

Restore Youthful Cell Energy

# LifeExtension<sup>®</sup>

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February 2018

BEYOND HEART HEALTH  
**Fish Oil  
Can Extend  
Human  
Lifespan**

New!  
Clear, Smaller,  
Omega-3  
Softgel

Two clear, smaller Omega-3 softgels are shown splashing in water. The softgels are a light yellowish color and are positioned above a large splash of blue water. The background is a bright blue sky with white clouds.

**Probiotics Fight  
Winter Flu Virus**

**Benefits of  
NAD<sup>+</sup> Restoration**

**Reply to American  
Heart Association**

**Green Tea and  
Colon Cancer**



# SUPER SALE

Life Extension®'s annual **SUPER SALE** enables clients to obtain **premium-grade** nutrient formulas at the year's **lowest** prices.

Long-term supporters know that the **quality** of the products are backed by **Life Extension's** commitment to extended healthy lifespans.

Below are a few examples of the savings you can enjoy during the **SUPER SALE**:



|   | Retail Price | SUPER SALE Discount Price Per Bottle            |
|---|--------------|---|
| <b>Extend-Release Magnesium</b><br>60 vegetarian capsules • Item #02107<br>Provides <b>immediate-release</b> magnesium citrate along with a 6-hour <b>extended-release</b> magnesium for sustained benefits.  | \$13         | <b>\$7.88</b><br><i>(four-bottle purchase)</i>  |
| <b>Two-Per-Day Multinutrient Formula</b><br>120 capsules • Item #02214<br>Higher-potency bioactive vitamins, minerals, and plant extracts provide convenient doses in two daily capsules.   | \$24         | <b>\$14.40</b><br><i>(four-bottle purchase)</i> |
| <b>Advanced Bio-Curcumin® with Ginger &amp; Turmerones</b><br>30 softgels • Item #01924<br>Absorbs up to <b>7-times</b> better, with added benefits of ginger and turmeric extracts.  | \$30         | <b>\$18.23</b><br><i>(four-bottle purchase)</i> |
| <b>Clearly EPA/DHA</b><br>120 softgels • Item #02200<br>Concentrated <b>fish oil</b> uses a patented technology to provide <b>1,500 mg</b> of EPA and <b>1,000 mg</b> of DHA in four <b>smaller</b> clear softgels.   | \$30         | <b>\$18</b><br><i>(four-bottle purchase)</i>    |
| <b>Bone Restore Chewable Chocolate Tablets</b><br>60 chewable tablets • Item #02123<br>New formula provides <b>bone-building</b> nutrients in tasty sugar-free, chewable, chocolate-flavored tablets.   | \$22         | <b>\$12.83</b><br><i>(four-bottle purchase)</i> |
| <b>Super Ubiquinol CoQ10</b><br>60 softgels • Item #01426<br>Super <b>ubiquinol</b> form of CoQ10 ( <b>100 mg</b> ) plus shilajit shown to <u>double</u> mitochondrial CoQ10 levels.  | \$62         | <b>\$35.10</b><br><i>(four-bottle purchase)</i> |
| <b>Ultra Natural Prostate</b><br>60 softgels • Item #02029<br>Comprehensive support for an aging prostate gland utilizing extracts from <b>pygeum</b> , <b>nettle</b> , <b>flower pollen</b> , and <b>saw palmetto</b> plus <b>boron</b> , <b>beta-sitosterol</b> and <b>lycopene</b> . | \$38         | <b>\$21.60</b><br><i>(ten-bottle purchase)</i>  |

**SUPER SALE ends January 31, 2018.**

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The flu vaccine is effective in just **17%-53%** of older adults due to declining immunity. An innovative **probiotic cocktail** boosts the body's immune defenses against winter cold and flu while reducing the severity of an attack.



#### 50 ANTI-AGING EFFECTS OF NAD<sup>+</sup>

**NAD<sup>+</sup>** promotes longevity through multiple mechanisms including **DNA repair**. Restoration of **NAD<sup>+</sup>** has been shown to increase lifespan in mice by the **human** equivalent of **4 years**.



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### DEPARTMENTS



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In 2017, the **American Heart Association** published findings showing that **fish oil** supplements are beneficial for **heart failure** patients and reduce hospitalizations. The **American Heart Association** went on to state there is "**lack of scientific research**" to support use of **fish oil** in the **general population**.

We rebut this irrational position that one should wait until after they develop heart disease before embarking on a program to optimize **omega-3** status.



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Dr. Lisa Bartoli worked with Olympic athletes to avoid pain and injury and now helps private patients maintain youthful function through integrative and osteopathic medicine.

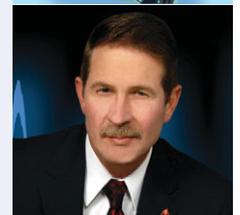
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# Super Bio-Curcumin®



## Super Bio-Curcumin®

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|-----------|--------------|------------------|
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Item #01924 • 30 softgels

|           | Retail Price | Super Sale Price |
|-----------|--------------|------------------|
| 1 bottle  | \$30         | \$20.25          |
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**Super Bio-Curcumin®** features a patented extract from turmeric root that absorbs up to **7 times** better than standard curcumin.

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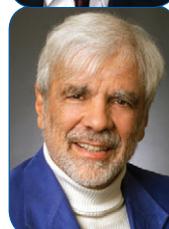
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| 4 bottles |                     | <b>\$12.60 each</b>     |

Each bottle provides a two-month supply.



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BY WILLIAM FALOON

## An Illogical Position of the American Heart Association

If you could travel back to year **1980**, you'd read some of the first published data revealing low heart-attack rates in those who consume coldwater **fish**.

These initial findings were based on observations of Eskimos and Greenlanders whose diets consist of foods high in **omega-3s**.<sup>1</sup>

Additional publications in the early **1980s** provided biologic explanations for the **arterial protective** effects of **omega-3s**.<sup>2</sup>

Since then, many studies have been published describing the potential of **omega-3s** to reduce cardiovascular risks.

Here we are **38 years** later and there is still a **debate** as to whether healthy people should supplement with **fish oil**.

You may ask why anyone still questions **fish oil's** value. After all, **heart disease** and **ischemic stroke** remain among the leading causes of disability and death.<sup>3</sup>

One answer can be found on the graphic at the end of this article. It describes **19** independent **heart-attack** risk-factors. **Fish oil** offers a degree of **protection** against some, but not all of these independent risks.

So when an isolated study fails to show a cardioprotective benefit, hurried doctors erroneously conclude there to be little benefit to **omega-3** supplements.

Omitted from these knee-jerk reactions are the other vascular risks that must be corrected if one is to reduce their odds of ischemic stroke, coronary artery blockage, and sudden cardiac arrest.

This kind of misguided reaction occurred in **2017** when the **American Heart Association** issued an advisory stating that **fish-oil** supplements:

*"... prevent death from heart disease in patients who recently had a heart attack and may prevent death and hospitalizations in patients with heart failure."<sup>4</sup>*

The **American Heart Association** immediately followed this advisory by stating there is "**lack of scientific research**" to support use of **fish oil** in the **general population**.<sup>4,5</sup>

An article on page 62 of this month's issue refutes this **illogic** by describing studies supporting use of **fish oil** to mitigate vascular risks and a **new** study showing that **omega-3s** reduce all-cause mortality.

This editorial describes approaches to cardiovascular disease **prevention** that most **Life Extension Magazine**® readers already follow.



## Fish-Oil Use Sharply Increases

Surging numbers of Americans now supplement with **fish oil** that provides **omega-3** fatty acids.

According to a report published by the **National Institutes of Health**, between **2002** and **2012**, there was almost a **four-fold increase** in the number of people using a **fish-oil** supplement.<sup>6</sup>

Another survey published by the **American Medical Association** showed a **nine-fold** increase in **fish-oil** supplement users between **1999** and **2012**.<sup>7</sup>

This same survey, however, revealed only **12%** of adult Americans are using an **omega-3** supplement.<sup>7</sup>

This indicates that while **fish oil-supplement** use has increased over the past two decades, vast numbers of Americans are not achieving optimal **EPA/DHA** status.

And most people in the United States are not ingesting sufficient **EPA/DHA** potencies via their diet or supplement program.<sup>8</sup>

### Results from the National Health Interview Survey Conducted by the National Center for Health Statistics

*"Fish oil was the most popular natural product used by adults in the United States in 2012. Nearly 8 million more adults used fish oil in 2012 than in 2007."<sup>9</sup>*

The public is now so aware of the **heart-health** properties of coldwater fish that the media garner few ratings by reporting on yet another favorable **fish-oil** study.

Instead, headline-hungry reporters latch onto any comment that challenges the benefits of **omega-3s**.

This happened in **2017**, when the **American Heart Association** published a favorable report about fish oil's newly discovered **cardiac benefits**,<sup>10</sup> but then argued **against** fish-oil supplementation for healthy adults.

## American Heart Association Declares that Fish Oil Combats Heart Failure

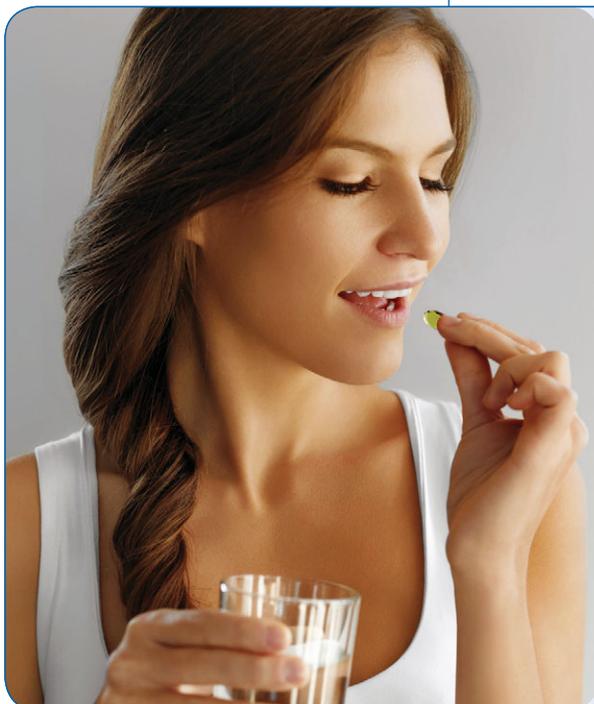
**Heart failure** occurs when the heart cannot adequately pump blood. An estimated **5.7 million** Americans currently suffer failing heart function.<sup>11</sup>

Headline news stories in **2017** report on "surprising" findings that **fish oil-supplements** not only help prevent **death** in **heart attack** patients, but they may also prevent **hospitalizations** in patients with chronic **heart failure**.<sup>12,13</sup>

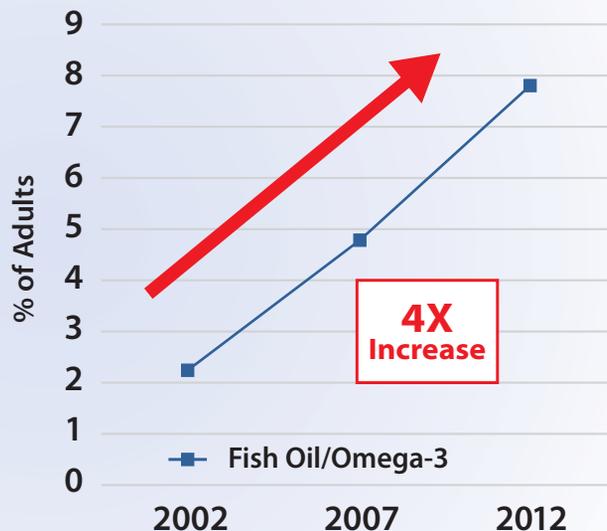
In response to this study, an **American Heart Association** physician stated:

*"What is new is that people with heart failure also may benefit from omega-3 fish-oil supplements."<sup>4</sup>*

This study, published by the **American Heart Association**, was based on a large, randomized, clinical trial.<sup>10</sup>



### Surging Use of Fish Oil/Omega-3 Supplements in the United States<sup>6</sup>





The results showed a low-dose fish-oil supplement reduced death and hospitalization by **9%** in **heart-failure** patients. This led the study authors to determine that doctors could consider **fish-oil supplements** for **heart-failure** patients.<sup>4</sup>

When we saw only a **9%** risk reduction in heart-disease patients taking approximately **1,000 mg** a day of an **omega-3** supplement, our reaction was how **trivial** this risk reduction and fish-oil potency were.

