteoarthritis than the animals fed a normal diet. But the ones given mitochondria-targeted antioxidants and the cholesterol-lowering drug atorvastatin had the least severe osteoarthritis of all.

**Editor's Note:** "Just when we thought all the angles on osteoarthritis had been uncovered, a new lead like this comes along," remarked Thoru Pederson, PhD, editor-in-chief of the FASEB Journal. "The focus of hypercholesterolemia, whether familial or sporadic, has, of course, always been on arterial disease. But here we have a fascinating new discovery."

\*FASEB J. 2017 Jan;31(1):356-367.





## Just-Published Protocol in the *Disease Prevention and Treatment* Book

The scientists and writers at **Life Extension®** continuously update the online *Disease Prevention and Treatment* protocol chapters based on the latest research. Recent updates are briefly summarized here with complete versions of these chapters and references available online at:

<http://www.lifeextension.com/Protocols>

### Peptic Ulcers

***Helicobacter pylori*** (a bacterium) and excessive use of **non-steroidal anti-inflammatory drugs (NSAIDs)** are the most common causes of peptic ulcers. Fortunately, medical ulcer treatments are much more effective than they used to be thanks to new discoveries. Also, integrative interventions including **deglycyrrhizinated licorice (DGL)**, **zinc-carnosine**, and **vitamin C** have powerful anti-*H. pylori* and ulcer-healing effects. **Probiotics**, particularly a strain called ***Lactobacillus reuteri* DSM17648**, appear to help control *H. pylori* and reduce inflammation. Treatment with probiotics can also enhance the ability of antibiotics to eliminate *H. pylori* infection and reduce drug side effects. Finally, life-style measures including smoking cessation, stress reduction, and avoidance of NSAIDs and excess alcohol help promote ulcer healing and prevent recurrence.

# MEGA GREEN TEA EXTRACT

## Powerful DNA Protection



FOR LESS  
THAN  
**25¢**  
A DAY!

**Mega Green Tea Extract** provides powerful antioxidant effects throughout the body.

Each **725 mg** capsule of **Mega Green Tea Extract** is standardized to 98% polyphenols that provide **326 mg** of **EGCG** to:

- Protect against DNA damage and oxidative stress<sup>1</sup>
- Support healthy blood sugar levels<sup>2</sup>
- Enhance heart health<sup>3</sup>
- Boost brain function<sup>4</sup>
- Support strong bones<sup>5</sup>
- Maintain healthy cholesterol levels already within normal range<sup>6</sup>

Each cost-effective bottle lasts over three months!

### References

1. *Mutagenesis*. 2015;30(1):129-37.
2. *Curr Opin Clin Nutr Metab Care*. 2013;16(6):688-97.
3. *Circ J*. 2010;74(3):578-88.
4. *Nutrition*. 2014;30(3):337-42.
5. *BMC Musculoskelet Disord*. 2009;10:110.
6. *J Transl Med*. 2015;13:79.

Note: **EGCG** is the acronym for **epigallocatechin gallate**, which is the polyphenol in green tea that has demonstrated the most robust health benefits.

### Mega Green Tea Extract Decaffeinated

Item #00954 • 100 vegetarian capsules

	Retail Price	Your Price
1 bottle	\$30	<b>\$22.50</b>
4 bottles		<b>\$18 each</b>

Non-GMO



### Mega Green Tea Extract Lightly Caffeinated

Item #00953 • 100 vegetarian capsules

	Retail Price	Your Price
1 bottle	\$30	<b>\$22.50</b>
4 bottles		<b>\$18 each</b>

Non-GMO



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

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

# Sweet DREAMS

Healthy sleep is one of the best ways to feel revitalized and maintain optimal health. Increasingly, research has shown the health benefits of a good night's sleep. Melatonin is one of the most popular supplements for supporting sleep.

For optimal results, melatonin should be taken within 30-60 minutes before going to sleep.



## Melatonin 3 mg

Item #00330 • 60 vegetarian capsules

	Retail Price	Your Price
1 bottle	\$8	<b>\$6</b>
4 bottles		<b>\$5.16 each</b>

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

### Non-GMO

**Caution:** Consult your health care provider before taking this product if you are being treated for a medical condition (especially autoimmune or depressive disorders). Use caution if combining with alcohol. This product is not intended for children, pregnant or lactating women, or women trying to become pregnant. Do not attempt to drive or operate heavy machinery after taking this product.

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.

# ZINC ACETATE LOZENGES

## FOR WINTER SEASON SUPPORT

Zinc stimulates the activity of about 300 enzymes<sup>1</sup> and fortifies the immune system.<sup>2</sup>

Taking the best zinc lozenge is important for maintaining the body's natural defense system during the cold season—and throughout the year.

**Enhanced Zinc Lozenges** is a special "ionic formula" that delivers on the original promise of seasonal immune support and comes in natural peppermint flavor.

### References

1. *J Nutr.* 2000 May;130(5S Suppl):1437S-46S.
2. *Am J Clin Nutr.* 2007 Mar;85(3):837-44.

### Zinc Lozenges

Item #01961 • 30 vegetarian lozenges

	Retail Price	Your Price
1 bottle	\$12	\$9
4 bottles		\$6 each

Non-GMO

To order Enhanced Zinc Lozenges,  
call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)



# RHODIOLA Quickly Combats Fatigue



One of the most common complaints of older adults to their physician is a lack of energy, or a feeling of being "tired all the time." These are just a few of the symptoms of **fatigue**.

As many as **one-third** of adults suffer from fatigue symptoms that substantially interfere with their daily lives.<sup>1</sup> In fact, it is so common in elderly people that many physicians either ignore it, or chalk it up to "normal aging."<sup>2</sup>

There have been growing concerns that if left untreated, fatigue can progress to a debilitating condition known as **chronic fatigue syndrome**.<sup>1,2</sup> That means that a large group of otherwise healthy older adults are suffering from a progressive condition without adequate therapy.

But what if there was a way to start feeling like yourself again *in as little as one week*?

A new study shows that supplementation with an extract of the plant ***Rhodiola rosea*** produces statistically significant improvements in symptoms associated with fatigue—and it starts working in *less than a week*.<sup>1</sup>

*Rhodiola* represents a safe and effective way to combat the real-world fatigue that so many adults face as they grow older.

## Rhodiola Combats Prolonged and Chronic Fatigue

An article published online in **February 2017** in the journal *Complementary Medicine Research* reports on an important study of subjects with **prolonged fatigue** (fatigue lasting between one and six months), and those with **chronic fatigue syndrome** (fatigue lasting longer than six months).<sup>1</sup>

This is important because of growing concerns that **fatigue worsens** without effective treatment.<sup>1,2</sup>

Successfully treating patients with fatigue lasting less than 6 months would be a **major breakthrough**. It could prevent prolonged fatigue from progressing to debilitating chronic fatigue syndrome.<sup>1</sup>

The investigators studied extracts of *Rhodiola rosea*, which has **adaptogenic** properties. Adaptogens are natural compounds that help your body *adapt* to stress—a major contributor to fatigue.

*Rhodiola* has long been popular in Eastern European and Asian traditional medical systems for its nervous system stimulation, antidepressive, fatigue-eliminating, and performance-enhancing properties.<sup>3</sup> Research shows that adaptogens improve mental performance and enhance endurance in people with fatigue.<sup>1,4</sup>

Let's look at the details of this **2017** study.<sup>1</sup>



## Reduce Fatigue Symptoms in Just One Week

The **2017** study included 100 subjects with either prolonged or chronic fatigue.<sup>1</sup> All subjects took **400 mg (200 mg twice per day)** of *Rhodiola rosea* extract every day for eight weeks. They were then administered standard tests and received scores relating to fatigue and functional impairment.

By the end of the study, there was a *significant decrease* in all measures of fatigue and impairment used.<sup>1</sup>

The subjects didn't have to wait long to see results. The fastest decline across all outcome measures occurred in the *very first week* of the study, and these measures continued to fall significantly between week four and the end of the study.<sup>1</sup>

**Rapid improvement** in levels of stress, sleep quality, anxiety/panic/phobia, depression, and executive function (the ability to sort priorities and execute intentions) were also seen. In addition, scores on the **Clinical Global Impression** scale showed that **83%** of subjects reported themselves to be “very much” or “much” improved by the end of the study.<sup>1</sup>

The safety profile of this extract was also favorable.<sup>1</sup>

This was a large clinical trial with **uniformly positive results**, and included a substantial number of subjects with prolonged as well as chronic fatigue, making it **groundbreaking** in its own way.

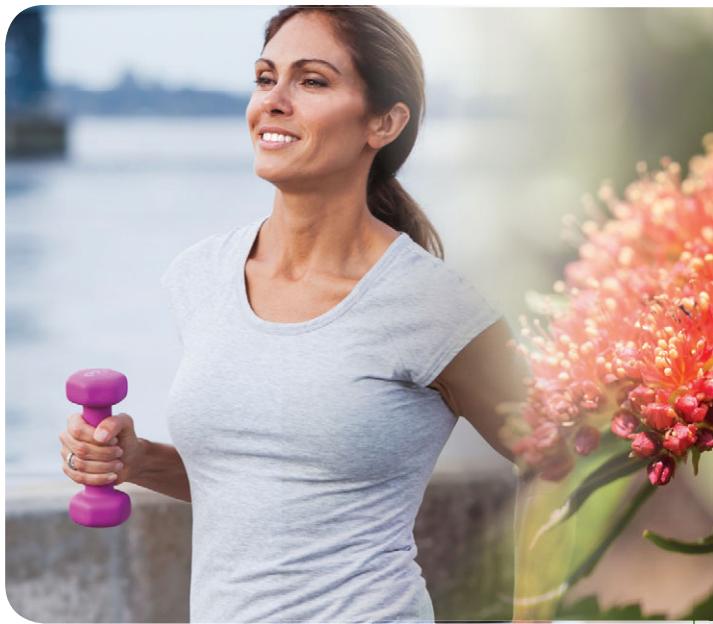
This study did not include a placebo arm. Other studies were **placebo**-controlled and have shown encouraging results with *Rhodiola* extracts in the setting of fatigue and its major input, **stress**.

## Stress-Reducing Adaptogen Combats Fatigue

**Stress** *exacerbates* fatigue, reduces sleep quality, induces depression, and generally robs us of energy.<sup>5-7</sup> In fact, a study immediately after Hurricane Andrew in 1992 showed that physical symptoms of chronic fatigue were sharply increased by the brutal storm and its aftermath.<sup>8</sup>

Research shows the body's major stress-response system (called the *hypothalamic-pituitary-adrenal axis*, or *HPA*), is strongly implicated in chronic fatigue syndrome, which helps to explain why stress seems to worsen the condition.<sup>9</sup>

As one of the best known and most thoroughly documented **adaptogens**, *Rhodiola* has a lot to offer people who are suffering from fatigue that is either brought on by stress or exacerbated by it. Clinical trials have produced some exciting results for ***Rhodiola*** extracts in this context.



RHODIOLA ROSEA



## What You Need to Know

### Fight Fatigue with Rhodiola

- Fatigue affects up to one-third of the US adult population, impacting quality of life, work productivity, and relaxation.
- Modern medical care has little to offer people with fatigue, and in fact may belittle their problems.
- *Rhodiola rosea* (golden root) has been revered as an *adaptogen* in traditional medical systems for centuries, targeting people with low energy, anxiety, depression, and stress.
- Studies now show that *Rhodiola* extracts act directly and indirectly on the body's stress-response systems at a biochemical level, enhancing our ability to overcome stress and improve energy levels.
- A new open-label clinical trial just out in 2017 has shown across-the-board improvements in symptoms in *Rhodiola*-supplemented subjects with prolonged or chronic fatigue, validating and extending findings from earlier randomized, placebo-controlled studies.
- It is now clear that *Rhodiola*'s *adaptogenic* properties make it an ideal candidate for battling fatigue as well as the stresses that generate and sustain it.
- Anyone suffering unremitting fatigue for one month or more should explore the fatigue-resisting, stress-relieving powers of *Rhodiola*.

One such study evaluated a population of people with life-stress symptoms.<sup>10</sup> In this study, 101 subjects received **400 mg (200 mg twice per day)** of *Rhodiola* per day for four weeks.

As with the **2017** study of *Rhodiola* in fatigued patients, all of the stress scores evaluated improved during the study, showing reductions in stress symptoms, disability, and functional impairment.<sup>10</sup> And patients started seeing improvements *in just three days!*

Remarkably, these improvements continued to grow for the entire four weeks of the study.

### The True Test of Stress Reduction

There's hardly a more stressed, fatigued group than physicians doing night duty, when the biological clock is disrupted, meals are irregular, sleep is scarce, and stress is high.

In a study of the effects of *Rhodiola* on fatigue in 56 healthy young physicians, subjects received either a standardized *Rhodiola* extract or placebo, and then underwent five different tests of stress and fatigue at the beginning and end of a two-week period of night duty.<sup>11</sup>

The group receiving the *Rhodiola* extract experienced a significant improvement in all of these tests. This is a clear indication of *Rhodiola*'s stress- and fatigue-fighting adaptogenic properties.

Several other randomized, placebo-controlled studies have confirmed or extended these findings in people undergoing stress and experiencing fatigue—including college students during exam periods, military cadets in basic training, and otherwise healthy adults with stress-related fatigue.<sup>12-14</sup>

## Rhodiola's Adaptogenic Properties Fight Fatigue-Inducing Stress

*Rhodiola rosea* has a lengthy history in traditional medical systems in Eastern Europe and Asia, where it is considered an **adaptogen**.<sup>3,18</sup>

The term “adaptogen” has only recently gained credibility in our Western-dominated, cause-and-effect-oriented scientific communities, but the concept is now well-supported by key biochemical discoveries.<sup>4</sup>

A review in *Current Clinical Pharmacology*, a journal that publishes peer-reviewed articles on the latest advances in clinical pharmacology, defined adaptogens as, “A pharmacological group of herbal preparations that increase tolerance to mental exhaustion and enhance attention and mental endurance in situations of decreased performance.”<sup>4</sup>

In other words, adaptogens help your body *adapt* to stress. Adaptogens essentially help regulate the HPA axis or the body’s major stress response system.

Since stress is a major contributor to fatigue, helping your body better manage stress represents an important way to help combat fatigue.

*Rhodiola rosea* extracts have been found to improve key **stress-related** features of prolonged and chronic fatigue, including attention, cognitive function, and mental performance.<sup>4</sup>

Research now shows that adaptogens like *Rhodiola* protect against stress by modulating interactions between the hypothalamus, the pituitary, and the adrenal glands, where the stress hormone cortisol is produced.<sup>4</sup>

Biochemically, *Rhodiola* extracts up-regulate the “stress-sensor” protein called **Hsp70**, which is a core regulator of cell survival or death. When Hsp70 is activated, it inhibits the production of stress-induced nitric oxide, and modulates levels of circulating cortisol.

These changes in turn result in increased production of ATP, the energy-rich molecule that all cells use for power, which increases endurance and performance (mental as well as physical).<sup>4</sup>

It is these adaptogenic properties that give *Rhodiola* extracts their stress- and fatigue-specific effects.

These studies all used slightly different outcome measures, but reached startlingly similar results, showing that *Rhodiola rosea* extract significantly improved:

- Physical fitness, mental fatigue, and performance on neurological and motor tests
- Self-assessed general well-being
- Scores on a specially-designed **anti-fatigue index**
- Scores on a standardized “burnout” scale
- Mental health measures
- Cognitive tests of attention
- Cortisol responses to stress

Studies in laboratory animals corroborate these effects. For example, *Rhodiola* extract significantly induced antidepressant-like, antianxiety-like, and energy-stimulating effects in mice.<sup>15</sup> In rats subjected to a forced-swim test, animals supplemented with *Rhodiola* extract for four weeks demonstrated significantly increased swimming performance and longer swimming times, a demonstration of increased energy and endurance.<sup>16,17</sup>

The evidence shows that the way ***Rhodiola*** achieved these effects was by inhibiting oxidative stress in blood, liver, and skeletal muscles, while *increasing* stress-responsiveness (this was measured by higher levels of the stress-resisting protein Hsp70).<sup>16,17</sup>





## Summary

Prolonged fatigue—the kind that interferes with daily work, home life, and pleasure—affects up to one-third of US adults. If not dealt with, it can progress to full-blown chronic fatigue syndrome.

There is no safe, acceptable pharmacological cure for prolonged fatigue, leaving sufferers to live with poor quality of life and often leading to significant anxiety and depression.

In traditional medical systems of Eastern Europe and Asia, such symptoms have long been treated with extracts of *Rhodiola rosea*, which is known as an **adaptogen**.

Modern science has shown that *Rhodiola* extracts enhance the body's systems for dealing with chronic stress, which is a major contributor to all forms of fatigue.

Clinical studies show that *Rhodiola*'s adaptogenic properties significantly improve symptoms associated with fatigue. This includes improving scores on multiple scales of fatigue, cognitive performance, attention, and more, while reducing measurable stress levels.

In addition to the research described in this article, studies published by other clinicians have used a range of doses to evaluate the effects of *Rhodiola* on stress and cognitive fatigue.<sup>11-13,19</sup>

Those suffering from fatigue severe enough to interfere with quality of life, cognition, or attention may consider supplementing with **250 mg** of standardized ***Rhodiola* extract** before breakfast and a second **250 mg** capsule before lunchtime, both doses on an empty stomach. ●

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. Lekomtseva Y, Zhukova I, Wacker A. Rhodiola rosea in Subjects with Prolonged or Chronic Fatigue Symptoms: Results of an Open-Label Clinical Trial. *Complement Med Res.* 2017;24(1):46-52.
2. Gambert S. Why do I always feel so tired? Evaluating older patients reporting fatigue. *Consultant.* 2013;53(11):785-9.
3. Kelly GS. Rhodiola rosea: a possible plant adaptogen. *Altern Med Rev.* 2001;6(3):293-302.
4. Panossian A, Wikman G. Evidence-based efficacy of adaptogens in fatigue, and molecular mechanisms related to their stress-protective activity. *Curr Clin Pharmacol.* 2009;4(3):198-219.
5. Pae CU, Marks DM, Patkar AA, et al. Pharmacological treatment of chronic fatigue syndrome: focusing on the role of antidepressants. *Expert Opin Pharmacother.* 2009;10(10):1561-70.
6. Van Houdenhove B, Luyten P. Customizing treatment of chronic fatigue syndrome and fibromyalgia: the role of perpetuating factors. *Psychosomatics.* 2008;49(6):470-7.
7. Van Houdenhove B, Pae CU, Luyten P. Chronic fatigue syndrome: is there a role for non-antidepressant pharmacotherapy? *Expert Opin Pharmacother.* 2010;11(2):215-23.
8. Lutgendorf SK, Antoni MH, Ironson G, et al. Physical symptoms of chronic fatigue syndrome are exacerbated by the stress of Hurricane Andrew. *Psychosom Med.* 1995;57(4):310-23.
9. Tanriverdi F, Karaca Z, Unluhizarci K, et al. The hypothalamo-pituitary-adrenal axis in chronic fatigue syndrome and fibromyalgia syndrome. *Stress.* 2007;10(1):13-25.
10. Edwards D, Heufelder A, Zimmermann A. Therapeutic effects and safety of Rhodiola rosea extract WS(R) 1375 in subjects with life-stress symptoms--results of an open-label study. *Phytother Res.* 2012;26(8):1220-5.
11. Darbinyan V, Kteyan A, Panossian A, et al. Rhodiola rosea in stress induced fatigue--a double blind cross-over study of a standardized extract SHR-5 with a repeated low-dose regimen on the mental performance of healthy physicians during night duty. *Phytomedicine.* 2000;7(5):365-71.
12. Spasov AA, Wikman GK, Mandrikov VB, et al. A double-blind, placebo-controlled pilot study of the stimulating and adaptogenic effect of Rhodiola rosea SHR-5 extract on the fatigue of students caused by stress during an examination period with a repeated low-dose regimen. *Phytomedicine.* 2000;7(2):85-9.
13. Shevtsov VA, Zhulos BI, Shervary VI, et al. A randomized trial of two different doses of a SHR-5 Rhodiola rosea extract versus placebo and control of capacity for mental work. *Phytomedicine.* 2003;10(2-3):95-105.
14. Olsson EM, von Scheele B, Panossian AG. A randomised, double-blind, placebo-controlled, parallel-group study of the standardised extract shr-5 of the roots of Rhodiola rosea in the treatment of subjects with stress-related fatigue. *Planta Med.* 2009;75(2):105-12.
15. Perfumi M, Mattioli L. Adaptogenic and central nervous system effects of single doses of 3% rosavin and 1% salidroside Rhodiola rosea L. extract in mice. *Phytther Res.* 2007;21(1):37-43.
16. Lee FT, Kuo TY, Liou SY, et al. Chronic Rhodiola rosea extract supplementation enforces exhaustive swimming tolerance. *Am J Chin Med.* 2009;37(3):557-72.
17. Huang SC, Lee FT, Kuo TY, et al. Attenuation of long-term Rhodiola rosea supplementation on exhaustive swimming-evoked oxidative stress in the rat. *Chin J Physiol.* 2009;52(5):316-24.
18. Panossian AG. Adaptogens in mental and behavioral disorders. *Psychiatr Clin North Am.* 2013;36(1):49-64.
19. Spasov AA, Mandrikov VB, Mironova IA. The effect of the preparation rodakson on the psychophysiological and physical adaptation of students to an academic load. *Eksp Klin Farmakol.* 2000;63(1):76-8.



## Supports Healthy Blood Circulation

Taking one **81 mg** (low-dose), enteric-coated **aspirin** daily helps to maintain normal platelet aggregation in blood vessels via *several* mechanisms, while also temporarily relieving minor aches and pains.

For full product description and to order **Aspirin 81 mg**, call **1-800-544-4440** or visit [www.LifeExtension.com](http://www.LifeExtension.com)

# Multiple Benefits of Daily, Low-Dose Aspirin



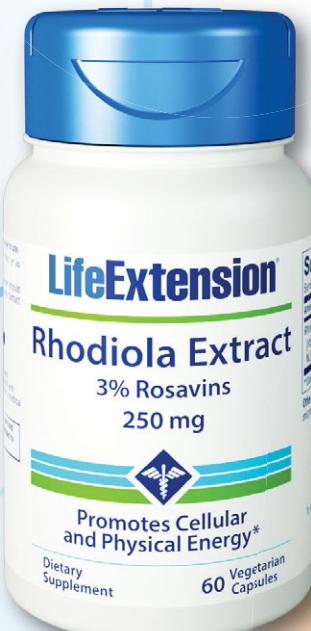
### Aspirin 81 mg

Item # 01066 • 300 enteric coated tablets

	Retail Price	Your Price
1 bottle	\$6	<b>\$4.50</b>
4 bottles		<b>\$4 each</b>

Do not exceed recommended dosage. Drink a full glass of water with each dose. Adults and children 12 years of age and over: take 4 to 8 tablets every four hours not to exceed 48 tablets in 24 hours, unless directed by a doctor. Children under 12 years of age: consult a doctor. **Reye's syndrome:** Children and teenagers who have or are recovering from chicken pox or flu-like symptoms should not use this product. When using this product, if changes in behavior with nausea and vomiting occur, consult a doctor because these symptoms could be an early sign of Reye's syndrome, a rare but serious illness. **Allergy alert:** Aspirin may cause a severe allergic reaction which may include hives, facial swelling, asthma (wheezing), or shock. **Stomach bleeding warning:** This product contains a nonsteroidal anti-inflammatory drug (NSAID), which may cause stomach bleeding. The chance is higher if you: are age 60 or older, have had stomach ulcers or bleeding problems, take a blood thinner (anticoagulant) or steroid drug, take other drugs containing prescription or nonprescription NSAIDs (aspirin, ibuprofen, naproxen, or others), have 3 or more alcoholic drinks every day while using this product, or take more or for longer time than directed. **Do not use** if you have ever had an allergic reaction to any other pain reliever/fever reducer. **Ask a doctor if:** stomach bleeding warning applies to you, you have a history of stomach problems, such as heartburn, you have high blood pressure, heart disease, liver cirrhosis, or kidney disease, you are taking a diuretic, or you have asthma. **Stop use and ask a doctor** if you experience any of the following signs of stomach bleeding: feel faint, vomit blood, have bloody or black stools, have stomach pain that does not get better, allergic reaction occurs, ringing in the ears or a loss of hearing occurs, pain gets worse or lasts more than 10 days, fever gets worse or lasts more than 3 days, any new symptoms appear, or redness or swelling is present in the painful area. **If pregnant or breast-feeding:** ask a health professional before use. It is especially important not to use aspirin during the last 3 months of pregnancy unless definitely directed to do so by a doctor because it may cause problems in the unborn child or complications during the delivery. Keep out of reach of children. In case of overdose, get medical help or contact a Poison Control Center right away.

# BOOST MENTAL and PHYSICAL ENERGY with RHODIOLA EXTRACT



*Helps restore vital cellular energy.*

Prized for its potent adaptogenic properties, **Rhodiola** has long been used by elite athletes, soldiers, and even cosmonauts to enhance mental and physical stamina.

**Rhodiola Extract** is uniquely standardized for adaptogenic compounds *rosavins* and *salidrosides*.

Life Extension's® **Rhodiola Extract** provides **250 mg** of *Rhodiola rosea* extract in each capsule.

Based upon the literature as a whole, as well as the experience of natural medicine practitioners well-versed in the use of adaptogenic herbs, daily doses of **Rhodiola rosea** (standardized to **3%** rosavins and **1%** salidrosides) in a range of approximately **250 mg** to **500 mg**, ideally in divided doses, are likely to yield sustained benefits for perceived stress and cognitive fatigue.

## Rhodiola Extract

Item #00889 • 60 vegetarian capsules

	Retail Price	Your Price
1 bottle	\$14	<b>\$10.50</b>
4 bottles		<b>\$9 each</b>

## Non-GMO

**Caution:** Individuals with manic or bipolar disorder should not use rhodiola. Take early in the day if Rhodiola Extract interferes with your sleep.

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

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

# The Overlooked Importance of **BONE HEALTH**





## People often think of **bone loss** as something that happens mostly to elderly women.

The reality is that more than **half** of adults over age 50 in the United States—including men—have **bone loss** or **osteoporosis**.<sup>1,2</sup>

Up to **one-quarter** of men over 50 will suffer an osteoporosis-related fracture. Men who suffer from a major fracture are more likely than women to **die** from the same injury.<sup>3</sup>

Poor bone health predisposes us to fractures. A bone fracture not only creates painful loss of mobility, but is also life-threatening.

In older adults with **hip fractures** who are bedridden, risk of pneumonia and formation of deadly clots skyrockets.<sup>4-6</sup>

Osteoporosis is associated with an increased risk of other age-related conditions, including cancer,<sup>7</sup> atherosclerosis,<sup>8</sup> dementia,<sup>9,10</sup> and depression.<sup>11</sup>

This makes it essential for men *and* women to take **active steps** to prevent bone loss.

In addition to **calcium** and **vitamin D**, researchers have identified other key nutrients that promote bone formation, including **magnesium**, **silicon**, and **boron**.<sup>12-14</sup>

We need to be sure we're getting these nutrients to optimize bone density—and overall health—as we age.

## Calcium Stops Bone Loss

Most people associate calcium with bone health, and for good reason. Adequate calcium intake is needed for the proper mineralization, strength, and structure of bones.<sup>15</sup> Despite this common knowledge, most Americans fail to get enough calcium in their diets.<sup>16</sup>

Studies show that supplementation with calcium (in the form of **calcium citrate** or **calcium carbonate**) makes a substantial difference in the rate at which bone breakdown and loss of minerals occurs.<sup>16-18</sup>

In multiple studies of early- and mid-postmenopausal women, supplementing with **800 mg-1,000 mg** of calcium citrate daily was shown to effectively **stop bone loss** in the lower vertebrae and forearm, two common fracture sites in older adults. It also significantly improved bone density at other sites, including the hip and total body, compared to placebo recipients.<sup>19,20</sup>

Research has also shown that several markers of bone resorption, or breakdown, decreased in the patients supplementing with **calcium citrate**.<sup>21,22</sup>

A **2014** comparison study found that **calcium citrate** and **calcium carbonate** are effective in raising serum calcium levels and reducing markers of bone loss.<sup>23</sup>

Ample calcium intake is a prerequisite for good bone health, but bones are made of more than calcium. They rely on a variety of nutritional and lifestyle factors to support their health.

One key nutrient that works in conjunction with calcium is vitamin D.

## Vitamin D's Bone Health Benefits

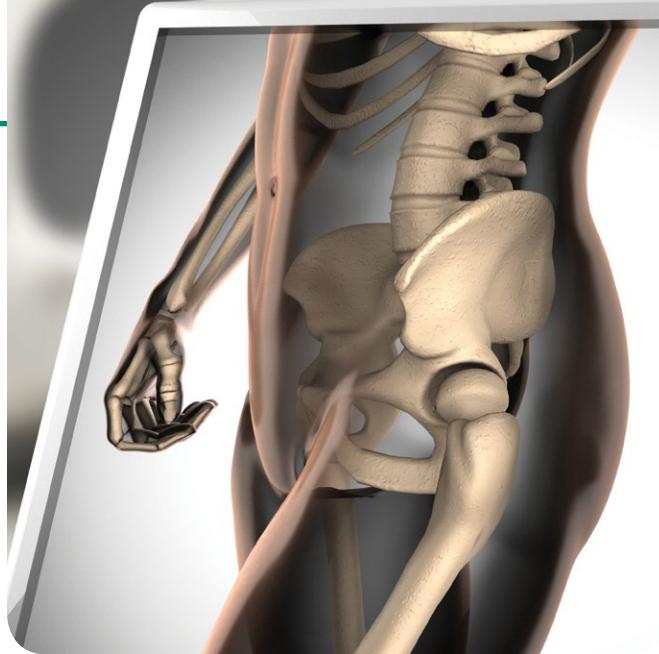
Most people don't get anywhere near the recommended intake of vitamin D.<sup>24</sup>

This is a major concern because vitamin D insufficiency (below **20 ng/mL**) can *accelerate* osteoporosis, especially in aging men and women.<sup>25</sup>

Current recommendations are that people with vitamin D levels below **20 ng/mL** should supplement with **800-1,000 IU/day**, along with adequate calcium intake.<sup>25</sup>

**Life Extension®** believes people should strive for precise individualized dosing (**5,000-8,000 IU/day**) to achieve a blood level between **50 and 80 ng/mL**.

Vitamin D works hand-in-hand with calcium to reduce the risk of osteoporosis. It promotes intestinal absorption of calcium and helps direct how calcium is incorporated into bone.<sup>26,27</sup> It also facilitates the transfer of calcium from the blood and other extracellular fluids to the surface of bones, where it makes them stronger and less likely to break.<sup>28</sup> Vitamin D helps the body absorb zinc and manganese as well, which are trace elements essential for bone metabolism.<sup>29</sup>



A **2017** study demonstrated that three years of calcium and vitamin D supplementation powerfully influenced both the mineral and the organic protein matrix of bone.<sup>30</sup>

In a **2016** meta-analysis of eight studies involving nearly 31,000 subjects, supplementation with calcium plus vitamin D was found to reduce the risk of fractures. Together, these two nutrients produced a **15%** reduction in the risk of *any* fracture, and a significant **30%** reduction in the risk of hip fractures,<sup>31</sup> which are so often the beginning of the end for frail, elderly people.

Calcium and vitamin D are *especially* important for people taking prescription drugs for osteoporosis.

One study found that up to **30%** of those taking bone-protective **bisphosphonate** drugs did not respond well to treatment, which could be a result of low vitamin D levels. Non-responders tended to have low vitamin D and higher loss of a marker of bone loss.<sup>32</sup>

This study showed that people with vitamin D levels lower than **30 ng/mL** were more than **four times** as likely to fail to respond to drug treatment for osteoporosis.<sup>32</sup>

Despite the consistency of these findings, many physicians who prescribe bisphosphonate drugs fail to supplement their patients with these critical nutrients.<sup>33,34</sup>

## Magnesium Slows Bone Turnover

Magnesium is another essential component of the bone mineral matrix. About half of all magnesium in the body is stored in bone.<sup>35</sup>

It's not surprising that animal studies show a positive correlation between magnesium intake and bone mineral density. Magnesium *deficiency* has been shown to reduce the number of **osteoblasts** (cells that build new bone) and increase the number of **osteoclasts** (cells that break down bone).<sup>35</sup>

The good news is that in animal models of postmenopause, *restoring* magnesium levels improved bone formation, reduced breakdown, and ultimately improved bone strength.<sup>35</sup> Other studies have shown similar results in male animals as well.<sup>36,37</sup>

Human studies support these findings, demonstrating significant reductions in bone turnover rates—particularly in markers of bone resorption—in both men and women who took magnesium daily.<sup>38,39</sup>

### Zinc Promotes New Bone Formation

Zinc is another key nutrient that is essential for bone health. Research shows that higher levels of zinc correlate with better bone mineral density, while lower blood levels have been associated with osteoporosis.<sup>40</sup>

That may be because zinc stimulates the activity of bone-forming **osteoblasts**, while suppressing bone-resorbing **osteoclasts**.<sup>41,42</sup> Zinc also suppresses the bone-destroying effects of inflammatory compounds by modulating activity of the “master regulator of inflammation” nuclear factor-kappaB (NF- $\kappa$ B).<sup>41,42</sup>

In an animal study of postmenopause, zinc supplementation led to potent increases in bone mineralization as well as improvements in overall bone structure.<sup>43</sup> In humans, oral supplementation of zinc prevented significant decreases in whole-body bone density and bone mineralization in women with low zinc consumption.<sup>44</sup>



### Manganese Inhibits Postmenopausal Bone Loss

Manganese is a trace element with numerous properties that promote healthy bones.

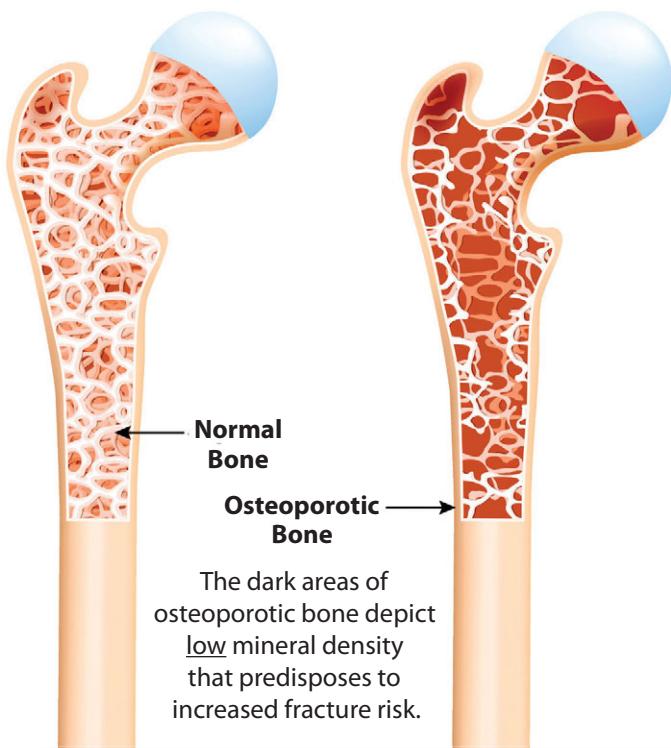
In a rat model of postmenopause, manganese supplementation significantly improved both bone mineral content and bone mineral density in the femur, the large bone in the thigh.<sup>45</sup>

And in a study of postmenopausal women, combination of manganese, zinc and copper with calcium stopped bone loss in its tracks.<sup>46</sup>

### What You Need to Know

#### Key Nutrients for Bone Health

- **Osteoporosis is a growing problem in the aging population for both men and women.**
- **In addition to causing bone loss and increasing the risk for fractures, osteoporosis can lead to many other conditions.**
- **Osteoporosis is at least partially preventable by careful and appropriate use of nutritional supplements.**
- **While calcium and vitamin D remain the mainstays of bone nutrition, they cannot fully optimize bone health by themselves.**
- **Additional minerals are required for overall bone strength and mineralization, including magnesium, zinc, manganese, silicon, and boron.**
- **For the best bone-maintenance, osteoporosis-prevention program, it's important to include the full profile of bone nutrients.**



### Understanding Osteoporosis and Loss of Bone Mineral Density

We typically think of bones as solid, static structures. In reality, they are living tissues that are constantly changing and responding to environmental stresses and other factors. With movement, exercise, weight gain, and other changes, bones grow stronger in some sections, while thinning in others.

Think of this process like a bank account. Cells called **osteoblasts** make deposits (leading to new bone formation and increased mineral density), while **osteoclasts** make withdrawals (leading to bone resorption and loss of mineral density).<sup>62,63</sup>

In healthy adult bones, this process is kept in balance. But as we age, the withdrawals start to outweigh the deposits, which reduces bone-mineral density and increases osteoporosis and fracture risks.<sup>64</sup>

Sex hormones like testosterone and estrogen are critical for maintaining this balance because they inhibit **osteoclast** activity (bone breakdown), and promote **osteoblast** activity (new bone formation).<sup>62,65</sup>

The problem is that sex hormones decrease starting in midlife, and this decline accelerates at menopause and andropause—which means they’re not able to preserve and maintain bone strength and quality as well as they should.<sup>64</sup> The result is an overdraft in the bone mineralization “bank account,” ultimately leading to thinner bones and a higher risk of fractures.

These hormonal changes are a critical and too often overlooked factor in the rising osteoporosis risk we face as we age.<sup>64</sup>

But beware, many common drugs can also contribute to osteoporosis risk. Take a look:

### Biological Silicon Promotes New Bone Formation

Silicon is the second most abundant element in the Earth’s crust.<sup>47</sup> Most people think of this element in terms of its role in computers and engineering applications, but it plays a significant role in a number of life-science areas, including bone mineralization.