We say this based on better improvements in **cardiac function** that have been observed in response to supplementation with **coenzyme Q10**,<sup>14-22</sup> **taurine**,<sup>23-25</sup> **magnesium**,<sup>26-29</sup> and **higher-dose fish oil**.<sup>30-33</sup>

The fact that this **modest dose** (approximately **1,000 mg** a day of EPA/DHA) produced such benefits in **heart failure** patients is a revelation.

Most of you supplement with double this **EPA/DHA** dose, along with healthy dietary choices **AND** other nutrients that protect against cardiovascular disease via different mechanisms.

## American Heart Association Attacks Fish-Oil Supplements

After publishing the favorable **2017** report on fish oil aiding **heart failure** patients and preventing **cardiac death**, the **American Heart Association** emphasized that healthy people would not benefit by taking low-dose fish-oil supplements.

This recommendation against **healthy** people using **fish oil** was based on earlier flawed studies that were discredited in rebuttals we long ago published that can be accessed at [LifeExtension.com/fish](http://LifeExtension.com/fish)

The American Heart Association advisory concludes that:

*“supplementation with omega-3 fish oil may benefit patients with specific, clinical, cardiovascular disease indications, including patients with a recent prior heart attack and heart failure.”<sup>4</sup>*

According to this twisted logic, people should wait until after they have a **heart attack** or suffer **heart failure** before supplementing with **fish oil**.

We view these kinds of public decrees, such as “*don’t take fish oil until after you suffer a heart attack*”, as an example of widespread **medical stagnation** that causes so many premature illnesses.

## Multiple Factors Involved In Heart Disease

The **arterial system** is our modern day Achilles tendon.

Normal aging results in loss of **endothelial function** and subsequent development of **atherosclerotic** lesions that impede blood flow.

When **platelets** bump up against jagged **atherosclerotic** plaque, they can abnormally aggregate and cause an acute **blockage** of blood flow to a coronary or cerebral artery. This can result in a myocardial infarction (heart attack) or ischemic stroke.

Unstable **arterial plaque** is prone to sudden **rupture**, which can acutely occlude blood flow to arteries in our heart or brain resulting in sudden death.

Serious plaque buildup in **coronary arteries** creates angina pain that mercifully can be relieved via insertion of **stents** into narrowed arteries. In cases of severe coronary blockage, **open-chest surgery** is needed to bypass the blocked arteries.

**Multiple** pathologies are involved in the initiation and progression of arterial disease. **Fish oil** helps circumvent some of them by:

- Reducing triglyceride levels<sup>34,35</sup>
- Reducing C-reactive protein (helps stabilize plaque)<sup>36,37</sup>
- Reducing platelet stickiness (a thrombotic factor)<sup>38-40</sup>
- Reducing inflammation<sup>41-45</sup>
- Increasing EPA/DHA blood levels<sup>46,47</sup>
- Increasing large buoyant LDL particle size and other sub-lipid profiles<sup>48,49</sup>

These six validated benefits make it obvious that healthy people should ingest sufficient **omega-3s**.

**Fish oil**, however, does not miraculously circumvent all independent vascular pathologies.

When one understands that fish oil protects against many, but not all arterial **risk factors**, studies showing benefit to **omega-3** supplementation alone should be viewed with greater respect.

The inability of fish oil to circumvent other atherogenic risk factors mandates that people take additional steps to protect their delicate vascular system. Most readers of this magazine follow these preventive strategies.

### Curcumin Mitigates Heart Failure

Popularity of **curcumin** in recent years has grown more rapidly than **fish oil**.

Relief from **inflammation** is one reason why people use standardized **curcumin** supplements.

Curcumin is a **polyphenol** contained in the curry spice turmeric. It has demonstrated **anti-cancer** effects and may protect against

the deleterious changes involved with **atherosclerosis** and **atrial arrhythmia**.<sup>50</sup>

A hallmark characteristic of **heart failure** is **enlargement** of the heart muscle. In particular, the **left ventricle** that pumps blood directly into circulation **enlarges** and gradually loses **functionality**.

Heart enlargement can occur in response to **stress signals** that create adverse **gene-expression** changes in heart-muscle cells.

**Curcumin** has been shown to specifically inhibit **gene-expression** changes that contribute to chronic **heart failure**.<sup>51</sup>

Curcumin inhibits enlargement of cultured heart cells and prevents onset of heart failure caused by hypertensive heart disease and coronary infarction in rat models.<sup>52</sup>

One of several drugs used clinically to mitigate **heart failure** is **enalapril**. A group of researchers found that **curcumin** works simi-

larly to **enalapril** monotherapy in rat studies.<sup>51,53</sup>

When researchers combined **curcumin** with **enalapril**, they observed additive improvements in heart function. This suggests the mechanism of action of curcumin differs from the conventional cardiac drug (enalapril).<sup>51,53</sup>

The researchers pointed out that:

*“Combination therapy with curcumin and these agents [cardiac drugs] may be more effective for cardiac hypertrophy and heart failure.”<sup>51</sup>*

When reviewing published data, it would appear that combining **curcumin** with **fish oil** (along with conventional therapy) would reduce deaths and hospitalizations more than the meager **9%** reported in **2017** by the **American Heart Association** that focused on low-dose **fish oil**.



Curcumin and turmeric root

## Fight Back Against Medical Apathy

Protecting against **arterial disease** and **heart failure** are paramount concerns for aging humans.

**Pomegranate** improves **nitric oxide** status in the inner arterial wall,<sup>54,55</sup> vitamins like **5-MTHF** (folate) slash **homocysteine**,<sup>56</sup> while **CoQ10**,<sup>57-59</sup> **PQQ**,<sup>60,61</sup> and **NAD**<sup>62</sup> bolster **mitochondrial energy** in heart cells. All of this improves cardiac function.

No one should be **deficient** in **vitamins D** and **K2** as these are **low-cost** supplements that readily **absorb** when taken with a meal that contains some fat.

While some supplements help lower **blood pressure**, most aging people need medications to achieve optimal systolic readings of around **115 mmHg**. The drug **telmisartan** safely lowers blood pressure AND has vascular side benefits.<sup>63-67</sup>

**AMPK**-activating nutrients and/or drugs (like metformin) **lower** blood **glucose** and **insulin**.<sup>68</sup>

We advocate that **LDL cholesterol** be kept in the **low** normal ranges (under **100 mg/dL**). This can usually be accomplished by following a **Mediterranean** style diet and/or using **low-doses** of prescription drugs.

**Hormone balance** should be initiated after comprehensive **blood testing**.

## Refuting Illogic

By understanding the many factors that underlie **heart attack** and **stroke**, one can readily dismiss allegations made by groups like the **American Heart Association** that claim **fish oil** benefits heart-disease patients but is of little value to the general population.



This illogic assumes **heart-attack** and **stroke** victims were **not** part of the general population **prior** to their vascular disaster.

Most readers of *Life Extension Magazine*<sup>®</sup> were alerted to these **independent** vascular risk factors decades ago and take appropriate preventive measures.

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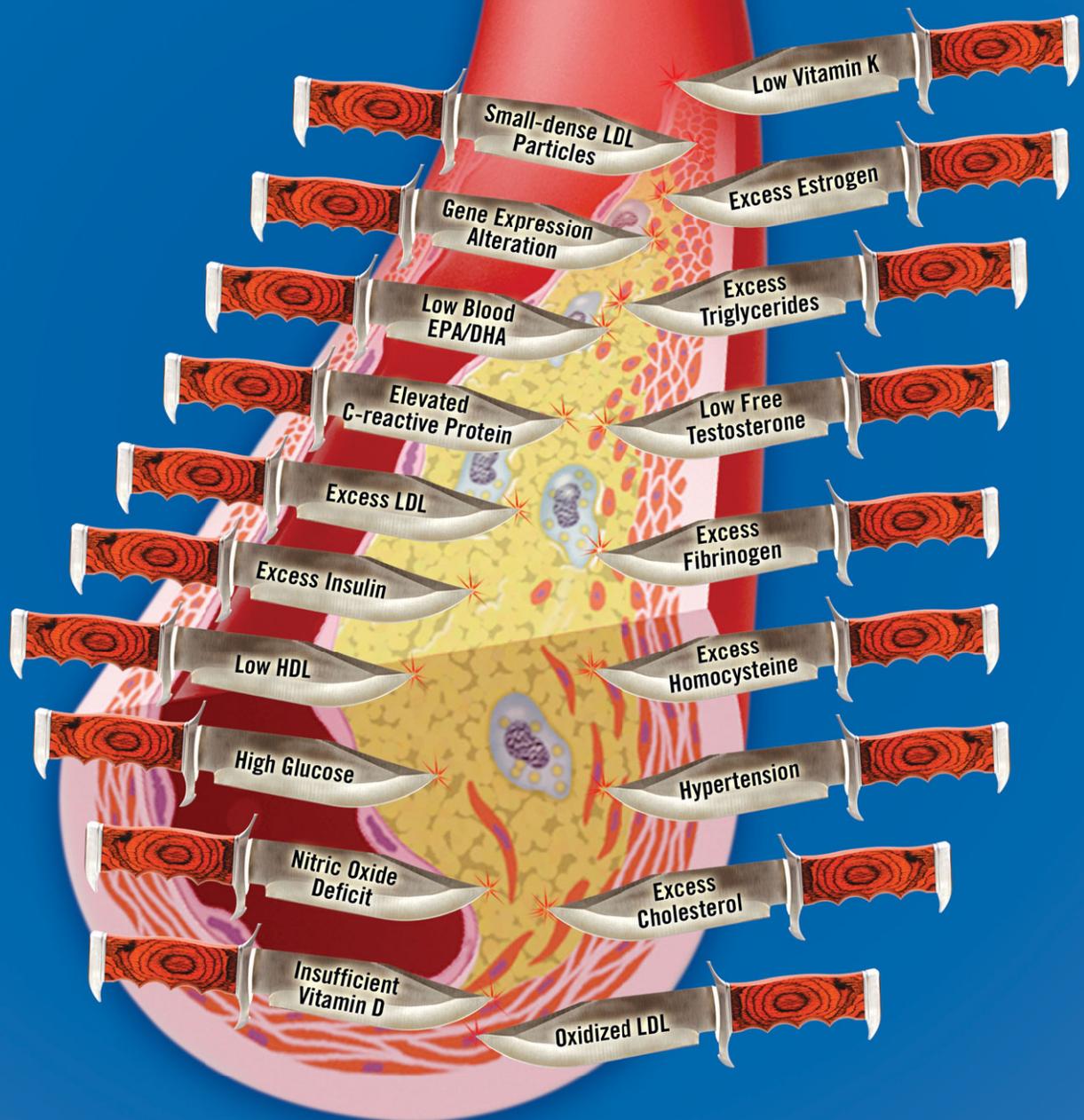
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Turn this page to view 19  
independent vascular risk factors.