Animal studies of postmenopause show that silicon supplementation stops bone loss both in the vertebral column and in the femur (upper leg), while promoting bone growth and mineral density in the femur and tibia (lower leg).<sup>48,49</sup> Closer examination in one animal model of postmenopause showed that silicon improved bone quality by reducing bone resorption—especially in those with low calcium intake.<sup>50</sup>

Human and animal studies indicate that silicon improves bone quality and strength and increases bone mineral density.<sup>12</sup> Our bodies don’t absorb silicon very well in its elemental form. Fortunately, animal and human studies show that *bioavailable* silicon effectively promotes bone formation.<sup>49,51-53</sup>

- **Cancer-fighting drugs** that inhibit sex hormones, such as anti-androgen therapy (which reduces levels of testosterone) and aromatase inhibitors (which reduce estrogen activity), cause or contribute to bone loss, osteoporosis, and fracture risk.<sup>66,67</sup>

- **Corticosteroids** (prednisone, hydrocortisone, dexamethasone, and many others) have a clear and important association with bone loss and increased fracture risk.<sup>68,69</sup>

- **Warfarin** (Coumadin®) inhibits calcium from being incorporated into bone protein. At the same time, it also **increases** the risk of mineral deposits precisely where we don’t want them: in arterial walls.<sup>70-72</sup>

- **Proton-pump inhibitors** (e.g., Nexium®, Prilosec®, Prevacid®) can slow calcium absorption from the stomach, depriving the bone matrix of the minerals it needs to support a positive bone mineral balance.<sup>73</sup>

People taking any of these drugs may want to monitor their bone mineral status, as may people concerned about the impact of aging on their bones.

The most common bone mineral density test is **DEXA**. A problem with DEXA is that it can pick up **calcification** of blood vessels and arthritic regions and report this as bone density that does not exist. **Life Extension®** has long advocated for **QCT** (*quantitative computerized tomography*) bone mineral density testing. The challenge with QCT is it is not widely available like DEXA is.

## Deadly Link between Osteoporosis and Heart Disease

A destructive effect of osteoporosis is the loss of the **calcium** from bone tissues, which leaves bones susceptible to fractures.

But where does the calcium go?

Discoveries over two decades show it often winds up in a bad place: the linings of blood vessels.

Lower bone densities (a measure of calcium content in the bones) are strongly associated with higher levels of dangerous **arterial calcification**, which occurs when calcium is deposited in the walls of blood vessels that supply blood to the body and the brain.<sup>74-79</sup>

This can be clearly seen on standard X-rays of the lower spine, where dense calcium mineral deposits in the aorta lie immediately next to shadowy, calcium-depleted vertebrae.<sup>77</sup>

In some instances, the calcification may form around valves.<sup>80</sup> This can lead to narrowing of important heart valves, such as the aortic valve, leading to decreased blood flow, unhealthy thickening of the walls of the heart, and in later stages symptoms including fatigue and shortness of breath with mild exertion, and chest pain (angina).<sup>81</sup>

These are not theoretical risks. Studies show that the severity of osteoporosis is closely correlated with the severity of atherosclerosis.

- For example, one study showed that patients with osteoporosis had a disturbing **5.6-fold** greater odds of having coronary artery disease than those without osteoporosis.<sup>78</sup>
- Men with low bone-mineral density in the spine have up to **36%** greater risk of cardiovascular disease than those with normal density.<sup>76</sup>
- Among women, the risk of heart disease rises by as much as **28%** with each incremental loss of bone-mineral density.<sup>76</sup>

The relationship between bone-mineral density and coronary heart disease works in the other direction as well. In one study, women with coronary heart-disease risks of **20%** or more were at a **73%** greater risk for thinning bones than were women whose heart-disease risk was less than **10%.**<sup>75</sup>

Keeping **calcium** in the **bone** (which is what **vitamin K2** helps facilitate) can provide the added benefit of reducing vascular calcium deposits, thereby simultaneously fighting two destructive pathologies of aging.

## Boron Supports Bone Health

Boron is a component of the Earth's crust that plays an underappreciated part in human health.<sup>54</sup>

Boron works with magnesium, calcium, and vitamin D to support bone metabolism and bone health.<sup>55-57</sup>

Clinical studies show that when people don't get enough boron, they experience signs of bone loss resembling those seen in older men and in postmenopausal women with osteoporosis.<sup>55</sup>

Supplementation with boron has been shown to improve bone health specifically in diabetic mice, an important finding since diabetes is associated with lower bone density, bone quality, and fracture risk.<sup>58-60</sup>

A human study of a multi-nutrient supplement containing boron, calcium, vitamin D3, magnesium, zinc, copper, and manganese improved hip-bone mineral density in postmenopausal women, while also relieving back and joint pain.<sup>61</sup>

Supplementation with at least **3 mg**/day of boron is recommended for anyone at risk of osteoporosis, or for those who don't consume a lot of fruits and vegetables.<sup>54</sup>

## Summary

Osteoporosis is a threat to all aging adults—including up to one-quarter of men.

Osteoporosis threatens not only bone strength, but also health throughout the body.

Ample calcium and vitamin D intake are essential for supporting good bone health as we age, but we also need sufficient amounts of other nutrients in order to optimize both skeletal and whole-body wellbeing.

Studies show that magnesium, zinc, manganese, silicon, and boron contribute to increased new bone formation and reduced bone resorption (or both), while also promoting calcium and vitamin D effectiveness.

The best bone-maintenance, osteoporosis-prevention program includes the full profile of bone nutrients. ●

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

- Wright NC, Looker AC, Saag KG, et al. The Recent Prevalence of Osteoporosis and Low Bone Mass in the United States Based on Bone Mineral Density at the Femoral Neck or Lumbar Spine(). *J Bone Miner Res.* 2014;29(11):2520-6.
- Available at: <https://www.iofbonehealth.org/facts-statistics>. Accessed August 17, 2017.
- Sidlauskas KM, Sutton EE, Biddle MA. Osteoporosis in men: epidemiology and treatment with denosumab. *Clin Interv Aging.* 2014;9:593-601.
- Hannan EL, Magaziner J, Wang JJ, et al. Mortality and locomotion 6 months after hospitalization for hip fracture: risk factors and risk-adjusted hospital outcomes. *Jama.* 2001;285(21):2736-42.
- Mehta KV, Lee HC, Loh JS. Mechanical thromboprophylaxis for patients undergoing hip fracture surgery. *J Orthop Surg (Hong Kong).* 2010;18(3):287-9.
- Available at: <http://www.webmd.com/osteoporosis/osteoporosis-complications>. Accessed August 17, 2017.
- Sun LM, Liang JA, Lin CL, et al. Cancer risk in patients with osteoporosis: a population-based cohort study. *Curr Med Res Opin.* 2017;33(4):733-9.
- Ye C, Xu M, Wang S, et al. Decreased Bone Mineral Density Is an Independent Predictor for the Development of Atherosclerosis: A Systematic Review and Meta-Analysis. *PLoS One.* 2016;11(5):e0154740.
- Amouzougan A, Lafaie L, Marotte H, et al. High prevalence of dementia in women with osteoporosis. *Joint Bone Spine.* 2016.
- Chang KH, Chung CJ, Lin CL, et al. Increased risk of dementia in patients with osteoporosis: a population-based retrospective cohort analysis. *Age (Dordr).* 2014;36(2):967-75.
- Drosselmeyer J, Rapp MA, Hadji P, et al. Depression risk in female patients with osteoporosis in primary care practices in Germany. *Osteoporos Int.* 2016;27(9):2739-44.
- Price CT, Koval KJ, Langford JR. Silicon: a review of its potential role in the prevention and treatment of postmenopausal osteoporosis. *Int J Endocrinol.* 2013;2013:316783.
- Ishimi Y. [Nutrition and bone health. Magnesium and bone]. *Clin Calcium.* 2010;20(5):762-7.
- Palacios C. The role of nutrients in bone health, from A to Z. *Crit Rev Food Sci Nutr.* 2006;46(8):621-8.
- Faine MP. Dietary factors related to preservation of oral and skeletal bone mass in women. *J Prosthet Dent.* 1995;73(1):65-72.
- Straub DA. Calcium supplementation in clinical practice: a review of forms, doses, and indications. *Nutr Clin Pract.* 2007;22(3):286-96.
- Bischoff-Ferrari HA, Rees JR, Grau MV, et al. Effect of calcium supplementation on fracture risk: a double-blind randomized controlled trial. *Am J Clin Nutr.* 2008;87(6):1945-51.
- Kalluru R, Ames R, Mason B, et al. Bone density in healthy men after cessation of calcium supplements: 20-month follow-up of a randomized controlled trial. *Osteoporos Int.* 2015;26(1):173-8.
- Ruml LA, Sakhaei K, Peterson R, et al. The effect of calcium citrate on bone density in the early and mid-postmenopausal period: a randomized placebo-controlled study. *Am J Ther.* 1999;6(6):303-11.
- Reid IR, Mason B, Horne A, et al. Randomized controlled trial of calcium in healthy older women. *Am J Med.* 2006;119(9):777-85.
- Weisman SM, Matkovic V. Potential use of biochemical markers of bone turnover for assessing the effect of calcium supplementation and predicting fracture risk. *Clin Ther.* 2005;27(3):299-308.
- Kenny AM, Prestwood KM, Biskup B, et al. Comparison of the effects of calcium loading with calcium citrate or calcium carbonate on bone turnover in postmenopausal women. *Osteoporos Int.* 2004;15(4):290-4.
- Bristow SM, Gamble GD, Stewart A, et al. Acute and 3-month effects of microcrystalline hydroxyapatite, calcium citrate and calcium carbonate on serum calcium and markers of bone turnover: a randomised controlled trial in postmenopausal women. *Br J Nutr.* 2014;112(10):1611-20.
- Newmark HL, Heaney RP, Lachance PA. Should calcium and vitamin D be added to the current enrichment program for cereal-grain products? *Am J Clin Nutr.* 2004;80(2):264-70.

## Lifestyle Tips for Better Bone Health

While a certain amount of bone loss may occur with aging, developing osteoporosis is not inevitable. Regardless of genetic risks, most of us can maintain strong, fracture-resistant bones by exercising regularly, receiving preventive health check-ups, and nourishing our bone-building cells with bioavailable calcium and other supportive nutrients.

- Both men and women should follow a program of regular weight-bearing exercise to strengthen their bones. Join a gym or consult with a physical trainer.
- Avoid smoking and excess alcohol.
- Request a bone density test from your physician. QCT is superior to DEXA when measuring bone mineral density, but DEXA is often the only test available in many regions.
- Eat foods that are rich in calcium, other minerals, vitamins, and that are relatively low in phosphorus. Pay special attention to dark leafy vegetables, legumes, whole grains and, in moderation, milk products.
- Regardless of your gender, consider natural hormone replacement from midlife onward with appropriate hormones, under medical guidance.

- Rizzoli R, Boonen S, Brandi ML, et al. Vitamin D supplementation in elderly or postmenopausal women: a 2013 update of the 2008 recommendations from the European Society for Clinical and Economic Aspects of Osteoporosis and Osteoarthritis (ESCEO). *Curr Med Res Opin.* 2013;29(4):305-13.
- Quesada Gomez JM, Blanch Rubio J, Diaz Curiel M, et al. Calcium citrate and vitamin D in the treatment of osteoporosis. *Clin Drug Investig.* 2011;31(5):285-98.
- Bikle DD. Vitamin D and bone. *Curr Osteoporos Rep.* 2012;10(2):151-9.
- Schild A, Herter-Aeberli I, Fattinger K, et al. Oral Vitamin D Supplements Increase Serum 25-Hydroxyvitamin D in Postmenopausal Women and Reduce Bone Calcium Flux Measured by 41Ca Skeletal Labeling. *J Nutr.* 2015;145(10):2333-40.
- Claro da Silva T, Hiller C, Gai Z, et al. Vitamin D3 transactivates the zinc and manganese transporter SLC30A10 via the Vitamin D receptor. *J Steroid Biochem Mol Biol.* 2016;163:77-87.
- Paschalis EP, Gamsjaeger S, Hassler N, et al. Vitamin D and calcium supplementation for three years in postmenopausal osteoporosis significantly alters bone mineral and organic matrix quality. *Bone.* 2017;95:41-6.
- Weaver CM, Alexander DD, Boushey CJ, et al. Calcium plus vitamin D supplementation and risk of fractures: an updated meta-analysis from the National Osteoporosis Foundation. *Osteoporos Int.* 2016;27(1):367-76.
- Peris P, Martinez-Ferrer A, Monegal A, et al. 25 hydroxyvitamin D serum levels influence adequate response to bisphosphonate treatment in postmenopausal osteoporosis. *Bone.* 2012;51(1):54-8.
- Reymondier A, Caillet P, Abbas-Chorfa F, et al. MENOPOST—calcium and vitamin D supplementation in postmenopausal osteoporosis treatment: a descriptive cohort study. *Osteoporos Int.* 2013;24(2):559-66.

34. Boonen S, Bouillon R, Haentjens P, et al. Optimizing the benefits of bisphosphonates in osteoporosis : the importance of appropriate calcium intake. *Treat Endocrinol.* 2006;5(6):375-83.

35. Matsuzaki H. Prevention of osteoporosis by foods and dietary supplements. Magnesium and bone metabolism. *Clin Calcium.* 2006;16(10):1655-60.

36. Matsuzaki H, Fuchigami M, Miwa M. Dietary magnesium supplementation suppresses bone resorption via inhibition of parathyroid hormone secretion in rats fed a high-phosphorus diet. *Magnes Res.* 2010;23(3):126-30.

37. Katsumata SI, Matsuzaki H, Uehara M, et al. Effect of dietary magnesium supplementation on bone loss in rats fed a high phosphorus diet. *Magnes Res.* 2005;18(2):91-6.

38. Dimai HP, Porta S, Wirnsberger G, et al. Daily oral magnesium supplementation suppresses bone turnover in young adult males. *J Clin Endocrinol Metab.* 1998;83(8):2742-8.

39. Aydin H, Deyneli O, Yavuz D, et al. Short-term oral magnesium supplementation suppresses bone turnover in postmenopausal osteoporotic women. *Biol Trace Elem Res.* 2010;133(2):136-43.

40. Hyun TH, Barrett-Connor E, Milne DB. Zinc intakes and plasma concentrations in men with osteoporosis: the Rancho Bernardo Study. *Am J Clin Nutr.* 2004;80(3):715-21.

41. Yamaguchi M. Role of nutritional zinc in the prevention of osteoporosis. *Mol Cell Biochem.* 2010;338(1-2):241-54.

42. Yamaguchi M, Weitzmann MN. Zinc stimulates osteoblastogenesis and suppresses osteoclastogenesis by antagonizing NF-kappaB activation. *Mol Cell Biochem.* 2011;355(1-2):179-86.

43. Bhardwaj P, Rai DV, Garg ML. Zinc as a nutritional approach to bone loss prevention in an ovariectomized rat model. *Menopause.* 2013;20(11):1184-93.

44. Nielsen FH, Lukaski HC, Johnson LK, et al. Reported zinc, but not copper, intakes influence whole-body bone density, mineral content and T score responses to zinc and copper supplementation in healthy postmenopausal women. *Br J Nutr.* 2011;106(12):1872-9.

45. Rico H, Gomez-Raso N, Revilla M, et al. Effects on bone loss of manganese alone or with copper supplement in ovariectomized rats. A morphometric and densitometric study. *Eur J Obstet Gynecol Reprod Biol.* 2000;90(1):97-101.

46. Strause L, Saltman P, Smith KT, et al. Spinal bone loss in postmenopausal women supplemented with calcium and trace minerals. *J Nutr.* 1994;124(7):1060-4.

47. Luyckx M, Hausman JF, Lutts S, et al. Silicon and Plants: Current Knowledge and Technological Perspectives. *Front Plant Sci.* 2017;8:411.

48. Rico H, Gallego-Lago JL, Hernandez ER, et al. Effect of silicon supplement on osteopenia induced by ovariectomy in rats. *Calcif Tissue Int.* 2000;66(1):53-5.

49. Bae YJ, Kim JY, Choi MK, et al. Short-term administration of water-soluble silicon improves mineral density of the femur and tibia in ovariectomized rats. *Biol Trace Elem Res.* 2008;124(2):157-63.

50. Kim MH, Bae YJ, Choi MK, et al. Silicon supplementation improves the bone mineral density of calcium-deficient ovariectomized rats by reducing bone resorption. *Biol Trace Elem Res.* 2009;128(3):239-47.

51. Jugdaohsingh R. Silicon and bone health. *J Nutr Health Aging.* 2007;11(2):99-110.

52. Schiano A, Eisinger F, Detolle P, et al. [Silicon, bone tissue and immunity]. *Rev Rhum Mal Osteoartic.* 1979;46(7-9):483-6.

53. Eisinger J, Clairet D. Effects of silicon, fluoride, etidronate and magnesium on bone mineral density: a retrospective study. *Magnes Res.* 1993;6(3):247-9.

54. Pizzorno L. Nothing Boring About Boron. *Integr Med (Encinitas).* 2015;14(4):35-48.

55. Nielsen FH. Studies on the relationship between boron and magnesium which possibly affects the formation and maintenance of bones. *Magnes Trace Elem.* 1990;9(2):61-9.

56. Volpe SL, Taper LJ, Meacham S. The relationship between boron and magnesium status and bone mineral density in the human: a review. *Magnes Res.* 1993;6(3):291-6.

57. Schaafsma A, de Vries PJ, Saris WH. Delay of natural bone loss by higher intakes of specific minerals and vitamins. *Crit Rev Food Sci Nutr.* 2001;41(4):225-49.

58. Available at: [https://www.niams.nih.gov/Health\\_Info/Bone/Osteoporosis/Conditions\\_Behaviors/diabetes.asp](https://www.niams.nih.gov/Health_Info/Bone/Osteoporosis/Conditions_Behaviors/diabetes.asp). Accessed August 28, 2017.

59. Chau DL, Edelman SV. Osteoporosis and Diabetes. *Clinical Diabetes.* 2002;20(3):153-7.

60. Dessordi R, Spirlandeli AL, Zamarioli A, et al. Boron supplementation improves bone health of non-obese diabetic mice. *J Trace Elem Med Biol.* 2017;39:169-75.

61. Benevolenskaia LI, Toroptsova NV, Nikitinskaia OA, et al. Vitrum osteomag in prevention of osteoporosis in postmenopausal women: results of the comparative open multicenter trial. *Ter Arkh.* 2004;76(11):88-93.

62. Lerner UH. Bone remodeling in post-menopausal osteoporosis. *J Dent Res.* 2006;85(7):584-95.

63. Tanaka Y, Nakayamada S, Okada Y. Osteoblasts and osteoclasts in bone remodeling and inflammation. *Curr Drug Targets Inflamm Allergy.* 2005;4(3):325-8.

64. Demontiero O, Vidal C, Duque G. Aging and bone loss: new insights for the clinician. *Ther Adv Musculoskelet Dis.* 2012;4(2):61-76.

65. Riggs BL, Khosla S, Melton LJ, 3rd. Sex steroids and the construction and conservation of the adult skeleton. *Endocr Rev.* 2002;23(3):279-302.

66. Lumachi F, Luisetto G, Basso SM, et al. Endocrine therapy of breast cancer. *Curr Med Chem.* 2011;18(4):513-22.

67. Mazzotti G, Canalis E, Giustina A. Drug-induced osteoporosis: mechanisms and clinical implications. *Am J Med.* 2010;123(10):877-84.

68. Briot K, Roux C. Drug-induced osteoporosis: beyond glucocorticoids. *Curr Rheumatol Rep.* 2008;10(2):102-9.

69. Mirza F, Canalis E. Management of endocrine disease: Secondary osteoporosis: pathophysiology and management. *Eur J Endocrinol.* 2015;173(3):R131-51.

70. Cranenburg EC, Schurgers LJ, Vermeer C. Vitamin K: the coagulation vitamin that became omnipotent. *Thromb Haemost.* 2007;98(1):120-5.

71. Namba S, Yamaoka-Tojo M, Hashikata T, et al. Long-term warfarin therapy and biomarkers for osteoporosis and atherosclerosis. *BBA Clin.* 2015;4:76-80.

72. Namba S, Yamaoka-Tojo M, Kakizaki R, et al. Effects on bone metabolism markers and arterial stiffness by switching to rivaroxaban from warfarin in patients with atrial fibrillation. *Heart Vessels.* 2017.

73. Kopic S, Geibel JP. Gastric acid, calcium absorption, and their impact on bone health. *Physiol Rev.* 2013;93(1):189-268.

74. Barengolts EI, Berman M, Kukreja SC, et al. Osteoporosis and coronary atherosclerosis in asymptomatic postmenopausal women. *Calcif Tissue Int.* 1998;62(3):209-13.

75. Broussard DL, Magnus JH. Coronary heart disease risk and bone mineral density among U.S. women and men. *J Womens Health (Larchmt).* 2008;17(3):479-90.

76. Farhat GN, Strohmeyer ES, Newman AB, et al. Volumetric and areal bone mineral density measures are associated with cardiovascular disease in older men and women: the health, aging, and body composition study. *Calcif Tissue Int.* 2006;79(2):102-11.

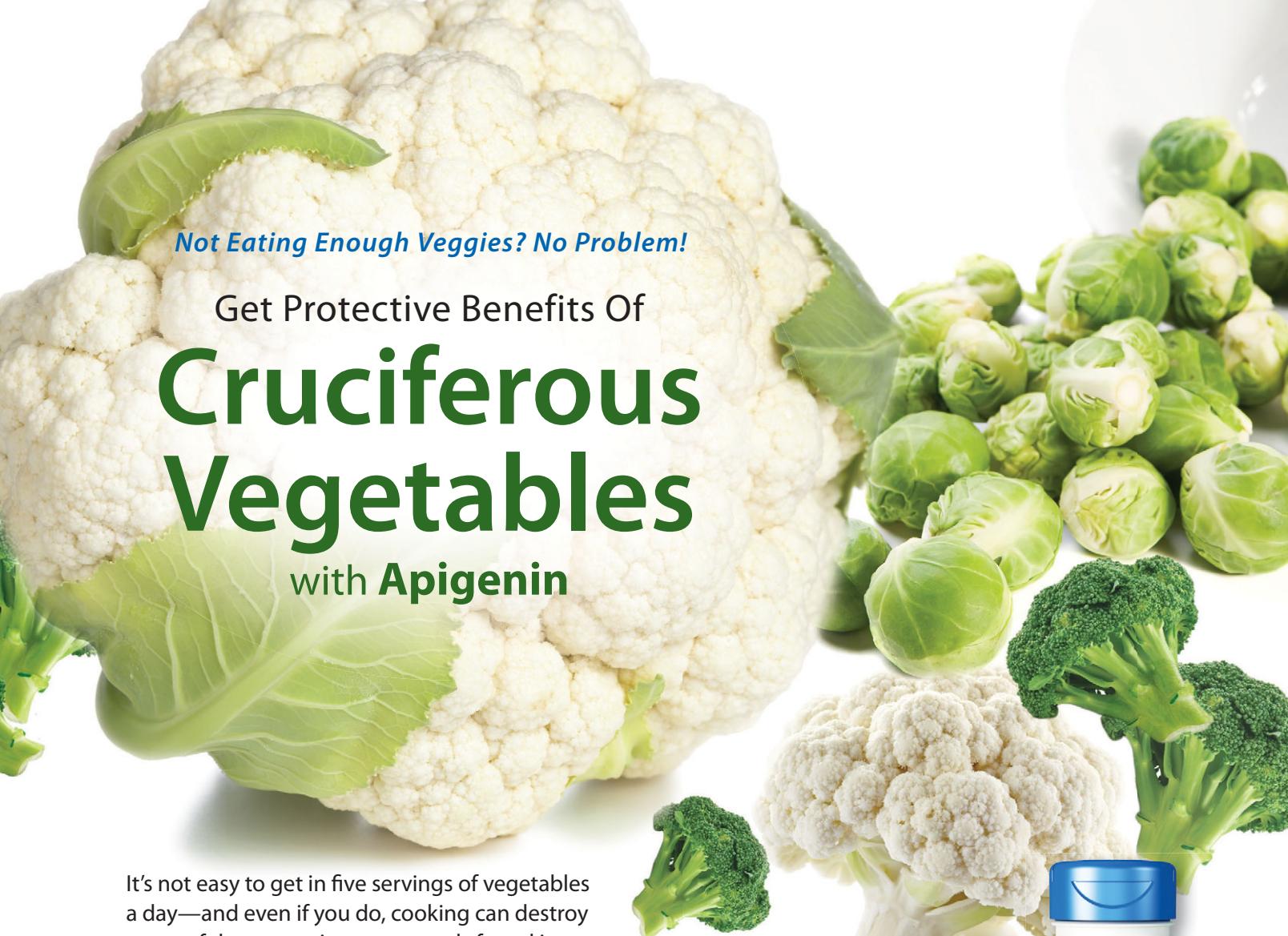
77. Kiel DP, Kauppila LI, Cupples LA, et al. Bone loss and the progression of abdominal aortic calcification over a 25 year period: the Framingham Heart Study. *Calcif Tissue Int.* 2001;68(5):271-6.

78. Marcovitz PA, Tran HH, Franklin BA, et al. Usefulness of bone mineral density to predict significant coronary artery disease. *Am J Cardiol.* 2005;96(8):1059-63.

79. Tanko LB, Bagger YZ, Christiansen C. Low bone mineral density in the hip as a marker of advanced atherosclerosis in elderly women. *Calcif Tissue Int.* 2003;73(1):15-20.

80. Pfister R, Michels G, Sharp SJ, et al. Inverse association between bone mineral density and risk of aortic stenosis in men and women in EPIC-Norfolk prospective study. *Int J Cardiol.* 2015;178:29-30.

81. Available at: <https://medlineplus.gov/ency/article/000178.htm>. Accessed August 28, 2017.



*Not Eating Enough Veggies? No Problem!*

Get Protective Benefits Of

# Cruciferous Vegetables

with Apigenin

It's not easy to get in five servings of vegetables a day—and even if you do, cooking can destroy many of the protective compounds found in **broccoli, Brussels sprouts, cauliflower, and celery**.

**Triple Action Cruciferous Vegetable Extract** combines vital plant **extracts** that have been shown to protect cellular DNA.

The formula provides optimal potencies of cruciferous extracts like **I3C** (*Indole-3-carbinol*) and **DIM** (*di-indolyl-methane*) to favorably modulate estrogen metabolism,<sup>1-5</sup> along with **apigenin**.

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

1. *Biochem Pharm.* 2002; 64;393-404.
2. *Toxicol Appl Pharm.* 2001 Jul 15;174(2):146-52.
3. *In Vivo.* 2006 Mar-Apr;20(2):221-8.
4. *Cancer Detect Prevent.* 2004;28:72-9.
5. *Mol Carcinog.* 2012 Mar;51(3):244-56.

**Triple Action Cruciferous Vegetable Extract**

Item #01468 • 60 vegetarian capsules

	Retail Price	Your Price
1 bottle	\$24	<b>\$18</b>
4 bottles		<b>\$16.50 each</b>

Non-GMO



**Triple Action Cruciferous Vegetable Extract with Resveratrol**

Item #01469 • 60 vegetarian capsules

	Retail Price	Your Price
1 bottle	\$32	<b>\$24</b>
4 bottles		<b>\$22.20 each</b>

Non-GMO



**NEW!**  
**Chocolate Chewable Tablet**



**BUILD  
HEALTHY  
BONES  
with a  
TASTY  
CHEWABLE  
TABLET**



**Bone Restore** contains **7** essential *bone-building nutrients* in a delicious, sugar-free, chewable chocolate tablet.

Scientifically formulated **Bone Restore** helps build healthy bones and connective tissue for a stronger skeletal system.

Just two chewable chocolate tablets daily provide an array of bone supporting nutrients.

**ITEM # 02123 • 60 chewable tablets • Non-GMO • Retail price \$22 • Your price \$16.50 • 4 bottles \$14.25 each**

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

Chew tablets before swallowing. Keep out of reach of children. Do not exceed recommended dose.

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.



## Promote Oral Health with Targeted Probiotic Blend

Maintaining good oral hygiene is important for overall health.<sup>1</sup> Unfortunately, brushing and flossing may not be enough.

**FLORASSIST® Oral Hygiene** provides the beneficial *S. salivarius* **BLIS M18™** oral probiotic that colonizes the mouth and inhibits the growth of unwanted bacteria.<sup>2-3</sup>

Just one great-tasting mint cherry lozenge of **FLORASSIST® Oral Hygiene** a day maximizes oral hygiene by optimizing oral pH, easing inflammation, and supporting healthy bacterial colonization throughout the mouth.<sup>4,5</sup>



### FLORASSIST® Oral Hygiene

Item #02120 • 30 lozenges

	Retail Price	Your Price
1 bottle	\$20	<b>\$15</b>
4 bottles		<b>\$13 each</b>

#### References

1. *Nat Rev Immunol.* 2015 Jan;15(1):30-44.
2. *Oral Microbiol Immunol.* 2009 Apr;24(2):152-61.
3. *J Med Microbiol.* 2013 Jun;62(Pt 6):875-84.
4. *Benef Microbes.* 2011 Jun;2(2):93-101.
5. IADR/AADR/CADR 89th General Session and Exhibition, 16-19 March 2011, San Diego, CA, USA. Paper no. 150126.

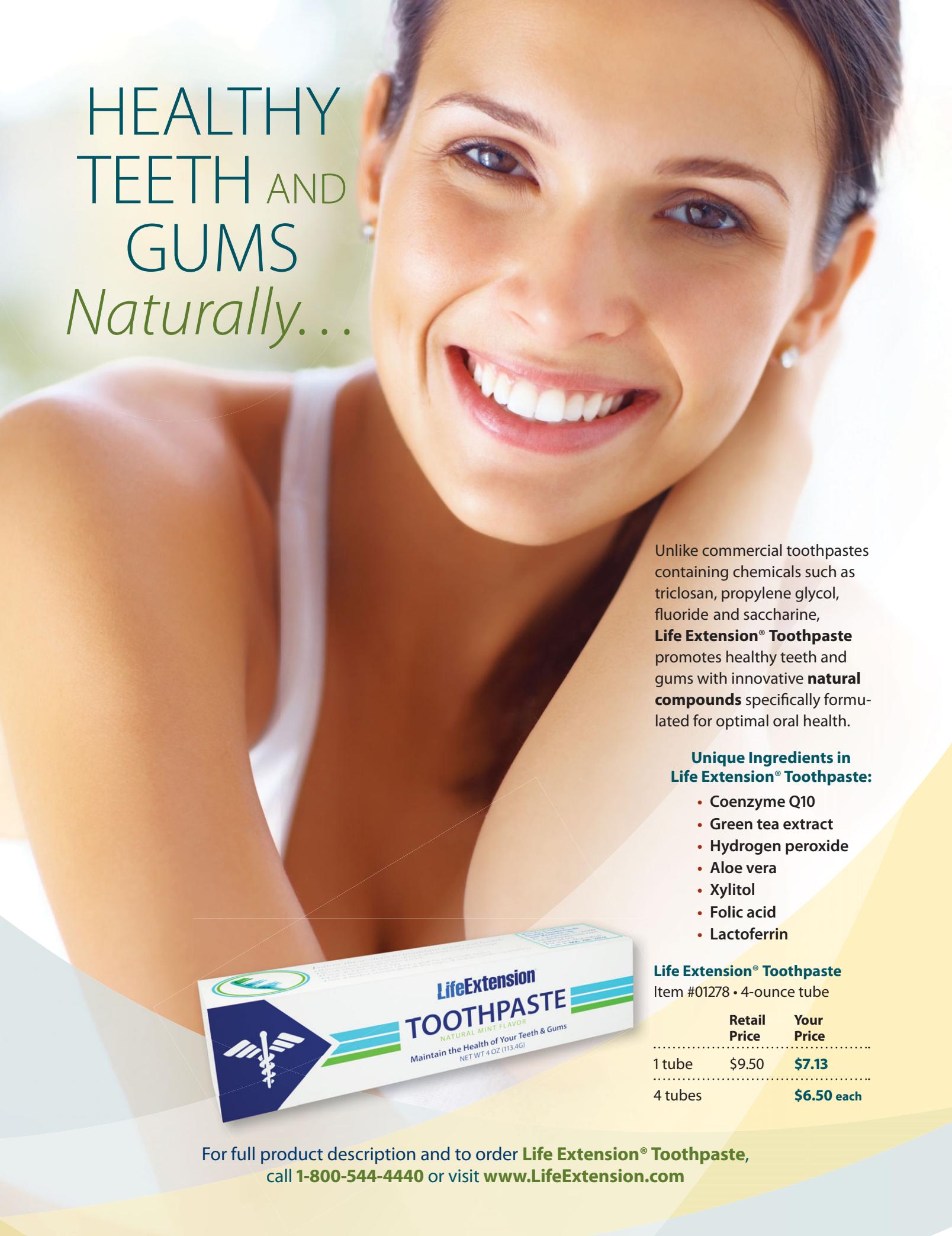
Contains milk. Keep out of reach of children.  
Do not exceed recommended dose.

BLIS™ and BLIS M18™ are trademarks of Blis Technologies Limited and the subject of USA patent no. 7226590. Immuno-LP20® is a registered trademark of House Foods Group Inc.

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

# HEALTHY TEETH AND GUMS

## Naturally...



Unlike commercial toothpastes containing chemicals such as triclosan, propylene glycol, fluoride and saccharine, **Life Extension® Toothpaste** promotes healthy teeth and gums with innovative **natural compounds** specifically formulated for optimal oral health.

### Unique Ingredients in Life Extension® Toothpaste:

- Coenzyme Q10
- Green tea extract
- Hydrogen peroxide
- Aloe vera
- Xylitol
- Folic acid
- Lactoferrin

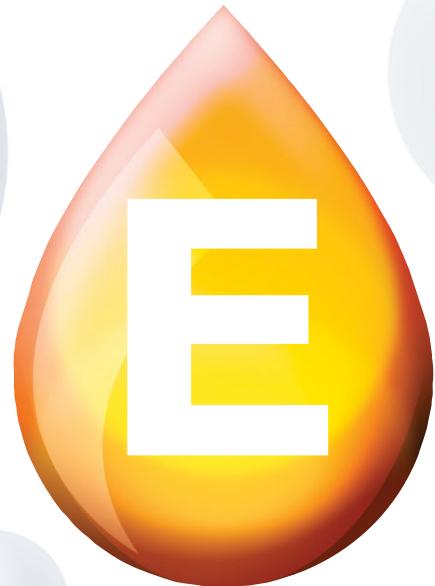
### Life Extension® Toothpaste

Item #01278 • 4-ounce tube

	Retail Price	Your Price
1 tube	\$9.50	<b>\$7.13</b>
4 tubes		<b>\$6.50 each</b>



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



# ARE YOU TAKING THE RIGHT FORM OF VITAMIN E?

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

**Gamma E Mixed Tocopherols** provides a full spectrum of natural vitamin E.



	Retail Price	Your Price
1 bottle	\$32	\$24
4 bottles		\$21.75 each

Item# 02075 • 60 softgels

Non-GMO



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

For full product description and to order **Gamma E Mixed Tocopherol with Sesame Lignans**, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

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

# Suzanne Somers

Author of  
*Two's Company*

Actress and best-selling author **Suzanne Somers** has written an inspirational new book.

A highly personal memoir, *Two's Company* reveals Suzanne's personal career and health struggles as she found success as an actress, conquered cancer on her terms and took on the drug industry with regard to the dangers of conventional hormone replacement therapy for women.

The author of more than 25 books, Suzanne has focused on enlightening the public about life-enhancing alternatives to conventional medical practice.

*Two's Company* provides intriguing insight into Suzanne's personal life, including her early relationship challenges and the uniquely successful marriage she has with Alan Hamel.

In this new interview with **Life Extension®**, Suzanne Somers discusses how she turned her serious health problems into a road-map for millions of women to improve their health to get the most out of life.



**LE:** You revolutionized menopause for millions of women by educating them about bioidentical hormones so that they could avoid hormone drugs that were shown to increase disease risks.

**SS:** My books made a significant dent in the synthetic hormone business, a fact I'm sure the drug companies were not enjoying. Since the introduction of bioidentical hormones, the synthetic hormone business has dropped by a whopping **72%**. If I were them, I'd probably want to shut me up.

**LE:** That is a huge accomplishment and a major change in how women age. How did you discover bioidentical hormones?

**SS:** I couldn't sleep. From my research for the books I was writing, I knew sleep was vitally important for optimal health. What was wrong? When you don't sleep for nights on end, you're just not in the best mood. My leg itched fiercely and I was gaining weight again. My sex drive, which is normally off the charts, was nonexistent.

**LE:** So this was the first sign that something was wrong. What did you decide to do?

**SS:** I went from doctor to doctor and was offered sleeping pills, antidepressants, cholesterol-lowering pills, and diuretics. All the doctors had to offer was drugs and more drugs. One doc said to me, "The drug companies know best, dear!" I finally said to one doctor, "Are you joking? Is this the best you can offer women?" I left his office determined to figure out how to turn the problem of menopause into an asset.

**LE:** That's a huge realization. What happened next?

**SS:** I suddenly became aware of how many pills my friends were taking: pills to go to sleep, pills to wake up, pills to lose weight, pills to take away menopausal symptoms, pills to get erections. No one was doing or feeling well, but doctors were providing the "solutions" to mask their patients' problems and symptoms with pills, pills and more pills until they became walking, talking, confused messes. Not for me—I didn't want to be all drugged up.

**LE:** It's very dispiriting when you know the doctors don't have the answers that you need. It shouldn't be this way. There are good doctors out there but you really have to search them out.

**SS:** Finally, I heard about the endocrinologist Dr. Diana Schwarzbein in Santa Barbara. I sent in my blood work, then drove like a maniac on my appointment day. As she looked at my lab results, she said, "You poor thing—you must feel awful." She explained that I had virtually no progesterone left (the feel good hormone) and almost no estrogen. I was like a car running without gas and oil. We humans rely on precise regulation of our biochemistry and a woman's hormonal makeup is particularly complex.

**LE:** You were very fortunate to find exactly the right doctor who could help you. So many people go from doctor to doctor and still don't get better.

**SS:** I didn't know it then, but this day would be a life-changer for me, the beginning of a huge new reinvention. The day I began to learn about bioidentical hormone replacement was the day I got on track to get my life back. Using natural bioidentical hormone replace-

ment week by week, I eventually got "me" back. I didn't itch, I didn't sweat, and my weight was normalized. I felt good all the time, I was upbeat, and I had great clarity. By changing my diet and my thoughts, fixing my sleep, and replacing missing hormones, I dodged a bullet.

**LE:** That is a remarkable turnaround. It's unfortunate that all the other doctors you saw weren't able to solve this problem for you.

**SS:** I had never realized the profound effect of hormones on human health and well-being. And I never realized so little was known about menopause. Researching natural hormone replacement, I learned the critical importance of hormonal balance. In my cancer scenario, I was what is called estrogen dominant. This means that while my estrogen production was low, I stopped producing sufficient progesterone. When your progesterone production slows or stops and you become estrogen dominant, with no progesterone to control abnormal cell proliferation, you are set up for certain cancers.