Scientific references for  
this article begin on page 14.

## 19 DAGGERS OF ARTERIAL DISEASE



This graphic shows **19** daggers aimed at an artery occluded with atherosclerotic plaque.

Any one of these “daggers” can initiate and propagate atherosclerotic vascular disease.

You’ve just read statements made by the **American Heart Association** claiming there is little value in fish oil supplementation to the general population.

Most readers of this magazine are aware of the pathologies involved in **arterial disease** and follow comprehensive preventive measures.



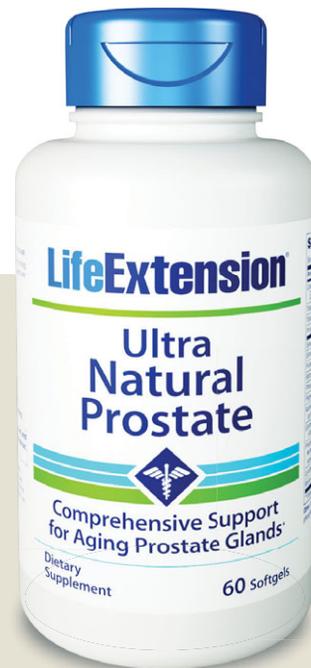
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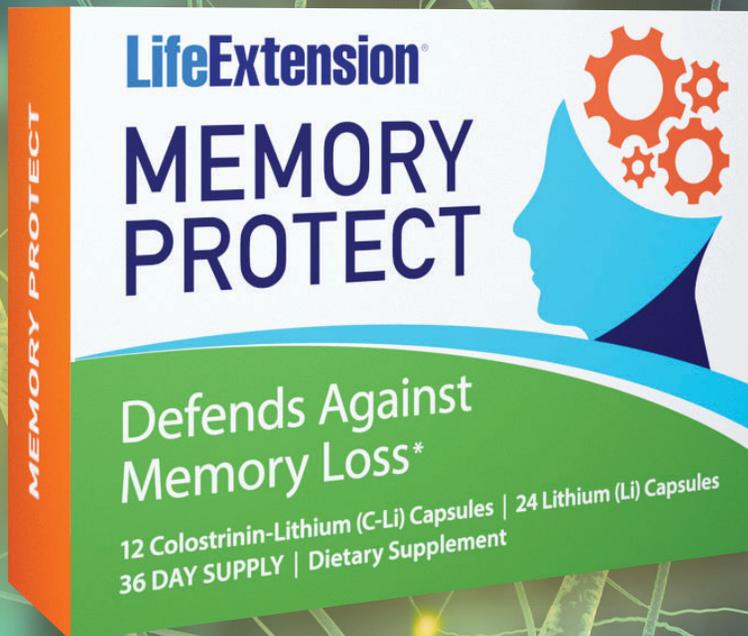
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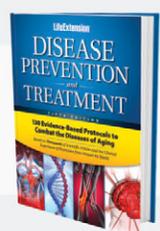
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## Blueberries Improve Brain Function in Elderly

New research has found that concentrated **blueberry** juice is linked to improvements in brain blood-flow and cognitive function in older people.\*

Researchers believe the flavonoids and pterostilbene content of blueberries, which can be obtained more easily and in greater concentration in supplement form, is likely responsible for these beneficial effects.

The study from England's University of Exeter employed 26 healthy subjects ages 65 to 77. Twelve of the subjects drank concentrated blueberry juice once daily. The other 14 received a placebo. The study went on for 12 weeks.

Prior to and after the study, the participants were given a number of cognitive tests while their resting blood flow was measured and an MRI monitored their brain activity to establish a baseline.

Results showed that, during the study, subjects who consumed the **blueberry concentrate** had a significant increase in brain activity compared to those who took the placebo.

**Editor's Note:** This study backs up a large number of studies showing the health benefits of fruits and vegetables in general. "Our cognitive function tends to decline as we get older," said lead study author Dr. Joanna Bowtell. "But previous research has shown that cognitive function is better preserved in healthy older adults with a diet rich in plant-based foods."

\**Appl Physiol Nutr Metab.* 2017 Jul;42(7):773-779.

## Vitamin D Supplementation Helps Manage Pain

Monica Levy Andersen and colleagues at Brazil's Universidade Federal de Sao Paulo's department of psychology suggest that supplementation with **vitamin D** combined with sound sleep could help manage chronic pain.\*

"Sleep and pain share neurotransmitters in their physiological processes," the authors explain. Decreased vitamin D levels have been associated with infectious diseases, inflammation, and sleep disorders, all of which can affect pain. Such conditions as fibromyalgia, rheumatoid arthritis, low back pain, lupus, and more have been associated with disordered sleep.

"We can hypothesize that suitable vitamin D supplementation combined with sleep hygiene may optimize the therapeutic management of pain-related diseases, such as fibromyalgia," Dr. Andersen stated. "It is necessary to understand the possible mechanisms involved in this relationship, including immunological and neurobiological pathways related to interrelationship among sleep, vitamin D and pain."

**Editor's Note:** Periodic blood testing to determine serum 25-hydroxyvitamin D levels may be helpful for those experiencing chronic pain.

\* *J Endocrinol.* 2017 Jul 1:234.



## Supplements Lower Risk of Metabolic Syndrome

A study reported in the journal *Nutrients* found a lower incidence of metabolic syndrome among dietary **supplement** users in Korea.\*

The study included 1,847 supplement users and 4,461 nonusers enrolled in the 2010-2011 Korea National Health and Nutrition Examination Survey. Twenty-four-hour diet recall data was analyzed for antioxidant content. Survey responses provided information concerning the use of supplements.

Metabolic syndrome was diagnosed when three or more risk factors for the condition—abdominal fat, high blood pressure, high blood sugar, and unhealthy cholesterol levels—were present during health examinations.

The study uncovered an **18%** lower prevalence of metabolic syndrome in supplement users. Among those whose intake of vitamin A was among the highest one-third of supplement users there was a **28%** lower risk of metabolic syndrome compared to nonusers whose intake of the vitamin was among the lowest third. For supplement users whose vitamin E intake was among the highest, the risk was **26%** lower.

**Editor's Note:** Supplement users whose total antioxidant capacity from diet and supplements was among the top third of subjects had a **28%** lower risk of metabolic syndrome than nonusers whose total antioxidant capacity was among the lowest.

\* *Nutrients*. 2017 Sep 22.

## Resveratrol Linked to Lower Glucose Levels

The results of a meta-analysis published in *Nutrition & Metabolism* add evidence to an association between supplementing with **resveratrol** and improved management of type II diabetes.\*

For their analysis, Ling Li of Southeast University and associates selected nine randomized, controlled trials involving a total of 283 type II diabetics. They compared levels of glucose, insulin and other factors among participants who received resveratrol to those who received a placebo or to a control group of diabetics.

The analysis concluded that resveratrol supplementation was associated with significantly reduced insulin levels and insulin resistance. Fasting plasma glucose was reduced by an average of **5.2 mg/dL** among those who received resveratrol compared to placebo or control groups.

**Editor's Note:** Further analysis determined that only **100 mg** or higher doses of resveratrol were associated with lower glucose levels.

Elevated **fasting insulin** often precedes diagnosis of **type II diabetes** by years or decades. **Resveratrol** exerts several beneficial mechanisms to help improve insulin sensitivity.

\* *Nutr Metab.* 2017 Sep 22.

## Diabetes Raises Risk of Sudden Cardiac Death

Research suggests that diabetics under age 50 have a seven-times higher risk of succumbing to sudden cardiac death compared to nondiabetics.\*

Sudden cardiac death occurs when the heart's electrical system malfunctions and the organ suddenly stops.

The 10-year Danish study looked at the medical records of all Danes in two groupings: those between the ages of 1 and 35 in 2000-2009 and those between the ages of 36 to 49 in 2007-2009. Out of 14,000 deaths, **5%** were diabetic—about 500 had type I diabetes and about 200 had type II diabetes.

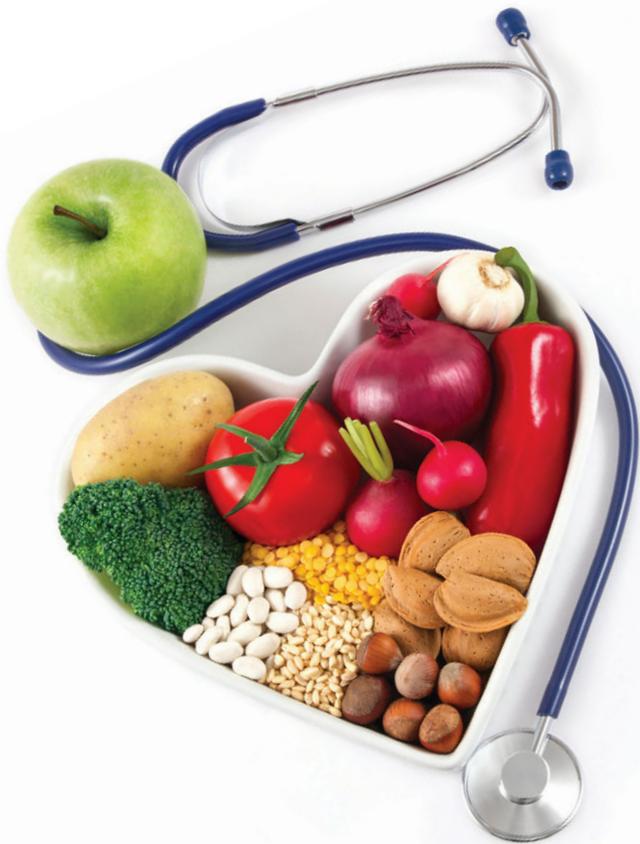
The results showed people with type II diabetes had a five-times higher risk of cardiac death and those with type I diabetes had a 12-times higher risk.

Moreover, the diabetics were found to have an **eight-times higher** risk of dying from heart disease of *any* kind.

Chief Cardiologist Dr. James Catanese of Northern Westchester Hospital in Mount Kisco, N.Y., was not surprised by the finding of higher risk in itself, but the amount of risk surprised him. "A seven- or eight-times higher risk is astounding, particularly in people below age 50," he said.