**LE:** *Life Extension* has been reporting on this for years. It's time the medical community caught up. Glad you are spreading the word and living by example.

**SS:** So many women enter menopause and spend the rest of their lives white-knuckling, dealing with debilitating symptoms. As I learned everything I could about replacement, I quickly realized that the pharmaceutical hormone business is designed to keep women essentially bandaged. Synthetic hormones don't fix the problem, because they don't balance the missing hormones and aren't human hormones. They're not a solution, just a way to calm women

down. And women get fat on this protocol. Women not knowing or understanding how it works figure it's just a midlife trade-off. These synthetic hormones are responsible for putting a woman's body into a state of imbalance rather than balance. Imbalance is where cancer has its opportunities. With this information, why would these dangerous hormones still be prescribed? This knowledge made bioidentical hormone replacement even more exciting to me. If menopausal women could safely rebalance our hormones, then we could essentially trick the brain into believing we are still reproductive.

**LE:** You were on the cutting edge when you discovered bioidentical hormone replacement. The amazing thing is that you were able to share your knowledge with millions of women through your books.

**SS:** What I loved the most was the win/win aspect. I had taken my problem and turned it into a great asset for myself and for others. My interviews with cutting-edge, knowledgeable doctors allowed women to age in a new way, without drugs, while keeping their memories intact, their sex lives active, and their beauty restored.

The book outraged many doctors. I believe because it exposed their ignorance of how this natural passage, menopause, really works, and of the realities of real hormone replacement. The solution is not in a synthetic pill that matches nothing a woman makes in her own body—that only confuses the body and it's not good for the human body to be confused. The drug companies took shots at me and ridiculed me. The book was a phenomenal success. I was becoming the messenger for a new kind

of health, one that changed the way women age. I went on every talk show, and the response from the public was overwhelmingly positive. The book sold over one million copies! Without looking for it, I found a new life mission, taking care of women in a way no one had.

**LE:** A million copies means you were changing a lot of minds!

**SS:** A movement was starting to take place and it was growing fast. Women were demanding better treatment and relief from their doctors. They were calling their doctors in droves saying they had read Suzanne Somers's book and "wanted what she had." It has been my experience that doctors are "down on what they are not up on," and BHRT (bioidentical hormone replacement therapy) was not and still is not taught at medical school. So frankly I felt and feel that in many cases I knew more than a lot of the doctors about this subject. I was a walking, talking example of BHRT's health-giving, life-enhancing power. Other doctors came to my lectures, and they saw and heard that my research was science-based and backed up by credible doctors. They were aware that the information in my books was given to me by knowing doctors and scientists who gave generously of their time.

**LE:** Can you specifically talk about what changes you created for women?

**SS:** Up until then, women went through their passages with a pill for every ailment, and here I was saying there is another way. My life without drugs was inspiring to many women. The concept of putting back what you lost in

the aging process with natural remedies appealed to so many. Hormone replacement has to be individualized. There is no one pill that fits all. What I need is different from what the next woman needs. Without hormonal balance, lives were being ruined, and women were losing themselves. I called hormone balance the "Juice of youth," the answer to good health.

**LE:** Let's step back a bit. Before your discovery of bioidentical hormones, you were diagnosed with cancer. For many people, a cancer diagnosis may seem like a death sentence. What was your reaction when you were diagnosed with cancer? In what ways did your life change?

**SS:** I decided cancer was a gift from which I would learn. From that moment I would eat as though my life depended upon it, which it does. I would change my life in every way. I had been working too hard into the early mornings. I was staying up regularly until three and four a.m. I'd get into bed afterward and then have trouble sleeping.

Sleep is a game changer. If you don't sleep seven to eight hours a night, the repair work the body depends upon for life and health can't happen. I was going to eat, sleep, and think like an athlete. A great athlete thinks to win. I would win. I would be able to use this experience to help others.

**LE:** Through your books and lectures, you have influenced millions of women to not accept aging as a part of their lives. You are a pioneer and an explorer and bring back lifesaving information from your journeys. Tell us about one of your breakthrough experiences of surviving cancer.

## Author Interview

**SS:** I would become the first American woman to legally regrow my breast using my own stem cells and my fat. I had heard about Dr. Kotaro Yoshimura of the University of Tokyo—he had successfully regrown the breasts of over four hundred Japanese women using their own stem cells. In 2011 I took a chance and called him. Lucky for me he had heard of me and my books. He graciously agreed to come to America and teach the procedure to my friend Dr. Joel Aronowitz, who was involved with stem cells and research. The goal was to obtain permission from the FDA to qualify for a clinical trial to regrow my breast. It took three years for the permission to be granted, and as soon as we received it, we went to work to make it happen.

**LE:** You certainly don't give up easily and are brave to try these medical procedures on yourself.

**SS:** It was about more than my becoming whole again; it was about a breakthrough for all women. At present, women in my position are offered implants or a TRAM flap (which often has very disappointing results and is generally unattractive, with much scarring and a long painful recovery). To do the surgery, they removed fat from my stomach, spun out the stem cells, discarded the weak ones, and injected the strong cells back into my removed fat. That fat was then injected in my once-cancerous breast until it was the same size as the other one.

**LE:** What were your thoughts after the operation?

**SS:** I had adjusted to losing half of my breast, figuring that being alive was the better option. But

to become whole again would be a great experience. The surgery was a fantastic success. I awoke and looked down and saw myself perfect back together. Once again, I had two beautiful breasts, and they were all me. Nothing plastic or foreign. It was a huge step forward for women. Since then over a thousand women have been able to take advantage of this incredible procedure.

**LE:** Your readers are fortunate that you were curious enough to seek out this type of procedure and to take the risk of having it done.

**SS:** Once again, a problem became an opportunity.

**LE:** Now that you have optimized your health, written more than two dozen books and changed women's health forever, what's next for you?

**SS:** For the last year, I've been back performing nightly off and on in Vegas as well as on occasional random stages around the country. I'm grateful every minute for having achieved superb health. It allows me the energy, strength, strong bones and fast-working brain needed to be out there night after night at 70. I thought age 70 was supposed to be old, but for me it's not. The body is a magnificent machine. What craziness to abuse something so valuable. That has become my life's work: getting people to value their bodies. I want to change the thinking. Age is a number only; living at any age is about vitality and energy. And that's how I live my life. I'm as young as my energy.

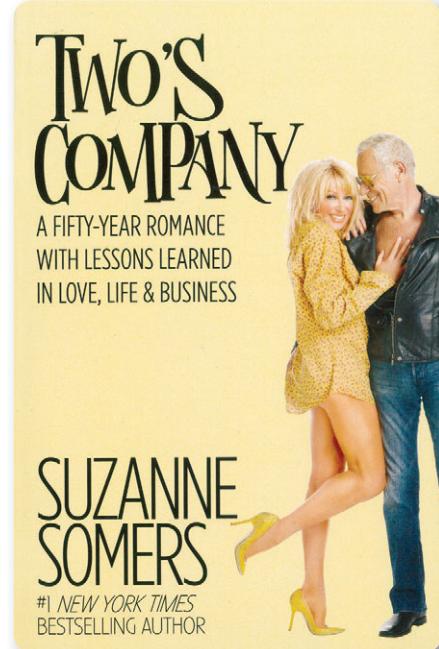
**LE:** What words of wisdom would you like to impart to our readers?

**SS:** Health is all we have, yet our choices belie that fact. We seem to take a great working body for granted, and that is a dangerous mindset. It takes a long time to wise up. You can't give up. Ever! Happiness takes work. A great relationship takes work. Every choice matters; every thought creates. We are all in control of our joy. Inevitably, it's the dark times and negatives that are our best teachers. Life is the process of learning from all of it. The lucky ones do. ●

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

To order a copy of *Two's Company*, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

Item #34132  
Retail Price \$26  
Your Price \$19.50





# Restore Youthful-Looking Skin from the Inside Out

As skin ages, it loses suppleness and smoothness. A prime reason is loss of **ceramides** that are required for skin to retain its **moisture**.

**Skin Restoring Phytoceramides** contains wheat-derived ceramide oils in an **oral** capsule that **hydrate** the deepest dermal layers to nourish the entire body's skin.



**Skin Restoring Phytoceramides with Lipowheat®** • Item #01596  
30 liquid vegetarian capsules • Non-GMO

	Retail Price	Your Price
1 bottle	\$25	<b>\$18.75</b>
4 bottles		<b>\$17.25 each</b>

For full product description  
and to order **Skin Restoring  
Phytoceramides with Lipowheat®**,  
call 1-800-544-4440  
or visit [www.LifeExtension.com](http://www.LifeExtension.com)

Contains wheat. Gluten free. Lipowheat® is a registered trademark of Arco, Robertet Group, France.

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.

# THE PROBIOTIC FOR WOMEN

Clinically Documented Probiotic  
Strains That Promote Healthy Vaginal  
Microflora and Urinary Tract Health\*

Jarro-Dophilus® Women contains the four predominant *Lactobacilli* strains of the healthy vaginal tract.\*

All four strains were isolated from the vaginal tracts of healthy pregnant women and have been clinically tested for efficacy in helping to maintain protective, healthy vaginal microflora and urinary tract health.\*

When it comes to choosing effective probiotics, clinically documented strains matter.™

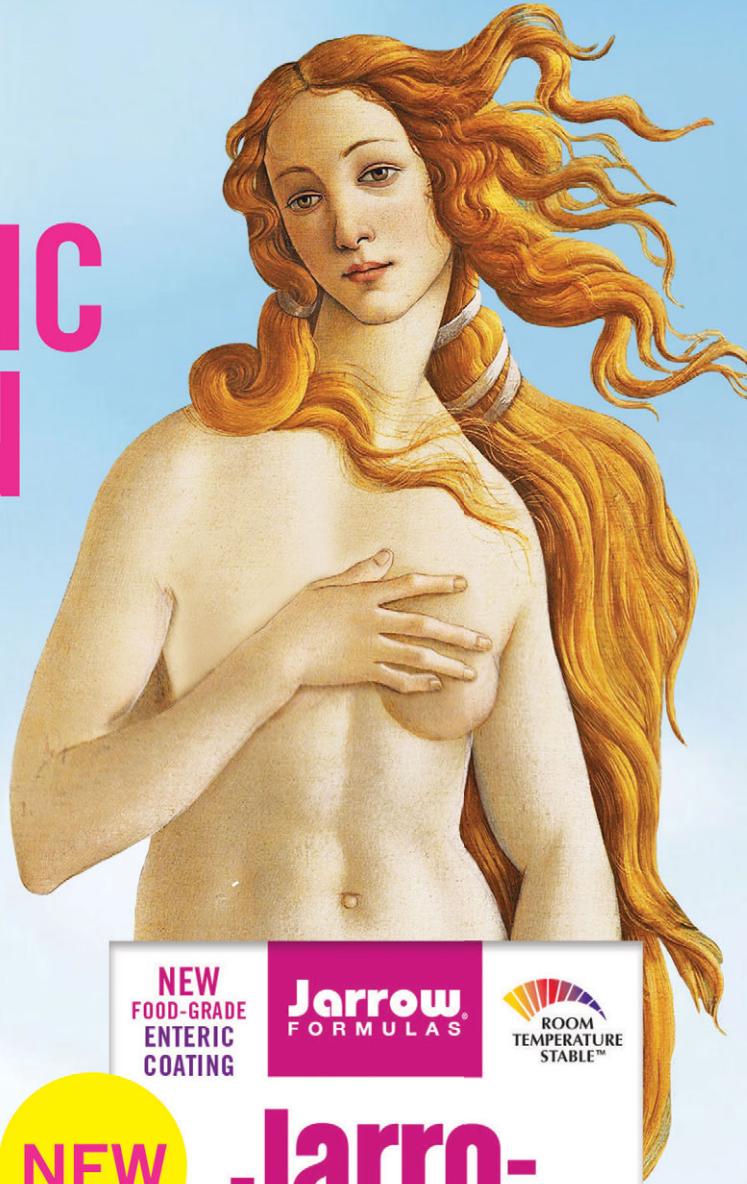
Choose science.

Choose Jarro-Dophilus® probiotics.

## Jarro-Dophilus® Women 5 Billion Per Capsule 30 Veggie Caps

Item # 52142 Retail Price \$27.95 Your Price \$20.96

For full product description or to order Jarro-Dophilus® Women call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)



NEW  
FOOD-GRADE  
ENTERIC  
COATING

**Jarrow**  
FORMULAS

ROOM  
TEMPERATURE  
STABLE™



Jarro-Dophilus® Women contains the clinically tested Astarte® strains which are protected by U.S. Patent 8,846,027 and European Patent 2,509,610. Astarte® is owned by HSO Health Care GmbH, Vienna, Austria, and licensed in the U.S. to Jarrow Formulas, Inc. Other international patents pending.

**ASTARTE**

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

# Discover a European Secret for Beautiful Legs



For full product description  
and to order European Leg  
Solution featuring  
Certified Diosmin 95,  
call 1-800-544-4440 or visit  
[www.LifeExtension.com](http://www.LifeExtension.com)

## Combat Unsightly Veins

**European Leg Solution with certified Diosmin 95** helps your legs look and feel great by:<sup>1-4</sup>

- Supporting healthy blood flow.
- Maintaining healthy venous tone and elasticity.
- Safeguarding collagen suppleness.

### European Leg Solution featuring Certified Diosmin 95

Item #01042 • 30 vegetarian tablets

	Retail Price	Your Price
1 bottle	\$20	<b>\$15</b>
4 bottles		<b>\$13.50 each</b>

#### References

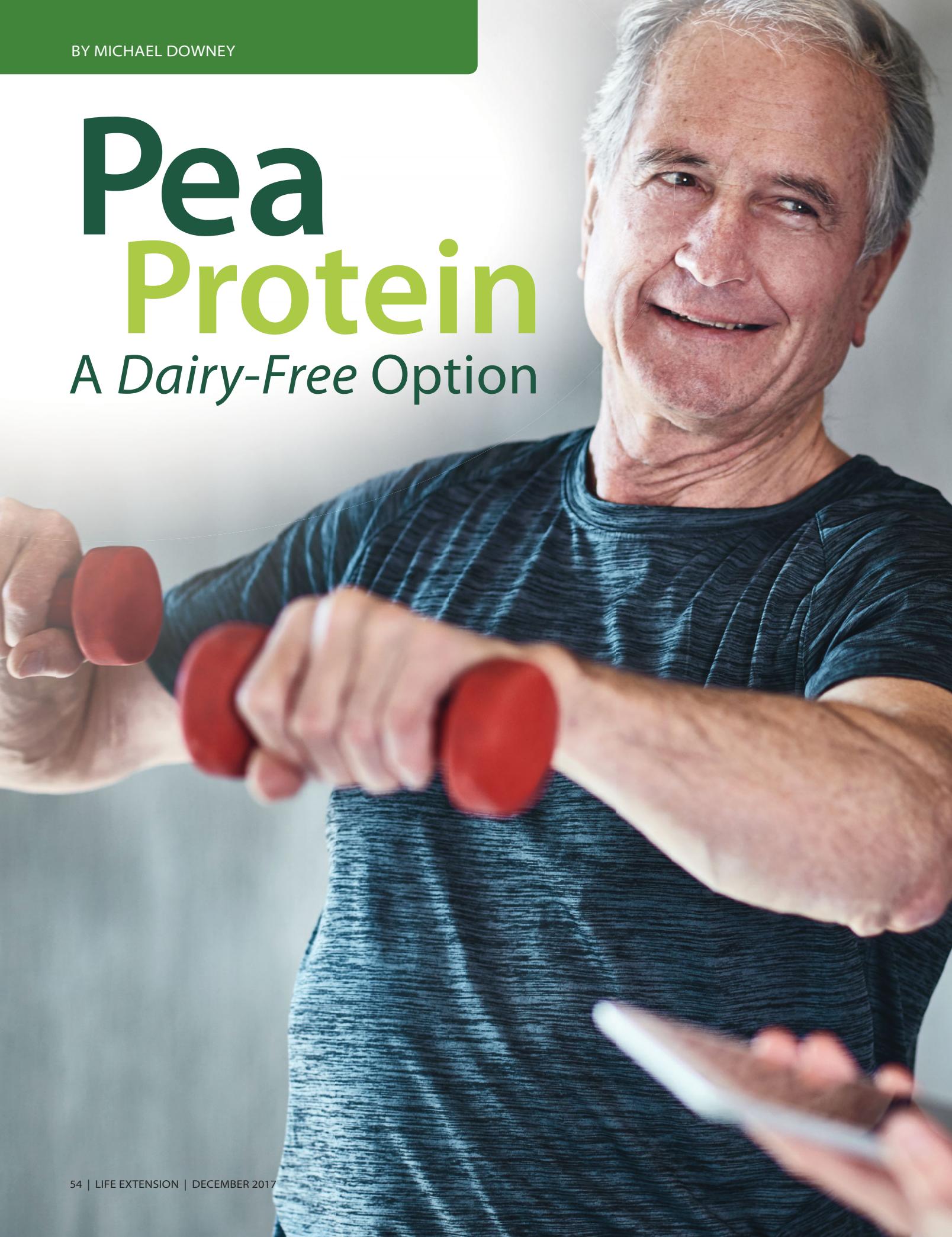
1. *Angiology*. 1994 Jun;45(6):419-28.
2. *Angiology*. 2003 Jul-Aug;54 Suppl 1:S33-44.
3. *Angiology*. 2000 Jan;51(1):31-7.
4. *Angiology*. 2005 Sep-Oct;56 Suppl 1:S25-32.

**Caution:** If you are taking anticoagulant or antiplatelet medications, or have a bleeding disorder, consult your health care provider before taking this product.

BY MICHAEL DOWNEY

# Pea Protein

## *A Dairy-Free Option*





With age, people often unwittingly fail to ingest sufficient **protein** in their diets.

Protein is a major building block in our body. It is especially important to help preserve **muscle** mass.

If you are not already ingesting excess calories, an easy way to ensure against protein insufficiency is a concentrated powder made from high-quality organic **peas**.

Studies show that older adults may need anywhere from **11%** to **250% more protein** than adults in general.<sup>1-9</sup>

Old or young, protein is essential as a supply of amino acids. These proteins are transformed into *functional* proteins that take care of almost every physiologic need from cell structure to waste clearance.<sup>10</sup>

Sufficient amounts of protein are needed to inhibit **sarcopenia**—the age-related muscle loss that boosts the risk of frailty, falls, and disability.<sup>11-14</sup>

But whey, egg, and soy protein supplements may be off-limits for those who are allergic to dairy, egg, or soy or are lactose intolerant, vegetarian or vegan.

Researchers have been eager to find a plant-based protein supplement that is nutritious, hypoallergenic, and high in essential amino acids. A new **pea protein** powder provides low-fat protein with high digestibility—free of dairy, egg, soy, lactose, gluten, and sugar.

This plant-based protein contains muscle-promoting **branched-chain amino acids** and **glutamine** that can help avert age-related muscle loss and promote recovery from exercise.

## Retaining Muscle Mass While Aging

Aging is associated with a marked reduction in *cellular protein synthesis*.<sup>15</sup>

Muscle strength and function diminishes after **40**. That loss—called **sarcopenia**—accelerates after the age of about **75**, even among those who have been physically active throughout their lives.<sup>11,14,16</sup>

Since muscles generate much of the mechanical stress required to keep bones healthy, the reduced muscle activity from sarcopenia may increase susceptibility to osteoporosis. A **2016** study suggested there is significant “cross-talking” between muscle and bone cells,<sup>17</sup> potentially setting up a cycle of declining health.

Muscle loss also hikes the risks that follow surgery or traumatic events, because muscles act as a “metabolic reservoir” of amino acids that maintain the protein synthesis required for survival and recovery.<sup>18,19</sup>

Fortunately, the use of **protein supplements**, especially when combined with exercise, has been demonstrated to have an anabolic, or tissue-building, effect on muscle mass among aging adults.<sup>20-22</sup>



Daily supplementation with **15 grams** of essential amino acids—the building blocks of protein—was found to *increase* muscle synthesis and lean body mass in older women within three months, “possibly offsetting the debilitating effects of sarcopenia.”<sup>23</sup>

Additionally, research has linked a diet low in calories, but rich in high-quality **vegetable** protein, to reduced cardiovascular-risk profiles in adults of all ages, including LDL-cholesterol and blood pressure.<sup>24</sup>

And clinical research reveals that older individuals require a higher daily intake of protein than normally recommended for younger persons.<sup>1-9</sup>

Aging adults—along with vegans, vegetarians, the lactose-intolerant, those with allergies to dairy, soy, or egg, and people concerned about the GMOs commonly found in soy—now have a high-quality alternative in high-quality protein derived from the pea plant.

## Pea-Protein

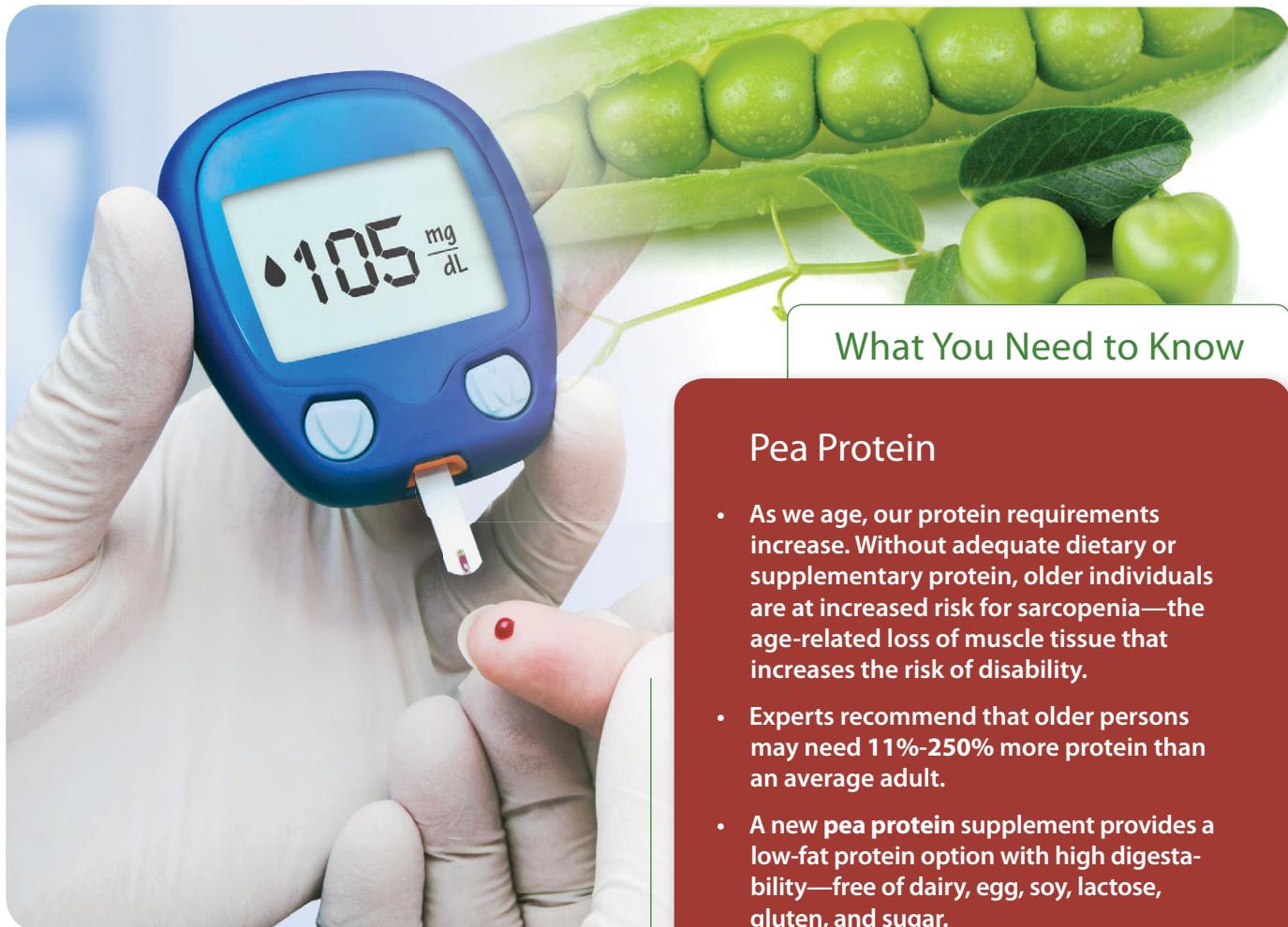
**Pea protein** has been shown to exert numerous healthful effects when taken by aging humans.

In **2016**, scientists showed that *meals* high in pea (and bean) protein favorably affected appetite regulation more so than meals high in animal protein, with similar energy and protein content. The legume protein-rich meals resulted in reduced appetite scores, hunger, and prospective consumption, and a greater sensation of postprandial (after-meal) fullness.<sup>25</sup>

Supplemental pea protein is now available in a proprietary formula that contains no common allergens such as dairy or egg, while delivering:

- **Beta-glucan fiber**, which supports healthy cholesterol and postprandial blood sugar;<sup>26-30</sup>
- **Agave inulin** and **FOS** (fructooligosaccharides), prebiotics that support digestive and immune health;<sup>31-33</sup>
- **Branched-chain amino acids** (BCAAs), which promote muscle synthesis;<sup>34,35</sup> and
- **Glutamine**, which is a key amino acid in a number of metabolic functions.<sup>36-38</sup>

While pea protein has BCAA values comparable to those in the “gold standard” protein supplements whey, egg, and casein, it provides significantly higher amounts of arginine, which is essential for *nitric oxide* synthesis.<sup>39</sup>



## What You Need to Know

### Pea Protein

- As we age, our protein requirements increase. Without adequate dietary or supplementary protein, older individuals are at increased risk for sarcopenia—the age-related loss of muscle tissue that increases the risk of disability.
- Experts recommend that older persons may need 11%–250% more protein than an average adult.
- A new pea protein supplement provides a low-fat protein option with high digestibility—free of dairy, egg, soy, lactose, gluten, and sugar.
- It provides branched-chain amino acids and beneficial glutamine and arginine.

### Glutamine: Critical Muscle and Whole-Body Support

**Glutamine**—the most abundant amino acid in the body, is highly concentrated in the skeletal muscles.<sup>40,41</sup>

Research indicates that output levels of human growth hormone increase **four-fold** after supplementing with glutamine.<sup>42</sup> Glutamine can also help replenish muscle stores of glycogen after exercise,<sup>43</sup> providing a ready fuel source for muscles.

In addition to its effects on exercise, glutamine contributes to a number of key functions, including support for the immune system and prevention of infections and improved gut barrier function.<sup>37</sup>

During stressful states of illness or injury, glutamine becomes “conditionally essential,” meaning that the body cannot supply an adequate amount and it must be taken in from food or supplements.<sup>37,44</sup> A wealth of evidence indicates that this amino acid can play a key role in treating serious and critical illnesses,<sup>45–48</sup> injuries,<sup>49</sup> infections,<sup>48,50</sup> and postoperative wound-healing.<sup>37,51,52</sup>

### Branched-Chain Amino Acids Inhibit Muscle Loss

Abundant in pea protein are the three essential branched-chain amino acids—**leucine**, **isoleucine**, and **valine**—which play an important role in muscle protein synthesis and muscle recovery, damage, and fatigue during and after exercise.<sup>53–58</sup> BCAAs have also been shown to reduce muscle damage, inflammation, and perceived exertion and fatigue during exercise.<sup>59</sup>

BCAAs are transported and metabolized differently than other amino acids. Instead of being broken down in the liver, they enter the bloodstream and are absorbed directly into the skeletal muscle. There, they pass into the mitochondria, which are the cells’ powerhouses.<sup>60</sup>

Human research examining this novel handling of BCAAs in the bloodstream and in skeletal muscle has suggested that BCAAs play a critical role in muscle recovery from fatigue or from intensive physical activity such as resistance training.<sup>53-58</sup> They may also act as performance enhancers.<sup>61</sup>

Amino acid mixtures that have been enriched with BCAAs have shown promise for improving the muscle-wasting of sarcopenia in elderly humans, who were demonstrated to gain muscle mass during treatment.<sup>62</sup> This implies that BCAAs may be effective in other conditions characterized by debilitation and muscle loss.

### Complementary Beneficial Nutrients

Agave-derived **inulin** and **fructooligosaccharides** (FOS)—both of which are powerful prebiotics—as well as gluten-free **oat bran**, which contains beneficial beta-glucans, offer added health benefits to pea protein alone.

The long-chain *prebiotic* inulin, extracted from agave plant fiber, arrives at the colon intact and remains longer, and supports the growth of the beneficial intestinal bacteria, including *Lactobacilli* and *Bifidobacteria*.<sup>32,33</sup> Together, inulin and FOS favorably transform the composition of the gut microbiota to maintain digestive health and immunity.<sup>31-33</sup>



Animal studies have shown that inulin-based prebiotics may improve ulcerative colitis,<sup>63</sup> prevent the initiation of colon cancer,<sup>64,65</sup> lower cholesterol and triglycerides,<sup>66</sup> and support calcium absorption for better bone health.<sup>67</sup>

Oat bran is a source of the soluble fiber beta-glucans, which has been shown to promote a healthy postprandial glycemic response<sup>30</sup> and significantly reduce plasma cholesterol levels.<sup>26</sup>

Pea protein delivers essential nutrients to help protect against muscle-wasting, it also protects against a wide array of diseases.

### Pea Protein Validated in Human Studies

Published research shows that—well beyond protecting against sarcopenia—pea protein promotes beneficial effects including:

- **Weight Loss:** Pea protein was demonstrated in a clinical study to induce a feeling of fullness or satiety,<sup>25</sup> and in an animal study to significantly lower the hunger hormone ghrelin.<sup>68</sup> Both of these effects would reduce food intake. As a result, pea protein may help with weight-loss. Many people neglect protein when dieting. This is regrettable because of pea protein's satiety and hormonal effects that can help the body burn fat faster.
- **Healthier Heart:** Pea protein decreases blood pressure.<sup>69</sup> In addition, a group of researchers found that, compared to a low-carbohydrate diet based on animal sources, a vegetable-based low-carbohydrate diet is associated with lower all-cause and cardiovascular disease rates.<sup>70</sup>
- **Lower Blood Sugar:** Blood glucose levels may be reduced after consumption of a combination of pea protein and fiber, which suggests the potential for enhanced glycemic control. A **2014** study found that adding pea protein and fiber to a meal results in a blood sugar level that is lower at 30 minutes, compared to a control meal. The study author concluded that, “*This trial supports the use of pea components as value-added ingredients in foods designed to improve glycemic control.*”<sup>71</sup>

Sugar-free pea protein is the ideal alternative for those who are unable to take dairy-based, egg, or soy-protein supplements but wish to prevent sarcopenia and other age-related conditions.



## Summary

Studies show that older individuals may need more protein than adults in general, especially if they want to prevent **sarcopenia**, the age-related loss of muscle tissue that increases the risk of frailty and disability.

The good news for vegans and those with food intolerances is that a new plant protein, featuring **organic pea protein** provides a nutrient-dense, low-fat protein that is high in essential amino acids, with excellent digestibility—free of dairy, egg, soy, lactose, gluten, and sugar.

Those already over-consuming protein calories should not take **pea** or other bulk **protein supplements** as they may accelerate certain aging processes. ●

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

- Gaffney-Stomberg E, Insogna KL, Rodriguez NR, et al. Increasing dietary protein requirements in elderly people for optimal muscle and bone health. *J Am Geriatr Soc.* 2009;57(6):1073-9.
- Morais JA, Chevalier S, Gougeon R. Protein turnover and requirements in the healthy and frail elderly. *J Nutr Health Aging.* 2006;10(4):272-83.
- Morse MH, Haub MD, Evans WJ, et al. Protein requirement of elderly women: nitrogen balance responses to three levels of protein intake. *J Gerontol A Biol Sci Med Sci.* 2001;56(11):M724-30.
- Campbell WW, Crim MC, Dallal GE, et al. Increased protein requirements in elderly people: new data and retrospective reassessments. *Am J Clin Nutr.* 1994;60(4):501-9.
- Houston DK, Nicklas BJ, Ding J, et al. Dietary protein intake is associated with lean mass change in older, community-dwelling adults: the Health, Aging, and Body Composition (Health ABC) Study. *Am J Clin Nutr.* 2008;87(1):150-5.
- Karakelides H, Nair KS. Sarcopenia of aging and its metabolic impact. *Curr Top Dev Biol.* 2005;68:123-48.
- Young VR. Amino acids and proteins in relation to the nutrition of elderly people. *Age Ageing.* 1990;19(4):S10-24.
- Courtney-Martin G, Ball RO, Pencharz PB, et al. Protein Requirements during Aging. *Nutrients.* 2016;8(8).
- Baum JI, Kim IV, Wolfe RR. Protein Consumption and the Elderly: What Is the Optimal Level of Intake? *Nutrients.* 2016;8(6).
- Available at: <https://www.nature.com/scitable/topicpage/protein-function-14123348>. Accessed August 25, 2017.
- Paddon-Jones D, Short KR, Campbell WW, et al. Role of dietary protein in the sarcopenia of aging. *Am J Clin Nutr.* 2008;87(5):1562s-6s.
- Doherty TJ. Invited review: Aging and sarcopenia. *J Appl Physiol (1985).* 2003;95(4):1717-27.
- Beasley JM, Shikany JM, Thomson CA. The role of dietary protein intake in the prevention of sarcopenia of aging. *Nutr Clin Pract.* 2013;28(6):684-90.
- Beaudart C, McCloskey E, Bruyere O, et al. Sarcopenia in daily practice: assessment and management. *BMC Geriatr.* 2016;16(1):170.
- Rattan SI. Synthesis, modifications, and turnover of proteins during aging. *Exp Gerontol.* 1996;31(1-2):33-47.
- Waters DL, Baumgartner RN, Garry PJ. Sarcopenia: current perspectives. *J Nutr Health Aging.* 2000;4(3):133-9.
- Reginster JY, Beaudart C, Buckinx F, et al. Osteoporosis and sarcopenia: two diseases or one? *Curr Opin Clin Nutr Metab Care.* 2016;19(1):31-6.
- Wolfe RR. The underappreciated role of muscle in health and disease. *Am J Clin Nutr.* 2006;84(3):475-82.
- Argiles JM, Campos N, Lopez-Pedrosa JM, et al. Skeletal Muscle Regulates Metabolism via Interorgan Crosstalk: Roles in Health and Disease. *J Am Med Dir Assoc.* 2016;17(9):789-96.
- Baum JI, Wolfe RR. The Link between Dietary Protein Intake, Skeletal Muscle Function and Health in Older Adults. *Healthcare (Basel).* 2015;3(3):529-43.
- Tieland M, Dirks ML, van der Zwaluw N, et al. Protein supplementation increases muscle mass gain during prolonged resistance-type exercise training in frail elderly people: a randomized, double-blind, placebo-controlled trial. *J Am Med Dir Assoc.* 2012;13(8):713-9.
- Lancha AH, Jr., Zanella R, Jr., Tanabe SG, et al. Dietary protein supplementation in the elderly for limiting muscle mass loss. *Amino Acids.* 2017;49(1):33-47.
- Dillon EL, Sheffield-Moore M, Paddon-Jones D, et al. Amino acid supplementation increases lean body mass, basal muscle protein synthesis, and insulin-like growth factor-I expression in older women. *J Clin Endocrinol Metab.* 2009;94(5):1630-7.

24. Jenkins DJ, Wong JM, Kendall CW, et al. The effect of a plant-based low-carbohydrate ("Eco-Atkins") diet on body weight and blood lipid concentrations in hyperlipidemic subjects. *Arch Intern Med.* 2009;169(11):1046-54.

25. Kristensen MD, Bendsen NT, Christensen SM, et al. Meals based on vegetable protein sources (beans and peas) are more satiating than meals based on animal protein sources (veal and pork) - a randomized cross-over meal test study. *Food Nutr Res.* 2016;60:32634.

26. Queenan KM, Stewart ML, Smith KN, et al. Concentrated oat beta-glucan, a fermentable fiber, lowers serum cholesterol in hypercholesterolemic adults in a randomized controlled trial. *Nutr J.* 2007;6:6.

27. Vachon C, Jones JD, Wood PJ, et al. Concentration effect of soluble dietary fibers on postprandial glucose and insulin in the rat. *Can J Physiol Pharmacol.* 1988;66(6):801-6.

28. Rondanelli M, Opizzi A, Monteferrario F. [The biological activity of beta-glucans]. *Minerva Med.* 2009;100(3):237-45.

29. Braaten JT, Wood PJ, Scott FW, et al. Oat gum lowers glucose and insulin after an oral glucose load. *Am J Clin Nutr.* 1991;53(6):1425-30.

30. Björklund M, van Rees A, Mensink RP, et al. Changes in serum lipids and postprandial glucose and insulin concentrations after consumption of beverages with beta-glucans from oats or barley: a randomised dose-controlled trial. *Eur J Clin Nutr.* 2005;59(11):1272-81.

31. Franco-Robles E, Lopez MG. Implication of fructans in health: immunomodulatory and antioxidant mechanisms. *ScientificWorldJournal.* 2015;2015:289267.

32. Wilson B, Whelan K. Prebiotic inulin-type fructans and galacto-oligosaccharides: definition, specificity, function, and application in gastrointestinal disorders. *J Gastroenterol Hepatol.* 2017;32 Suppl 1:64-8.

33. Corzo N, Alonso JL, Azpiroz F, et al. [Prebiotics: concept, properties and beneficial effects]. *Nutr Hosp.* 2015;31 Suppl 1:99-118.

34. Koopman R, Verdijk L, Manders RJ, et al. Co-ingestion of protein and leucine stimulates muscle protein synthesis rates to the same extent in young and elderly lean men. *Am J Clin Nutr.* 2006;84(3):623-32.

35. Katsanos CS, Kobayashi H, Sheffield-Moore M, et al. A high proportion of leucine is required for optimal stimulation of the rate of muscle protein synthesis by essential amino acids in the elderly. *Am J Physiol Endocrinol Metab.* 2006;291(2):E381-7.

36. Newsholme P, Curi R, Pithon Curi TC, et al. Glutamine metabolism by lymphocytes, macrophages, and neutrophils: its importance in health and disease. *J Nutr Biochem.* 1999;10(6):316-24.

37. L-glutamine. *Altern Med Rev.* 2001;6(4):406-10.

38. Lee WJ, Hawkins RA, Vina JR, et al. Glutamine transport by the blood-brain barrier: a possible mechanism for nitrogen removal. *Am J Physiol.* 1998;274(4 Pt 1):C1101-7.

39. Tapiero H, Mathe G, Couvreur P, et al. I. Arginine. *Biomed Pharmacother.* 2002;56(9):439-45.

40. Walsh NP, Blannin AK, Robson PJ, et al. Glutamine, exercise and immune function. Links and possible mechanisms. *Sports Med.* 1998;26(3):177-91.

41. D'Souza R, Powell-Tuck J. Glutamine supplements in the critically ill. *J R Soc Med.* 2004;97(9):425-7.

42. Welbourne TC. Increased plasma bicarbonate and growth hormone after an oral glutamine load. *Am J Clin Nutr.* 1995;61(5):1058-61.

43. Gleeson M. Dosing and efficacy of glutamine supplementation in human exercise and sport training. *J Nutr.* 2008;138(10):2045s-9s.

44. Lacey JM, Wilmore DW. Is glutamine a conditionally essential amino acid? *Nutr Rev.* 1990;48(8):297-309.

45. Avenell A. Hot topics in parenteral nutrition. Current evidence and ongoing trials on the use of glutamine in critically-ill patients and patients undergoing surgery. *Proc Nutr Soc.* 2009;68(3):261-8.

46. Novak F, Heyland DK, Avenell A, et al. Glutamine supplementation in serious illness: a systematic review of the evidence. *Crit Care Med.* 2002;30(9):2022-9.

47. Kelly D, Wischmeyer PE. Role of L-glutamine in critical illness: new insights. *Curr Opin Clin Nutr Metab Care.* 2003;6(2):217-22.

48. Tao KM, Li XQ, Yang LQ, et al. Glutamine supplementation for critically ill adults. *Cochrane Database Syst Rev.* 2014(9):Cd010050.

49. Wilmore DW. The effect of glutamine supplementation in patients following elective surgery and accidental injury. *J Nutr.* 2001;131(9 Suppl):2543S-9S; discussion 50S-1S.

50. Wischmeyer PE, Dhaliwal R, McCall M, et al. Parenteral glutamine supplementation in critical illness: a systematic review. *Crit Care.* 2014;18(2):R76.

51. Fan YP, Yu JC, Kang WM, et al. Effects of glutamine supplementation on patients undergoing abdominal surgery. *Chin Med Sci J.* 2009;24(1):55-9.

52. Sandini M, Nespoli L, Oldani M, et al. Effect of glutamine dipeptide supplementation on primary outcomes for elective major surgery: systematic review and meta-analysis. *Nutrients.* 2015;7(1):481-99.

53. Blomstrand E, Eliasson J, Karlsson HK, et al. Branched-chain amino acids activate key enzymes in protein synthesis after physical exercise. *J Nutr.* 2006;136(1 Suppl):269s-73s.

54. Greer BK, Woodard JL, White JP, et al. Branched-chain amino acid supplementation and indicators of muscle damage after endurance exercise. *Int J Sport Nutr Exerc Metab.* 2007;17(6):595-607.

55. Gualano AB, Bozza T, Lopes De Campos P, et al. Branched-chain amino acids supplementation enhances exercise capacity and lipid oxidation during endurance exercise after muscle glycogen depletion. *J Sports Med Phys Fitness.* 2011;51(1):82-8.

56. Shimomura Y, Yamamoto Y, Bajotto G, et al. Nutraceutical effects of branched-chain amino acids on skeletal muscle. *J Nutr.* 2006;136(2):529s-32s.

57. Jackman SR, Witard OC, Philp A, et al. Branched-Chain Amino Acid Ingestion Stimulates Muscle Myofibrillar Protein Synthesis following Resistance Exercise in Humans. *Front Physiol.* 2017;8:390.

58. Bajotto G, Sato Y, Kitaura Y, et al. Effect of branched-chain amino acid supplementation during unloading on regulatory components of protein synthesis in atrophied soleus muscles. *Eur J Appl Physiol.* 2011;111(8):1815-28.

59. Matsumoto K, Koba T, Hamada K, et al. Branched-chain amino acid supplementation attenuates muscle soreness, muscle damage and inflammation during an intensive training program. *J Sports Med Phys Fitness.* 2009;49(4):424-31.

60. Cole JT. Metabolism of BCAAs. In: Rajendram R, Preedy VR, Patel VB, eds. *Branched Chain Amino Acids in Clinical Nutrition: Volume 1.* New York, NY: Springer New York; 2015:13-24.

61. Kreider RB, Wilborn CD, Taylor L, et al. ISSN exercise & sport nutrition review: research & recommendations. *J Int Soc Sports Nutr.* 2010;7:7.

62. Solerte SB, Gazzaruso C, Bonacasa R, et al. Nutritional supplements with oral amino acid mixtures increases whole-body lean mass and insulin sensitivity in elderly subjects with sarcopenia. *Am J Cardiol.* 2008;101(11a):69e-77e.

63. Guarner F. Inulin and oligofructose: impact on intestinal diseases and disorders. *Br J Nutr.* 2005;93 Suppl 1:S61-5.

64. Femia AP, Luceri C, Dolara P, et al. Antitumorigenic activity of the prebiotic inulin enriched with oligofructose in combination with the probiotics *Lactobacillus rhamnosus* and *Bifidobacterium lactis* on azoxymethane-induced colon carcinogenesis in rats. *Carcinogenesis.* 2002;23(11):1953-60.

65. Vergheese M, Rao DR, Chawan CB, et al. Dietary inulin suppresses azoxymethane-induced preneoplastic aberrant crypt foci in mature Fisher 344 rats. *J Nutr.* 2002;132(9):2804-8.

66. Rault-Nania MH, Gueux E, Demougeot C, et al. Inulin attenuates atherosclerosis in apolipoprotein E-deficient mice. *Br J Nutr.* 2006;96(5):840-4.

67. Nzeusseu A, Dienst D, Haufroid V, et al. Inulin and fructo-oligosaccharides differ in their ability to enhance the density of cancellous and cortical bone in the axial and peripheral skeleton of growing rats. *Bone.* 2006;38(3):394-9.

68. Overduin J, Guerin-Deremaux L, Wils D, et al. NUTRALYS((R)) pea protein: characterization of in vitro gastric digestion and in vivo gastrointestinal peptide responses relevant to satiety. *Food Nutr Res.* 2015;59:25622.

69. Li H, Prairie N, Udenigwe CC, et al. Blood pressure lowering effect of a pea protein hydrolysate in hypertensive rats and humans. *J Agric Food Chem.* 2011;59(18):9854-60.

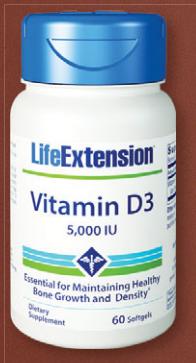
70. Fung TT, van Dam RM, Hankinson SE, et al. Low-carbohydrate diets and all-cause and cause-specific mortality: two cohort studies. *Ann Intern Med.* 2010;153(5):289-98.

71. Mollard RC, Luhovsky BL, Smith C, et al. Acute effects of pea protein and hull fibre alone and combined on blood glucose, appetite, and food intake in healthy young men--a randomized crossover trial. *Appl Physiol Nutr Metab.* 2014;39(12):1360-5.

# “D”-fend Your Health

## VITAMIN D3

Systemic Support for Youthful Cell Function



Non-GMO	Retail Price	Your Price
1 bottle	\$10	<b>\$7.50</b>
4 bottles		<b>\$6.50 each</b>

Item # 01713 • 5,000 IU • 60 softgels

For full product description and to order **Vitamin D3**, call **1-800-544-4440** or visit **www.LifeExtension.com**

**Caution:** Individuals consuming more than 2,000 IU/day of vitamin D (from diet and supplements) should periodically obtain a serum 25-hydroxy vitamin D measurement. Do not exceed 10,000 IU per day unless recommended by your doctor. Vitamin D supplementation is not recommended for individuals with high blood calcium levels.

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

# POWER UP!

## TURN ON YOUR CELLULAR ENERGY

### Optimized NAD+ Cell

**Regenerator™** combines **250 mg** of **nicotinamide riboside** with **resveratrol** and other **plant extracts**

For **resveratrol** to deliver functional results, it requires **NAD+**.

**NAD+** levels **plummet** with **age** but increase in response to **nicotinamide riboside**.

For those already taking resveratrol, we also offer **NAD+ Regenerator™** that provides **250 mg** of **nicotinamide riboside**.

### Optimized NAD+ Cell Regenerator™ Item #02145 • 30 vegetarian capsules

	Retail Price	Your Price
1 bottle	\$50	\$37.50
4 bottles		\$34 each



### NAD+ Cell Regenerator™ Item #02144 • 30 vegetarian capsules

	Retail Price	Your Price
1 bottle	\$42	\$31.50
4 bottles		\$28 each



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

pTeroPure® and NIAGEN® are registered trademarks of ChromaDex, Inc., Patents see: [www.ChromaDexPatents.com](http://www.ChromaDexPatents.com)

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

# PLANT POWER!

*Get a Protein Boost with Organic Pea Protein*

**Plant Protein Complete and Amino Acid Complex** delivers:

- **18 grams** of high-quality **organic pea protein**,
- Abundant branched-chain amino acids,
- Powerful prebiotics,
- Beneficial beta-glucans
- Digestive enzyme blend

**Plant Protein Complete and Amino Acid Complex** contains no dairy, egg, soy, gluten, lactose, animal products, or sugar. Just a natural vanilla flavor.



#### Plant Protein Complete and Amino Acid Complex

Item #02127 • 450 gram container

	Retail Price	Your Price
1 container	\$34	<b>\$25.50</b>
4 containers		<b>\$23 each</b>

Nutrim® is a registered trademark of VDF FutureCeuticals, Inc.



For full product description and to order **Plant Protein Complete and Amino Acid Complex**, call **1-800-544-4440** or visit [www.LifeExtension.com](http://www.LifeExtension.com)

BY MICHAEL DOWNEY



# Rebuild Youthful *Skin, Hair, and Nails* from Within

Although aging impacts the whole body, the most visible effects occur in our **skin, hair, and nails**.

As we mature, our outer tissues lose their framework of structural proteins, namely keratin, collagen, and elastin.

Loss of **structural proteins** in the body is further compounded by *external* factors such as pollution and sun exposure.

To counter this **visible** deterioration, scientists have investigated nutrients that can be taken **orally** to rebuild the underlying architecture of the skin, hair, and nails.

Their work has resulted in *targeted* nutritional interventions—highly bioavailable forms of **collagen peptides** and **solubilized keratin**, combined with **biotin** and **silicon**.

These nutrients have been shown to support more youthful, vibrant skin, lustrous hair, and stronger nails from the *inside out*.<sup>1-15</sup>

## Rebuilding Youthful Skin, Hair, and Nails

With age, our bodies produce less of the **structural proteins** that are essential to the integrity of the tissues that make up hair, skin, and nails. These proteins include:

- **Keratin**, a structural component of hair, nails, and the outer layer of skin,
- **Collagen fibers**, the principle source of the skin's strength, and
- **Elastin**, an elastic protein in connective tissue that allows many tissues in the body to resume their shape after stretching or contracting.

By the age of 21 we start losing about **1%** of the **collagen** in our skin every year.<sup>9</sup>

The visible effects of a decrease in these proteins include thin, wrinkled, sagging, and dry skin; thinning, weak, dull hair; and dull, brittle nails.

But the age-related decline in these critical proteins goes far beyond the external, cosmetic effects. They reflect more serious problems on the *inside*, including adverse changes in blood vessel walls, bone, connective tissues, and other vital organs where these structural proteins predominate.

In addition, skin exposed over time to the sun's radiation undergoes a breakdown and alteration of collagen fibers and accumulates disorganized elastin proteins throughout the **dermis**, the deeper layers of the skin.<sup>10</sup>

The good news is that a number of highly **bioactive compounds** have been found to **reverse** these age-revealing structural changes.

## Rebuilding Your Skin's Structure

Many keratin supplements on the market aren't very effective because of how they're processed. But in a critical advance, scientists developed a patented process that converts keratin into a form our bodies can use.

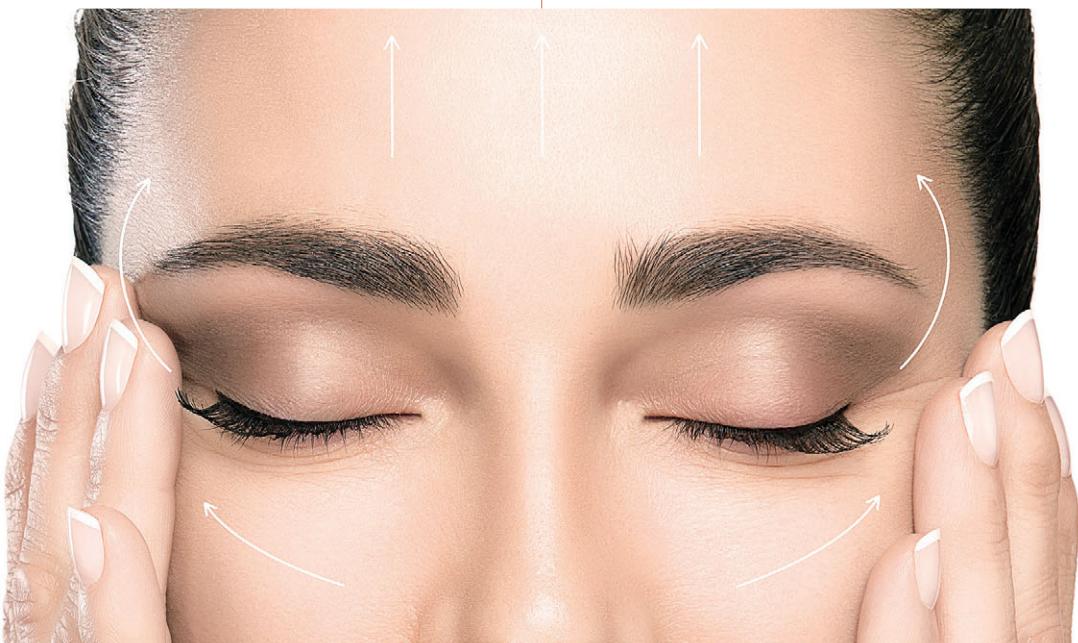
As a result, this **solubilized keratin** provides highly bioavailable, protein-forming building blocks needed to replace the body's natural keratin lost in the aging process. This allows the delivery of high-quality keratin proteins *directly* to the cells that make up the skin, hair, and nails. And their high bioavailability means they can *quickly* replenish depleted keratin levels.<sup>16-18</sup>

*In vitro* studies show that **soluble keratin** stimulates skin cells to proliferate at a rate up to **160%** greater than they otherwise would, permitting cells to increase their own production of diminished structural proteins.<sup>17</sup>

Because of its improved delivery, this patented **solubilized keratin** has been documented to:<sup>17</sup>

- Reduce hair loss from washing, improve hair strength, and increase hair brightness and luster
- Provide nails with improved strength, elasticity, and moisture retention
- Reduce fine lines and wrinkles
- Promote skin firmness and elasticity
- Decrease inflammatory redness of skin
- Add brightness and radiance to the skin, and
- Reduce water loss from the skin.

Impressive clinical studies validate the benefits of this novel "solubilized" keratin.





### Improvements in Hair and Nails

When it comes to improving the strength and appearance of hair and nails, several studies show that **solubilized keratin** is especially effective.

In one study, women with damaged, fragile, and stressed hair took two capsules of a special formulation daily, providing a total of **500 mg** of **solubilized keratin**, along with biotin, zinc, copper, and vitamins B3, B5, and B6.

After 90 days, electron microscope photos showed that uneven hair surfaces had become smooth, interlocking, and watertight—which translates into smoother, shinier hair. Also, the number of hairs lost during washing was reduced by **30%**, and hair strength was increased by **12%**. The researchers concluded that the keratin supplement promoted hair growth, strength, and appearance.<sup>11</sup>

Another trial found that taking two capsules of the same formulation daily decreased hair loss and improved the strength and appearance of nails in adult women. By day 90, the women experienced:<sup>12</sup>

- **47.1%** subjective improvement in hair appearance,
- **5.9%** improvement in hair strength,
- **9.2%** increase in hair follicles in the growth phase, and a
- **47%** reduction in the number of hairs that could be removed in a hair-pull test.

### Targeted Support for Youthful Hair, Skin, and Nails

- The most obvious signs of aging can be seen in our skin, hair, and nails.
- This is affected both by *intrinsic* biological aging and *extrinsic* environmental factors such as ultraviolet radiation.
- The underlying architecture of these body areas is rapidly diminished by the resulting loss of structural proteins, notably keratin, collagen, and elastin.
- Fortunately, novel and bioavailable forms of collagen peptides and solubilized keratin have been developed to reverse this process in skin, hair, and nails.
- Biotin and silicon have been documented to enhance these rejuvenation effects.

Also, their nails demonstrated:<sup>12</sup>

- **87.5%** improvement in the tendency to break (compared with **28.5%** in the placebo group),
- **50%** increased hardness,
- **54.2%** greater resistance to breaking,
- **33.2%** improved overall integrity,
- **37.5%** increased smoothness, and
- **20.8%** improved natural appearance.

An additional placebo-controlled study showed that keratin can also reduce the appearance of fine lines and **wrinkles**. Scientists again gave two capsules of the same keratin formulation daily to women between 40 and 71 who had obvious skin aging. By day 90, they documented:<sup>13</sup>

- **30.4%** improvement in skin moisture, almost a **12%** reduction in wrinkle depth,
- **58.3%** of subjects showed visible improvement in wrinkle depth,
- **16.8%** improved skin elasticity,
- **17.9%** improved skin smoothness, and almost a **9%** decreased skin roughness.

## Stronger Skin from Within

**Collagen** is an important component of youthful skin. It makes up **70%** of the weight of the dermis, the inner layer of the skin.<sup>19</sup> It also supports levels of *elastin*, the protein that allows skin to stretch and return to its original shape—which makes collagen a critical element in maintaining supple, flexible skin.

### Bioactive Collagen Peptides Improve Nail Brittleness and Growth Rate

A recent compelling study reported by the *Journal of Cosmetic Dermatology* demonstrated that oral supplementation with bioactive **collagen** peptides accelerated nail growth, improved nail brittleness, and powerfully decreased the frequency of nail breakage.<sup>23</sup>

Brittle nail syndrome affects about **20%** of the population, with women being affected twice as often as men. This challenging disorder is characterized by fragility of the nail plate, roughness, raggedness, and peeling. Patients often complain that their nails are too soft, weak, slow-growing, and easily broken. Usually underlying these symptoms is an impaired water-binding ability, which might reflect an abnormality in keratin or lipid content.

In this trial, 25 healthy women ages 18 to 50 were given **2.5 grams** of bioactive collagen peptides once daily for 24 weeks and then were removed from treatment for another four weeks. Nail characteristics and growth rate were assessed during treatment and after the off-therapy period.

Bioactive collagen peptides were found to have resulted in an increase of **12%** in nail growth rate and a decrease of **42%** in the frequency of broken nails.<sup>23</sup>

Additionally, treatment with bioactive collagen peptides clearly attenuated the symptoms of brittle nails. Clinical improvement in nail brittleness was observed in **64%** of participants after the 24-week treatment period. This beneficial effect was even more pronounced after the four-week washout period, when **88%** of study participants showed clinical improvement in nail brittleness. The study author concluded that this positive effect likely resulted from the direct effect of the peptides on the nail matrix.<sup>23</sup>

The vast majority of participants, **80%**, agreed that the use of the bioactive collagen peptides had improved their nails' appearance, and they expressed their complete satisfaction with the treatment results.<sup>23</sup>

As we get older, the number of collagen fibers in the dermis steadily decreases, and elastin fibers begin to fray and lose elasticity. This deterioration leads to **wrinkled** and **sagging** skin.<sup>20</sup>

Scientific innovators have developed a patented composition of different **bioactive collagen peptides**, which are derived from type I collagen that has been partially broken down using water. This unique process makes these peptides highly *bioavailable*, which provides the building blocks for collagen synthesis and stimulates the production of new collagen and elastin in the extracellular matrix of the skin.<sup>15</sup>

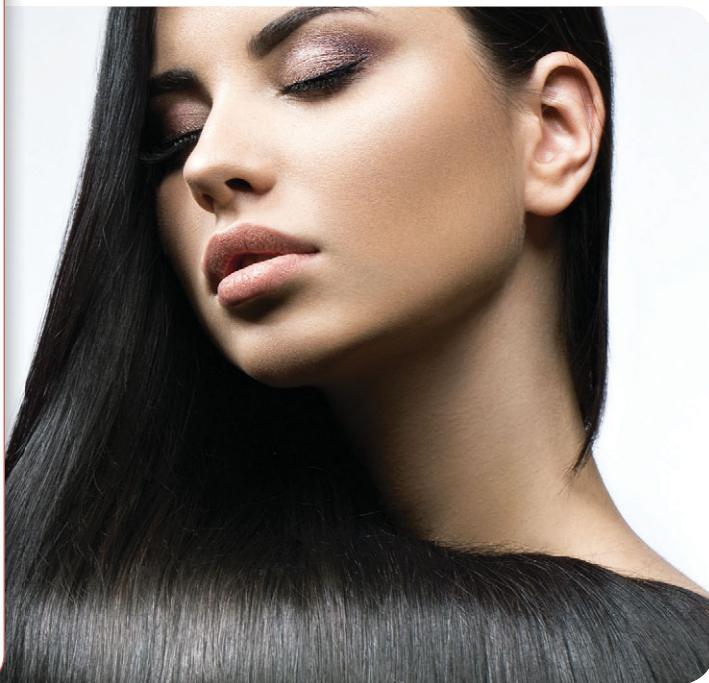
Another way these collagen peptides protect the skin is by reducing the activity of *metalloproteinase 2*, a “protein-melting” enzyme that breaks down collagen and hastens skin aging.<sup>21</sup>

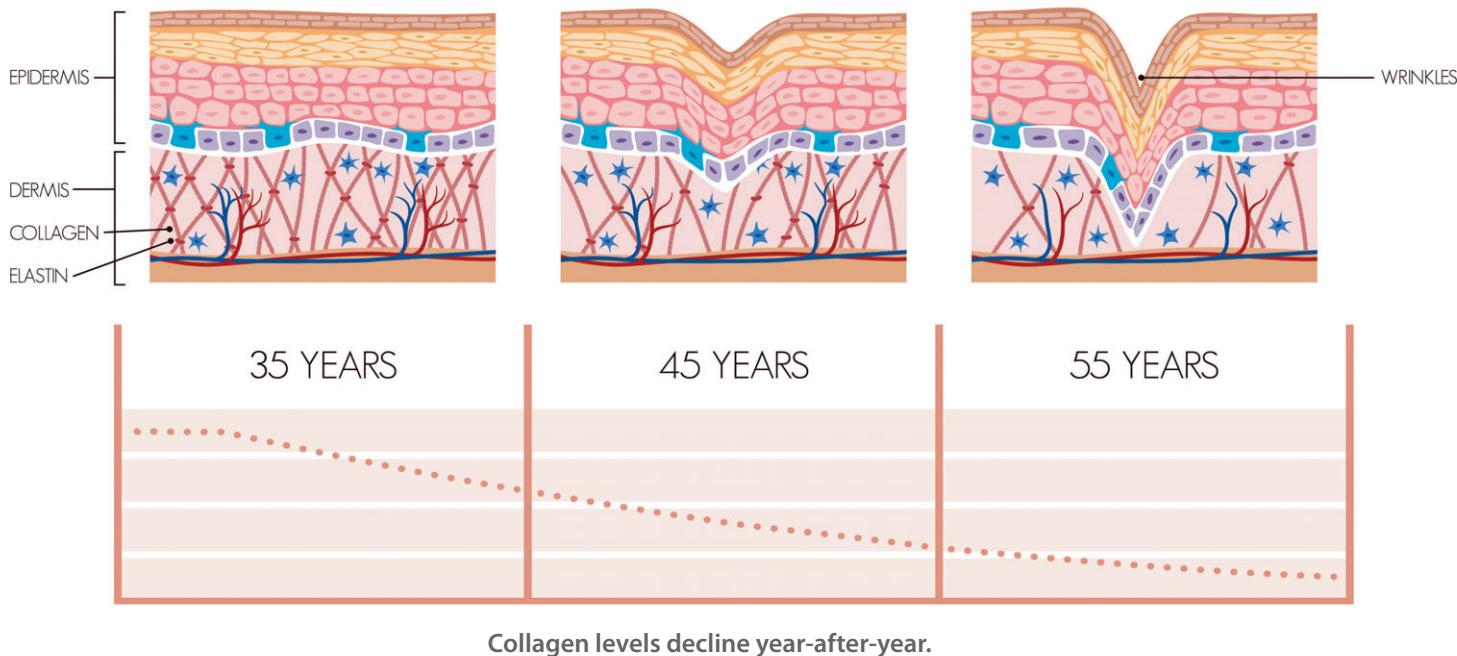
The effect in skin tissue is a remarkable reduction of skin wrinkles and improved dermal matrix synthesis.

### Reduce Wrinkles in Eight Weeks

Scientists put **bioactive collagen peptides** to the same rigorous clinical testing as solubilized keratin, and the results were equally impressive.

In one study, supplementing with either **2.5** or **5 grams** of this oral supplement for eight weeks led to a **7%** improvement in skin elasticity. This higher elasticity persisted even four weeks *after* they stopped taking the supplement, showing the lasting benefits of replacing the body's lost collagen.<sup>14</sup>





Another placebo-controlled trial demonstrated that women ages 45 to 65 who took **2.5 grams** of bioactive collagen peptides daily for just eight weeks achieved healthier, more supple skin. This was indicated by:<sup>15</sup>

- **20.1%** reduction in wrinkle depth,
- **65%** increase in the accumulation of essential type-I pro-collagen, and **18%** increase in elastin fibers.

As an added benefit, restoring dermal architecture can also decrease the appearance of *cellulite* by lessening the amount of fat showing through the skin. A **2015** study found that taking **2.5 grams** of bioactive collagen peptides daily for six months reduced cellulite scores in women by **9%** and decreased thigh skin waviness by **11.1%.<sup>8</sup>**

In **2017**, scientists reported that drinking a liquid blend of **collagen** peptides and antioxidants daily for 90 days improved skin elasticity by **7.5%** and significantly enhanced skin texture.<sup>10</sup>

Clinical trials now **validate** that these oral ingredients quickly change the effects of aging that occurs in skin, hair, and nails.

Although the development of uniquely bioavailable forms of solubilized keratin and bioactive collagen peptides have **revolutionized** the rejuvenation of skin, hair, and nails, two important nutrients have the capacity to act as catalysts in this structural rebuilding: **biotin** and **silicon**.

### Building Stronger Nails

**Biotin** is a water-soluble B vitamin. Animal<sup>22</sup> and human<sup>1-3</sup> studies indicate that biotin supplementation improves the hardness and integrity of the nail structure.

One study showed that taking **2.5 mg** of biotin every day for an average of 5.5 months transformed aged and damaged fingernails into firmer, harder nails in an amazing **91%** of treated subjects.<sup>2</sup>

In another study, when women with brittle, splitting, or soft fingernails took biotin, they experienced a **25%** increase in nail thickness and reduced nail splitting. Electron microscopy scanning revealed that the irregular arrangement of cells on the nail surface of brittle nails had become more regular.<sup>1</sup>

Finally, a third study found that when people with brittle and splitting nails took **2.5 mg** of biotin per day for at least one month, **63%** of the subjects experienced a **clinical improvement** in nail integrity, brittleness, and splitting.<sup>3</sup>

### Additional Support

**Silicon** is an essential trace element involved in the metabolism of connective tissue in skin and hair.<sup>4-6</sup> It activates "hydroxylation" enzymes that cross-link collagen, which improves strength and elasticity.<sup>7</sup> Silicon is also associated with the synthesis of molecules known as *glycosaminoglycans*, which help create the substance that fills the space between collagen and

elastin.<sup>9</sup> Because of these important roles, silicon is an important component of healthy hair, nails, and skin.

It has been suggested that hair strands that have higher **silicon** content have a lower rate of falling out and greater brightness.

Silicon is also a predominant mineral in the composition of healthy nails. As a **2016** study indicated, “*The presence of soft and brittle nails can indicate systemic deficiency of silicon.*”<sup>9</sup>

Better collagen ultimately translates into better hair, skin, and nails.<sup>9</sup>

## Summary

The aging process is outwardly obvious in skin, hair, and nails.

To counter this visible deterioration, scientists have developed targeted **oral** interventions—highly bioavailable forms of **collagen peptides, solubilized keratin, biotin, and silicon**—that together rebuild the architecture behind youthful skin, lustrous hair, and stronger nails from *within*. ●

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

- Colombo VE, Gerber F, Bronhofer M, et al. Treatment of brittle fingernails and onychoschizia with biotin: scanning electron microscopy. *J Am Acad Dermatol.* 1990;23(6 Pt 1):1127-32.
- Floersheim GL. Treatment of brittle fingernails with biotin. *Z Hautkr.* 1989;64(1):41-8.
- Hochman LG, Scher RK, Meyerson MS. Brittle nails: response to daily biotin supplementation. *Cutis.* 1993;51(4):303-5.
- Seaborn CD, Nielsen FH. Silicon deprivation decreases collagen formation in wounds and bone, and ornithine transaminase enzyme activity in liver. *Biol Trace Elem Res.* 2002;89(3):251-61.
- Schwarz K. A bound form of silicon in glycosaminoglycans and polyuronides. *Proc Natl Acad Sci U S A.* 1973;70(5):1608-12.
- Carlisle EM. Silicon as an essential trace element in animal nutrition. *Ciba Found Symp.* 1986;121:123-39.
- Seaborn CD, Nielsen, F.H. Silicon: A nutritional beneficence for bones, brains and blood vessels? *Nutrition Today.* Vol July/August 1993;1993:13-8.
- Schunck M, Zague V, Oesser S, et al. Dietary Supplementation with Specific Collagen Peptides Has a Body Mass Index-Dependent Beneficial Effect on Cellulite Morphology. *J Med Food.* 2015;18(12):1340-8.
- Araujo LA, Addor F, Campos PM. Use of silicon for skin and hair care: an approach of chemical forms available and efficacy. *An Bras Dermatol.* 2016;91(3):331-5.
- Genovese L, Corbo A, Sibilla S. An Insight into the Changes in Skin Texture and Properties following Dietary Intervention with a Nutraceutical Containing a Blend of Collagen Bioactive Peptides and Antioxidants. *Skin Pharmacol Physiol.* 2017;30(3):146-58.
- Quaglini M, Marzatico, F. Clinical Study: Evaluation of the efficacy of a food supplement to strengthen and support hair growth. *Farcoderm;* 2010.
- Beer C, Wood S, Veghte RH. A clinical trial to investigate the effect of Cynatine HNS on hair and nail parameters. *ScientificWorld-Journal.* 2014;2014:641723.
- Beer C, Wood S, Veghte RH. A randomized, double-blind, placebo-controlled clinical trial to investigate the effect of Cynatine® HNS on skin characteristics. *Int J Cosmet Sci.* 2013;35(6):608-12.
- Proksch E, Segger D, Degwert J, et al. Oral supplementation of specific collagen peptides has beneficial effects on human skin physiology: a double-blind, placebo-controlled study. *Skin Pharmacol Physiol.* 2014;27(1):47-55.
- Proksch E, Schunck M, Zague V, et al. Oral intake of specific bioactive collagen peptides reduces skin wrinkles and increases dermal matrix synthesis. *Skin Pharmacol Physiol.* 2014;27(3):113-9.
- Marzatico F. In vitro efficacy study: Evaluation of the bioavailability activity of a dietary supplement. *Farcoderm;* 2010.
- Roxlor International. Technical Information Regarding Cynatine(R) HNS. In: Roxlor International, ed: Keratec, LTD.; 2010.
- Sando L, Kim M, Colgrave ML, et al. Photochemical crosslinking of soluble wool keratins produces a mechanically stable biomaterial that supports cell adhesion and proliferation. *J Biomed Mater Res A.* 2010;95(3):901-11.
- Available at: <http://emedicine.medscape.com/article/1294744-overview>. Accessed October 26, 2015.
- McLafferty E, Hendry C, Alistair F. The integumentary system: anatomy, physiology and function of skin. *Nurs Stand.* 2012;27(3):35-42.
- Zague V, de Freitas V, da Costa Rosa M, et al. Collagen hydrolysate intake increases skin collagen expression and suppresses matrix metalloproteinase 2 activity. *J Med Food.* 2011;14(6):618-24.
- Comben N, Clark RJ, Sutherland DJ. Clinical observations on the response of equine hoof defects to dietary supplementation with biotin. *Vet Rec.* 1984;115(25-26):642-5.
- Hexsel D, Zague V, Schunck M, et al. Oral supplementation with specific bioactive collagen peptides improves nail growth and reduces symptoms of brittle nails. *J Cosmet Dermatol.* 2017.





# Environmental Protection For Your Skin

**Environmental Support Serum** with *Marrubium vulgare* plant extract helps block the cumulative effects of **environmental** and oxidative pollutants—for smoother, clearer, and younger-looking skin.

## Cosmesis Environmental Support Serum

Item #80167 • 1 fl. oz. (30 ml) bottle

	Retail Price	Your Price
1 bottle	\$59	<b>\$44.25</b>
4 bottles		<b>\$39 each</b>



Not tested on animals. Keep out of reach of children. For external use only. Avoid contact with eyes.

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



**NEXT-GENERATION**  
**Glucose-Insulin**  
**MANAGEMENT**

**Glycemic Guard™** contains  
**maqui-berry** and **clove extract**.

These **plant extracts** help  
maintain healthy *after-meal*  
**blood glucose** levels and  
**insulin** response, and promote  
healthy HbA1c levels.



**ITEM # 02122 • 30 vegetarian capsules • Non-GMO • Retail price \$42 • Your price \$31.50 • 4 bottles \$28 each**

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

Delphinol® is a registered trademark of MNL. Clovinol® is a registered trademark of Akay USA LLC.

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.



*The quickest way to betray your age is a tired appearance ...*

## Revive Worn-out Hair, Skin, and Nails from Within

Working from the inside out, **Hair, Skin & Nails** is an oral supplement with nutrients shown to benefit the hair, skin, and nails to keep them looking vibrant and healthy. Rejuvenating nutrients include:

- **VERISOL® Bioactive Collagen Peptides®**—Stimulates the formation of new collagen and elastin to promote skin suppleness and elasticity<sup>1</sup>
- **Cynatine® HNS Plus**—Provides solubilized keratin, zinc, B vitamins, biotin, and copper to boost production of keratin for strong hair, skin, and nails
- **Biotin**—Supports nail strength and integrity<sup>2</sup>
- **Silicon**—For the formation of collagen and keratin molecules<sup>3</sup>

### Hair, Skin & Nails Rejuvenation Formula with VERISOL®

Item #02002 • 90 tablets

	Retail Price	Your Price
1 bottle	\$32	<b>\$24</b>
4 bottles		<b>\$22 each</b>

#### Non-GMO

#### References

1. *Skin Pharmacol Physiol.* 2014;27(3):113-9.
2. *Vet Rec.* 1984 Dec 22-29;114(25-26):642-5.
3. *Nutr Today.* 1993;28(4):13-8.

**Caution:** Individuals with in-born errors of copper metabolism (e.g. Wilson's disease) should avoid daily, chronic use of this product.

For full product description and to order  
**Hair, Skin & Nails Rejuvenation Formula with VERISOL®**,  
call **1-800-544-4440** or visit **www.LifeExtension.com**

Cynatine® is a registered trademark of Roxlor, LLC. VERISOL® and Bioactive Collagen Peptides® are registered trademarks of GELITA AG.

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.

# Is SUGAR Aging You?



## MEGA BENFOTIAMINE

SUPPORTS HEALTHY BLOOD SUGAR METABOLISM

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

	Retail Price	Your Price
1 bottle	\$30	\$22.50
4 bottles		\$20.25 each

Item #00925 • 120 vegetarian capsules

Non-GMO

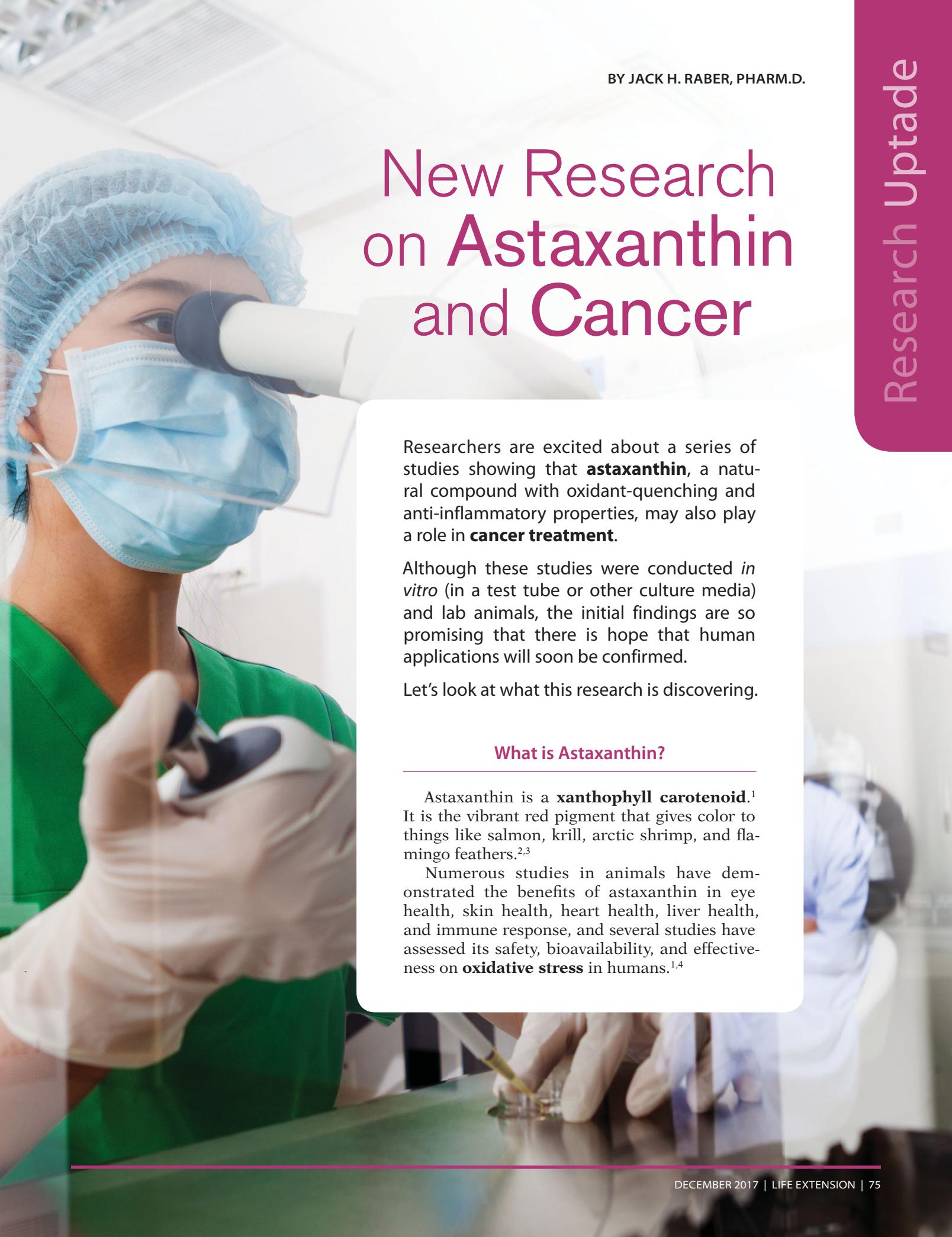


Item # 00925

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

BY JACK H. RABER, PHARM.D.