**Editor's Note:** Copenhagen University Hospital medical student and lead author Jesper Svane remarked, "It is important that healthcare providers are aware that young patients with diabetes have an elevated risk of mortality and that this is mainly explained by an increased risk of cardiac death."

\* Available at: <http://tinyurl.com/y9sze86k>. Accessed November 14, 2017.



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| <p><b>Health Booster (Once-Daily)</b> • 60 softgels, Item #02091 (2-month supply)<br/>Just <u>one</u> softgel provides three forms of vitamin K, blueberry extract, gamma tocopherol, sesame lignans, chlorophyllin, lycopene, <i>trans</i>-zeaxanthin, <i>meso</i>-zeaxanthin, and lutein.</p> | \$54         | <b>\$34.20</b><br>(four-bottle purchase) |
| <p><b>Vitamin D3</b> • 5,000 IU, 60 softgels, Item #01713<br/>High-potency vitamin D in a softgel to provide greater absorption into the bloodstream.</p>   | \$10         | <b>\$5.85</b><br>(four-bottle purchase)  |
| <p><b>MacuGuard® Ocular Support</b> • 60 softgels, Item #01992<br/>Eye protection with <i>meso</i>-zeaxanthin, lutein, <i>trans</i>-zeaxanthin, and saffron to support healthy vision.</p>  | \$25         | <b>\$15.75</b><br>(four-bottle purchase) |
| <p><b>ComfortMax™</b> • 60 vegetarian tablets, Item #02202<br/>Two natural compounds to reduce common discomforts and improve freedom of movement.</p>  | \$44         | <b>\$26.10</b><br>(four-bottle purchase) |
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| <p><b>Mitochondrial Energy Optimizer with PQQ®</b> • 120 capsules, Item #01868<br/><b>Glycation-protection</b> formula helps maintain cell function, protein structural integrity, and mitochondrial biogenesis. Provides high potency <b>carnosine</b> along with <b>R-lipoic acid, PQQ, benfotiamine, luteolin, and taurine</b>.</p> | <b>\$68</b> | <b>\$40.50</b><br>(four-bottle purchase) |
| <p><b>FLORASSIST® Prebiotic Chewable</b> • 60 chewable tablets, Item #02203<br/>Strawberry-flavored <b>FLORASSIST® Prebiotic Chewable</b> helps promote healthy bifidobacteria levels in as little as 14 days using a novel <b>XOS</b> prebiotic fiber.</p>  | <b>\$20</b> | <b>\$11.70</b><br>(four-bottle purchase) |
| <p><b>PQQ Caps</b> • 10 mg, 30 vegetarian capsules, Item #01500<br/>Promotes generation of new mitochondria in aging cells.</p>  | <b>\$18</b> | <b>\$9.90</b><br>(four-bottle purchase)  |
| <p><b>Memory Protect</b> • 36-day supply, Item #02101<br/>Microdose <b>lithium</b> and <b>proline-rich polypeptide</b> to inhibit cognitive decline.</p>   | <b>\$24</b> | <b>\$14.40</b><br>(four-box purchase)    |
| <p><b>Super Omega-3 EPA/DHA with Sesame Lignans &amp; Olive Extract</b> • 120 softgels, Item #01982<br/>Highly purified <b>EPA (1,400 mg)</b> and <b>DHA (1,000 mg)</b> from Alaskan Pollock, <b>sesame lignans</b> plus potent <b>olive extract</b> provides essential components of the Mediterranean diet in four softgels .</p>    | <b>\$32</b> | <b>\$18.90</b><br>(four-bottle purchase) |
| <p><b>Clearly EPA/DHA</b> • 120 softgels, Item #02200<br/><b>Concentrated Omega-3</b> uses a patented technology to provide <b>1,500 mg</b> of EPA and <b>1,000 mg</b> of DHA in four <b>smaller</b> clear softgels.</p>   | <b>\$30</b> | <b>\$18</b><br>(four-bottle purchase)    |
| <p><b>Bone Restore Chewable Tablets</b> • 60 chewable tablets, Item #02123<br/>This <u>new</u> formula provides <b>bone-building</b> nutrients in a tasty sugar-free, chewable, chocolate-flavored tablet.</p>   | <b>\$22</b> | <b>\$12.83</b><br>(four-bottle purchase) |
| <p><b>Glycemic Guard™</b> • 30 vegetarian capsules, Item #02122<br/><b>Glycemic Guard™</b> contains <b>plant extracts</b> help maintain healthy after-meal blood glucose levels and insulin response, and promote healthy HbA1c levels.</p>  | <b>\$42</b> | <b>\$25.20</b><br>(four-bottle purchase) |
| <p><b>Optimized NAD<sup>+</sup> Cell Regenerator™ with Resveratrol</b> • 30 vegetarian capsules, Item #02145<br/>NIAGEN® <b>nicotinamide riboside</b>, <i>trans-resveratrol</i>, quercetin, fisetin, <i>trans-pterostilbene</i>, and more support healthy cellular metabolism.</p>   | <b>\$50</b> | <b>\$30.60</b><br>(four-bottle purchase) |



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A microscopic view of several large, spherical cells with a textured, blue-tinted surface. The cells are arranged in a cluster, with some overlapping. The background is a soft, light blue gradient. In the lower-left corner, a portion of a microscope is visible, showing the objective lens and part of the eyepiece.

# Reverse Underlying Cause of Degenerative Aging

To remain alive, your cells generate a continuous flow of **energy**.

When **energy** is produced by burning **hydrocarbons** such as coal or oil, the result is residual **waste** pollutants that damage living beings.

A similar event occurs during cellular **energy** metabolism. Left behind in the energy cycle is toxic **debris**.

The primary way cells “**clean house**” is via **autophagy**.<sup>1</sup>

**Autophagy** defines a natural process whereby cells clear damaged proteins and other metabolic waste products.<sup>1,2</sup>

An emerging body of evidence points to imbalanced **autophagy** as a driver of premature **aging**.<sup>3,4</sup>

Recent discoveries show that almost **every** intervention proven to extend healthy lifespan involves activation of **autophagy** (removing toxic cellular waste).<sup>3,4</sup>

Restoring balanced **autophagy** is a critical factor in reversing biological aging.<sup>4</sup>

## How to Restore Autophagy

**Rapamycin** is a drug that regulates **autophagy**. Preliminary evidence points to its potential to delay aging.<sup>5,6</sup>

Although rapamycin has consistently demonstrated lifespan extension in animal models, mainly by delaying cancer onset,<sup>5</sup> such a powerful drug needs more human studies to ensure against potential risks.

There are natural methods to improve **autophagy** that include supplementation with **lithium** and **NAD<sup>+</sup>** precursors like **nicotinamide riboside**.<sup>7-9</sup>

One of the safest and most effective methods to optimize **autophagy** is by activating an **enzyme** in our cells called **AMPK**.<sup>10-12</sup>

When AMPK is **activated**, it signals cells to **remove** internal **pollutants** via the process of **autophagy**.<sup>13,14</sup>

This enables cells to function in a more **youthful** manner, as evidenced by **reduced abdominal fat** stores in many people using **AMPK-activating** compounds.<sup>15</sup>

## New Longevity Factor: mTOR

**AMPK** performs its **fat-removing** process, in part, by **regulating** a protein called **mTOR** which stands for "**mechanistic target of rapamycin**."<sup>14,23-25</sup>

The drug called **rapamycin** is a powerful **autophagy-inducer**. It is demonstrating significant **age-delaying** effects in older animals.<sup>26</sup> Differing doses of **rapamycin** are being studied in humans to assess if a once-per-week dosing can provide benefits without the immunosuppression that occurs when rapamycin is taken daily.<sup>27</sup>

To clean out **metabolic waste** from aging cells today, the best way of regulating **mTOR** is to **boost AMPK functionality**.

## Balance mTOR to Burn Fat

When cell **mTOR** is properly **balanced**, the initial effect is breakdown of **fat stores** that are used to fuel cellular energy.<sup>14,23-25,28</sup>

## AMPK Signals Cells to Devour Internal Fat

**AMPK** was first identified in **1973** for its cell-regenerative effects.<sup>16</sup>

When people practice **calorie restriction**, AMPK activity increases in cells.<sup>17,18</sup>

Increasing **AMPK** activity helps protect against degenerative aging.<sup>3,19,20</sup>

AMPK turns down cell proliferation to conserve energy in the face of restricted food intake.<sup>17,18,20,21</sup>

**AMPK** signals cells to devour stored **fat** in response to perceived energy (food) shortages.<sup>20-22</sup>

This is how our ancestors survived **famines**. When confronted with food scarcity, cells react by slowing their replication and utilizing **stored fat** reserves for essential **energy** production.

If **mTOR** is **not** balanced, aging individuals often accumulate unwanted **fat stores**, even when they don't excessively ingest calories.<sup>14,23-25,28</sup>

When nutrient **signaling** pathways are saturated, the result is **storage** of excess energy in adipose tissue, which manifests outwardly as **body fat**. This happens because of increased **size** of **adipocytes** (fat cells).

Excessive nutrition (calorie intake) causes up-regulation of **mTOR**, which sets the stage for **increased** risk of malignancy and atherosclerosis.

In our youth, energy-sensing **AMPK** delicately balances cellular energy and fat storage.<sup>29,30</sup> Young bodies do a wonderful job of adapting to nutrient availability and energy demands.

Many factors contribute to the age-related loss in flexibility of our **signaling** pathways. Cell culture and animal data suggests that sensitivity of key energy regulators is lost with age. This causes some pathways to become hyperactive, whereas others are underactive.<sup>19,31</sup>

**AMPK** is a key **energy regulator** that seems an ideal target of longevity-enhancing therapeutics that can also help reduce unwanted belly fat.

Optimizing **AMPK** activity facilitates removal of cellular debris (via autophagy) and suppresses excess cell propagation.<sup>10,11,32</sup> When **mTOR** is **inhibited** by **AMPK activators** there are **reductions** in **cancer risks**.<sup>20,33</sup>

As it relates to combatting aging, achieving **optimal mTOR activation status** is a critical factor that you will learn more about this upcoming year.

## Maximizing Healthspan is a Balancing Act mTOR Activation

Insufficient tissue rejuvenation by stem cells

**Inadequate**

Tissue maintenance and growth

**Optimal**

Cancer, accelerated aging and stem cell depletion

**Excessive**

## Powerful Anti-Aging Mechanism

Optimize AMPK to Balance mTOR signaling

**INADEQUATE mTOR**  
Inefficient tissue  
repair by stem cells

**EXCESSIVE mTOR**  
Accelerated aging, cancer  
and stem cell depletion



Modern populations consume an abundance of calories throughout the day. The pathologic impact: **AMPK** is chronically suppressed while **mTOR** stays **elevated**. Excess calorie consumption in adults causes pathological **mTOR activity** that can result in malignant transformation, accelerated aging, and excess fat storage. Those consuming typical modern diets need to **enhance AMPK** activity, which has the **side benefit** of normalizing hyperactivated **mTOR**.