# New Research on Astaxanthin and Cancer



Researchers are excited about a series of studies showing that **astaxanthin**, a natural compound with oxidant-quenching and anti-inflammatory properties, may also play a role in **cancer treatment**.

Although these studies were conducted *in vitro* (in a test tube or other culture media) and lab animals, the initial findings are so promising that there is hope that human applications will soon be confirmed.

Let's look at what this research is discovering.

## What is Astaxanthin?

Astaxanthin is a **xanthophyll carotenoid**.<sup>1</sup> It is the vibrant red pigment that gives color to things like salmon, krill, arctic shrimp, and flamingo feathers.<sup>2,3</sup>

Numerous studies in animals have demonstrated the benefits of astaxanthin in eye health, skin health, heart health, liver health, and immune response, and several studies have assessed its safety, bioavailability, and effectiveness on **oxidative stress** in humans.<sup>1,4</sup>

Research findings from around the world are uncovering the ability of **astaxanthin** to combat cancer.

These studies show that astaxanthin has at least **six different mechanisms of action** that help combat cancer on multiple fronts.<sup>5</sup>

## Six Ways Astaxanthin Defeats Cancer

### 1. Decreases Cancer Cell Proliferation.

Tumors develop when cancer cells rapidly proliferate, invade, migrate and adhere to healthy tissues and organs.<sup>5,6</sup> Astaxanthin is capable of decreasing proliferation of malignant cells.

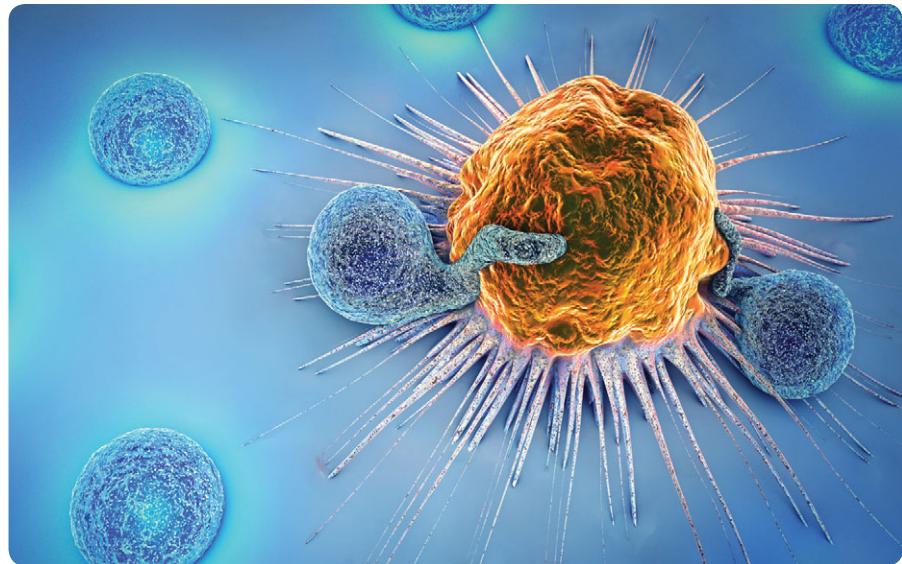
In one study, investigators noted a strong association between the presence of astaxanthin and the *decreased proliferation* of rat liver- and breast-cancer cells, and of mouse lung-cancer cells.

It's interesting to note that a control group of *normal* human liver cells was barely affected by the presence of astaxanthin.<sup>7</sup> This indicates the ability of astaxanthin to **selectively target** cancer cells.

In another study, when astaxanthin was compared to the three other carotenoids (beta-carotene, capsanthin, and bixin), astaxanthin was found to be the most active in preventing the reproduction of human **leukemic** cells.<sup>8</sup>

### 2. Promotes Cell Death.

Programmed cell death, also known as **apoptosis**, is a healthy process in which the body removes damaged or dysfunctional cells.<sup>9,10</sup> A hallmark of cancer is its ability to evade apoptosis, which allows cancer cells to survive and reproduce.<sup>11</sup> One potent way to combat



cancer is to turn this programmed cell death **back on** in cancer cells, and astaxanthin appears to do just that.

Astaxanthin has been shown to promote apoptosis in several *in vitro* studies involving cell lines of both **oral** and **liver cancer**.<sup>7,12,13</sup>

### 3. Reduces Oxidative Stress.

Oxidative stress promotes by the growth and spread of certain types of cancers.<sup>14,15</sup>

Italian investigators found that astaxanthin **stops** the production of reactive oxygen species in a human **lymphoma cell** line.<sup>16</sup> Similarly, Chinese investigators noted that astaxanthin stifled the growth of human **leukemia** cells.<sup>8</sup>

### 4. Reduces Inflammation.

It is well known that inflammation plays a prominent role in cancer proliferation and survival.<sup>17-19</sup> Astaxanthin has been found to inhibit the occurrence of inflammatory mucosal ulcers and pockets. This led to the prevention of **adenocarcinoma** in the colons of mice.<sup>20</sup>

In other studies, astaxanthin suppressed the production of inflammation-inducing *cytokines*, including *tumor necrosis factor alpha* in human **lymphoma** cell lines.<sup>16,21</sup>

### 5. Prevents the Spread of Cancer.

The spread of cancer to other sites such as organs and bone (metastasis) occurs when cancer cells break away from the original tumor.

Enzymes known as **matrix metalloproteinases** (MMPs) facilitate a step in this complex process, allowing tumor cells to migrate to another organ where new growth takes place.<sup>5,22,23</sup> In other words, MMPs may promote tumor growth and progression.

Scientists believe that astaxanthin works to prevent the spread of cancer by **inhibiting** MMPs and modulating pathways related to tumor blood supply, cell proliferation, and cancer formation, progression and invasion.<sup>24-25</sup>

These protective effects have been demonstrated in **oral-cancer** cell lines from hamsters and in **colon-** and **liver-cancer** cell lines from rats.<sup>24-26</sup>

## 6. Improves Communication Among Cells.

Individual cells within an organ communicate with each other using **gap-junction channels**, structures which allow the coordination of metabolism and other critical functions. When there are defects in communication, it opens the door for disorders such as inflammation, cellular damage—and ultimately, cancer.<sup>27-29</sup>

Astaxanthin appears to support and **enhance** this form of cell-to-cell communication, which means it may be beneficial against a variety of different types of cancer.

For example, one investigator found that astaxanthin enhanced gap-junction communication, while noting that previous studies found that this enhanced communication has been shown to inhibit cancer formation and growth.<sup>30</sup>

## Recent Studies on the Use of Astaxanthin in Cancer

### Oral Cancer

Investigators in India recently examined the role of astaxanthin in stopping the growth and spread of **oral cancer** in hamsters.

To test this, researchers gave the animals a chemical designed to induce oral cancer, and then gave them either astaxanthin or no treatment. The investigators noted that the **signaling** pathways involved in the proliferation and spread of oral cancer were **significantly inhibited** in the cancer group that received astaxanthin. This included reducing the ability of tumor cells to create new blood vessels to fuel its growth (known as angiogenesis). These mechanisms demonstrate a potential value of astaxanthin to help treat oral cancer.<sup>24</sup>

### Liver Cancer

As of 2012, liver cancer is the fifth most common cancer and the third most fatal cancer worldwide.<sup>31,32</sup> Despite modern treatments, liver cancer has a high recurrence rate,<sup>33,34</sup> which makes finding a new, effective treatment even more critical. Astaxanthin could be a step in that direction.

Investigators in China recently studied the use of astaxanthin *in vitro* in two cell lines of human hepatocellular carcinoma. They used several different concentrations of astaxanthin along with a control drug, dimethyl sulfoxide (DMSO). What they found was that astaxanthin induced a high level of **cell death** in both cell lines at *three of these concentrations*, leading investigators to conclude that astaxanthin is potentially useful in combatting this difficult-to-treat tumor.<sup>35</sup>

### Colorectal Cancer

As of 2012, **colorectal cancer** is the third most common cancer in men and the second most common cancer in women worldwide.<sup>36</sup> Three important studies have shown astaxanthin's ability to combat colorectal cancer.

In the first study, investigators found that when they gave astaxanthin to rats with colorectal cancer, it significantly *decreased* the expressions of proteins consistent with inflammation and colorectal cancer, and significantly increased apoptosis (programmed cell death).<sup>25</sup>

In the second study, mice fed dietary astaxanthin experienced a *decrease* in the growth of cancer cells, and an *increase* in cell death.<sup>20</sup> And in a third study, astaxanthin inhibited cell growth of two colorectal cancer cell lines over a 72-hour period and caused cell-cycle arrest and cell death.<sup>37</sup>





Overall, these studies make it clear that astaxanthin has significant anti-inflammatory and anti-cancer effects in colorectal cancer.

## Lung Cancer

Two promising lung cancer studies have recently shown that astaxanthin can help boost the effectiveness of standard cancer treatments.

In the first study, investigators treated human lung-cancer cell lines with either the chemotherapy drug **pemetrexed**, an **astaxanthin** solution, or both for 24 hours. The researchers found that combining the two agents (*pemetrexed*, and *astaxanthin*) improved cancer cell-killing and inhibited cancer cell growth.<sup>38</sup>

In a similar study, when investigators treated two human lung-cancer cell lines with astaxanthin solutions, they noted that astaxanthin reduced the viability of the cancer cells and decreased the pro-

duction of proteins associated with chemotherapy resistance. Then, when astaxanthin was combined with equal amounts of the anticancer drug **mitomycin C**, the viability of the cancer cells decreased more than would be expected if either agent had been used separately.

The researchers concluded that not only may astaxanthin be useful on its own, but the combination of mitomycin C chemotherapy with astaxanthin could represent an effective method for improving the cancer cell-killing ability of this conventional treatment.<sup>39</sup>

## Prostate Cancer

Astaxanthin also shows promise in combatting one of the most common cancers in men: **prostate cancer**. In a recent study, investigators inoculated mice with human androgen-independent prostate cancer cells and then gave them either a high dose or a low dose of astaxanthin, or a placebo.

After just 31 days, **tumor volume** in the high-dose astaxanthin group was over **40%** smaller than in the control group, and tumor weight was reduced by nearly **40%**.

High-dose astaxanthin-treated mice also experienced a decrease in a tumor marker and in a marker of cell proliferation, as well as increases in the expression of tumor-suppressor genes.<sup>40</sup>

The investigators concluded that the use of astaxanthin may prove beneficial in the treatment of prostate cancer.<sup>40</sup>

## Summary

Astaxanthin is being studied *in vitro* and in animals against a variety of animal- and human-cancer cell lines.

At least six possible mechanisms of action have been put forward to explain astaxanthin's anticancer effects.

In addition to its standalone anticancer properties, two studies demonstrated astaxanthin's role in increasing the effectiveness of cytotoxic chemotherapy.

These initial findings offer hope that astaxanthin could play a significant role in combatting some of the most common forms of cancer, including solid tumors and hematologic malignancies like leukemia. ●

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. Guerin M, Huntley ME, Olaizola M. Haematococcus astaxanthin: applications for human health and nutrition. *Trends Biotechnol*. 2003;21(5):210-6.

2. Choi S, Koo S. Efficient syntheses of the keto-carotenoids canthaxanthin, astaxanthin, and astacene. *J Org Chem*. 2005;70(8):3328-31.

3. Hussein G, Sankawa U, Goto H, et al. Astaxanthin, a carotenoid with potential in human health and nutrition. *J Nat Prod*. 2006;69(3):443-9.

4. Fassett RG, Coombes JS. Astaxanthin, oxidative stress, inflammation and cardiovascular disease. *Future Cardiol*. 2009;5(4):333-42.

5. Zhang L, Wang H. Multiple Mechanisms of Anti-Cancer Effects Exerted by Astaxanthin. *Mar Drugs*. 2015;13(7):4310-30.

6. Available at: <https://www.ncbi.nlm.nih.gov/books/NBK9963/>. Accessed August 22, 2017.

7. Song XD, Zhang JJ, Wang MR, et al. Astaxanthin induces mitochondria-mediated apoptosis in rat hepatocellular carcinoma CBRH-7919 cells. *Biol Pharm Bull*. 2011;34(6):839-44.

8. Zhang X, Zhao WE, Hu L, et al. Carotenoids inhibit proliferation and regulate expression of peroxisome proliferators-activated receptor gamma (PPAR $\gamma$ ) in K562 cancer cells. *Arch Biochem Biophys*. 2011;512(1):96-106.

9. Lo AC, Woo TT, Wong RL, et al. Apoptosis and other cell death mechanisms after retinal detachment: implications for photoreceptor rescue. *Ophthalmologica*. 2011;226 Suppl 1:10-7.

10. Elmore S. Apoptosis: a review of programmed cell death. *Toxicol Pathol*. 2007;35(4):495-516.

11. Hanahan D, Weinberg RA. The Hallmarks of Cancer. *Cell*. 2000;100(1):57-70.

12. Song X, Wang M, Zhang L, et al. Changes in cell ultrastructure and inhibition of JAK1/STAT3 signaling pathway in CBRH-7919 cells with astaxanthin. *Toxicol Mech Methods*. 2012;22(9):679-86.

13. Kavitha K, Kowshik J, Kishore TK, et al. Astaxanthin inhibits NF- $\kappa$ B and Wnt/beta-catenin signaling pathways via inactivation of Erk/MAPK and PI3K/Akt to induce intrinsic apoptosis in a hamster model of oral cancer. *Biochim Biophys Acta*. 2013;1830(10):4433-44.

14. Cairns RA, Harris IS, Mak TW. Regulation of cancer cell metabolism. *Nat Rev Cancer*. 2011;11(2):85-95.

15. Glasauer A, Chandel NS. Targeting antioxidants for cancer therapy. *Biochem Pharmacol*. 2014;92(1):90-101.

16. Franceschelli S, Pesce M, Ferrone A, et al. Astaxanthin treatment confers protection against oxidative stress in U937 cells stimulated with lipopolysaccharide reducing O<sub>2</sub>- production. *PLoS One*. 2014;9(2):e88359.

17. Coussens LM, Werb Z. Inflammation and cancer. *Nature*. 2002;420(6917):860-7.

18. Mantovani A, Allavena P, Sica A, et al. Cancer-related inflammation. *Nature*. 2008;454(7203):436-44.

19. Karin M. Nuclear factor- $\kappa$ B in cancer development and progression. *Nature*. 2006;441(7092):431-6.

20. Yasui Y, Hosokawa M, Mikami N, et al. Dietary astaxanthin inhibits colitis and colitis-associated colon carcinogenesis in mice via modulation of the inflammatory cytokines. *Chem Biol Interact*. 2011;193(1):79-87.

21. Speranza L, Pesce M, Patruno A, et al. Astaxanthin treatment reduced oxidative induced pro-inflammatory cytokines secretion in U937: SHP-1 as a novel biological target. *Mar Drugs*. 2012;10(4):890-9.

22. van Zijl F, Krupitza G, Mikulits W. Initial steps of metastasis: Cell invasion and endothelial transmigration. *Mutation Research/Reviews in Mutation Research*. 2011;728(1-2):23-34.

23. Fidler IJ. The pathogenesis of cancer metastasis: the 'seed and soil' hypothesis revisited. *Nat Rev Cancer*. 2003;3(6):453-8.

24. Kowshik J, Baba AB, Giri H, et al. Astaxanthin inhibits JAK/STAT-3 signaling to abrogate cell proliferation, invasion and angiogenesis in a hamster model of oral cancer. *PLoS One*. 2014;9(10):e109114.

25. Nagendraprabhu P, Sudhandiran G. Astaxanthin inhibits tumor invasion by decreasing extracellular matrix production and induces apoptosis in experimental rat colon carcinogenesis by modulating the expressions of ERK-2, NF $\kappa$ B and COX-2. *Invest New Drugs*. 2011;29(2):207-24.

26. Kozuki Y, Miura Y, Yagasaki K. Inhibitory effects of carotenoids on the invasion of rat ascites hepatoma cells in culture. *Cancer Lett*. 2000;151(1):111-5.

27. Castellano P, Eugenin EA. Regulation of gap junction channels by infectious agents and inflammation in the CNS. *Front Cell Neurosci*. 2014;8:122.

28. Willecke K, Eiberger J, Degen J, et al. Structural and functional diversity of connexin genes in the mouse and human genome. *Biol Chem*. 2002;383(5):725-37.

29. Mesnil M, Crespin S, Avanzo J-L, et al. Defective gap junctional intercellular communication in the carcinogenic process. *Biochimica et Biophysica Acta (BBA) - Biomembranes*. 2005;1719(1-2):125-45.

30. Hix LM, Lockwood SF, Bertram JS. Upregulation of connexin 43 protein expression and increased gap junctional communication by water soluble disodium disuccinate astaxanthin derivatives. *Cancer Lett*. 2004;211(1):25-37.

31. Available at: <http://globocan.iarc.fr/old-FactSheets/cancers/liver-new.asp>. Accessed August 23, 2017.

32. Wong MC, Jiang JY, Goggins WB, et al. International incidence and mortality trends of liver cancer: a global profile. *Sci Rep*. 2017;7:45846.

33. Portolani N, Coniglio A, Ghidoni S, et al. Early and late recurrence after liver resection for hepatocellular carcinoma: prognostic and therapeutic implications. *Ann Surg*. 2006;243(2):229-35.

34. Soong RS, Yu MC, Chan KM, et al. Analysis of the recurrence risk factors for the patients with hepatocellular carcinoma meeting University of California San Francisco criteria after curative hepatectomy. *World J Surg Oncol*. 2011;9:9.

35. Li J, Dai W, Xia Y, et al. Astaxanthin Inhibits Proliferation and Induces Apoptosis of Human Hepatocellular Carcinoma Cells via Inhibition of Nf- $\kappa$ B P65 and Wnt/Beta-Catenin in Vitro. *Mar Drugs*. 2015;13(10):6064-81.

36. Available at: <http://globocan.iarc.fr/old-FactSheets/cancers/colorectal-new.asp>. Accessed August 23, 2017.

37. Liu X, Song M, Gao Z, et al. Stereoisomers of Astaxanthin Inhibit Human Colon Cancer Cell Growth by Inducing G2/M Cell Cycle Arrest and Apoptosis. *J Agric Food Chem*. 2016.

38. Liao KS, Wei CL, Chen JC, et al. Astaxanthin enhances pemetrexed-induced cytotoxicity by downregulation of thymidylate synthase expression in human lung cancer cells. *Regul Toxicol Pharmacol*. 2016;81:353-61.

39. Ko JC, Chen JC, Wang TJ, et al. Astaxanthin down-regulates Rad51 expression via inactivation of AKT kinase to enhance mitomycin C-induced cytotoxicity in human non-small cell lung cancer cells. *Biochem Pharmacol*. 2016;105:91-100.

40. Ni X, Yu H, Wang S, et al. Astaxanthin Inhibits PC-3 Xenograft Prostate Tumor Growth in Nude Mice. *Mar Drugs*. 2017;15(3).





## Now Delivering into California!

- Full Compounding Lab
- Full Retail Pharmacy
- Bio-Identical Hormone Replacement Therapy
- Free Standard Delivery/Shipping
- Durable Medical Equipment
- Trilingual (English, Spanish, French)
- Licensed to Ship into 42 States

Renew Rx's online to

**RECEIVE \$1 OFF EACH Rx**  
(Cash Rx's only)

Did you know we carry a full line of  
PET products? Mention this ad to

**RECEIVE 10% OFF**  
your first order

*Quality, Reliability, Integrity*

***Lowest Prices: Ask for  
Customer Discount Pricing***

*Providing Trusted Prescription  
Compounding for Over 45 Years!*

Proud Members of



**(877) 877-9700**

Phone: (954) 989-6524 | Fax: (866) 892-3432

4401 Sheridan St. Hollywood, FL 33021  
**www.PostHastePharmacy.com**



Support the Eye-Brain Connection

# Highly Absorbable Astaxanthin

**Astaxanthin** has long been shown to promote proper **eye health**, and more recent studies indicate it can also benefit the brain and:

- Heart,
- Skin, and
- Immune system.

Life Extension®'s proprietary blend has been shown to enhance carotenoid absorption by **several-fold**.<sup>1</sup>

Non-GMO

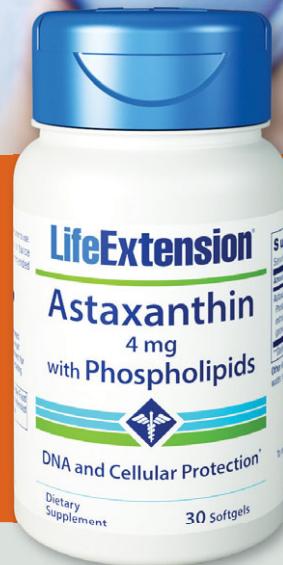
**Reference**

1. *Int J Pharm.* 2011 Jun 30, 412(1-2):99-105.

## Astaxanthin 4 mg with Phospholipids

Item #01923 • 30 softgels

	Retail Price	Your Price
1 bottle	\$16	<b>\$12</b>
4 bottles		<b>\$10.50 each</b>



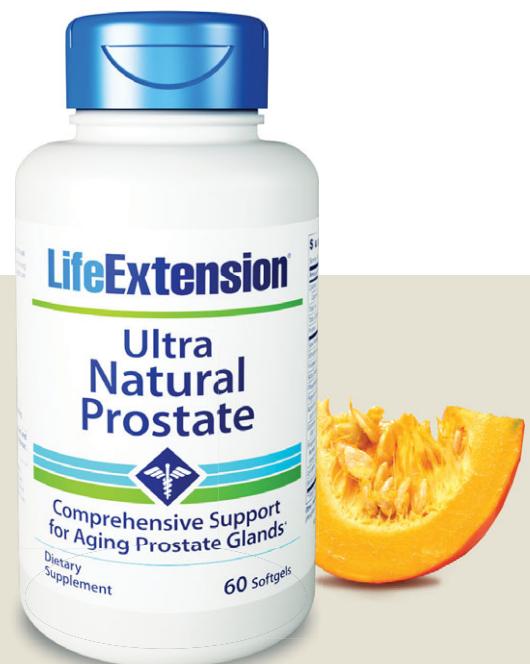
For full product description and to order **Astaxanthin 4 mg with Phospholipids**,  
call 1-800-544-4440 or  
visit [www.LifeExtension.com](http://www.LifeExtension.com)



# PROSTATE HEALTH

The best way to keep  
You in the picture.

As a man ages, maintaining a healthy prostate is key. We created Ultra Natural Prostate to help you maintain prostate health, so you can focus on what's important. With over a dozen natural ingredients, this supplement promotes healthy prostate function, supports easier urination, inhibits inflammatory factors, and encourages natural division of prostate cells. Ultra Natural Prostate. The most comprehensive prostate health supplement.



Item #02029 • 60 softgels



Retail  
Price

YOUR  
PRICE

1-bottle \$38.00

**\$28.50**

4-bottle —

**\$26.25 ea**

Non-GMO

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

ApresFlex® is a registered trademark of Laila Nutraceuticals exclusively licensed to PL Thomas - Laila Nutra LLC. U.S. Patent No. 8,551,496 and other patents pending.

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

BY GARRY MESSICK

# The Happiness Diet

Journalist Rachel Kelly had suffered from anxiety and depression for years. She found medication helpful, but realized it caused side effects, such as weight gain. Eventually, Kelly's doctor introduced her to the connection between mood and food, and some of the scientific evidence supporting that concept.

Kelly soon discovered that changing her diet made a significant difference in how she felt, and even friends and family remarked that she looked happier. Intrigued, the journalist wanted to explore the mood/food connection in greater depth, so she met with nutritionist Alice Mackintosh. The two formed a partnership that led to their book, *The Happiness Diet*.

Kelly says her book "is not intended as a substitute for medication or other strategies," but she feels antidepressants and other mood-altering drugs are best for short-term use. *The Happiness Diet* is intended as a guide to meals that not only counter depression, but also foods that can have many other mood-related benefits. Accordingly, the book is divided into groups of recipes, each targeting specific topics, such as mental clarity, energy, and promotion of quality sleep.

On the next three pages are three sample recipes from *The Happiness Diet*. These meals can help make your kitchen, as Kelly puts it, "a place of creativity and adventure."



*FOR A BREAKFAST THAT PROMOTES RESTFULNESS  
AT THE END OF THE DAY:*

## Overnight Bircher Muesli

Serves 2

Stir together the oats, yogurt, chia seeds, almonds, cinnamon, and dairy milk or almond milk. Leave the mixture in the fridge in a covered jar or tub for 4 hours, or overnight. It should form a thick, creamy consistency. Add more milk if you prefer it a little thinner.

When you are ready to eat, add the fresh berries and pumpkin seeds. You can also sprinkle over some goji berries if you want extra color and sweetness.

**3 tablespoons rolled oats**

**4 tablespoons natural yogurt**

**1 tablespoon chia seeds**

**Handful of almonds, chopped**

**Pinch of ground cinnamon**

**1/4 cup low-fat milk, more if needed**

**(or dairy-free alternative such as  
unsweetened almond or oat milk)**

**Handful of fresh berries of your choice**

**1 tablespoon pumpkin seeds (optional)**

**1 tablespoon goji berries (optional)**

TO PROMOTE CALMNESS:

## Jeweled Guacamole and Roasted Peppers on Rye Bread

Serves 1, with leftover

Preheat the oven to 350°F.

Place the peppers on a baking sheet and drizzle with the olive oil and a little chopped parsley. Bake for 20 minutes, turning them halfway through. We like them slightly charred on the outside.

Scoop out the avocado flesh and mash it together with the garlic and a dash of olive oil. We prefer it a little lumpy, but if you want a smooth consistency, mash away to your heart's content.



Add a squeeze of lemon (not too much) and mix in the pomegranate seeds.

Once the peppers are cooked, you are ready to serve. Drizzle olive or hempseed oil over the hot toast, and then spread on the guacamole. Place the roasted peppers on top and add a sprinkle of parsley. The guacamole can be stored in the fridge but may go a little brown as the avocado oxidizes, so it is better eaten the same day.

**2 red, yellow, or orange bell peppers, seeded and sliced**

**2 tablespoons olive oil**

**Small handful of flat-leaf parsley, chopped**

**1 large ripe avocado**

**½ garlic clove, crushed**

**Squeeze of lemon juice**

**Handful of pomegranate seeds**

**2 slices of toasted rye bread, with added seeds if possible**

## FOR FIGHTING THE BLUES:

### Mushroom and Mustard Soup

Serves 4

Pour  $\frac{3}{4}$  cup boiling water over the porcini mushrooms in a bowl, cover, and let them soak for 20 minutes.

Heat the olive oil in a large saucepan and add the red onion. Cook it on medium heat for 3-4 minutes, then stir in the garlic and parsnips.

When the onions have softened, add the fresh mushrooms and cook for another minute, then pour in the white wine.

Drain the liquid from the porcini mushrooms into another bowl, then add them to the pan. Sieve the liquid a few times to remove any grit before pouring it into the pan along with the stock.

Turn down the heat, cover the pan with a lid, and let it simmer for 20-30 minutes, or until all the ingredients are soft.

Remove the pan from the heat and add the parsley and mustard, then blend the soup to your preferred consistency using an immersion blender. Don't blend it for too long, or you will lose the texture of the mushrooms.

Stir in the mascarpone (I sometimes add a little extra mustard, too) before serving, or dollop it on top with a sprinkle of parsley once you have ladled the soup into bowls.

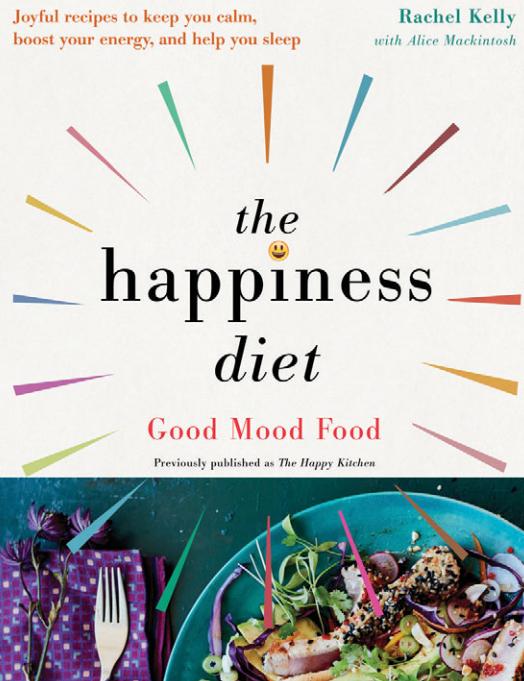
**10 dried porcini mushrooms**  
**1  $\frac{1}{4}$  pounds mixed mushrooms (oyster, shiitake, button), roughly chopped**  
**2 tablespoons olive oil**  
**1 red onion, sliced**  
**2 garlic cloves, chopped**  
**3 parsnips, washed and chopped**  
 **$\frac{1}{4}$  cup white wine**  
**3 cups vegetable or chicken stock**  
**3 ounces fresh parsley**  
**1 tablespoon prepared mustard**  
**1  $\frac{1}{2}$  tablespoons mascarpone cheese**

From THE HAPPINESS DIET by RACHEL KELLY.

Copyright © 2017 by Rachel Kelly.

Photography copyright © Laura Edwards. Originally published in Great Britain in 2017 by Short Books.

Reprinted by permission of ATRIA BOOKS, a Division of Simon & Schuster, Inc.



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

To order *The Happiness Diet*, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

Item #34131  
Retail price \$19.99  
Your price \$14.99

# IT'S SO PURE... IT'LL TOUCH YOUR HEART

Highly Purified Fish Oil From  
Wild-Caught Alaska Pollock  
For A Strong Healthy Heart.



Item #01982 • 120 softgels

	Retail Price	Your Price
1-bottle	\$32.00	<b>\$24</b>
4-bottle	—	<b>\$21 ea</b>

NON-GMO



For full product description and to order, call 1-800-544-4440 toll-free • [www.LifeExtension.com](http://www.LifeExtension.com)

AlaskOmega® is a registered trademark of Organic Technologies. 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 statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.



# Pump Up Your Heart Health

UBIQUINOL

# CoQ10

BETTER ABSORPTION  
WITH ADDED MITOCHONDRIAL SUPPORT

Non-GMO



For full product description and to order **Super Ubiquinol CoQ10  
with Enhanced Mitochondrial Support**,

call **1-800-544-4440** or visit **www.LifeExtension.com**

60 softgels • Retail Price is \$62 • Your price is \$46.50 • 4 bottles are only \$39 each

Item # 01426

Q+®, Kaneka Ubiquinol™, and the quality seal™ are registered or pending trademarks of Kaneka Corp.

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

BY JON VANZILE

# Daniel Cohn

## Living the Good Life



DAN COHN

Dan Cohn knows a thing or two about staying healthy on the road.

As the CEO of the Daniel Cohn Wine Company, a start-up brand that introduced its first wine in January 2016, Cohn maintains a punishing travel schedule. In 2016, he spent 308 days on the road promoting his first blockbuster vintage, Bellacosa Cabernet.

"The wine business is a very exciting industry, but it's a 24-hour-a-day commitment," Cohn says. "In order to stay on top of the quality and every single detail, the day cannot end at 5 p.m. or 6 p.m. Weekends off are rare."

His challenge is compounded by where Cohn ends up spending a lot of time. Selling wine involves visiting fine restaurants, where butter and saturated fats rule the menu and alcohol is a central part of the experience.

To stay fit, Cohn has developed a routine and philosophy that makes it possible to hopscotch across the map—and of course he relies on **Life Extension®** supplements to make sure he's receiving the nutrients he needs.



## The Road Warrior's Routine

Cohn's typical day begins in a hotel room and ends in an airport. On any given day, he might find himself traveling to a new city or two and meeting with potential distributors or clients, all while doing press and staying in touch with the company itself back in Sonoma County.

"The whole idea is to share the experience of the wine," Cohn said. "Because a lot of people can't go to Sonoma or Napa, these beautiful wine regions, I bring it to them."

Along the way, he's learned a few crucial tips to keep up his energy.

"One of the keys is that if you ever have to eat in an airport, don't do it," he said. "The food in airports is terrible for you, so you're better just to avoid it totally."

When he does eat out, he tries to avoid butter in favor of simply grilled proteins that aren't swimming in saturated fat.

"Eighty percent of staying healthy on the road is about what you put in your face and keeping up your exercise routine," he says. "Keeping up a healthy lifestyle on the road can be hard."

Cohn aims for 20 minutes of exercise every day, even if that means exercising on the floor of his hotel room. It adds up to 200 push-ups and 200 sit-ups every day.

"I also rely on **Life Extension**," he says. "I'm fortunate to have **Life Extension** supplements that support me while I spread the joy of wine one bottle at a time."

## A Bottle of Joy

So far, there's been a lot of joy to spread. When it comes to the wine business, Cohn draws on a generation of experience. His father, Bruce Cohn, was a legend in the music world who helped establish supergroups like Night Ranger

## Supplements for the Road

Dan Cohn spends a lot of time on the road, so it's not always easy to eat a healthy diet. His supplement routine is designed to provide all the baseline nutrients he needs, as well as bolster his immune system. His supplement program was designed for him by **Life Extension** to match his personal goals. It includes:

- Florassist GI
- Coenzyme Q10
- Super Curcumin
- Two-Per-Day Capsules
- Ultra Natural Prostate
- Super Omega-3
- Vitamin D

and Bruce Hornsby. He also managed the rock band The Doobie Brothers for thirty years, traveling relentlessly to support the band.

In the early 1970s, Bruce Cohn purchased a tract of land in Sonoma County, California, to put down some roots. The California wine business was in its infancy at the time, so it was mostly by sheer luck that Bruce realized he had lucked into some of the best cabernet grape acreage in the country. The property was already planted with Spanish olive trees that dated to the late 19th century. Looking for a break from the hectic pace of the music business, Bruce Cohn started making wine.

"I was raised in a vineyard," Dan said. "Back then, it was very much about community and small but beautiful vineyards. The fields were covered with independent wine growers and artisanal winemakers who labored to create great wines. It was about what went into

the wine. The connection was the most important of making and sharing wine."

Dan spent his childhood and teenage years working in the family business, crushing grapes, cleaning tanks, and working in the cellar. When the family sold the business in 2015, Cohn knew he didn't want to continue, so he started his own wine company.

The company's first release, Bellacosa, was launched in January 2016 and quickly earned rave reviews. The vintage was named as one of *Wine Business's* 2016 Top Hot Wine Brands and was awarded more than 90 points by several leading wine critics. In an extensive profile in *Forbes* magazine, Cohn was identified as one of America's hottest and most exciting winemakers.

The first vintage sold out of 25,000 cases in 10 months. Recently, Cohn announced plans to intro-

duce the single-vineyard Oakville Reserve Cabernet Sauvignon as a thank-you to everyone who helped Bellacosa become one of the most exciting wines of 2016. Oakville is a handcrafted, limited 500-case release. Cohn quickly received pre-orders for the first 200 cases.

"I've been in the wine business my whole life and never seen a launch like Bellacosa," Cohn said. "We sold out our first vintage completely."

One of the remarkable aspects of the Bellacosa story is how the company is in many ways a throwback to the vineyards of Cohn's youth and the small, artisanal wineries he grew up around. In the decades since then, as the region's reputation for great wines grew, bigger and bigger companies moved in, until "those small guys have been bought up."

But not Bellacosa. Artisanal wine is still in Cohn's blood.

"I'm still living in the early days of Sonoma and Napa Valley wine making," he said. "The connection, the moments. I'm involved every step of the way from concept, creation and curating to the connection and sharing of Bellacosa. I see the industry moving back into more of a connected, intimate setting, with smaller productions and more consumer connection."

In the future, Cohn plans to continue building his brand—which means he'll likely be on the road for a long time, signing bottles and spreading the word.