## New Way to Activate AMPK

One of the most stubborn aspects of normal aging is accumulation of deep **visceral** (abdominal) **fat**.<sup>34</sup>

Not only can this be unsightly, but it generates systemic **inflammation** and **glucose/lipid** imbalances that are root causes of **metabolic syndrome** and **type II diabetes**.<sup>34-36</sup>

Seeking a natural approach to boosting **AMPK**, researchers studied a citrus flavonoid called **hesperidin**. Laboratory results show that **hesperidin** markedly **activates AMPK**.<sup>37</sup>

## Hesperidin Studied in High-Risk Patients

**Metabolic syndrome** describes a cluster of factors that markedly increase **heart attack** and **stroke** risk.

Patients with **metabolic syndrome** typically have:<sup>38</sup>

- High blood pressure
- Elevated blood sugar
- Lipid imbalance (high triglycerides/low HDL)
- Excess fat around the waist
- Low-level systemic inflammation

Metabolic syndrome patients are at increased risk to progress to **type II diabetes**.

## What You Need to Know

### The Benefits of AMPK

- **Autophagy** is a process in which cells “clean house” by removing damaged proteins and other metabolic waste products. *Almost every intervention proven to extend healthy lifespan involves the promotion of autophagy.*
- **Activation of an enzyme in our cells called AMPK** is a particularly safe and effective method to optimize autophagy.
- AMPK signals cells to remove internal pollutants via autophagy. This enables cells to function in a more *youthful manner, as evidenced by reduced abdominal fat* in many who use AMPK-activating compounds.
- **Abdominal fat isn’t just unsightly.** It can also generate the systemic inflammation and glucose/lipid imbalances at the root of metabolic syndrome and type II diabetes.
- **AMPK performs its fat-removing process, in part, by regulating a protein called mTOR.** Currently, the best way to sweep out metabolic waste from aging cells is through regulating mTOR by boosting AMPK functionality.
- **Laboratory results show that the citrus flavonoid hesperidin** markedly activates AMPK.
- **As well, an extract from the *Gynostemma pentaphyllum* plant** has demonstrated strong AMPK-activating properties.
- ***Gynostemma pentaphyllum* extract and hesperidin** provide a dual boost to cell AMPK activity, which in turn helps reduce fat by burning it for energy and helps mitigate some of the deleterious mechanisms of aging.
- **AMPK can be activated with prescription drugs like metformin** or by using a new once-daily combination of standardized extracts of *Gynostemma pentaphyllum* and *hesperidin*.

Based on this festering heart attack epidemic, researchers tested standardized **hesperidin** on a group of **metabolic-syndrome** patients.<sup>37</sup>

In this randomized double-blind crossover clinical trial, half the **metabolic-syndrome** subjects took **500 mg/day** of **hesperidin** or **placebo** over a three-week period. They were all “crossed over” so that each patient received either **hesperidin** or **placebo** at some point during the study period.

Participants were explicitly counseled before initiation of the study to maintain their usual physical activity and dietary habits. Baseline and follow-up tests included blood markers of **cardiac risk** and an ultrasound measure of **arterial function**.

**C-reactive protein** is a marker of **inflammation** that increases risk of **heart attack** and **stroke**. Those with excess **belly fat** often have elevated C-reactive protein blood levels.<sup>39</sup>

In this study, **metabolic syndrome** patients taking the **hesperidin** supplement had a striking **33% reduction** in **C-reactive protein** levels compared to baseline.<sup>37</sup>

**Flow-mediated dilation** is a non-invasive test that utilizes **ultrasound** to assess **endothelial function** in humans.<sup>40</sup>

When these **metabolic syndrome** study subjects were given **hesperidin**, there was a **25% improvement** in this (ultrasound) assessment of **arterial health**.<sup>37</sup>

When the same **metabolic syndrome** patients were **crossed-over** and given **placebo**, endothelial function slightly worsened. (Metabolic syndrome is characterized by declining arterial health along with increased inflammation.)

## Metabolic Syndrome Risk Factors

**Apolipoprotein B** is a protein portion of **LDL** cholesterol. Those with high **apolipoprotein B** levels are at significantly greater risk for **coronary artery** disease.<sup>41,42</sup>

In this study of **metabolic syndrome** patients, **apolipoprotein B** decreased **2.2%** in the **hesperidin** arm but increased **3.3%** when the recipients were given **placebo**.<sup>37</sup>

Those afflicted with **metabolic syndrome** have a cluster of conditions that include excess belly fat, high blood pressure, high blood sugar, inflammatory indicators and abnormal lipids. These factors are an underlying cause of many **heart attacks** and **strokes**.<sup>38</sup>

This three-week study demonstrated reductions in measures of cardiovascular risk in **metabolic syndrome** patients given a standardized **hesperidin** supplement. We attribute many of these benefits to the increase in **AMPK activity** that **hesperidin** was recently found to induce at the cellular level.

## Activating AMPK to Reduce Belly Fat

**AMPK activation** helps remove excess stored fat by telling your cells that energy is needed so they will stop storing fat and begin using it for energy production.

Based on the known **fat-reducing** effects of **AMPK activation**, a study evaluated people with moderately high **body mass index 24-30 kg/m<sup>2</sup>**.<sup>46</sup>

Study participants were provided with a daily dose of nearly **400 mg** of **hesperidin** that was administered over a 12-week period.

All participants in this study were advised to maintain their regular activity levels and meal size for the duration of the study. Baseline and follow-up tests included **CT-scan imaging** of **abdominal fat**.

At the study conclusion, **abdominal fat** in the **placebo** group increased over **5%**, whereas the group receiving **hesperidin** had about a **1.5%** abdominal-fat reduction.

This is comparable to average **belly fat-loss** effects of **metformin** recorded in a separate open-label study of type II diabetics that were given exercise and diet plans.<sup>46,47</sup>

**Hesperidin** demonstrated marked **AMPK activation** in the laboratory. This discovery has now been corroborated by findings of **abdominal fat loss** and improved **vascular function** in **humans** who supplemented with *standardized hesperidin*.



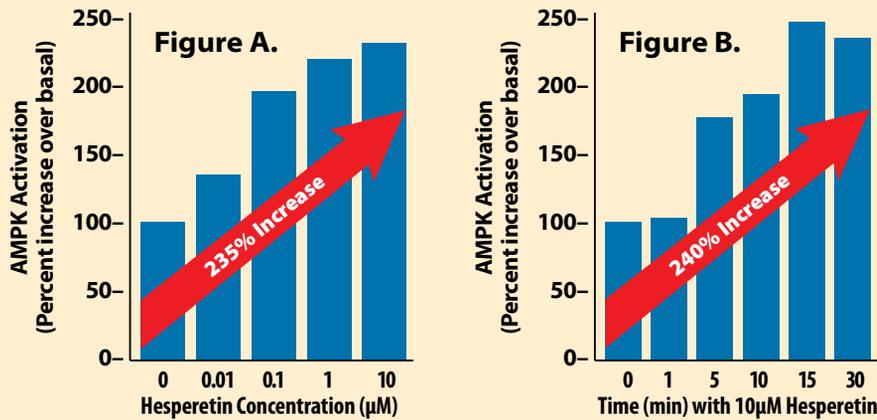
## Hesperidin Increases AMPK

Preclinical studies have shown that **AMPK** activity declines with normal **aging**.<sup>19</sup>

Specific **plant extracts** can help reverse this degenerative trend.

One of these **AMPK**-activating nutrients is the citrus flavonoid **hesperidin**.

The charts below reveal greater than **two-fold increase** in **AMPK** activity in response to the bioactive form of **hesperidin**.<sup>37</sup>



**Hesperetin** stimulated **AMPK** activation in a concentration- and time-dependent manner.

**Figure A:** The amount (**10 µM**) of **hesperetin** that resulted in a > **two-fold** increase in **AMPK** activity.

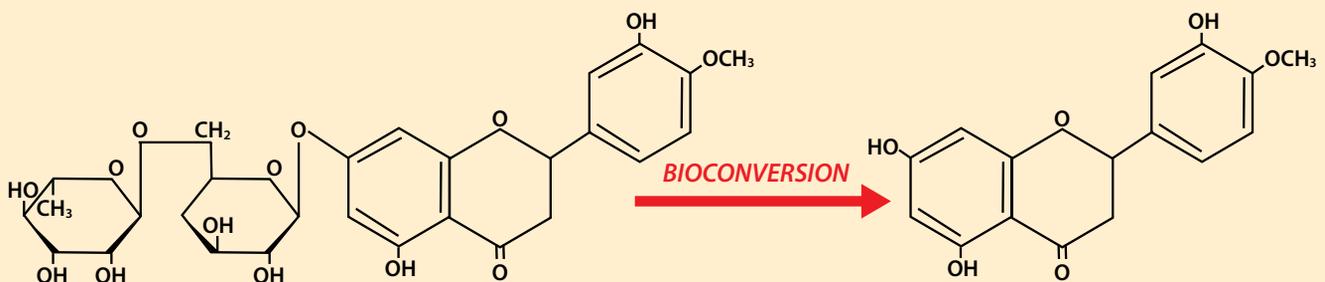
**Figure B:** Treatment of cells with **10 µM** of hesperetin reveals statistically significant activation of **AMPK**.<sup>43</sup>

Based on separate bioavailability clinical study of hesperidin,<sup>44</sup> it is expected that after ingesting **500 mg** of **hesperidin**, blood levels of bioactive **hesperetin** would remain at a concentration greater than **10 µM** throughout the day.

## Measuring AMPK Activity of Hesperidin

**Hesperetin** is the bioactive form of **hesperidin** the body converts to after **oral** ingestion.<sup>37,45</sup>

The diagram below shows the conversion of oral **hesperidin** to bioactive **hesperetin**:



Hesperidin is a citrus peel extract that long-ago demonstrated robust vascular benefits.

When hesperidin is orally ingested, it converts to bioactive **hesperetin**.

For cell-based *in vitro* studies, researchers use **hesperetin** to measure **AMPK** activity.<sup>37</sup>

**In vitro** cell studies help prove a biological concept, such as the ability of a nutrient or drug to activate **AMPK**. They do not always correspond to the same **in vivo** impact.

As it relates to **hesperidin**, human data indicates beneficial effects that correspond in many ways to **AMPK-activating** compounds like **metformin**.<sup>37</sup>



*Gynostemma pentaphyllum*

## Impressive Results with *Gynostemma Pentaphyllum*

An extract from the *Gynostemma pentaphyllum* plant has previously demonstrated potent **AMPK-activating** properties.<sup>48,49</sup>

In a randomized study of **80** obese-but-otherwise healthy people, supplementation with **450 mg** a day of *Gynostemma*—**standardized extract** resulted in a **6.29%** total decline in **belly fat** compared to a **0.86%** drop in the **placebo** group.<sup>15</sup>

More impressively, obese individuals receiving the standardized *Gynostemma* extract had nearly an **11%** drop in dangerous **visceral fat** compared to **2.96%** in the **placebo** arm.<sup>15</sup>

**Visceral fat** accumulates around **internal organs** in the belly. It is the most dangerous kind of fat as it emits **inflammatory** cytokines that inflict systemic damage.<sup>50,51</sup>

### AMPK-Boosting Effects of *Gynostemma pentaphyllum*

In an *in vitro* study, a standardized extract from the *Gynostemma pentaphyllum* plant induced a nearly **seven-fold** increase in **AMPK activity** compared to baseline.<sup>54</sup>

When **humans** take this standardized *Gynostemma pentaphyllum*,<sup>15</sup> study findings reveal some benefits similar to diabetic patients using the drug **metformin**.<sup>47</sup>

In particular, standardized *Gynostemma pentaphyllum* has shown significant reductions in abdominal **fat mass** compared to placebo in controlled studies.