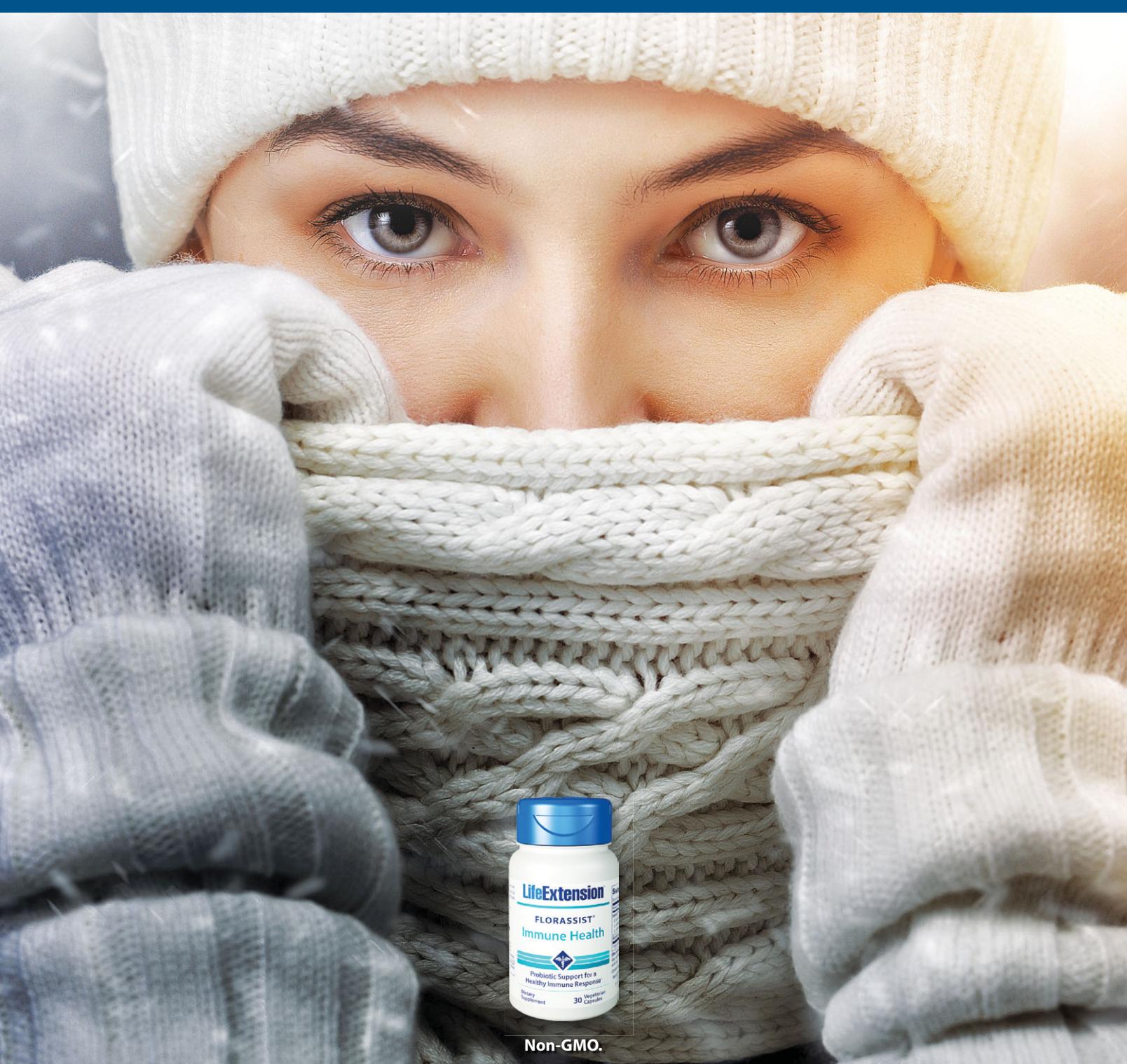
"Because of **Life Extension**, I can keep up with my rigorous travel schedule," he said. ●

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



# FLORASSIST® Immune Health

## Probiotic Blend for *Optimal* Immune Support



Non-GMO.

**ITEM # 02124 • 30 vegetarian capsules • Retail price \$26 • Your price \$19.50 • 4 bottles \$18 each**

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

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

# DANIEL COHN

## WINE COMPANY



BELLACOSA  
“AMERICA’S  
HOTTEST  
WINE”

- Forbes

*Robert Parker*  
WINE ADVOCATE  
2015 Bellacosa Cabernet Sauvignon

“GORGEOUS,  
SILKY  
AND LUSH.”

90 POINTS

Join the Bellacosa wine family:

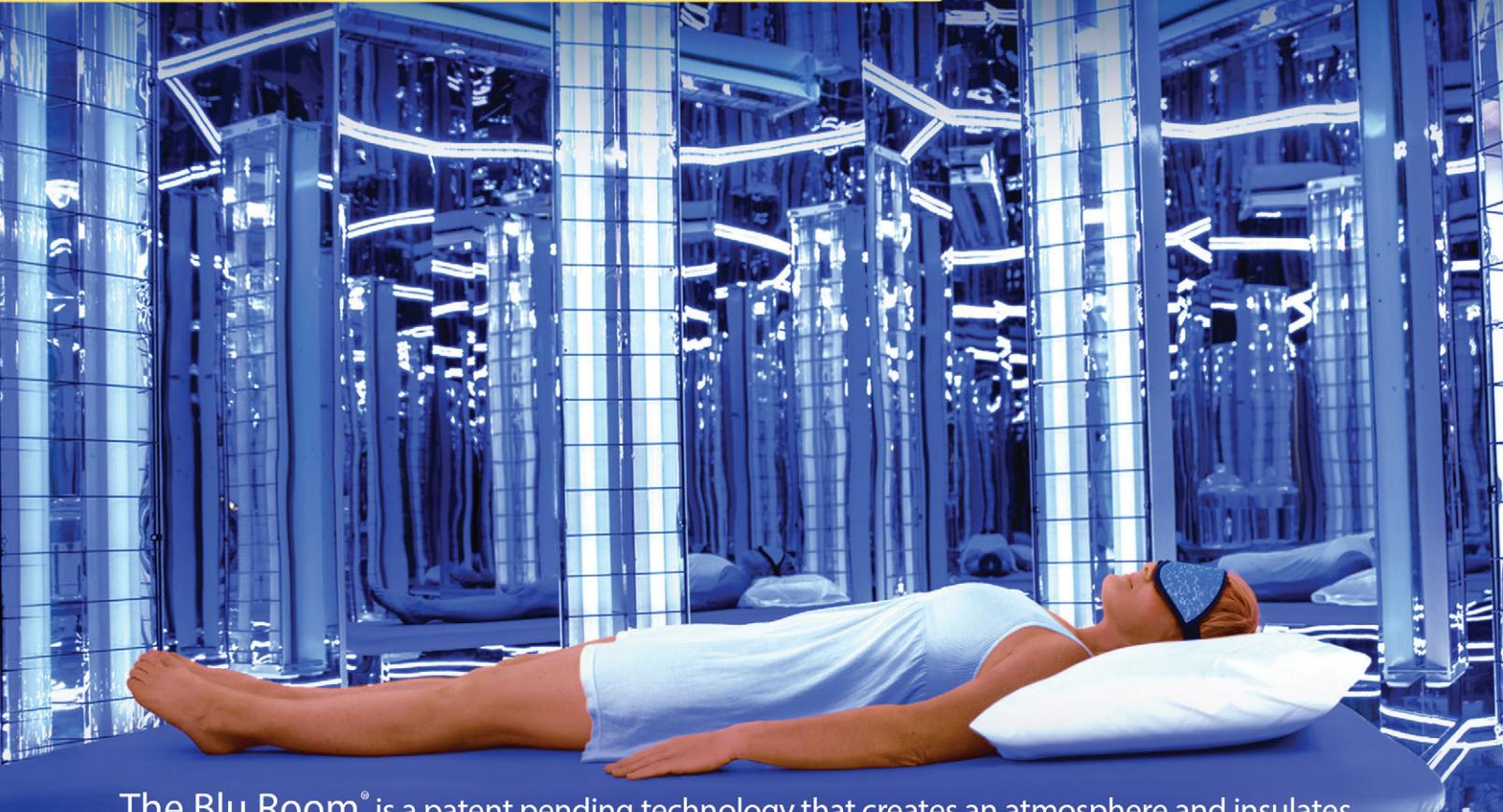
**FREE SHIPPING**

FOR LIFE EXTENSION CUSTOMERS  
on one or more cases of wine!

USE CODE: **WINELIFE** AT CHECKOUT

Visit **DANIELCOHNWINE.COM**  
and click **WHERE TO BUY.**

# BLU ROOM



The Blu Room® is a patent pending technology that creates an atmosphere and insulates the user from the daily environment. It provides the participant with a mind/body/spirit consciousness lifting environment that can augment one's state of creative focus.

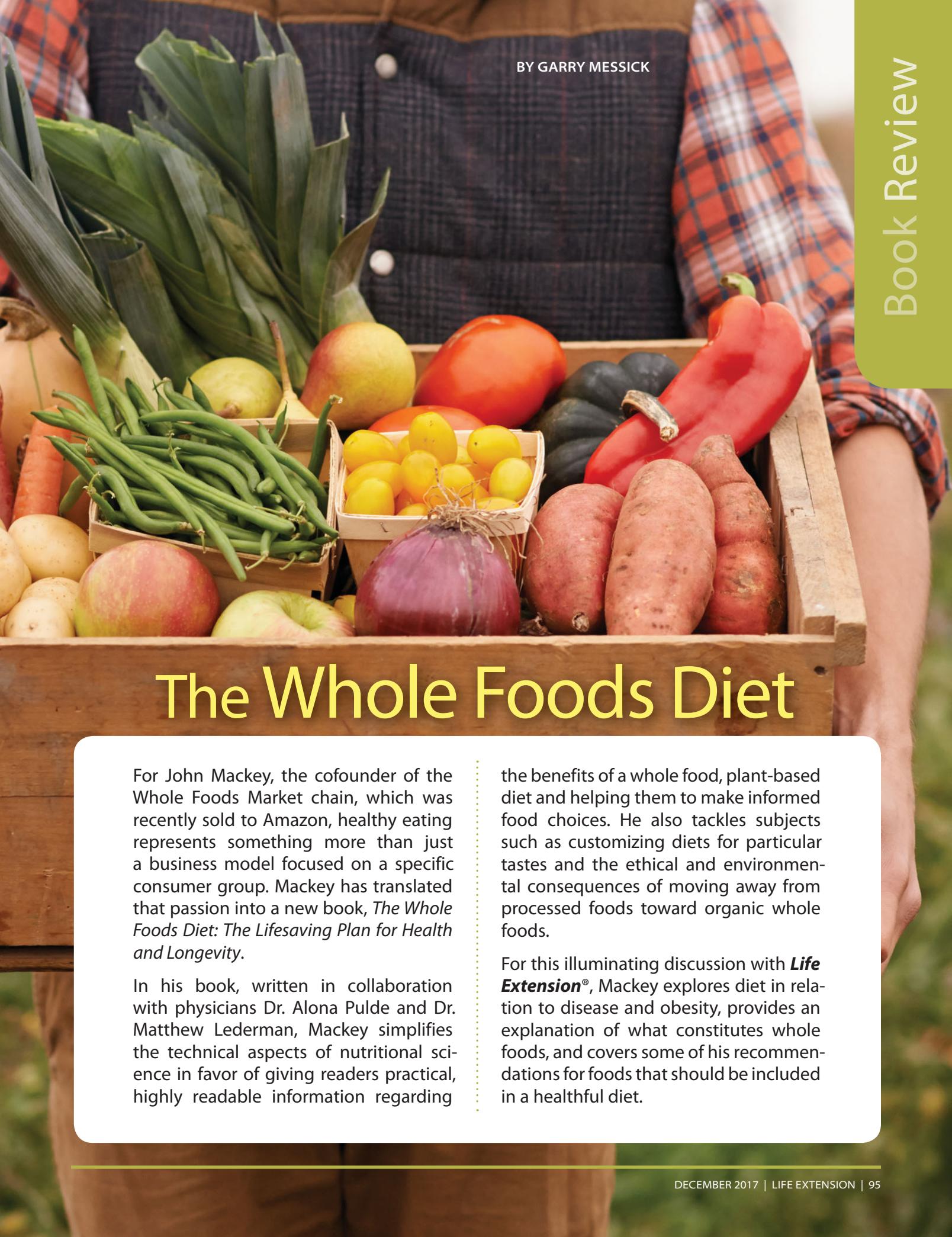
- Improved health and well-being
- Deepened focus
- Increased creativity
- Faster healing process
- Greater self-awareness
- Relief from physical pain
- Relief from mental stress & anxiety
- Significant source of vitamin D\*

\*Each 3 minutes of UVB provides a light-skinned person with an equivalent of around 10,000 IU of oral vitamin D and around 5,000 IU for a tanned or darker skinned person.

**Find A Location at [www.bluroom.com](http://www.bluroom.com)**

Blu Room® is a registered trademark of JZ Knight used with permission.

BY GARRY MESSICK



# The Whole Foods Diet

For John Mackey, the cofounder of the Whole Foods Market chain, which was recently sold to Amazon, healthy eating represents something more than just a business model focused on a specific consumer group. Mackey has translated that passion into a new book, *The Whole Foods Diet: The Lifesaving Plan for Health and Longevity*.

In his book, written in collaboration with physicians Dr. Alona Pulde and Dr. Matthew Lederman, Mackey simplifies the technical aspects of nutritional science in favor of giving readers practical, highly readable information regarding

the benefits of a whole food, plant-based diet and helping them to make informed food choices. He also tackles subjects such as customizing diets for particular tastes and the ethical and environmental consequences of moving away from processed foods toward organic whole foods.

For this illuminating discussion with ***Life Extension***®, Mackey explores diet in relation to disease and obesity, provides an explanation of what constitutes whole foods, and covers some of his recommendations for foods that should be included in a healthful diet.

**LE:** What's your view of the current problem of obesity?

**JM:** There is an unavoidable connection between excess weight and a host of chronic conditions that all of us would rather avoid. Gaining weight is often the first warning sign that chronic disease is building up under the surface of your body. "Weight sits like a spider at the center of an intricate, tangled web of health and disease," writes Harvard Medical School's Dr. Walter Willett. Strands in that web include heart disease, strokes, several types of cancer, diabetes, arthritis, and many more unpleasant and sometimes life-threatening conditions. Maintaining a healthy body weight is therefore in our best interests if we want to remain vital, active, and glowing with the beauty that good health conveys, for decades to come.

This is not to say that a healthy weight is a guarantee of health. If you're someone who maintains a lean body without much effort, you may think you're better off, but it's not necessarily true. You could still have heart disease, diabetes, or cancer developing in your body, even though you don't have a visible warning sign telling you how sick you are. I'm sure you've heard stories of the seemingly "thin and healthy" people who are suddenly struck down by diseases they didn't appear to be at risk for.

**LE:** What sorts of dietary tendencies are most associated with diseases?

**JM:** High consumption of red meat and processed meats has been connected with greater risk of death from all causes, including chronic diseases such as cardiovascular disease and type II diabetes. Eating large amounts of animal protein has been correlated with higher incidences of cancer and mortal-

ity. Over a thousand studies on bowel cancer risk have confirmed that red meat increases risk while high-fiber plant foods decrease it. Processed meats are particularly scary, with significant studies linking them to stomach cancer, breast cancer, and colon cancer, and the World Health Organization classifying them as a carcinogen. As a result, the World Cancer Research Fund International and the American Institute for Cancer Research came out with firm recommendations for people to "eat mostly foods of plant origin," including whole grains, fruits vegetables, and beans.

These studies are not merely outliers. In fact, they are just a few among a multitude of compelling data points that make the case for a whole foods, plant-based diet. The research supporting the wisdom of this way of eating, even briefly summarized, is enough to fill several books. Rigorous laboratory experiments, carefully controlled clinical trials, and long-term observational studies following millions of people over several decades confirm the profound value of eating more real, plant-based foods and minimizing highly processed foods and animal products.

**LE:** How do you define "whole foods?"

**JM:** These are "real foods." These foods are essentially intact, close to the form in which they grew. None of their essential nutritious parts have been removed, and no unhealthy substances have been added to them. This includes all types of whole fruits and vegetables, whole grains, beans and other legumes, and nuts and seeds, as well as unprocessed animal foods. You'll often find unprocessed foods in the perimeter aisles of the grocery store, as well as at the farmer's market. They usually don't need much if any packaging, nor do they feature long ingredient lists. They won't contain preservatives, and many of them will need to be kept in the refrigerator and consumed soon after purchase, unless they've been dried, like beans and whole grains, or purchased frozen.

**LE:** The main food group you encourage people to eat are plant foods. How prominent should they be in the average person's diet?

**JM:** Some people, for ethical reasons, may choose not to eat any animal products, or only to eat dairy products and eggs. Putting



aside the ethical issues for now, from a health perspective, our recommendation is that plants should make up at least **90%** of your overall calorie intake.

**LE:** What's your advice for those who want to include animal products in their diet?

**JM:** If you choose to eat animal foods, keep in mind the way in which the animals are raised. Modern industrial factory farming has made animal foods widely available and affordable, but it comes at significant cost—both to the well-being of the animals and to your health. From a health perspective, common practices that are cause for concern include treating livestock with antibiotics and growth hormones, and feeding them corn and other products that are far removed from their natural diet.

We recommend that you follow these guidelines if you choose to eat animal foods: Choose grass-fed, organic, antibiotic-free meat and dairy products, and pasture-raised chickens and eggs.

Choose wild-caught fish and seafood where possible, and avoid those more likely to contain toxins such as mercury. Species to avoid tend to be those that are longer-lived and higher up on the food chain, including tuna, swordfish, and king mackerel.

Avoid processed meats. The World Health Organization recently categorized processed meats as a Group 1 carcinogen, alongside cigarettes and asbestos. If you decide to eat meat, choose unprocessed forms and stay away from hot dogs, salami, bologna, bacon, ham, and the like.

**LE:** In your book you list what you call the "Essential Eight" food groups: whole grains and starchy vegetables, beans and other

legumes, berries, other fruits, cruciferous vegetables, leafy greens, nonstarchy vegetables, and nuts and seeds. Comment, if you would, on a few of these—cruciferous vegetables, for instance.

**JM:** The cruciferous family of vegetables, also known as brassica vegetables, includes broccoli, radishes, cabbage, collard greens, Brussels sprouts, cauliflower, artichokes, arugula, and kale. Not only are these diverse foods all related, they also share some extraordinary health benefits, particularly when it comes to preventing cancer. In fact, Dr. Joel Fuhrman points out that cruciferous vegetables are the most micronutrient dense of all vegetables, and calls them "the most powerful anticancer foods in existence."

This latter distinction may be due to a potent cancer fighter that is unique and particularly important to this group of foods, a family of substances known as glucosinolates. Glucosinolates are responsible for the pungent aroma and bitter flavor of many cruciferous vegetables. When these glucosinolates are broken down, either during food preparation or through chewing and digestion, they form compounds called isothiocyanates and indoles that have been shown in numerous studies to inhibit the development of cancer.

**LE:** Any serving suggestions, particularly for those who don't have a taste for these veggies?

**JM:** It turns out moms all over America are right when they tell kids, "Eat your broccoli!" The good news is, there are creative ways to eat broccoli and other cruciferous vegetables that your mom may not have known about. Raw or lightly steamed broccoli or cauliflower florets add a satisfying crunch to

a salad or dipped in hummus. Kale can be blended raw into smoothies, "massaged" into a salad, or lightly steamed with some garlic and lemon juice. Zesty radishes, thinly sliced, add bite to salads, while the peppery flavor of arugula makes a nice change from lettuce.

You can also try tossing in a few handfuls of raw arugula into your warm pasta with veggies, letting it wilt just a little. Bok choy is a lovely addition to stir-fries, with its combination of crunchy stalks and tender leaves. Add it right at the end, as it needs only a couple of minutes to cook.

**LE:** How about leafy greens?

**JM:** Some fall into the cruciferous category, like kale, collards, arugula, and bok choy. Other particularly potent greens include watercress, Swiss chard, spinach, romaine, and other salad greens.

Researchers at Harvard University found greens to be the food most highly associated with protection from major chronic disease and cardiovascular disease. They have also been associated with reduced risk of diabetes. Greens are packed with fiber, protein, and antioxidants, as well as disease-fighting phytochemicals.

You can eat your greens raw as a salad, add handfuls to a smoothie, steam them lightly and serve them with lemon juice, toss them into a soup or stew at the end so they lightly wilt, blend them into flavorful pesto-style sauces, add steamed greens to mashed potatoes, or water-sauté them with garlic. Spinach makes a great addition to homemade hummus or other bean spreads. Greens are so extraordinarily healthy that we try to add them whenever possible to the dishes we cook. Try to eat greens every day!

**LE:** Nuts and seeds?

**JM:** Nuts and seeds are packed with health-promoting nutrients and consistently associated with good health outcomes. They are a rich source of all kinds of nutrients—understandable, given that they contain the energy to create an entire plant or tree.

Indeed, the consumption of nuts and seeds has been associated with reduced risk of heart disease and diabetes, as well as an increased lifespan. While some people raise concerns about the relatively high calorie density of nuts, they are also extremely filling and are generally not associated with an increase in weight or BMI. Having said that, if you are trying to lose weight, you might want to limit your nut and seed intake to less than a handful a day.

**LE:** Could you elaborate on the differences between whole carbohydrates and processed carbohydrates?

**JM:** One of the things many people love about a whole foods, plant-based diet is that it includes the comforting starchy “carb” foods... sweet and earthy yams, hearty winter squashes, tender juicy corn, and even the much-loved potato, as well as all the varieties of tasty, satisfying whole grains, can find a regular place on the whole foodie plate. In this category we also include the grainlike seeds, such as quinoa, millet, amaranth, buckwheat, and teff, which are nutritionally similar to grains.

The important and often-missed distinction between whole carbohydrates, like whole grains and starchy vegetables, and highly processed, refined carbohydrates (is that) while the latter are to be avoided, the former play a key role in an optimum diet.

Carbohydrates are the best energy source human beings have

available, and over the course of evolution, our bodies have adapted to be able to metabolize them efficiently. Whole grains provide fiber, protein, essential fatty acids, and numerous phytochemicals, as well as carbohydrates, in the perfect package to give us the energy we need. They have been linked to lower risk of heart disease, diabetes, obesity, certain cancers, and mortality from all causes. Eating whole grains also improves bowel health, helping to maintain regular bowel movements and promote growth of healthy gut bacteria.

Contrary to popular opinion, carbs in the form of whole grains can actually help you lose weight. Whole grains and starchy vegetables leave you feeling full and satisfied, and therefore combat snacking and overeating, actually preventing you from becoming or remaining overweight.

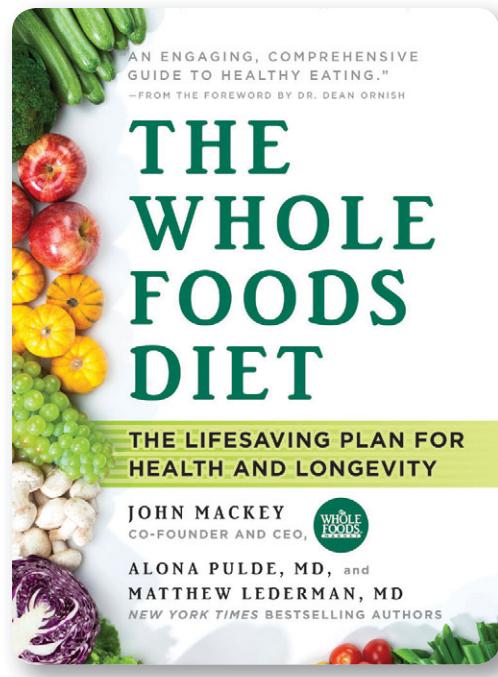
**LE:** Finally, what's your advice to someone attempting to drop unhealthy, processed and sugary foods in favor of a healthy diet?

**JM:** Eat enough! One of the most common reasons people struggle in the transition to a whole foods, plant-based diet is that they don't eat enough. That's right. You're much more likely to fail from eating too little than from eating too much. Many people start out by focusing on what they shouldn't eat and don't give enough attention to all the good things they should be eating. Because whole plant foods are less calorie dense than highly processed foods and animal foods, you may need to eat larger portions or more frequently than you are accustomed to. Try to include as many of the Essential Eight in your everyday diet as possible, and particularly focus on the starchy vegetables, whole grains, and legumes.

Listen to your body, especially in the early days of your transition. If you're feeling hungry again only a couple of hours after eating, you probably didn't have a big enough meal or include enough satiating whole grains or starchy vegetables. If you feel satisfied and content, stop eating, but if not, eat more. There is no right or wrong time to eat, only right and wrong foods. You can now trust your hunger signals without fear of overconsuming calories. You're no longer in a battle with your body or your cravings—so long as the only food on your plate is real food (particularly of the whole food, plant-based variety).

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

*The Whole Foods Diet* is available from bookstores and online retailers.



BY GARRY MESSICK

# Kale

If a vegetable can be said to be trendy, kale fits that description.

In recent years, this green, leafy, cruciferous vegetable, a member of the cabbage family, has become very popular, and with good reason. Experts say that kale is one of the most nutrient-dense foods on earth. But that's just the beginning of the story...

## Anticancer Properties

Kale contains a number of compounds that have been found to be associated with anticancer effects. These include **indole-3-carbinol**<sup>1</sup> as well as **sulforaphane**, which offer significant protection against the development of the disease.<sup>2</sup>

## Oxidant Reducers

Oxidant reducers help fight diseases of aging, including cancer, that our bodies are susceptible to due to the destructive effects of free radicals. Kale contains these compounds.<sup>3</sup> Flavonoids are also found in kale in the form of **quercetin** and **kaempferol**. These substances are associated with anti-inflammatory, anti-cancer, and antiviral properties.<sup>4</sup>

## Eye Protection

Studies show that supplementing with **lutein** and **zeaxanthin** significantly lowers your risk of age-related loss of eyesight due to cataracts and macular degeneration,<sup>5</sup> and kale contains both of these carotenoids in small amounts.

### References

1. *Adv Pharmacol Sci*. 2014;2014:832161.
2. *Cancer Treat Res*. 2014;159:207-23.
3. *Acta Sci Pol Technol Aliment*. 2012;11(3):239-48.
4. *ScientificWorldJournal*. 2013;2013:162750.
5. *Invest Ophthalmol Vis Sci*. 2003;44(6):2461-5.



# GET RELIEF FROM FOOT, LEG & BACK PAIN

## Kenkoh Revitalizes and Rejuvenates Your Whole Body!

A clinical study in a Japanese school of medicine concluded that Kenkoh massage footwear improves circulation, reduces swelling around the legs and ankles, and improves energy levels and mood.

# Kenkoh®

“The Original Japanese Massage Sandal”

**LEM.DISCOVERKENKOH.COM**

1-800-336-6657

**Kenkoh** IS JAPANESE FOR HEALTH AND BEAUTY



Kyu-Kichi Yamanashi invented the Kenkoh massage sandal in Japan over a 3-year period in the 1960's. He designed the unique foot bed to mimic two ancient healing techniques that saved his life: *Aodake-Fumi* (stepping on bamboo) and *Sokushindo* (Japanese reflexology), meaning “the path that leads to the heart.”

THE **Kenkoh** MASSAGE SANDAL IS UNIQUELY DESIGNED TO STIMULATE THOUSANDS OF NERVE ENDINGS IN THE FEET

- Nerves corresponding to organs and muscles are concentrated in the soles of the feet.
- Stimulating these nerves daily enhances overall health.
- Medical grade arch support alleviates foot pain.

FOOT REFLEXOLOGY CHART



**A FOOT MASSAGE WITH EVERY STEP**

# MEDITERRANEAN POLYPHENOL EXTRACT BLEND



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

The PhytoClean™ Method is a patented bioactive extraction method.  
**CAUTION:** If you have gallstones or a biliary tract obstruction, do not use this product. Do not take if pregnant or lactating. Contains tree nuts (walnut, pecan).  
Keep out of reach of children. Do not exceed recommended dose. **Non-GMO**

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.

**Mediterranean Whole Food Blend** provides standardized extracts of:

- Grape (seed)
- Olive (leaf)
- Pomegranate (fruit)
- Black walnut
- Pecan
- Artichoke fruit)
- Lentil (bran)

(Daily dose is 3 capsules)

**Mediterranean Whole Food Blend**  
Item #02109 • 90 vegetarian capsules

	Retail Price	Your Price
1 bottle	\$44	\$33
4 bottles		\$30 each





## FIVE EASY STEPS FOR ORDERING BLOOD TESTS:

1. Call **1-800-208-3444** to discuss and place your order with one of our knowledgeable Wellness Specialists. Online orders can also be placed at [www.LifeExtension.com/labtesting](http://www.LifeExtension.com/labtesting)
2. After your order is placed, you will be mailed either a requisition form to take to your local LabCorp Patient Service Center or a Blood Draw Kit, whichever is applicable. (Please note: If a blood draw kit is used, an additional local draw fee may be incurred.)
3. Have your blood drawn.
4. Your blood test results will be mailed, emailed, or faxed directly to you by Life Extension.
5. Take the opportunity to discuss the results with one of our knowledgeable Wellness Specialists by calling **1-800-226-2370**; or review the results with your personal physician.

**IT'S THAT SIMPLE!  
DON'T DELAY! CALL TODAY!**

### For Our Local Customers:

For those residing in the Ft. Lauderdale, Florida, area, blood-draws are also performed at the Life Extension Nutrition Center from 9:00 am to 2:00 pm Monday through Saturday. Simply purchase the blood test and have it drawn with no wait! Our address is:

**5990 NORTH FEDERAL HIGHWAY,  
FT. LAUDERDALE, FL, 33308-2633**

### Terms and Conditions

This blood test service is for informational purposes only and no specific medical advice will be provided. National Diagnostics, Inc., and Life Extension contract with a physician who will order your test(s), but will not diagnose or treat you. Both the physician and the testing laboratory are independent contractors and neither National Diagnostics, Inc., nor Life Extension will be liable for their acts or omissions. Always seek the advice of a trained health professional for medical advice, diagnosis, or treatment. When you purchase a blood test from Life Extension/National Diagnostics, Inc., you are doing so with the understanding that you are privately paying for these tests. There will be absolutely no billing to Medicare, Medicaid, or private insurance.

**LifeExtension**

# Blood Testing

## The Ultimate Information

YOUR  
PRICE

**\$35**

### ○ CBC/CHEMISTRY PROFILE (LC381822) *includes:*

#### Lipid Profile:

Total cholesterol • Triglycerides  
HDL cholesterol • LDL cholesterol (calc.)  
VLDL cholesterol (calc.)  
Total cholesterol/HDL ratio  
Estimated Coronary Heart Disease risk

#### Blood Sugar:

Glucose

#### Kidney Function:

Uric acid • BUN (blood urea nitrogen)  
Creatinine • BUN/creatinine ratio  
eGFR (estimated glomerular filtration rate)

#### Liver Function:

Alkaline phosphatase • LDH (lactate dehydrogenase)  
AST (aspartate aminotransferase)  
ALT (alanine transaminase)  
Total protein • Albumin • Globulin  
Albumin/globulin ratio • Bilirubin

#### Electrolytes and Minerals:

Sodium • Potassium • Chloride  
Calcium • Phosphorus • Iron

#### Complete Blood Count:

Red blood cell count • Hemoglobin  
Hematocrit • MCV (mean corpuscular volume)  
MCH (mean corpuscular hemoglobin)  
MCHC (mean corpuscular hemoglobin concentration)  
RDW (red blood cell distribution)  
White blood cell count  
Immune Cell Differentiation Count  
Platelet count

**SALE**  
**\$149.25**

### ○ NEUROTRANSMITTER BASIC PANEL\*\* (LC100058)

Serotonin, Dopamine, Epinephrine, Norepinephrine, GABA, Glutamate. Alterations in these six neurotransmitters play a significant role in contributing to symptoms such as cognitive disorders, depression, anxiety, diminished drive, fatigue and sleep difficulties, cravings, addictions, pain and more! Not available in NY.

**\$198**

### ○ FOOD SAFE ALLERGY TEST – BASIC\*\* (LCM73001)

This test measures delayed (IgG) food allergies for 95 common foods.

**\$198**

### ○ FOOD SAFE ALLERGY TEST – EXTENDED\*\* (LCM73002)

This test measures delayed (IgG) food allergies to an additional 95 foods.

**\$375**

### ○ FOOD SAFE ALLERGY TEST – COMBO\*\* (LCM73003)

This test measures delayed (IgG) food allergies to all 190 foods found in our Basic and Extended panels.

## GENETIC TESTING

**\$299**

### ○ DNA GENETIC CANCER RISK PROFILE\*\* (LC100057)

With only a saliva sample, you can identify your risk for 25 hereditary cancers by analyzing 98 genes from your DNA including the well-known BRCA1, BRCA2, TP53, and APC. Not available in NY and RI.

**\$149**

### ○ APOE GENETIC TEST FOR ALZHEIMER'S AND CARDIAC RISK \*\* (LC100059)

Apolipoprotein E (ApoE) is an important regulator of cholesterol and triglycerides levels in your blood and supports lipid transport and injury repair in your brain. Genetically, E4 is the strongest risk factor for developing Late Onset Alzheimer's disease. According to the National Institute of Health, inheriting a single copy of ApoE4 increases the risk of Alzheimer's disease by about three-fold. Inheriting two copies increases the risk by about 12-fold. In fact, almost 40% of AD patients have inherited an E4 allele.

In the cardiovascular system ApoE is involved in the transportation of fat molecules into your cells. E4 is associated with increased levels of cholesterol and triglycerides, which leads to atherosclerosis, heart disease and stroke.



## BLOOD TEST PANELS

### ○ MALE LIFE EXTENSION PANEL (LC322582)

**CBC/Chemistry Profile** • DHEA-S • PSA (prostate-specific antigen)  
Homocysteine • C-Reactive Protein (high-sensitivity)  
Free Testosterone • Total Testosterone • Estradiol • TSH for thyroid function • Vitamin D (25-hydroxyvitamin D) • Hemoglobin A1c

### ○ MALE HORMONE ADD-ON PANEL\* (LCADDM)

#### Pregnenolone and Dihydrotestosterone (DHT)

To provide an even more in-depth analysis of a man's hormone status, Life Extension has created this panel as an addition to the Male Life Extension Panel. This panel provides information about a testosterone metabolite that can affect the prostate; and the hormone pregnenolone that acts as a precursor to all other steroid hormones.

### ○ MALE ELITE PANEL (LC100016)\*

**CBC/Chemistry Profile** • Free and Total Testosterone • Total Estrogens  
Estradiol • DHEA-S • Progesterone • Pregnenolone • DHT • FSH • LH • TSH  
Free T3 • Free T4 • Reverse T3 • Free and Total PSA • IGF-1 • SHBG • HbA1c  
Vitamin D 25-OH • hs-CRP, ferritin • Homocysteine • Hemoglobin A1c

### ○ PSA (PROSTATE SPECIFIC ANTIGEN) (LC010322)

Screening for Prostate Cancer

### ○ MALE COMPREHENSIVE HORMONE PANEL (LC100010)\*

**CBC/Chemistry Profile** • DHEA-S, Estradiol • DHT • PSA  
Pregnenolone • Total and Free Testosterone • SHBG • TSH • Free T3  
This panel now includes Free T4 and Cortisol with no increase in price!

### ○ MALE BASIC HORMONE PANEL (LC100012)

DHEA-S • Estradiol • Total and Free Testosterone • PSA

### ○ THYROID ADD-ON PANEL (LCTHYROID)

Free T3 & Free T4.

### ○ INSULIN (LC004333)

Helpful to assess insulin resistance.

### ○ NMR LIPOPROFILE® (LC123810)

The NMR Lipoprotein profile® directly measures LDL particle size and number as well as HDL particle number, total cholesterol, and triglycerides. It also provides a calculation of one's risk of insulin resistance by assessing abnormalities in lipoprotein markers.

### ○ ADVANCED OXIDIZED LDL PANEL\* (LC100035)

This panel looks at vascular inflammatory biomarkers, beginning with lifestyle choices to the development of metabolic and cardiovascular disease as well as the formation of vulnerable plaque. The panel contains the following tests: F2-Isoprostanes, Myeloperoxidase and Oxidized LDL.

### ○ HOMOCYSTEINE (LC706994)

High homocysteine is associated with heart attack, stroke, and dementia. Find out your homocysteine level so you can take steps to lower it if necessary.

**Blood tests available in the continental United States only. Restrictions apply in NY, NJ, RI, and MA. Not available in Maryland. Kits not available in Pennsylvania.**

YOUR  
PRICE

\$269

### ○ FEMALE LIFE EXTENSION PANEL (LC322535)

**CBC/Chemistry Profile** • DHEA-S • Estradiol • Homocysteine  
C-Reactive Protein (high-sensitivity) • Progesterone • Free Testosterone  
Total Testosterone • TSH for thyroid function  
Vitamin D (25-hydroxyvitamin D) • Hemoglobin A1c

\$120

### ○ FEMALE HORMONE ADD-ON PANEL\* (LCADDF)

#### Pregnenolone and Total Estrogen

To provide an even more in-depth analysis of a woman's hormone status, Life Extension has created this panel as an addition to the Female Life Extension Panel. This panel provides information about total estrogen status and the hormone pregnenolone that acts as a precursor to all other steroid hormones.

\$575

### ○ FEMALE ELITE PANEL (LC100017)\*

**CBC/Chemistry Profile** • Free and total Testosterone • Total Estrogens  
Estradiol • Estrone • DHEA-S • Progesterone Pregnenolone  
DHT • FSH • LH • TSH • Free T3 • Free T4 • Reverse T3 • IGF-1 • SHBG • HbA1c  
Vitamin D 25-OH • hs-CRP • Ferritin • Homocysteine • Hemoglobin A1c

\$31

### ○ FEMALE COMPREHENSIVE HORMONE PANEL (LC100011)\*

**CBC/Chemistry Profile** • DHEA-S, Estradiol • Total Estrogens  
Progesterone • Pregnenolone • Total and Free Testosterone • SHBG  
TSH • Free T3

This panel now includes Free T4 and Cortisol with no increase in price!

\$75

### ○ FEMALE BASIC HORMONE PANEL (LC100013)

DHEA-S • Estradiol • Total and Free Testosterone • Progesterone

\$55

### ○ WEIGHT LOSS PANEL-COMPREHENSIVE (LC100028)

**CBC/Chemistry Profile** • DHEA-S • Free and Total Testosterone  
Estradiol • Progesterone • Cortisol, TSH • Free T3 • Free T4  
Reverse T3 • Insulin • Hemoglobin A1c • Vitamin D 25-hydroxy  
C-reactive protein (high sensitivity) • Ferritin

\$29.90

### ○ HEALTHY AGING PANEL-COMPREHENSIVE (LC100026)\*

**CBC/Chemistry Profile** • C-reactive protein (high sensitivity)  
Vitamin B12 • Folate • Homocysteine • Vitamin D 25-hydroxy • Hemoglobin A1c  
TSH • Free T3 • Free T4 • Ferritin • Urinalysis • Fibrinogen • Insulin

\$285

### ○ DIABETES MANAGEMENT PROFILE – COMPREHENSIVE (LC100040)

Hemoglobin A1C • Glucose • Insulin • Lipid Panel • Glycomark

\$54



With Your Healthy Rewards, you earn LE Dollars

back on every purchase you make —  
including blood tests!