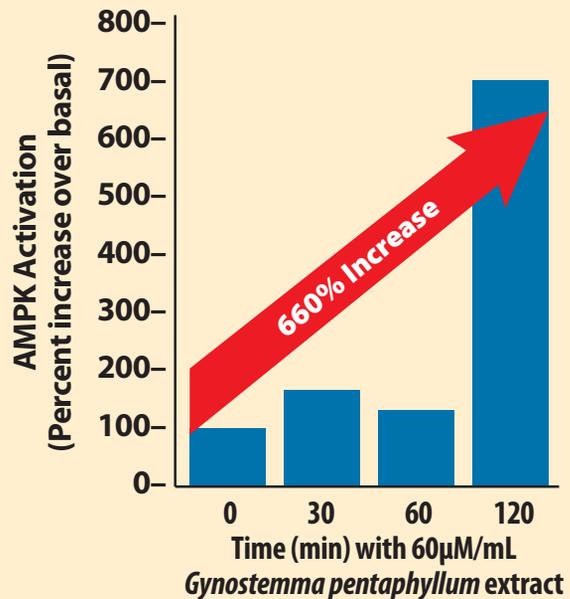
This chart shows the increase in **AMPK activity** in response to *Gynostemma pentaphyllum*.

As noted with the hesperidin data, *in vitro* studies help prove a biological concept, but do not always correspond to the identical *in vivo* effect.

As it relates to *Gynostemma pentaphyllum*, published data reveals significant **AMPK activation** in the **animal** (*in vivo*) model.<sup>54</sup>

Consistent with these findings, lower doses of standardized *Gynostemma pentaphyllum* (**450 mg/day**) used in a **human** study demonstrate significant reductions in **belly fat**.<sup>15</sup>

When analyzing **cell culture** (*in vitro*) and **animal** (*in vivo*) data showing **AMPK activation** and then comparing this with **human** data showing **abdominal fat reduction**, *Gynostemma pentaphyllum* demonstrates many beneficial properties of **metformin**.



A standardized extract of *Gynostemma pentaphyllum* activated **AMPK** in a time-dependent manner. A solution containing **60 µg/mL** *Gynostemma pentaphyllum* extract incubated with cells for two hours resulted in nearly a **seven-fold** activation of **AMPK** over baseline.<sup>54</sup>

Reducing **visceral fat** is a difficult but crucial objective for prevention of cardiovascular disorders, dementia and malignancies.<sup>52,53</sup>

***Gynostemma pentaphyllum* extract** and ***hesperidin*** provide a dual boost to cell **AMPK activity**, which in turn helps mobilize fat stores by utilizing them as energy sources.

### Combat Aging While Reducing Belly Fat

The age-related decline in **AMPK activity**<sup>19</sup> is thought to set off a cascade of pathological processes that include:

1. Decreased autophagy (removal of cellular debris)
2. Abnormal blood lipid profiles (cholesterol/triglycerides)
3. Increased C-reactive protein (chronic inflammation)
4. Increased abdominal fat storage (especially visceral fat)

Boosting **AMPK** activity using nutrients like ***Gynostemma*** and ***hesperidin*** has been demonstrated to mitigate some of these deleterious **mechanisms of aging** while helping to reduce belly fat.

### Do You Need to Suppress mTOR?

Not everyone should consider aggressive suppression of **mTOR** and turning up **autophagy** (cellular housecleaning).

If **mTOR** is excessively and constantly turned down, it could worsen sarcopenia and other frailty-associated conditions.

Western diets are increasingly putting Americans at risk of chronically elevated **mTOR activity** that contributes to metabolic disorders and unwanted fat accumulation.

There are people today who cycle between aggressively suppressing mTOR via calorie restriction and/or high-dose AMPK activators, and then eating balanced protein-rich diets. This enables mTOR to rebuild muscle mass while suppressing the undesirable impact of pathological mTOR activation.

When it comes to optimal health, **balance** is key.

### Summary

Anyone contemplating a weight-loss program that involves reducing calorie intake along with greater physical activity should ensure they get maximum results by increasing their cellular **AMPK activity**.

**AMPK activation** can be accomplished with prescription drugs like **metformin** or by using a once-daily nutrient combination of standardized **extracts of *Gynostemma pentaphyllum* and *hesperidin***.

Convenient dosing of just one tablet daily will enable more maturing individuals to boost their cellular **AMPK**. ●

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



### Comparing AMPK-Boosting Nutrients to Metformin

**Metformin** is an antidiabetic **drug** that **Life Extension®** recommended to combat degenerative **aging** processes starting in February **1995**.

The most studied mechanism of **metformin** action is its ability to boost **AMPK activity**.

Research indicates that **hesperidin** yields significant **AMPK-activating** properties.

Extracts from the ***Gynostemma pentaphyllum*** plant have also demonstrated **AMPK-activating** effects.<sup>48,49</sup>

Combining ***Gynostemma pentaphyllum*** with ***hesperidin*** may promote a greater increase in **AMPK activity**. This has been suggested by **human** studies that show reduction in **abdominal adiposity** in response to supplementation with these nutrients individually.

### Some People Cannot Tolerate Metformin

Metformin causes **gastrointestinal** upset in some people, along with **vitamin B12** deficiency in those who do not supplement with B12.<sup>55</sup>

People with kidney, lung, cardiac, or significant liver impairment have been historically advised to use **metformin** with **caution**.<sup>56</sup>

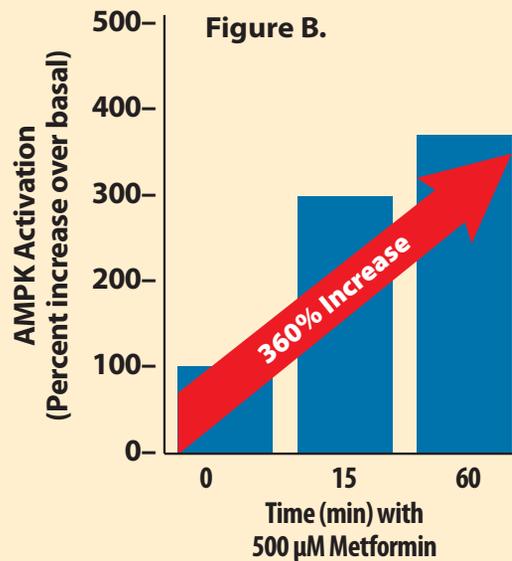
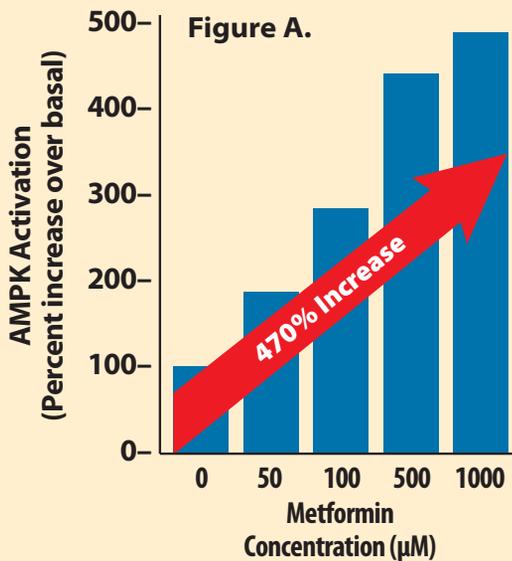
The reason is that metformin is safely removed from circulation via the kidneys. Those with pre-existing kidney/liver impairment, or severe circulatory deficit should monitor metformin dosing and blood markers of kidney/liver health.

Metformin cell-culture studies demonstrate that maximal **AMPK activation** occurs within concentration ranges

that metformin is expected to reach in plasma with oral doses of **690 mg** to **1,175 mg**. This dose is comparable to what many metformin users take today.

This means that those able to tolerate **metformin** should continue using it, but know there are alternative or additive benefits available with **plant extracts** that also activate **AMPK** without metformin's side effect concerns.

It may not yet be possible to fully restore **AMPK** to youthful ranges. Promoting optimal **AMPK** activation with drugs or nutrients provides intriguing potential to partially reverse this aspect of degenerative cell aging.



These charts show **metformin-stimulated AMPK activation** in cells in a concentration- and time-dependent manner.

**Figure A:** 100, 500 and 1000 µM of metformin resulted in greater than **two-fold** to nearly **five-fold** increase in **AMPK activity** that was statistically significant.

**Figure B:** Treatment of cells with **500 µM** of metformin revealed that maximal activation of AMPK is reached at 15 minutes and is maintained through at least 60 minutes.<sup>57</sup>

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#### References

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

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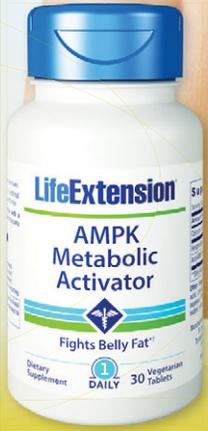
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# Probiotics Offer *Powerful* *Anti-Flu Defense*

A **2017** article in the journal *Frontiers of Immunology* described **influenza** as a leading cause of catastrophic disability in older adults.<sup>1</sup>

For some older adults, these infections, which are most common in the depths of winter, can be *life-threatening*.

Influenza and pneumonia are responsible for more than **57,000** US deaths annually.<sup>2</sup>

Conventional authorities recommend that older adults get a flu vaccine every year. But because of age-related decline in the immune system (called *immune senescence*), flu vaccines may not be enough to fight off viral infections on their own.<sup>3-5</sup>

Searching for an innovative way to reduce the risk of colds and flu, scientists have demonstrated that a specially formulated **probiotic cocktail** offers *targeted* prevention. It works to boost the body's immune defenses against the common cold and flu.<sup>6-8</sup>

Published studies show that these good bacteria significantly reduce the risk of getting upper respiratory tract infections, including colds and flus. And in those who do get sick, these probiotics reduce the severity and duration of the illness.

While anyone can benefit from additional immune support during cold and flu season, this potent probiotic defense is especially critical for elderly and immune-compromised individuals wishing to avoid potentially serious complications.

## Aging Makes the Flu Virus Potentially Deadly

The **influenza** virus can have a devastating impact on aging individuals.

At least **90%** of the flu-related deaths every year involve people over 65.<sup>9</sup> The flu *virus* can also boost the risk of secondary *bacterial* infections and can worsen preexisting medical problems.<sup>10-12</sup>

Most of those hospitalized for flu infections are older adults.<sup>13,14</sup> For this group, lengthy hospital stays pose additional health risks.<sup>15</sup>

In an effort to prevent the flu—and all of the risks associated with it—many older adults dutifully get a flu vaccine every winter. The problem is that the claimed effectiveness of the flu vaccine among aging adults is exaggerated.<sup>16</sup>

A very recent study found that the vaccine's effectiveness decreases as the degree of frailty (as measured by the Frailty Index) increases.<sup>17</sup> And while the vaccine works in **70%-90%** of young adults, that number drops to **17%-53%** in older adults.<sup>18</sup>

Fortunately, there's a way to boost your body's own defenses against the cold and flu—and it begins by taking care of your gut. Maintaining a healthy, balanced gut microbiome provides people of all ages with surprisingly strong protection against potentially deadly viruses such as cold and flu.

## Gut Bacteria Modulate Your Immune System

It's only been in recent years that scientists have come to recognize the importance of gut bacteria in modulating the immune system. More than **70%** of the human immune system resides in the gut.

In addition, the intestinal immune system contains more antibody-producing cells than the rest of the body put together.<sup>19</sup> As a result, fluid secreted from the digestive system (such as mucus and saliva) is as rich as breast milk in health-supporting and disease-preventing factors.<sup>20</sup>

A poorly functioning immune system is at the root of many conditions that aggressively target aging adults. For example, too little immune response makes us vulnerable to the infections that claim the lives of so many older adults. Yet a poorly balanced (overactive) immune system can produce **chronic inflammation**—contributing to a litany of age-related disorders such as diabetes, cancer, and metabolic syndrome.

**Probiotics** help restore the *balance* of your gut microbiome, and can strengthen its ability to interact with your immune system in many ways.<sup>21</sup> These friendly bacteria stimulate a healthy immune system, boosting populations of cells that seek out and destroy infecting organisms and cancers.<sup>22,23</sup>

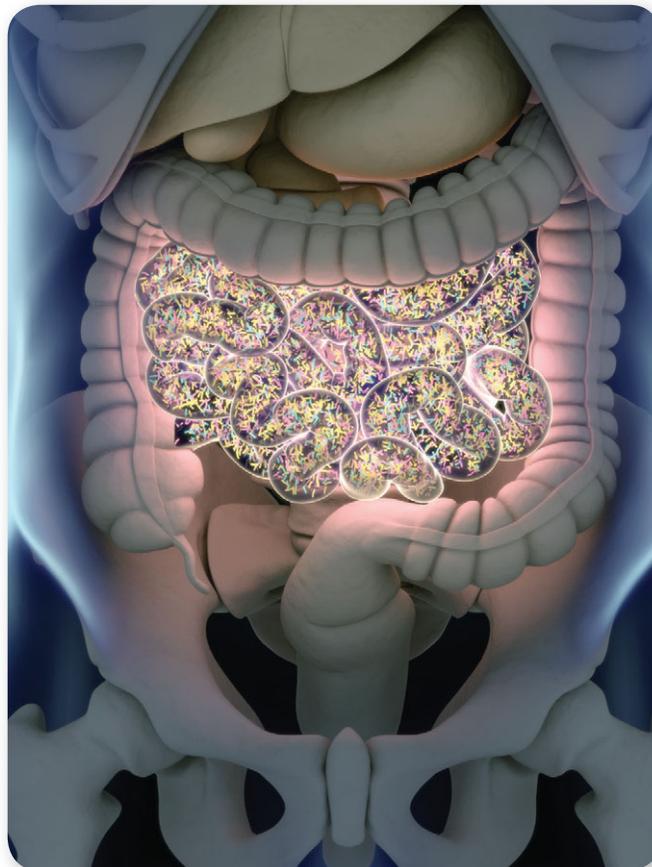
While probiotics promote immune balance and strength, scientists have found that a specific blend of unique probiotics is especially effective at blocking **flu, cold, and other respiratory viruses.**

## Supporting the Body's Secretory Immune System

Colds and flu are often treated with medications designed to reduce only the *symptoms* of these respiratory infections. These drugs can't activate the body's own immune response to fend off invading bacteria or viruses.

That's what makes **probiotics** different. Probiotics provide defense against the common cold and flu by activating the body's own immune response.

The immune system makes proteins called *antibodies* that fight bacteria, viruses, and toxins. One of the most common antibodies, called **secretory IgA** (immunoglobulin A), is found in mucous membranes. IgA acts as the body's built-in security system within mucous membranes that line the nose and upper respiratory tract.<sup>24-26</sup> When IgA levels are adequate, these antibodies can prevent cold and flu viruses from entering the body through the nasal mucous and respiratory tract.<sup>27</sup>





### Probiotics Block Virus Replication Cycle

Having adequate **IgA** levels is critical because these antibodies target both viral and bacterial invaders in the upper respiratory tract, deactivating them, and presenting them for destruction by the immune system. This IgA activity prevents cold and flu viruses from gaining a foothold and wreaking havoc on the respiratory tract.<sup>28</sup> Once a flu virus infects cells, it can then replicate out of control.<sup>29</sup>

To counteract this problem, researchers tested a unique **oral probiotic blend** designed to reduce the risk of respiratory infections by enhancing secretory immunity.

Secretory immunity is the production of specialized antibodies such as IgA in the mucous membranes lining the nose and portions of the windpipe and lungs.<sup>30</sup> By increasing IgA secretion and breaking the *virus replication cycle*, we can prevent colds, influenza, and other respiratory infections.

The ability of an immune-regulating probiotic cocktail to fight off microbes, including viruses that attack the respiratory tract, appears to be due to stimulation of IgA.

Several placebo-controlled, human clinical trials have demonstrated just how powerfully this unique probiotic blend works to prevent infection by cold and flu viruses.

## What You Need to Know

### Stop Colds and the Flu with Probiotics

- Flu and pneumonia kill more than 57,000 Americans each year, and aging adults are more susceptible to colds and flu—which can lead to pneumonia.
- More than 70% of the human immune system is found in the gut.
- Secretory IgA is a built-in security system present in mucosal membranes that line the nose and upper respiratory tract that can prevent cold and flu viruses from entering our bodies.
- Scientists have shown that six strains of orally ingested probiotic bacteria boost IgA production—enhancing immunity and blocking the virus replication cycle.
- Human trials show that specific probiotics reduce cold and flu-like infections, an effect that may be attributable in large part to increased IgA secretion.

### Unique Probiotic Blend Blocks Respiratory Infections

Of the six novel strains of probiotics that make up this respiratory infection-blocking cocktail, **five** strains were tested together in one clinical study:<sup>8</sup>

- *L. plantarum* (LP 01-LMG P-21021),
- *L. plantarum* (LP 02-LMG P-21020),
- *L. rhamnosus* (LR 04-DSM 16605),
- *L. rhamnosus* (LR 05-DSM 19739), and
- *B. lactis* (BS 01-LMG P-21384).

In a clinical trial during cold and flu season, 250 volunteers were randomly assigned to receive either a placebo or a mixture with these **five probiotic** strains. Over a period of 90 days, subjects reported daily on all diseases affecting their respiratory system, including cough, colds, bronchitis, or pneumonia, and how long they lasted. They also described their symptoms and the severity of the symptoms.<sup>8</sup>

Researchers classified these symptoms according to flu-like syndromes (those accompanied by fever), influenza-like illnesses, bronchitis-like diseases, upper respiratory tract infections, common cold, and cough without other symptoms.

Analysis of the data showed that taking these **five** strains of probiotics dramatically prevented both colds and flu, while also reducing the symptoms and duration of colds in those who did get sick. There were **16** cases of flu in the **placebo** group, compared to just **3** in the **probiotic** group.

In addition, taking the probiotic resulted in a:<sup>8</sup>

- **35% reduction** in the number of colds (20 episodes vs. 31 episodes)
- **22% reduction** in cold duration (4.7 days vs. 6 days)
- **39% reduction** in cough duration (4.5 days vs. 7.3 days)
- **25% reduction** in the number of days of acute upper respiratory infections (4.6 days vs. 6.1 days)

A similar study found that the **probiotic** cocktail resulted in a **48% decrease** in the number of flu episodes. And the number of days with flu symptoms dropped by a significant **55%**.<sup>6</sup>

## Fortifying the Probiotic Cocktail

Another group of scientists identified a **sixth** probiotic strain that provides further immune-stimulating effects, specifically among aging adults at risk for respiratory infections:<sup>7</sup>

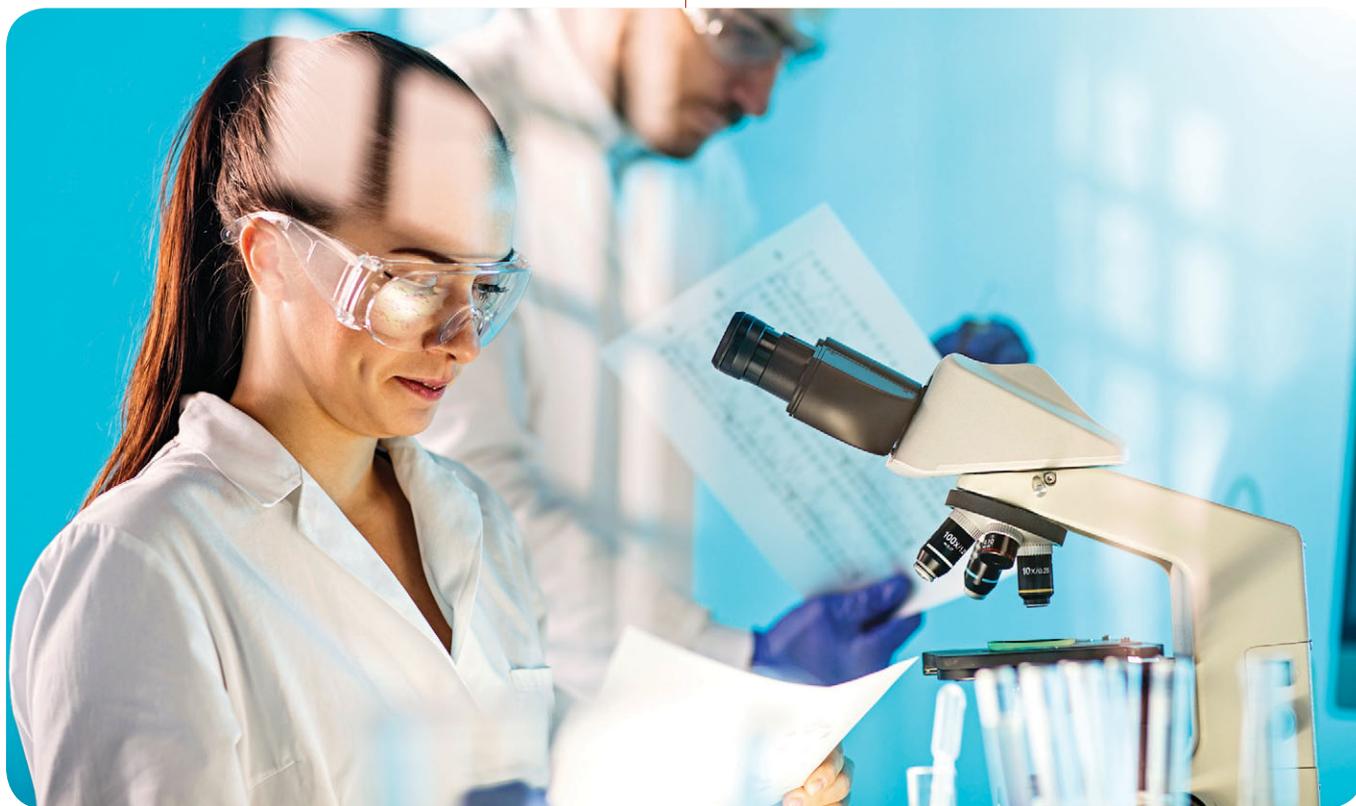
- *B. subtilis* CU1.