See [www.LifeExtension.com/Rewards](http://www.LifeExtension.com/Rewards) for details.

This is NOT a complete listing of LE blood test services.  
Call 1-800-208-3444 for additional information.

\* This test requires samples to be shipped to the lab on dry ice for customers using a Blood Draw Kit and will incur an additional \$35 charge. If the customer is having blood drawn at a LabCorp facility, this extra charge does not apply.

\*\* This test is packaged as a kit.

YOUR  
PRICE

\$269

\$125

\$575

\$299

\$75

\$275

\$249

\$129

**Amino Acids**

Arginine/L-Ornithine Capsules  
Arginine Ornithine Powder  
Branched Chain Amino Acids  
D,L-Phenylalanine Capsules  
L-Arginine Caps  
L-Carnitine  
L-Glutamine  
L-Glutamine Powder  
L-Lysine  
L-Taurine Powder  
L-Tyrosine Powder  
Super Carnosine  
Taurine

**Blood Pressure & Vascular Support**

Advanced Olive Leaf Vascular Support with Celery Seed Extract  
Arterial Protect  
Blood Pressure Monitor Arm Cuff  
Dual Action Blood Pressure  
Endothelial Defense™ with Pomegranate Complete and CORDIART™  
Endothelial Defense™ with GliSODin®  
Natural BP Management  
NitroVasc with CORDIART™  
Pomegranate Complete  
Pomegranate Fruit Extract  
Triple Action Blood Pressure AM/PM  
VenoFlow™

**Bone Health**

Bone Restore  
Bone Restore-Sugar Free  
Bone Restore with Vitamin K2  
Bone Strength Formula with KoAct®  
Bone-Up™  
Calcium Citrate with Vitamin D  
Dr. Strum's Intensive Bone Formula  
Strontium Caps

**Brain Health**

Acetyl-L-Carnitine  
Acetyl-L-Carnitine Arginate  
Blast™  
Brain Shield® Gastrodin  
CocoaMind™  
Cognitex® Basics  
Cognitex® with Brain Shield®  
Cognitex® with Pregnenolone & Brain Shield®  
Cognizin® CDP-Choline Caps  
DMAE Bitartrate (dimethylaminoethanol)  
Dopa-Mind™  
Ginkgo Biloba Certified Extract™  
Huperzine A  
Lecithin Granules  
Memory Protect  
Migra-Eeze™  
Neuro-Mag® Magnesium L-Threonate  
Optimized Ashwagandha Extract  
PS (Phosphatidylserine) Caps  
Vinpocetine

**Cholesterol Management**

Advanced Lipid Control  
Cho-Less™  
CHOL-Support™  
Red Yeast Rice  
Theaflavins Standardized Extract  
Vitamin B3 Niacin Capsules

**Digestion Support**

Artichoke Leaf Extract  
Digest RC®  
Effervescent Vitamin C - Magnesium Crystals  
Enhanced Super Digestive Enzymes  
Enhanced Super Digestive Enzymes w/Probiotics  
EsophagoCool™  
Esophageal Guardian  
Extraordinary Enzymes

**Gastro-Ease™**

Ginger Force®  
Pancreatin  
Regimint  
Tranquil Tract™  
TruFiber™  
WellBetX PGX plus Mulberry

**Energy Management**

Adrenal Energy Formula  
Asian Energy Boost  
D-Ribose Powder  
D-Ribose Tablets  
Forskolin  
Mitochondrial Basics with BioPQQ®  
Mitochondrial Energy Optimizer with BioPQQ®  
NAD+ Cell Regenerator™  
Optimized NAD+ Cell Regenerator™ with Resveratrol  
PQQ Caps  
Rhodiola Extract  
RiboGen™ French Oak Wood Extract  
Triple Action Thyroid

**Eye Health**

Astaxanthin with Phospholipids  
Brite Eyes III  
Certified European Bilberry Extract  
Eye Pressure Support with Mirtogenol®  
MacuGuard® Ocular Support  
MacuGuard® Ocular Support with Astaxanthin  
Tear Support with MaquiBright®

**Fish Oil & Omegas**

OMEGA FOUNDATIONS® Clearly EPA/DHA  
OMEGA FOUNDATIONS® Mega EPA/DHA  
OMEGA FOUNDATIONS® Mega GLA with Sesame Lignans  
OMEGA FOUNDATIONS® Super Omega-3 EPA/DHA with Sesame Lignans & Olive Extract  
OMEGA FOUNDATIONS® Super Omega-3 Plus EPA/DHA with Sesame Lignans, Olive Extract, Krill & Astaxanthin  
OMEGA FOUNDATIONS® Provinol® Purified Omega-7  
OMEGA FOUNDATIONS® Vegetarian DHA Organic Golden Flax Seed

**Food**

California Estate Extra Virgin Olive Oil  
Rich Rewards® Breakfast Blend  
Rich Rewards® Breakfast Blend Natural Mocha Flavor  
Rich Rewards® Breakfast Blend Natural Vanilla Flavor  
Rich Rewards® Breakfast Blend Whole Bean Coffee  
Rich Rewards® Decaf Roast  
Stevia Sweetener

**Glucose Management**

CinSulin® with InSea® and Crominex® 3+ Glycemic Guard™  
Mega Benfotiamine  
Tri Sugar Shield®

**Heart Health**

Aspirin (Enteric Coated)  
BioActive Folate & Vitamin B12 Caps  
Cardio Peak™ with Standardized Hawthorn and Arjuna  
Homocysteine Resist  
Optimized Carnitine with GlycoCarn®  
Super Ubiquinol CoQ10  
Super Ubiquinol CoQ10 with BioPQQ®  
Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™  
Super-Absorbable CoQ10 Ubiquinone with d-Limonene  
TMG Powder  
TMG Liquid Capsules

**Hormone Balance**

DHEA (Dehydroepiandrosterone)  
Inner Power  
Pregnenolone  
Triple Action Cruciferous Vegetable Extract with Resveratrol  
Triple Action Cruciferous Vegetable Extract

**Immune Support**

AHCC®  
Enhanced Zinc Lozenges  
Immune Modulator with Tinofend®  
Immune Protect with PARACTIN®  
Immune Senescence Protection Formula™  
Kinoko® Gold AHCC  
Kinoko® Platinum AHCC  
Kyolic® Garlic Formula 102  
Kyolic® Reserve  
Lactoferrin (apolactoferrin) Caps  
NK Cell Activator™  
Optimized Garlic  
Optimized Quercetin  
Peony Immune  
ProBoost Thymic Protein A  
Reishi Extract Mushroom Complex  
Standardized *Cistanche*  
Ten Mushroom Formula®  
Zinc Lozenges

**Inflammation Management**

5-LOX Inhibitor with AprèsFlex®  
Advanced Bio-Curcumin® with Ginger & Turmerones  
Black Cumin Seed Oil  
Black Cumin Seed Oil with Bio-Curcumin®  
Boswellia  
Comfort Max™  
Cytokine Suppress™ with EGCG  
Serraflazyme  
Specially-Coated Bromelain  
Super Bio-Curcumin®  
Zyflamend® Whole Body

**Joint Support**

Arthro-Immune Joint Support  
ArthroMax® Advanced with UC-II® & AprèsFlex®  
ArthroMax® with Theaflavins & AprèsFlex®  
ArthroMax® Herbal Joint Formula  
Bio-Collagen with Patented UC-II®  
Fast-Acting Joint Formula  
Glucosamine/Chondroitin Capsules  
Kril Healthy Joint Formula  
MSM (Methylsulfonylmethane)

**Kidney & Bladder Support**

Cran-Max® Cranberry Whole Fruit Concentrate  
Optimized Cran-Max® with Ellirose™  
Uric Acid Control  
Water-Soluble Pumpkin Seed Extract

**Liver Health & Detoxification**

Anti-Alcohol with HepatoProtection Complex  
Calcium D-Glucarate  
Chlorella  
Chlorophyllin  
European Milk Thistle  
Glutathione, Cysteine & C  
HepatoPro  
Liver Efficiency Formula  
N-Acetyl-L-Cysteine  
PectaSol-C®  
Silymarin  
SODzyme® with GliSODin® & Wolfberry

**Longevity & Wellness**

Alpha-Lipoic Acid  
AppleWise Polyphenol Extract  
Berry Complete  
Blueberry Extract  
Blueberry Extract with Pomegranate  
DNA Protection Formula  
Enhanced Berry Complete with Acai  
Essential Daily Nutrients

GEROPROTECT™ Ageless Cell™

GEROPROTECT™ Longevity A.I.™

Grapeseed Extract with

Resveratrol & Pterostilbene

Mediterranean Whole Food Blend

Mega Green Tea Extract (decaffeinated)

Mega Green Tea Extract (lightly caffeinated)

Optimized Fucoidan with Maritech® 926

Optimized Resveratrol

pTeroPure®

Pycnogenol® French Maritime

Pine Bark Extract

Resveratrol with Pterostilbene

RNA (Ribonucleic Acid)

Super R-Lipoic Acid

X-R Shield

## Men's Health

Mega Lycopene Extract

PalmettoGuard® Saw Palmetto with Beta-Sitosterol

PalmettoGuard® Saw Palmetto/Nettle Root Formula with Beta-Sitosterol

Pomi-T®

Prelox® Natural Sex for Men®

Super MiraForte with Standardized Lignans

Triple Strength ProstaPoll™

Ultra Natural Prostate

## Minerals

Boron

Extend-Release Magnesium

Ionic Selenium

Iron Protein Plus

Magnesium (Citrate)

Magnesium Caps

Only Trace Minerals

Optimized Chromium with Crominex® 3+

Sea-Iodine™

Se-Methyl L-Selenocysteine

Vanadyl Sulfate

Zinc Caps

## Miscellaneous

Potassium Iodide

Solarshield® Sunglasses

## Mood & Stress Management

5 HTP

L-Theanine

Natural Cortisol Balance

Natural Stress Relief

SAMe (S-Adenosyl-Methionine)

## Multivitamins

Children's Formula Life Extension Mix™

Comprehensive Nutrient Packs ADVANCED

Life Extension Mix™ Capsules without Copper

Life Extension Mix™ Capsules

Life Extension Mix™ Powder without Copper

Life Extension Mix™ Powder

Life Extension Mix™ Tablets with Extra Niacin

Life Extension Mix™ Tablets without Copper

Life Extension Mix™ Tablets

Once-Daily Health Booster

One-Per-Day Tablets

Two-Per-Day Capsules

Two-Per-Day Tablets

## Personal Care

Anti-Aging Rejuvenating Scalp Serum

Biosil

Dr. Proctor's Advanced Hair Formula

Dr. Proctor's Shampoo

European Leg Solution Featuring Certified Diosmin 95

Face Master Platinum Facial Toning System

Hair, Skin & Nail Rejuvenation Formula w/VERISOL®

Hair Suppress Formula

Life Extension Toothpaste

Sinus Cleanser

Venotone

Xyliwhite Mouthwash

## Pet Care

Cat Mix

Dog Mix

## Probiotics

Bifido GI Balance

FLORASSIST® Balance

FLORASSIST® GI with Phage Technology

FLORASSIST® Heart Health

FLORASSIST® Immune Health

FLORASSIST® Mood

FLORASSIST® Oral Hygiene

FLORASSIST® Prebiotic

FLORASSIST® Throat Health

Jarro-Dophilus® for Women

Theralac® Probiotics

TruFlora® Probiotics

## Skin Care

Advanced Anti-Glycation Peptide Serum

Advanced Growth Factor Serum

Advanced Lightening Cream

Advanced Peptide Hand Therapy

Advanced Triple Peptide Serum

Advanced Under Eye Serum with Stem Cells

Amber Self MicroDermAbrasion

Anti-Aging Face Oil

Anti-Aging Mask

Anti-Aging Rejuvenating Face Cream

Anti-Glycation Serum with Blueberry & Pomegranate Extracts

Antioxidant Facial Mist

Anti-Redness & Adult Blemish Lotion

Collagen Boosting Peptide Serum

DNA Repair Cream

Environmental Support Serum

Essential Plant Lipids Reparative Serum

Eye Lift Cream

Face Rejuvenating Anti-Oxidant Cream

Healing Formula

Healing Vitamin K Cream

Hyaluronic Facial Moisturizer

Hyaluronic Oil-Free Facial Moisturizer

Hydrating Anti-Oxidant Facial Mist

Hydroderm

Lifting & Tightening Complex

Melatonin Cream

Mild Facial Cleanser

Multi Stem Cell Skin Tightening Complex

Neck Rejuvenating Anti-Oxidant Cream

Rejuvenex® Body Lotion

Rejuvenex® Factor Firming Serum

Resveratrol Anti-Oxidant Serum

Shade Factor™

Shade Factor™ Sunscreen Lotion

Shade Factor™ Sunscreen Spray

Skin Care Collection Anti-Aging Serum

Skin Care Collection Body Lotion

Skin Care Collection Day Cream

Skin Care Collection Night Cream

Skin Firming Complex

Skin Lightening Serum

Skin Restoring Phytoceramides with Lipowheat®

Skin Stem Cell Serum

Skin Tone Equalizer

Stem Cell Cream with Alpine Rose

Tightening & Firming Neck Cream

Triple-Action Vitamin C Cream

Ultimate MicroDermabrasion

Ultra Eyelash Booster

Ultra Lip Plumper

Ultra Rejuvenex®

Ultra RejuveNight®

Ultra Wrinkle Relaxer

Under Eye Refining Serum

Under Eye Rescue Cream

Vitamin C Serum

Vitamin D Lotion

Vitamin E-ssential Cream

Youth Serum

## Sleep

Bioactive Milk Peptides

Enhanced Natural Sleep® with Melatonin

Enhanced Natural Sleep® without Melatonin

Fast-Acting Liquid Melatonin

Glycine

L-Tryptophan

Melatonin

Optimized Tryptophan Plus

## Sports Performance

Creatine Capsules

Creatine Whey Glutamine Powder

(Vanilla Flavor)

New Zealand Whey Protein Concentrate

(Natural Chocolate and Vanilla Flavor)

Tart Cherry with CherryPure®

Plant Protein Complete & Amino Acid Complex

Whey Protein Isolate

(Chocolate and Vanilla Flavor)

## Vitamins

Ascorbyl Palmitate

Benfotiamine with Thiamine

Beta-Carotene

BioActive Complete B-Complex

Biotin

Buffered Vitamin C Powder

Fast-C® with Dihydroquercetin

Gamma E Mixed Tocopherol Enhanced with Sesame Lignans

Gamma E Mixed Tocopherol/Tocotrienols

High Potency Optimized Folate

Inositol Caps

Liquid Emulsified Vitamin D3

Liquid Vitamin D3

Low-Dose Vitamin K2

Methylcobalamin

MK-7

Natural Vitamin E

No Flush Niacin

Optimized Folate (L-Methylfolate)

Pantothenic Acid (Vitamin B-5)

Pyridoxal 5'-Phosphate Caps

Super Absorbable Tocotrienols

Super K with Advanced K2 Complex

Vitamin B12

Vitamin B6

Vitamin C with Dihydroquercetin

Vitamin D3 with Sea-Iodine™

Vitamin D3

Vitamins D and K with Sea-Iodine™

## Weight Management

7-Keto® DHEA Metabolite

Advanced Anti-Adipocyte Formula

Advanced Natural Appetite Suppress

AMPK Metabolic Activator

CalReduce Selective Fat Binder

DHEA Complete

Garcinia HCA

HCActive™ Garcinia Cambogia Extract

Integra-Lean®

Mediterranean Trim with Sinetrol™-XPur

Optimized Irvingia with Phase 3™ Calorie Control Complex

Optimized Saffron with Satiereal®

Super Citrimax®

Super CLA Blend with Sesame Lignans

Waist-Line Control™

## Women's Health

Advanced Natural Sex for Women® 50+

Breast Health Formula

Femmenessence MacaPause®

Natural Estrogen

Progesta-Care®

Super-Absorbable Soy Isoflavones

Ultra Soy Extract

ITEM No.	PRODUCT	Retail Each \$	YOUR PRICE				QTY	Total
			1 Unit Each	4 Unit Each	10 Unit Each			
<b>A</b>								
01524	ACETYL-L-CARNITINE • 500 mg, 100 veg. caps	34.00	25.50	22.50				
01874	ACETYL-L-CARNITINE ARGINATE • 90 veg. caps	52.00	39.00	35.00				
01628	ADRENAL ENERGY FORMULA • 60 veg. caps	24.00	18.00	16.50				
01630	ADRENAL ENERGY FORMULA • 120 veg. caps	46.00	34.50	31.50				
01828	ADVANCED LIPID CONTROL • 60 veg. caps	30.00	22.50	20.25				
00681	AHCC® • 500 mg, 30 caps	59.98	44.99					
24404	AHCC® (KINOKO® PLATINUM) • 750 mg, 60 veg. caps	84.95	63.71					
29727	AHCC® (KINOKO® GOLD) • 500 mg, 60 veg. caps	74.95	52.47					
00457	ALPHA-LIPOIC ACID W/BIOTIN • 250 mg, 60 caps	37.00	27.75	24.00				
02207	AMPK METABOLIC ACTIVATOR • 30 veg. tabs	38.00	28.50	24.00				
01509	ANTI-ADIPOCYTE FORMULA W/MERATRIM® & INTEGRA LEAN® (Advanced) • 60 veg. caps	39.00	29.25	27.00				
02140	ANTI-ALCOHOL w/HEPATOPRO COMPLEX • 60 caps	22.00	16.50	15.00				
01625	APPLEWISE POLYPHENOL EXTRACT 600 mg, 30 veg. caps	21.00	15.75	14.25				
01039	ARGININE/ORNITHINE • 500/250, 100 caps	17.99	13.49					
00038	ARGININE/ORNITHINE POWDER • 150 grams	22.95	17.21	14.25				
01624	(L)-ARGININE CAPS • 700 mg, 200 veg. caps	26.50	19.88	17.44				
02004	ARTERIAL PROTECT • 30 veg. caps	44.00	33.00	29.00				
01617	ARTHROMAX® W/THEAFLAVINS & APRÈSFLEX® 120 veg. caps	44.00	33.00	30.00				
01618	ARTHROMAX® ADVANCED W/UC-II® & APRÈSFLEX® 60 caps	36.00	27.00	24.00				
02108	ARTHROMAX® HERBAL JOINT FORMULA • 60 veg. caps	40.00	30.00	27.00				
01404	ARTHRO-IMMUNE JOINT SUPPORT • 60 veg. caps	32.00	24.00	21.00				
00919	ARTICHOKE LEAF EXTRACT • 500 mg, 180 veg. caps	30.00	22.50	21.00				
01533	ASCORBYL PALMITATE • 500 mg, 100 veg. caps	22.50	16.88	15.00				
00888	ASHWAGANDHA EXTRACT (Optimized) • 60 veg. caps	10.00	7.50	6.75				
01805	ASIAN ENERGY BOOST • 90 veg. caps	24.00	18.00	16.50				
01066	ASPIRIN • 81 mg, 300 enteric coated tablets	6.00	4.50	4.00				
01923	ASTAXANTHIN WITH PHOSPHOLIPIDS • 4 mg, 30 softgels	16.00	12.00	10.50				
<b>B</b>								
00920	BENFOTIAMINE W/ THIAMINE • 100 mg, 120 veg. caps	19.95	14.96	13.95				
00925	BENFOTIAMINE (Mega) • 250 mg, 120 veg. caps	30.00	22.50	20.25				
01206	BERRY COMPLETE • 30 veg. caps	21.00	15.75	14.00				
01496	BERRY COMPLETE W/ACAI (Enhanced) • 60 veg. caps	29.00	21.75	19.50				
00664	BETA-CAROTENE • 25,000 IU, 100 softgels	11.50	8.63					
01622	BIFFO GI BALANCE • 60 veg. caps	20.00	15.00	13.50				
01873	BILBERRY EXTRACT • 100 mg, 90 veg. caps	36.00	27.00	24.00				
01512	BIOACTIVE MILK PEPTIDES • 30 caps	18.00	13.50	12.00				
01631	BIO-COLLAGEN W/PATENTED UC-II® • 40 mg, 60 small caps	36.00	27.00	24.00				
01006	BIOSIL™ • 5 mg, 30 veg. caps	19.99	15.99					
01007	BIOSIL™ • 1 fl oz	31.99	25.59					
00102	BIOTIN • 600 mcg, 100 caps	7.50	5.63	4.88				
01709	BLACK CUMIN SEED OIL • 60 softgels	16.00	12.00	10.50				
01710	BLACK CUMIN SEED OIL W/BIO-CURCUMIN® • 60 softgels	32.00	24.00	22.50				

SUBTOTAL OF COLUMN 1

ITEM No.	PRODUCT	Retail Each \$	YOUR PRICE				QTY	Total
			1 Unit Each	4 Unit Each	10 Unit Each			
01008	BLAST™ • 600 grams of powder	26.97	20.23					
02025	BLOOD PRESSURE (Dual Action) • 60 veg. tabs	44.00	33.00	28.00				
70000	BLOOD PRESSURE MONITOR (ACCUFIT™) • med/lg cuff	79.99	49.99					
70004	BLOOD PRESSURE MONITOR • Digital wrist cuff	69.95	52.46					
02024	BLOOD PRESSURE (Triple Action AM/PM) • 60 veg. tabs	44.00	33.00	28.00				
01214	BLUEBERRY EXTRACT • 60 veg. caps	22.50	16.88	15.00				
01438	BLUEBERRY EXTRACT W/ POMEGRANATE • 60 veg. caps	30.00	22.50	20.25				
01506	BONE FORMULA (DR. STRUM'S INTENSIVE) • 300 caps	56.00	42.00	37.50				
01726	BONE RESTORE • 120 caps	22.00	16.50	14.25				
02123	BONE RESTORE • Chocolate, Sugar-Free • 60 chewable tabs	22.00	16.50	14.25				
01727	BONE RESTORE W/VITAMIN K2 • 120 caps	24.00	18.00	16.50				
01725	BONE STRENGTH FORMULA W/KOACT® • 120 caps	45.00	33.75	30.00				
00313	BONE-UP® • 240 caps	28.95	21.71	20.41				
01661	BORON • 3 mg, 100 veg. caps	5.95	4.46	3.94				
00202	BOSWELLA • 100 caps	38.00	28.50	22.50				
01802	BRAIN SHIELD® GASTRODIN • 300 mg, 60 veg. caps	33.00	24.75	22.50				
01253	BRANCHED CHAIN AMINO ACIDS • 90 caps	19.50	14.63	12.75				
01942	BREAST HEALTH FORMULA • 60 caps	34.00	25.50	22.50				
00893	BRITE EYES III • 2 vials, 5 ml each	34.00	25.50	24.00				
01203	BROMELAIN (Specially-coated) 500 mg, 60 enteric coated tablets	21.00	15.75	14.25				
<b>C</b>								
01653	CALCIUM CITRATE W/VITAMIN D • 300 caps	24.00	18.00	15.94				
01651	CALCIUM D-GLUCARATE • 200 mg, 60 veg. caps	18.00	13.50	11.25				
01823	CALREDUCE SELECTIVE FAT BINDER 120 mint chewable tablets	45.00	33.75	28.50				
01700	CARDIO PEAK™ W/STANDARDIZED HAWTHORN & ARJUNA 120 veg. caps	36.00	27.00	24.00				
00916	CARNITINE W/GLYCOCARN® (Optimized) • 60 veg. caps	36.00	27.00	24.00				
01532	L-CARNITINE • 500 mg, 30 veg. caps	15.00	11.25	9.90				
01829	CARNOSINE • 500 mg, 60 veg. caps	36.00	27.00	24.00				
02020	CARNOSINE (Super) • 500 mg, 60 veg. caps	40.00	30.00	27.00				
01932	CAT MIX • 100 grams powder	14.00	10.50	8.25				
02199	CHILDREN'S FORMULA LIFE EXTENSION MIX™ 120 chewable tablets	25.00	18.75	17.00				
00550	CHLORELLA • 500 mg, 200 tablets	23.98	17.99					
01571	CHLOROPHYLLIN • 100 mg, 100 veg. caps	24.00	18.00	15.00				
01359	CHO-LESS™ • 90 capsules	35.00	26.25					
01910	CHOL-SUPPORT™ • 60 liquid veg. caps	48.00	36.00	32.00				
01504	CHROMIUM W/CROMINEX® 3+ (Optimized) 500 mcg, 60 veg. caps	9.00	6.75	6.00				
01503	CINSULIN® W/INSEAZ® AND CROMINEX® 3+ • 90 veg. caps	38.00	28.50	25.50				
01906	CISTANCHE (Standardized) • 30 veg. caps	20.00	15.00	12.00				
01818	CITRIMAX® (Super) • 180 veg. caps	40.00	30.00	28.50				
00818	CLA BLEND W/SESAME LIGNANS (Super) • 120 softgels	36.00	27.00	24.75	19.75			
02103	COCOAMIND™ • 14 packets	24.00	18.00	16.00				
01896	COGNITEX® W/BRAIN SHIELD® • 90 softgels	60.00	45.00	39.00	36.00			

SUBTOTAL OF COLUMN 2

ITEM No.	PRODUCT	Retail Each \$	YOUR PRICE			QTY Total
			1 Unit Each	4 Unit Each	10 Unit Each	
01897	COGNITEX® W/PREGNENOLONE & BRAIN SHIELD® 90 softgels	62.00	46.50	39.75	37.50	
01421	COGNITEX® BASICS • 60 softgels	38.00	28.50	26.25	24.00	
01659	COGNIZIN® CDP-CHOLINE CAPS • 250 mg, 60 veg. caps	36.00	27.00	25.50		
02202	COMFORTMAX™ • 30 day supply	44.00	33.00	29.00		
01945	COMPLETE B-COMPLEX (BioActive) • 60 veg. caps	12.00	9.00	8.00		
02298	COMPREHENSIVE NUTRIENT PACKS ADVANCED • 30 packs	90.00	67.50	61.50		
33840	CRWAY TO GREAT GLUCOSE CD •	225.00	225.00			
01949	COQ10 w/d-LIMONENE (Super-Absorbable) • 50 mg, 60 softgels	25.00	18.75	16.50	15.00	
01948	COQ10 w/d-LIMONENE (Super-Absorbable) 100 mg, 100 softgels	46.00	34.50	28.00	26.25	
01951	COQ10 w/d-LIMONENE (Super-Absorbable) 100 mg, 60 softgels	30.00	22.50	20.00		
01929	COQ10 (Super Ubiquinol) • 100 mg, 60 softgels	56.00	42.00	36.00	33.00	
01733	COQ10 w/BIOPQQ® (Super Ubiquinol) • 100 mg, 30 softgels	50.00	37.50	30.00	27.00	
01426	COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (Super Ubiquinol) • 100 mg, 60 softgels	62.00	46.50	39.00	36.00	
01425	COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (Super Ubiquinol) • 50 mg, 100 softgels	58.00	43.50	34.50	31.50	
01427	COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (Super Ubiquinol) • 50 mg, 30 softgels	20.00	15.00	12.00		
01431	COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (Super Ubiquinol) • 200 mg, 30 softgels	62.00	46.50	39.00	36.00	
00862	CRAN-MAX® • 500 mg, 60 veg. caps	17.50	13.13	11.25		
01424	CRAN-MAX® WITH ELLIROSE™ (Optimized) • 60 veg. caps	18.00	13.50	12.00		
01529	CREATINE CAPSULES • 120 veg. caps	10.95	8.21	6.94		
01746	CREATINE WHEY GLUTAMINE POWDER • 454 grams (vanilla)	30.00	22.50	19.50		
00407	CURCUMIN® (Super Bio) • 400 mg, 60 veg. caps	38.00	28.50	26.25		
01924	CURCUMIN® W/GINGER & TURMERONES (Advanced Bio) 30 softgels	30.00	22.50	20.25		
01804	CYTOKINE SUPPRESS™ W/EGCG • 30 veg. caps	30.00	22.50	20.25		
<b>COSMESIS</b>						
80157	ADVANCED ANTI-GLYCATION PEPTIDE SERUM • 1 oz	53.00	39.75	34.50		
80165	ADVANCED GROWTH FACTOR SERUM • 30 ml	65.00	48.75	42.75		
80154	ADVANCED LIGHTENING CREAM • 1 oz	65.00	48.75	42.75		
80155	ADVANCED PEPTIDE HAND THERAPY • 4 oz	46.00	34.50	29.25		
80152	ADVANCED TRIPLE PEPTIDE SERUM • 1 oz	65.00	48.75	42.75		
80140	ADVANCED UNDER EYE SERUM W/STEM CELLS • .33 oz	49.00	36.75	31.50		
80139	AMBER SELF MICRODERMABRASION • 2 oz	49.00	36.75	31.50		
80158	ANTI-AGING FACE OIL • 1 oz	59.00	44.25	39.00		
80118	ANTI-AGING MASK • 2 oz	72.00	54.00	47.52		
80151	ANTI-AGING REJUVENATING FACE CREAM • 2 oz	65.00	48.75	42.75		
80153	ANTI-AGING REJUVENATING SCALP SERUM • 2 oz	46.00	34.50	29.25		
80134	ANTI-GLYCATION SERUM W/BLUEBERRY & POMEGRANATE EXTRACTS • 1 oz	33.00	24.75	23.51		
80133	ANTIOXIDANT FACIAL MIST • 2 oz	32.00	24.00	22.80		
80105	ANTI-REDNESS & ADULT BLEMISH LOTION • 1 oz	74.50	55.88	49.17		
80156	COLLAGEN BOOSTING PEPTIDE SERUM • 1 oz	59.00	44.25	39.00		
80141	DNA REPAIR CREAM • 1 oz	49.00	36.75	31.50		

**SUBTOTAL OF COLUMN 3**

RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS

ITEM No.	PRODUCT	Retail Each \$	YOUR PRICE			QTY Total
			1 Unit Each	4 Unit Each	10 Unit Each	
80167	ENVIRONMENTAL SUPPORT SERUM • 1 fl. oz	59.00	44.25	39.00		
80108	ESSENTIAL PLANT LIPIDS REPARATIVE SERUM • 1 oz	74.95	56.21	49.46		
80163	EYE LIFT CREAM • 0.5 fl oz	59.00	44.25	39.00		
80123	FACE REJUVENATING ANTIOXIDANT CREAM • 2 oz	69.50	52.13	45.87		
80137	HEALING FORMULA ALL-IN-ONE CREAM • 1 oz	53.00	39.75	34.07		
80102	HEALING VITAMIN K CREAM • 1 oz	79.50	59.63	52.47		
80109	HYALURONIC FACIAL MOISTURIZER • 1 oz	58.00	43.50	38.28		
80110	HYALURONIC OIL-FREE FACIAL MOISTURIZER • 1 oz	58.00	43.50	38.28		
80138	HYDRATING ANTIOXIDANT FACE MIST • 4 oz	39.95	29.96	28.50		
80103	LIFTING & TIGHTENING COMPLEX • 1 oz	74.50	55.88	49.17		
80135	MELATONIN CREAM • 1 oz	33.00	24.75	20.33		
80114	MILD FACIAL CLEANSER • 8 fl. oz	59.00	44.25	38.94		
80159	MULTI STEM CELL SKIN TIGHTENING COMPLEX • 1 oz	59.00	44.25	39.00		
80122	NECK REJUVENATING ANTIOXIDANT CREAM • 2 oz	64.00	48.00	42.24		
80150	RENEWING EYE CREAM • 1/2 oz	65.00	48.75	42.75		
80142	RESVERATROL ANTI-OXIDANT SERUM • 1 oz	46.00	34.50	29.25		
80166	SKIN FIRMING COMPLEX • 1 fl. oz	53.00	39.75			
80112	SKIN LIGHTENING SERUM • 1/2 oz	85.00	63.75	56.10		
80130	SKIN STEM CELL SERUM • 1 oz	74.00	55.50	51.75		
80164	SKIN TONE EQUALIZER • 0.4 fl oz	59.00	44.25	39.00		
80143	STEM CELL CREAM W/ALPINE ROSE • 1 oz	66.00	49.50	43.50		
80148	TIGHTENING & FIRMING NECK CREAM • 2 oz	39.00	29.25	26.25		
80161	TRIPLE ACTION VITAMIN C CREAM • 1 oz jar	59.00	44.25	39.00		
80162	ULTIMATE MICRODERMABRASION • 8 fl. oz	39.00	29.25	26.25		
80160	ULTRA EYELASH BOOSTER • 0.25 oz (2 units \$39)	59.00	44.25			
80116	ULTRA LIP PLUMPER • 1/3 oz	64.00	48.00	42.24		
80101	ULTRA WRINKLE RELAXER • 1 oz	89.95	67.46	59.82		
80113	UNDER EYE REFINING SERUM • 1/2 oz	74.50	55.88	49.17		
80104	UNDER EYE RESCUE CREAM • 1/2 oz	74.50	55.88	49.17		
80129	VITAMIN C SERUM • 1 oz	85.00	63.75	56.10		
80136	VITAMIN D LOTION • 4 oz	36.00	27.00	25.25		
80145	VITAMIN E-ESSENTIAL CREAM • 1 oz	28.00	21.00	19.50		
80149	YOUTH SERUM • 1 oz	65.00	48.75	42.75		
<b>D</b>						
00658	7-KETO® DHEA METABOLITE • 25 mg, 100 caps	28.00	21.00	18.00		
01479	7-KETO® DHEA METABOLITE • 100 mg, 60 veg. caps	40.00	30.00	27.00		
01640	DHA (Vegetarian) • 30 veg. softgels	20.00	15.00	13.50		
00607	DHEA • 25 mg, 100 tablets (Dissolve in mouth)	14.00	10.50	8.81		
01478	DHEA COMPLETE • 60 veg. caps	48.00	36.00	32.40		
00335	DHEA • 25 mg, 100 caps	16.00	12.00	11.00		
00454	DHEA • 15 mg, 100 caps	14.00	10.50	9.00		
00882	DHEA • 50 mg, 60 caps	19.00	14.25	12.75		
01689	DHEA • 100 mg, 60 veg. caps	24.00	18.00	16.50		
01358	DIGEST RC® • 30 tablets	19.95	14.96	12.75		
02021	DIGESTIVE ENZYMES (Enhanced Super) • 60 veg. caps	22.00	16.50	15.00		
02022	DIGESTIVE ENZYMES w/PROBIOTICS (Enhanced Super) • 60 veg. caps	28.00	21.00	18.00		

**SUBTOTAL OF COLUMN 4**

DECEMBER 2017

ITEM No.	PRODUCT	Retail Each \$	YOUR PRICE				QTY Total
			1 Unit Each	4 Unit Each	10 Unit Each	I	
01671	D, L-PHENYLALANINE • 500 mg, 100 veg. caps	18.75	14.06	12.00			
01540	DMAE BITARTRATE • 150 mg, 200 veg. caps	18.00	13.50	11.25			
01570	DNA PROTECTION FORMULA • 60 veg. caps	34.00	25.50	24.00			
01931	DOG MIX • 100 grams powder	18.00	13.50	11.25			
02006	DOPA-MIND™ • 60 veg. tabs	44.00	33.00	28.00			
00321	DR. PROCTOR'S ADVANCED HAIR FORMULA • 2 oz	39.95	29.96	24.00			
00320	DR. PROCTOR'S HAIR SHAMPOO • 8 oz	24.95	18.71	16.50			
<b>E</b>							
01997	ENDOTHELIAL DEFENSE™ w/POMEGRANATE COMPLETE AND CORDIART™ • 60 softgels	68.00	51.00	46.50			
00997	ENDOTHELIAL DEFENSE™ w/GLISODIN® • 60 veg. caps	54.00	40.50	36.00			
02200	EPA/DHA (Clearly) • 120 softgels	30.00	22.50	20.00			
01937	EPA/DHA (Mega) • 120 softgels	20.00	15.00	13.50			
02009	ESOPHACOOL™ • 120 chewable tablets	20.00	15.00	13.50			
01737	ESOPHAGEAL GUARDIAN (Berry flavor) • 60 chewable tablets	36.00	27.00	24.00			
01042	EUROPEAN LEG SOLUTION DIOSMIN 95 600 mg, 30 veg. tabs	20.00	15.00	13.50			
01706	EXTRAORDINARY ENZYMES • 60 caps	26.00	19.50	18.00			
02008	(CALIFORNIA ESTATE) EXTRA VIRGIN OLIVE OIL • 500 ml (16.9 fl. oz)	33.00	24.75	22.50			
01514	EYE PRESSURE SUPPORT W/MIRTOGENOL® • 30 veg. caps	38.00	28.50	25.50			
<b>F</b>							
*01054	FACE MASTER® PLATINUM • Facial Toning System	199.00	199.00				
00965	FAST-ACTING JOINT FORMULA • 30 caps	39.00	29.25	27.00			
01717	FAST-C® W/DIHYDROQUERCETIN • 120 veg. tabs	26.00	19.50	18.00			
01064	FEMMENESSENCE MACAPAUSE® • 120 veg. caps	34.99	26.24				
02125	FLORASSIST® GI w/PHAGE TECHNOLOGY™ • 30 liquid veg. caps	33.00	24.75	22.50			
01821	FLORASSIST® HEART HEALTH • 60 veg. caps	32.00	24.00	21.00			
02124	FLORASSIST® IMMUNE HEALTH • 30 veg. caps	26.00	19.50	18.00			
02120	FLORASSIST® ORAL HYGIENE • 30 lozenges	20.00	15.00	13.00			
01825	FLORASSIST® BALANCE • 30 liquid veg. caps	32.00	24.00	21.00			
02000	FLORASSIST® MOOD • 60 caps	33.00	24.75	22.50			
02203	FLORASSIST® PREBIOTIC • Natural Strawberry, 60 chewable tabs	20.00	15.00	13.00			
01920	FLORASSIST® THROAT HEALTH • 30 lozenges	20.00	15.00	13.50			
01913	FOLATE HIGH POTENCY (Optimized) • 5,000 mcg, 30 veg. tablets	18.00	13.50	12.00			
01939	FOLATE (Optimized) • 1,000 mcg, 100 veg. tablets	15.00	11.25	10.00			
01842	FOLATE + VITAMIN B12 (BioActive) • 90 veg. caps	12.00	9.00	8.00			
01544	FORSKOLIN • 10 mg, 60 veg. caps	16.00	12.00	10.50			
01513	FUCOIDAN W/MARITECH® 926 (Optimized) • 60 veg. caps	36.00	27.00	24.75			
<b>G</b>							
02070	GAMMA E MIXED TOCOPHEROL/TOCOTRIENOLS • 60 softgels	40.00	30.00	27.00			
02075	GAMMA E MIXED TOCOPHEROL w/ENHANCED SESAME LIGNANS • 60 softgels	32.00	24.00	21.75			
01394	GARLIC (Optimized) • 200 veg. caps	24.95	18.71	15.75			
02100	GASTRO-EASE™ • 60 veg. caps	44.00	33.00	30.00			
02119	GEROPROTECT™ AGELESS CELL™ • 30 softgels	40.00	30.00	27.00			
02133	GEROPROTECT™ LONGEVITY A.I.™ • 30 softgels	56.00	42.00	38.00			
**01122	GINGER FORCE® • 60 liquid caps	34.95	26.21				

**SUBTOTAL OF COLUMN 5**

DECEMBER 2017

ITEM No.	PRODUCT	Retail Each \$	YOUR PRICE				QTY Total
			1 Unit Each	4 Unit Each	10 Unit Each	I	
01658	GINKGO BILOBA CERTIFIED EXTRACT™ 120 mg, 365 veg. caps	50.00	37.50	33.00			
00756	GLA WITH SESAME LIGNANS (Mega) • 60 softgels	19.50	14.63	13.50			
00345	(L-) GLUTAMINE CAPSULES • 500 mg, 100 veg. caps	14.95	11.21	10.13			
00141	(L-) GLUTAMINE POWDER • 100 grams	22.00	16.50	15.00			
00522	GLUCOSAMINE/CHONDROITIN CAPSULES • 100 caps	38.00	28.50	24.00			
01541	GLUTATHIONE, CYSTEINE & C • 100 veg. caps	20.00	15.00	13.50			
02122	GLYCEMIC GUARD™ • 30 veg. caps	42.00	31.50	28.00			
01669	GLYCINE • 1,000 mg, 100 veg. caps	12.00	9.00	8.10			
01411	GRAPE SEED EXTRACT W/RESVERATROL & PTEROSTILBENE 100 mg, 60 veg. caps	36.00	27.00	25.50			
01620	GREEN COFFEE EXTRACT COFFEEGENIC® 400 mg, 90 veg. caps	32.00	24.00	21.00			
00953	GREEN TEA EXTRACT (Mega) • lightly caffeinated, 100 veg. caps	30.00	22.50	18.00			
00954	GREEN TEA EXTRACT (Mega) • decaffeinated, 100 veg. caps	30.00	22.50	18.00			
<b>H</b>							
01074	5 HTP • 100 mg, 60 caps		27.95	20.96			
*02002	HAIR, SKIN & NAIL REJUVENATION FORM W/VERISOL® 90 tabs		32.00	24.00	22.00		
01738	HCA (Garcinia) • 90 veg. caps		17.00	12.75	11.25		
29754	HCACTIVE™ GARCINIA CAMBOGIA EXTRACT • 90 caps		30.00	22.50			
01393	HEPATOPRO • 900 mg, 60 softgels		50.00	37.50	34.50		
02121	HOMOCYSTEINE RESIST • 60 veg. caps		26.00	19.50	17.50		
01527	HUPERZINE A • 200 mcg, 60 veg. caps		40.00	30.00	27.00		
00661	HYDRODERM® • 1 oz		79.95	59.96	49.00		
<b>I</b>							
01704	IMMUNE MODULATOR W/TINOFEND® • 60 veg. caps		17.00	12.75	11.25		
00955	IMMUNE PROTECT W/PARACTIN® • 30 veg. caps		29.50	22.13	19.91		
02005	IMMUNE SENESCENCE PROTECTION FORMULA™ • 60 veg. tabs		40.00	30.00	27.00		
01049	INNERPOWER™ • 530 grams powder		44.97	33.73			
01674	INOSITOL CAPSULES • 1,000 mg, 360 veg. caps		62.00	46.50	43.50		
01292	INTEGRA-LEAN® AFRICAN MANGO IRVINGIA 150 mg, 60 veg. caps		28.00	21.00	18.00		
30731	IONIC SELENIUM • 2 oz, 300 mcg		13.69	10.27			
01677	IRON PROTEIN PLUS • 300 mg, 100 caps		28.00	21.00	19.50		
01492	IRVINGIA W/PHASE 3™ CALORIE CONTROL COMPLEX (Optimized African Mango) • 120 veg. caps		56.00	42.00	36.00		
<b>J, K, L</b>							
52142	JARRO-DOPHILUS® PROBIOTIC FOR WOMEN 30 enteric-coated veg. caps		27.95	20.96			
00056	JARRO-DOPHILUS EPS® • 60 veg. caps		23.95	17.96			
02034	K W/ADVANCED K2 COMPLEX (Super) • 90 softgels		30.00	22.50	20.25		
01600	KRILL HEALTHY JOINT FORMULA • 30 softgels		32.00	24.00	21.75		
01050	KRILL OIL (Jarrow) • 60 softgels		33.95	25.46			
00316	KYOLIC® GARLIC FORMULA 102 • 200 veg. caps		27.45	20.59			
00789	KYOLIC® RESERVE • 600 mg, 120 caps		28.95	21.71			
01681	LACTOFERRIN • 60 caps		44.00	33.00	30.00		
00020	LECITHIN • 16 oz granules		18.00	13.50	12.00		

**SUBTOTAL OF COLUMN 6**

RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS

ITEM No.	PRODUCT	Retail Each \$	YOUR PRICE			QTY Total
			1 Unit Each	4 Unit Each	10 Unit Each	
02255	LIFE EXTENSION MIX™ • 240 tablets	74.00	55.50	48.00	42.00	
02257	LIFE EXTENSION MIX™ W/EXTRA NIACIN • 240 tablets	74.00	55.50	48.00	42.00	
02254	LIFE EXTENSION MIX™ • 360 caps	78.00	58.50	50.00	44.00	
02256	LIFE EXTENSION MIX™ POWDER • 12.70 oz	72.00	54.00	46.00	40.00	
02265	LIFE EXTENSION MIX™ • 240 tablets w/o copper	74.00	55.50	48.00	42.00	
02264	LIFE EXTENSION MIX™ • 360 caps w/o copper	78.00	58.50	50.00	44.00	
01608	LIVER EFFICIENCY FORMULA • 30 veg. caps	18.00	13.50	12.00		
01639	5-LOX INHIBITOR W/APRÉSFLEX® • 100 mg, 60 veg. caps	22.00	16.50	15.00		
01678	L-LYSINE • 620 mg, 100 veg. caps	9.00	6.75	6.00		
00455	LYCOPENE (Mega) • 15 mg, 90 softgels	35.00	26.25	22.50		
<b>M</b>						
01992	MACUGUARD® OCULAR SUPPORT w/SAFFRON• 60 softgels	25.00	18.75	17.50		
01993	MACUGUARD® OCULAR SUPPORT w/SAFFRON & ASTAXANTHIN• 60 softgels	44.00	33.00	30.00		
01459	MAGNESIUM CAPS • 500 mg, 100 veg. caps	12.00	9.00	7.50		
01682	MAGNESIUM (CITRATE) • 160 mg, 100 veg. caps	12.00	9.00	7.50		
02107	(EXTEND-RELEASE) MAGNESIUM • 60 veg. caps	13.00	9.75	8.75		
01908	MEDITERRANEAN TRIM WITH SINETROL™-XPUR 60 veg. caps	18.00	13.50	12.00		
02109	MEDITERRANEAN WHOLE FOOD BLEND • 90 veg. caps	44.00	33.00	30.00		
01668	MELATONIN • 300 mcg, 100 veg. caps	5.75	4.31	3.75		
01083	MELATONIN • 500 mcg, 200 veg. caps	18.00	13.50	12.00		
00329	MELATONIN • 1 mg, 60 caps	5.00	3.75	3.47		
00330	MELATONIN • 3 mg, 60 veg. caps	8.00	6.00	5.16		
00331	MELATONIN • 10 mg, 60 veg. caps	28.00	21.00	18.00		
00332	MELATONIN • 3 mg, 60 veg. lozenges	8.00	6.00	5.16		
01734	MELATONIN (Fast-Acting Liquid) • 2 fl. oz (Citrus-Vanilla)	12.00	9.00	8.25		
01787	MELATONIN TIMED RELEASE • 300 mcg, 100 veg. tabs	12.00	9.00	8.25		
01788	MELATONIN TIMED RELEASE • 750 mcg, 60 veg. tablets	8.00	6.00	5.25		
01786	MELATONIN TIMED RELEASE • 3 mg, 60 veg. tabs	12.00	9.00	8.25		
02101	MEMORY PROTECT • 36 day supply	24.00	18.00	16.00		
01536	METHYLCOBALAMIN • 1 mg, 60 veg. lozenges (vanilla)	9.95	7.46	6.00		
01537	METHYLCOBALAMIN • 5 mg, 60 veg. lozenges (vanilla)	32.00	24.00	18.75	17.25	
00709	MIGRA-EEZE™ (Butterbur) • 60 softgels	33.00	24.75	22.00		
01522	MILK THISTLE (European) • 60 veg. caps	34.00	25.50	22.50		
01922	MILK THISTLE (European) • 60 softgels	28.00	21.00	18.75		
01925	MILK THISTLE (European) • 120 softgels	44.00	33.00	30.00		
01940	MIRAFORTE w/STANDARDIZED LIGNANS (Super) • 120 veg caps	62.00	46.50	42.00		
01869	MITOCHONDRIAL BASICS W/BIOPQQ® • 30 caps	40.00	30.00	27.00		
01868	MITOCHONDRIAL ENERGY OPTIMIZER w/BIOPQQ®•120 caps	68.00	51.00	45.00		
00065	MK-7 • 90 mcg, 60 softgels	28.00	21.00	18.75		
00451	MSM (Methylsulfonylmethane) • 1,000 mg, 100 caps	14.00	10.50	8.96		
<b>N</b>						
01534	N-ACETYL-L-CYSTEINE • 600 mg, 60 veg. caps	14.00	10.50	9.25		
01904	NAD+ CELL REGENERATOR™ • 100 mg, 30 veg. caps	22.00	16.50	15.00		
02144	NAD+ CELL REGENERATOR™ NICOTINAMIDE RIBOSIDE 250 mg, 30 veg. caps	42.00	31.50	28.00		

**SUBTOTAL OF COLUMN 7**

RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS

ITEM No.	PRODUCT	Retail Each \$	YOUR PRICE			QTY Total
			1 Unit Each	4 Unit Each	10 Unit Each	
02145	NAD+ CELL REGENERATOR™ W/RESVERATROL (Optimized) 30 veg. caps	50.00	37.50	34.00		
01807	NATURAL APPETITE SUPPRESS (Advanced) • 60 veg. caps	38.00	28.50	25.50		
00984	NATURAL BP MANAGEMENT • 60 tablets	44.00	33.00	30.00		
02012	NATURAL CORTISOL BALANCE • 30 veg. caps	45.00	33.75	30.00		
01892	NATURAL ESTROGEN • 60 veg. tabs	38.00	28.50	25.50		
01626	NATURAL SEX FOR WOMEN® 50+ (Advanced)•90 veg. caps	59.00	44.25	34.00		
01444	NATURAL SLEEP® • 60 veg. caps	13.00	9.75	7.50		
01551	NATURAL SLEEP® w/ MELATONIN (Enhanced) • 30 caps	22.00	16.50	15.00		
01511	NATURAL SLEEP® W/O MELATONIN (Enhanced) • 30 caps	20.00	15.00	13.50		
01445	NATURAL SLEEP® MELATONIN • 5 mg, 60 veg. caps	18.00	13.50	12.00		
00987	NATURAL STRESS RELIEF • 30 veg. caps	28.00	21.00	18.00		
01603	NEURO-MAG® MAGNESIUM L-THREONATE • 90 veg. caps	40.00	30.00	27.00		
02032	NEURO-MAG® MAGNESIUM L-THREONATE 93.35 grams • Tropical Punch Flavor	38.00	28.50	26.00		
01990	NITROVASC w/CORDIART™ • 30 veg. caps	18.00	13.50	12.00		
01903	NK CELL ACTIVATOR™ • 30 veg. tablets	45.00	33.75	31.50		
00373	NO FLUSH NIACIN • 800 mg, 100 caps	19.00	14.25	12.75		
<b>O</b>						
01824	OLIVE LEAF VASCULAR SUPPORT w/CELERY SEED EXTRACT (Advanced) • 60 veg. caps	36.00	27.00	24.00		
01988	OMEGA-3 PLUS EPA/DHA w/SESAME LIGNANS, OLIVE EXTRACT, KRILL & ASTAXANTHIN (SUPER)• 120 softgels	45.00	33.75	31.50	24.75	
01983	OMEGA-3 EPA/DHA w/SESAME LIGNANS & OLIVE EXTRACT (Super) • 60 softgels	18.00	13.50	12.00	9.38	
01982	OMEGA-3 EPA/DHA w/SESAME LIGNANS & OLIVE EXTRACT (Super) • 120 softgels	32.00	24.00	21.00	17.05	
01984	OMEGA 3 EPA/DHA w/SESAME LIGNANS & OLIVE EXTRACT (Super) • 120 enteric coated softgels	34.00	25.50	23.25	18.00	
01985	OMEGA 3 EPA/DHA w/SESAME LIGNANS & OLIVE EXTRACT (Super) • 60 enteric coated softgels	20.00	15.00	13.50	10.50	
01986	OMEGA 3 EPA/DHA w/SESAME LIGNANS & OLIVE EXTRACT (Super) • 240 small softgels	32.00	24.00	21.00	17.25	
02091	ONCE-DAILY HEALTH BOOSTER • 60 softgels	54.00	40.50	38.00		
02213	ONE-PER-DAY • 60 tablets	23.00	17.25	16.00		
01328	ONLY TRACE MINERALS • 90 veg. caps	15.00	11.25	9.38		
<b>P</b>						
01789	PALMETTOGUARD® SAW PALMETTO W/BETA-SITOSTEROL 30 softgels	15.00	11.25	10.50	9.00	
01790	PALMETTOGUARD® SAW PALMETTO/NETTLE ROOT W/BETA-SITOSTEROL • 60 softgels	28.00	21.00	19.50	18.00	
*00342	PECTA SOL-C® MODIFIED CITRUS PECTIN • 454 grams powder	113.95	96.86			
*01080	PECTA SOL-C® MODIFIED CITRUS PECTIN • 270 veg. caps	82.95	70.51			
01811	PEONY IMMUNE • 60 veg. caps	36.00	27.00	24.00		
*00673	PGX® PLUS MULBERRY (WellBetX®) • 180 veg. caps	34.95	26.21			
01953	POMEGRANATE COMPLETE • 30 softgels	24.00	18.00	15.75		
00956	POMEGRANATE FRUIT EXTRACT • 30 veg. caps	19.50	14.63	13.16		
*01837	POMI-T® • 60 veg. caps	35.00	26.25	24.00		
00577	POTASSIUM IODIDE • 130 mg, 14 tabs	6.95	5.21	3.94		
01500	PQQ CAPS • 10 mg, 30 veg. caps	18.00	13.50	11.00	10.00	

**SUBTOTAL OF COLUMN 8**

DECEMBER 2017

ITEM No.	PRODUCT	Retail Each \$	YOUR PRICE				QTY Total
			1 Unit Each	4 Unit Each	10 Unit Each		
01647	PQQ CAPS • 20 mg, 30 veg. caps	32.00	24.00	18.00	17.00		
00302	PREGNENOLONE • 50 mg, 100 caps	26.00	19.50	16.50			
00700	PREGNENOLONE • 100 mg, 100 caps	30.00	22.50	20.25			
*01373	PRELOX® NATURAL SEX FOR MEN® • 60 tablets	52.00	39.00	36.00			
00525	PROBOOST™ THYMIC PROTEIN A • 30 packets	66.60	49.95				
01441	PROGESTA-CARE® • 4 oz cream	36.39	27.29	25.72			
02029	PROSTATE FORMULA (Ultra Natural) • 60 softgels	38.00	28.50	26.25	24.00		
01909	PROSTAPOLLEN™ (Triple strength) • 30 softgels	28.00	21.00	18.75			
01742	PROTEIN-ISOLATE (Whey) Vanilla • 403 grams	30.00	22.50	19.50			
01743	PROTEIN-ISOLATE (Whey) Chocolate • 437 grams	30.00	22.50	19.50			
01770	PROTEIN CONCENTRATE (New Zealand Whey) Vanilla 500 grams	30.00	22.50	19.95			
01771	PROTEIN CONCENTRATE (New Zealand Whey) Chocolate 640 grams	30.00	22.50	19.95			
02127	PROTEIN (PLANT) COMPLETE & AMINO ACID COMPLEX 15.87 oz	34.00	25.50	23.00			
01812	PROVINAL® PURIFIED OMEGA-7 • 30 softgels	27.00	20.25	18.00			
01676	PS CAPS (Phosphatidylserine) • 100 mg, 100 veg. caps	54.00	40.50	36.00			
01508	PTERO PURE® Pterostilbene • 50 mg, 60 veg. caps	32.00	24.00	22.50			
01209	PUMPKIN SEED EXTRACT (Water-soluble) • 60 veg. caps	20.00	15.00	13.50			
01637	PYCGNOGENOL® FRENCH MARITIME PINE BARK EXTRACT 100 mg, 60 veg. caps	64.00	48.00	45.00			
01217	PYRIDOXAL 5'-PHOSPHATE • 100 mg, 60 veg. caps	22.00	16.50	14.85			
<b>Q, R</b>							
01309	QUERCETIN (Optimized) • 250 mg, 60 veg. caps	22.00	16.50	15.00			
01030	RED YEAST RICE (Bluebonnet) • 600 mg, 60 veg. caps	18.08	13.56				
00605	REGIMENT • 60 enteric-coated caps	19.95	14.96	14.00			
01708	REISHI EXTRACT MUSHROOM COMPLEX • 60 veg. caps	30.00	22.50	20.25			
01448	REJUVENEX® BODY LOTION • 6 oz	24.00	18.00	14.85	12.75		
01621	REJUVENEX® FACTOR FIRMING SERUM • 1.7 oz	65.00	48.75	37.50			
01220	REJUVENEX® (ULTRA) • 2 oz	52.00	39.00	33.00	29.25		
00676	REJUVENIGHT® (ULTRA) • 2 oz	39.95	29.96	27.00			
01410	RESVERATROL W/PTEROSTILBENE • 100 mg, 60 veg. caps	36.00	27.00	24.00			
02030	RESVERATROL (Optimized) • 60 veg. caps	46.00	34.50	31.00			
00889	RHODIOLA EXTRACT • 250 mg, 60 veg. caps	14.00	10.50	9.00			
01900	RIBOGEN™ FRENCH OAK WOOD EXTRACT 200 mg, 30 veg. caps	36.00	27.00	24.75			
00972	(D) RIBOSE POWDER • 150 grams	27.50	20.63	18.56			
01473	(D) RIBOSE TABLETS • 100 veg. tabs	32.00	24.00	21.00			
01609	RICH REWARDS® BREAKFAST GROUND COFFEE • 12 oz. bag	13.00	9.75				
01730	RICH REWARDS® BREAKFAST BLEND GROUND COFFEE Natural Mocha • 12 oz. bag	15.00	11.25	10.50			
01729	RICH REWARDS® BREAKFAST BLEND GROUND COFFEE Natural Vanilla • 12 oz. bag	15.00	11.25	10.50			
01612	RICH REWARDS® BREAKFAST BLEND WHOLE BEAN COFFEE 12 oz. bag	13.00	9.75				
01610	RICH REWARDS® DECAFFEINATED ROAST GROUND COFFEE 12 oz. bag	14.00	10.50				
01208	R-LIPOIC ACID (Super) • 240 mg, 60 veg. caps	49.00	36.75	33.75			
00070	RNA CAPSULES • 500 mg, 100 caps	17.95	13.46	12.12			

**SUBTOTAL OF COLUMN 9**

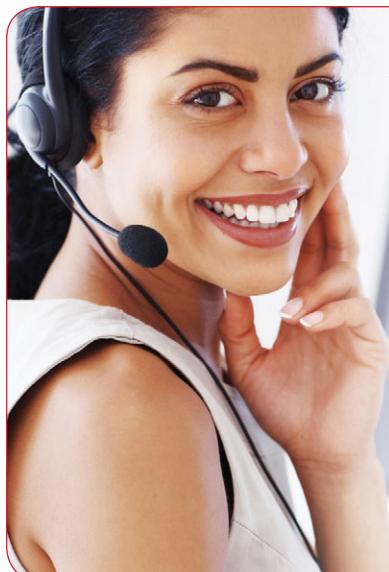
ITEM No.	PRODUCT	Retail Each \$	YOUR PRICE				QTY Total
			1 Unit Each	4 Unit Each	10 Unit Each		
	<b>S</b>						
01432	SAFFRON W/SATIERE® (Optimized) • 60 veg. caps	36.00	27.00	24.00			
01935	SAME (S-ADENOSYL-METHIONINE) 200 mg, 30 enteric coated tablets	25.00	18.75	16.50			
01933	SAME (S-ADENOSYL-METHIONINE) 400 mg, 30 enteric coated tablets	36.00	27.00	24.00			
01934	SAME (S-ADENOSYL-METHIONINE) 400 mg, 60 enteric coated tablets	66.00	49.50	45.00			
01740	SEA-IODINE™ • 1,000 mcg, 60 veg. caps	8.00	6.00	5.40			
01879	SE-METHYL L-SELENOCYSTEINE • 200 mcg, 90 veg. caps	11.00	8.25	7.50			
00318	SERRAFLAZYME • 100 tablets	18.00	13.50	12.00			
01938	SHADE FACTOR™ • 120 veg. caps	44.00	33.00	30.00			
02110	SHADE FACTOR™ SUNSCREEN LOTION • 4 fl. oz	20.00	15.00	13.00			
02118	SHADE FACTOR™ SUNSCREEN SPRAY • 6 fl. oz	22.00	16.50	14.25			
01884	SILYMARIN • 100 mg, 90 veg. caps	14.00	10.50	9.50			
01249	SINUS CLEANSER • 4 oz. bottle	25.00	18.75				
02129	SKIN CARE COLLECTION ANTI-AGING SERUM • 1.75 fl. oz	60.00	45.00	37.50			
02132	SKIN CARE COLLECTION BODY LOTION • 6 oz	28.00	21.00	18.00			
02130	SKIN CARE COLLECTION DAY CREAM • 1.65 fl. oz	50.00	37.50	33.00			
02131	SKIN CARE COLLECTION NIGHT CREAM • 1.65 fl. oz	39.00	29.25	27.00			
01596	SKIN RESTORING PHYTOCERAMIDES w/LIPOWHEAT® 30 liquid veg. caps	25.00	18.75	17.25			
00961	SODZYME® w/GLISODIN® & WOLFBERRY • 90 veg. caps	28.00	21.00	18.00			
00657	SOLARSHIELD® SUNGLASSES • Smoke color	12.99	9.74	8.63			
01097	SOY EXTRACT (ULTRA) • 150 veg. caps	76.00	57.00	50.00			
01649	SOY ISOFLAVONES (SUPER ABSORBABLE) • 60 veg. caps	28.00	21.00	18.75			
00432	STEVIA™ (Better) • 100 packets, 1 gram each	9.95	7.46				
00438	STEVIA™ ORGANIC LIQUID SWEETENER (Better) • 2 oz	11.00	8.25				
01476	STRONTIUM • 750 mg, 90 veg. caps	20.00	15.00	13.50			
01778	SUPER SELENIUM COMPLEX • 200 mcg, 100 veg. caps	14.00	10.50	9.00	8.25		
	<b>T</b>						
02023	TART CHERRY W/CHERRYPURE® 60 veg. caps	20.00	15.00	14.00			
01827	TAURINE • 1,000 mg, 90 veg. caps	13.00	9.75	9.00			
01918	TEAR SUPPORT w/MAQUIBRIGHT® • 60 mg, 30 veg. caps	18.00	13.50	12.00			
00133	L-TAURINE POWDER • 300 grams	20.00	15.00	12.66			
*13685	TEN MUSHROOM FORMULA® • 120 veg. caps	41.95	35.66				
01304	THEAFLAVIN STANDARDIZED EXTRACT • 30 veg. caps	18.00	13.50	12.00			
01683	(L) THEANINE • 100 mg, 60 veg. caps	24.00	18.00	15.38			
**01038	TERALAC® PROBIOTICS • 30 caps	47.95	35.96				
00668	THYROID FORMULA (Metabolic Advantage™) • 100 caps	21.95	16.46				
00349	TMG POWDER • 50 grams	14.00	10.50	8.25			
01859	TMG • 500 mg, 60 liquid veg. caps	13.00	9.75	9.00			
01400	TOCOTRIENOLS (Super-absorbable) • 60 softgels	30.00	22.50	21.00			
01278	TOOTHPASTE • 4 oz (Mint) tube	9.50	7.13	6.50			
01917	TRANQUIL TRACT™ • 60 veg. caps	52.00	39.00	34.50			

**SUBTOTAL OF COLUMN 10**

		YOUR PRICE				
ITEM No.	PRODUCT	Retail Each \$	1 Unit Each	4 Unit Each	10 Unit Each	QTY Total
01468	TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT 60 veg. caps	24.00	18.00	16.50		
01469	TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT w/RESVERATROL • 60 veg. caps	32.00	24.00	22.20		
02003	TRIPLE ACTION THYROID • 60 veg. caps	36.00	27.00	24.00		
01803	TRI SUGAR SHIELD® • 60 veg. caps	36.00	27.00	24.00		
01386	TRUFIBER™ • 180 grams	32.95	24.71			
01389	TRUFLORA® PROBIOTICS • 32 veg. caps	42.95	32.21			
01722	L-TRYPTOPHAN • 500 mg, 90 veg. caps	33.00	24.75	22.50		
01721	TRYPTOPHAN PLUS (Optimized) • 90 veg. caps	32.00	24.00	21.75		
02216	TWO-PER-DAY • 60 tablets	12.00	9.00	7.50		
02215	TWO-PER-DAY • 120 tablets	21.00	15.75	14.00		
02214	TWO-PER-DAY • 120 caps	24.00	18.00	16.00		
00326	L-TYROSINE • 500 mg, 100 tablets	13.50	10.13			
<b>U, V</b>						
01921	URIC ACID CONTROL • 60 veg. caps	24.00	18.00	16.50		
00213	VANADYL SULFATE • 7.5 mg, 100 veg. tablets	15.00	11.25	9.38		
02102	VENOFLOW™ • 30 veg. caps	52.00	39.00	36.00		
00408	VENOTONE • 60 caps	18.95	14.21	12.00		
01327	VINPOCETINE • 10 mg, 100 veg. tablets	18.00	13.50	10.50		
00372	VITAMIN B3 NIACIN • 500 mg, 100 caps	7.65	5.74	4.99		
02028	VITAMIN B5 • 500 mg, 100 veg. caps (Pantothenic Acid)	11.00	8.25	7.50		
01535	VITAMIN B6 • 250 mg, 100 veg. caps	12.50	9.38	8.25		
00361	VITAMIN B12 • 500 mcg, 100 lozenges	8.75	6.56	5.44		
01634	VITAMIN C w/DIHYDROQUERCETIN 1,000 mg, 60 veg. tablets	10.00	7.50	6.75		
00927	VITAMIN C w/DIHYDROQUERCETIN 1,000 mg, 250 veg. tablets	27.00	20.25	18.00		
00084	VITAMIN C POWDER (BUFFERED) • 454 grams	28.00	21.00	19.00		
01736	VITAMIN C-MAGNESIUM CRYSTALS (EFFERVESCENT) 180 grams	20.00	15.00	13.50		
01732	VITAMIN D3 • 2,000 IU, 1 fl. oz, Mint flavor	28.00	21.00	18.75		
01753	VITAMIN D3 • 1,000 IU, 90 softgels	7.00	5.25	4.50		
01751	VITAMIN D3 • 1,000 IU, 250 softgels	12.50	9.38	8.44		
01713	VITAMIN D3 • 5,000 IU, 60 softgels	10.00	7.50	6.50		
01718	VITAMIN D3 • 7,000 IU, 60 softgels	14.00	10.50	9.45		
01758	VITAMIN D3 W/SEA-IODINE™ • 5,000 IU, 60 caps	14.00	10.50	9.38		
00864	VITAMIN D3 LIQUID • 2,000 IU, 1 fl. oz	28.00	21.00	18.75		
02040	VITAMINS D AND K W/SEA-IODINE™ • 60 caps	24.00	18.00	16.50		
01863	VITAMIN E (Natural) • 400 IU, 90 softgels	28.00	21.00	19.50	18.00	
01936	VITAMIN K2 (Low dose) • 45 mcg, 90 softgels	18.00	13.50	12.00		
<b>W</b>						
01902	WAIST-LINE CONTROL™ • 120 veg. caps	42.00	31.50	28.50		
<b>X, Y</b>						
01919	X-R SHIELD • 90 veg. caps	15.00	11.25	9.75		
00409	XYLIWHITE™ MOUTHWASH • 16 oz	10.00	7.50			
<b>SUBTOTAL OF COLUMN 11</b>						

		YOUR PRICE				
ITEM No.	PRODUCT	Retail Each \$	1 Unit Each	4 Unit Each	10 Unit Each	QTY Total
	<b>Z</b>					
01813	ZINC HIGH POTENCY • 50 mg, 90 veg. caps	7.95	5.96	5.25		
01561	ZINC LOZENGES • 60 veg. lozenges	9.00	6.75	6.00		
01961	ZINC LOZENGES (Enhanced) • 30 veg. lozenges	12.00	9.00	6.00		
*01051	ZYFLAMEND® WHOLE BODY • 120 liquid veg. caps	72.95	54.71			
<b>BOOKS</b>						
33998	THE RIGHT TO TRY by Darcy Olsen • 2016	26.99	20.24			
33885	THE BLUE ZONES SOLUTION by Dan Buettner • 2015	26.00	19.50			
33877	THE TRUTH ABOUT MEN AND SEX by Abraham Morgentaler, MD, FACS • 2015	16.99	12.74			
33875	DOCTORED: THE DISILLUSIONMENT OF AN AMERICAN PHYSICIAN • by Sandeep Jauhar • 2015	26.00	19.50			
33874	MISSING MICROBES • by Martin J. Blaser, MD • 2014	28.00	21.00			
33873	EATING ON THE WILD SIDE • by Jo Robinson • 2014	16.00	12.00			
DPT05	DISEASE PREVENTION AND TREATMENT, EXPANDED FIFTH EDITION (Hardcover) • 2014	69.95	39.95	36.00		
33865	THE RESTORATION OF THE HUMAN BODY (IN 7 PARTS) by Sergey A. Dzigan, MD, PhD • 2014	29.95	22.46			
33862	I'M TOO YOUNG FOR THIS • by Suzanne Somers • 2013	26.00	19.50			
33835	PHARMOCRACY • by William Faloon • 2011	24.00	9.60	8.00		
33838	YOUR GUIDE TO HEALTHY SKIN THE NATURAL WAY by Gary Goldfaden, MD • 2012	26.00	15.00			
33815	KNOCKOUT • by Suzanne Somers • 2009	25.99	17.00			
<b>SUBTOTAL OF COLUMN 12</b>						

- \* These products are not 25% off retail price.
- \*\* Due to license restrictions, this product is not for sale to customers outside of the USA.
- \*\*\* Due to license restrictions, this product is not for sale to Canada.
- † Due to license restrictions, this product is not for sale to customers outside of the USA and Canada.
- †† These products are not 25% off retail price. Due to license restrictions this product is not for sale to customers outside of the USA.



**Not sure exactly  
which supplements  
you need?**

**Talk to a  
Wellness  
Specialist  
toll-free at  
1-800-226-2370**

# LifeExtension®

## ORDER SUBTOTALS

SUBTOTAL COLUMN 1

SUBTOTAL COLUMN 2

SUBTOTAL COLUMN 3

SUBTOTAL COLUMN 4

SUBTOTAL COLUMN 5

SUBTOTAL COLUMN 6

SUBTOTAL COLUMN 7

SUBTOTAL COLUMN 8

SUBTOTAL COLUMN 9

SUBTOTAL COLUMN 10

SUBTOTAL COLUMN 11

SUBTOTAL COLUMN 12

## ORDER TOTALS

### SUBTOTAL OF COLUMNS 1 - 12

<sup>††</sup> Customers enrolled in Premier receive free unlimited standard delivery in the U.S., excluding U.S. territories, and do not have to pay the \$5.50 postage and handling fee.

**POSTAGE & HANDLING** (Any size order, in the U.S. includes Alaska & Hawaii)

**\$5.50<sup>††</sup>**

### C.O.D.s (ADD \$7 FOR C.O.D. ORDERS)

UPS OVERNIGHT add \$16, UPS 2nd DAY AIR add \$7. For Puerto Rico, US Virgin Islands, add \$7. CANADA UPS EXPRESS Flat rate \$17.50, UK Flat rate \$25 USD. ALL OTHER INTERNATIONAL AIR WILL BE ADDED.

### GRAND TOTAL (MUST BE IN U.S. DOLLARS)

**PLEASE MAIL TO: Life Extension**  
**P.O. Box 407198 • Ft. Lauderdale, Florida 33340-7198**  
**Or Call Toll Free 1-800-544-4440 • Fax: 866-728-1050**

## BILL TO ADDRESS

NAME

ADDRESS

CITY/STATE/ZIP-POSTAL CODE

PHONE

VISA/MASTERCARD/AMEX/DISCOVER #

EXP. DATE

SIGNATURE



13. Publication Title	Life Extension		14. Issue Date for Circulation Data Below
15. Extent and Nature of Circulation		Oct 2017	
a. Total Number of Copies (Net press run)		Average No. Copies Each Issue During Preceding 12 Months	No. Copies of Single Issue Published Nearest to Filing Date
b. Paid Circulation (By Mail and Outside the Mail)	(1) Mailed Outside-County Paid Subscriptions Stated on PS Form 3541 (Include paid distribution above nominal rate, advertiser's proof copies, and exchange copies)	307,076	293,392
	(2) Mailed In-County Paid Subscriptions Stated on PS Form 3541 (Include paid distribution above nominal rate, advertiser's proof copies, and exchange copies)	238,825	236,548
	(3) Paid Distribution Outside the Mails Including Sales Through Dealers and Carriers, Street Vendors, Counter Sales, and Other Paid Distribution Outside USPS <sup>®</sup>	35,609	3,554
	(4) Paid Distribution by Other Classes of Mail Through the USPS (e.g., First-Class Mail <sup>®</sup> )	38,502	17,234
		75	76
c. Total Paid Distribution (Sum of 15a (1), (2), (3), and (4))		281,031	257,412
d. Free or Nominal Rate Distribution (By Mail and Outside the Mail)	(1) Free or Nominal Rate Outside-County Copies Included on PS Form 3541	68,093	52,302
	(2) Free or Nominal Rate In-County Copies Included on PS Form 3541	1,082	802
	(3) Free or Nominal Rate Copies Mailed at Other Classes Through the USPS (e.g., First-Class Mail)	824	76
	(4) Free or Nominal Rate Distribution Outside the Mail (Carriers or other means)	0	0
e. Total Free or Nominal Rate Distribution (Sum of 15d (1), (2), (3) and (4))		70,001	53,240
f. Total Distribution (Sum of 15c and 15e)		311,044	293,312
g. Copies not Distributed (See instructions to Publishers #4 (page #3))		253,610	12,521
h. Total (Sum of 15f and g)		505,251	305,863
i. Percent Paid (15c divided by 15f times 100)		90.1	87.7

\* If you are claiming electronic copies, go to line 16 on page 3. If you are not claiming electronic copies, skip to line 17 on page 3.



## SHIP TO ADDRESS

NAME

ADDRESS

CITY/STATE/ZIP-POSTAL CODE

PHONE

SIGNATURE

Prices subject to change without notice.  
 Please notify Life Extension of any address change.

# Compare **TWO-PER-DAY** to the Leading Brand **CENTRUM®**



The **Two-Per-Day** multinutrient formula is superior to commercial multivitamins because it provides vastly **higher** potencies of **vitamins, minerals and plant extracts**.

**Centrum®**  
Can't  
Compete

## **TWO-PER-DAY** provides:

- 50 times the vitamin B1**
- 25 times the vitamin B6**
- 12 times the vitamin B12**
- 10 times the biotin**
- 10 times the selenium**
- 8 times the vitamin C**
- 2 times the vitamin D**
- 2 times the vitamin E**
- 2 times the vitamin B3**
- 3 times the zinc**

### **Two-Per-Day Capsules**

Item #02214 • 120 capsules • Non-GMO

	Retail Price	Your Price
1 bottle	\$24	\$18
4 bottles		\$16 each

### **Two-Per-Day Tablets**

Item #02215 • 120 tablets • Non-GMO

	Retail Price	Your Price
1 bottle	\$21	\$15.75
4 bottles		\$14 each

Each bottle provides a two-month supply.

For full product description and to order call **1-800-544-4440** or visit **Life Extension.com**

\* Rated based on results of the 2017 ConsumerLab.com Survey of Supplements Users. More information at [www.consumerlab.com/survey2017](http://www.consumerlab.com/survey2017)



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.



## WHAT'S INSIDE

Visit us at [www.LifeExtension.com](http://www.LifeExtension.com)

# LifeExtension® Magazine



### 7 HOW BONE LOSS ACCELERATES AGING

Osteoporosis causes the release of *growth factors* that contribute to degenerative illnesses. Maintaining strong bones reduces these risks while protecting against **fractures**.



### 47 SUZANNE SOMERS INTERVIEW

**Suzanne Somers** reveals how she took on Big Pharma to protect women against conventional hormone replacement **drugs**.



### 26 RHODIOLA QUICKLY COMBATS FATIGUE

A new study shows that **rhodiola** extract improves symptoms of fatigue in *less than a week*.



### 34 CONVENIENT WAY TO MAINTAIN BONE HEALTH

A tasty chocolate chewable tablet simplifies **osteoporosis** prevention by providing optimal potencies of **bone-building** nutrients.



### 54 PEA PROTEIN: A DAIRY-FREE OPTION

Organic **pea protein** powder provides a nutrient-dense protein, high in essential amino acids, with excellent digestibility.



### 64 REBUILD SKIN, HAIR, AND NAILS FROM WITHIN

Oral ingestion of collagen peptides, solubilized keratin, biotin, and silicon can help restore youthful skin, hair, and nails.