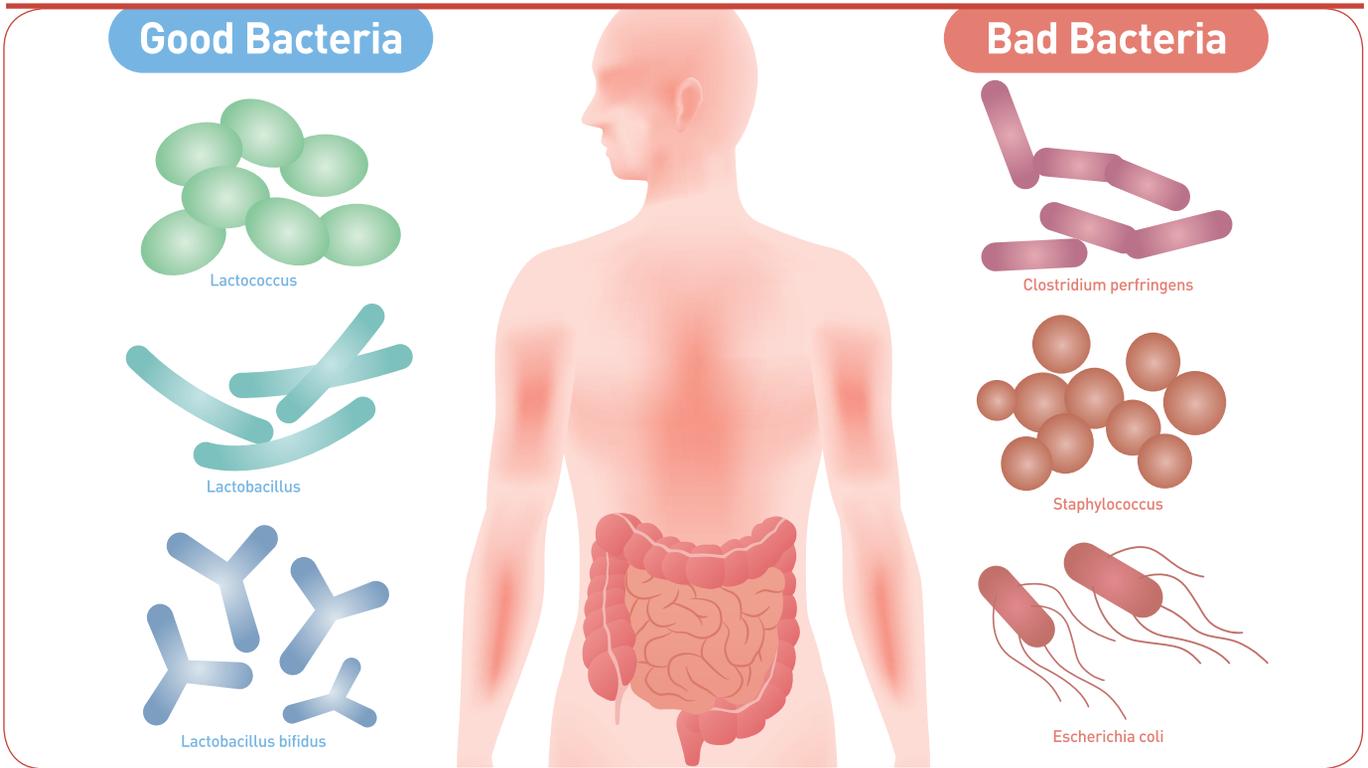
Researchers have very recently hypothesized that *Bacillus subtilis* generates potent **probiotic** effects, including “*the production of antimicrobials, stimulation of the immune system, and overall enhancement of gut microflora.*”<sup>31</sup>

Of all *Bacillus* bacteria, *B. subtilis* is the species known to produce the most **antimicrobial** compounds.<sup>32</sup> *B. subtilis* CU1 is a newly identified strain of this species, and it has been described as “*an effective probiotic in healthy elderly subjects.*”<sup>31</sup>

*B. subtilis* CU1 creates a natural protective shield that resists the acid in the stomach, which helps the probiotic stay alive until it reaches nonacidic conditions, lower in the digestive tract.<sup>33</sup> This probiotic strain can stimulate IgA secretion, which provides a critical mechanism for preventing respiratory infections.<sup>7,34</sup>

Scientists conducted a human clinical trial among healthy older adults during flu season in France. For the study, adults 60-74 years old were randomly assigned to receive either *B. subtilis* CU1 or a placebo. Participants





took one capsule daily, containing **two billion** microorganisms per capsule.<sup>7</sup>

The findings not only showed decreased respiratory infections—but also strongly suggested that increased IgA was at least partly responsible for the observed impact. Specifically, there was a:<sup>7</sup>

- **45% decrease** in respiratory infections, and
- **45% increase** in concentrations of IgA in subjects' saliva.

The increase in IgA levels and the corresponding decrease in respiratory infections prompted the authors to attribute these effects to the ability of *B. subtilis* CU1 to enhance systemic—as well as intestinal and respiratory mucosal—immune responses.<sup>7</sup>

No significant side effects were observed in either group.<sup>7</sup>

A later study was conducted specifically to evaluate the safety of *B. subtilis* CU1. Analysis of both *in vitro* and clinical studies demonstrated that this strain is non-pathogenic and non-toxicogenic. The study concluded that this strain of *B. subtilis* is “**safe and well-tolerated during repeated consumption in healthy elderly subjects**” and is “**therefore considered safe and suitable for use as a probiotic ingredient.**”<sup>31</sup>

These studies provide compelling evidence that these **six** probiotic strains specifically enhance the body's immune defense against upper respiratory tract infections—a particular risk for older adults who have reduced immune response.

### Summary

For aging adults, viral cold or flu infections can cause catastrophic disability and lead to bacterial infections such as pneumonia. Flu and pneumonia kill over 57,000 Americans each year.

Robust defenses against respiratory infection require optimal secretory immunity, which depends in large part on **antibodies** known as **IgA**.

Six specific strains of orally ingested **probiotic bacteria** have been shown to stimulate the body's production of IgA, which protects the delicate mucous membranes, and ultimately helps prevent the virus replication cycle.

Human studies demonstrate that using these six strains of bacteria can reduce the incidence of colds and flu-like illnesses, an effect largely attributable to enhanced levels of IgA. ●

### What Should You Do?

Most of our readers take a **probiotic** supplement for digestive and other health benefits.

For winter months, you may consider switching to an **immune-specific** probiotic that contains many of the same beneficial bacterial strains, plus additional ones that have shown robust results in recent clinical trials.

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

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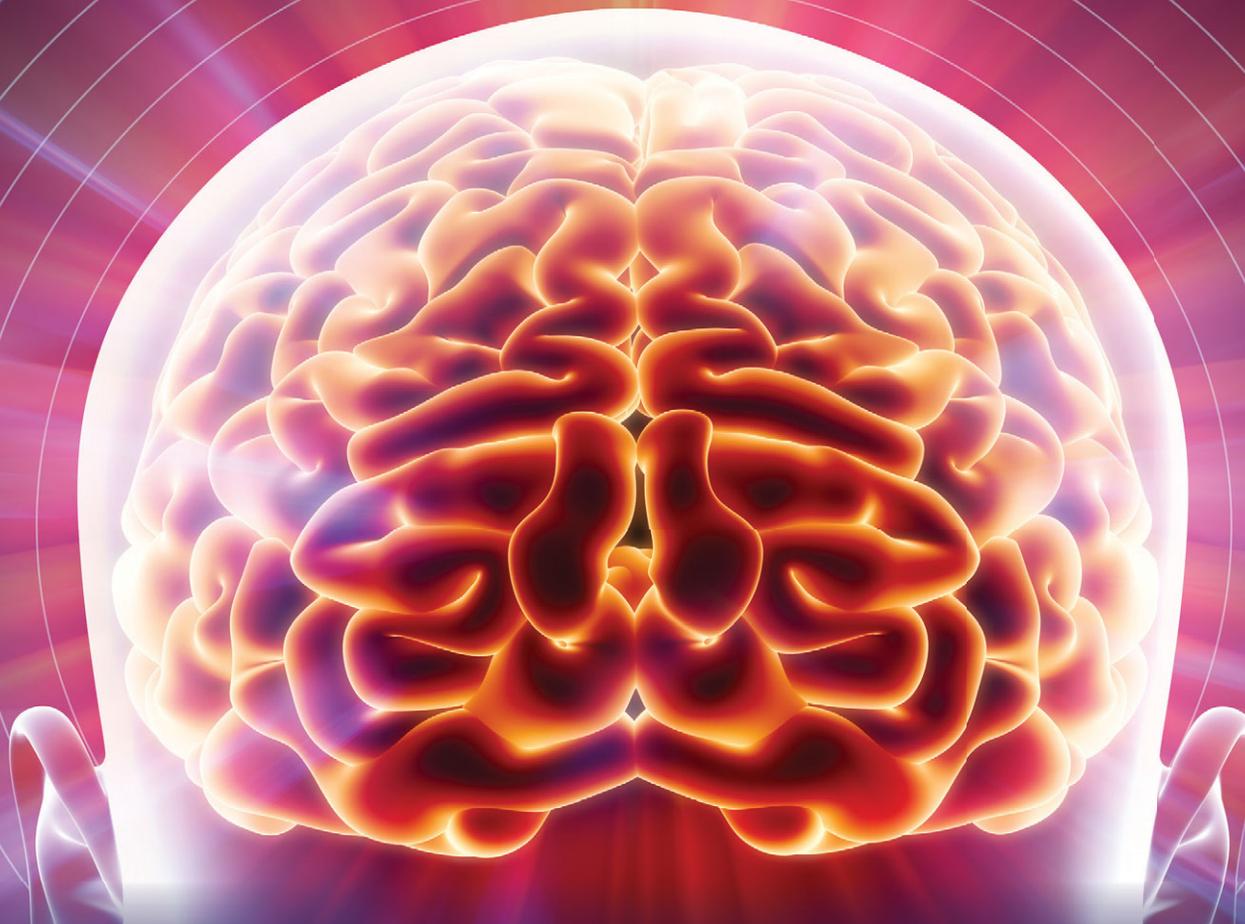


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BY STEPHEN HARRINGTON

# Anti-Aging Mechanisms of



# NAD<sup>+</sup>

Scientists are discovering new ways that **NAD<sup>+</sup>** facilitates healthy longevity.<sup>1-3</sup>

**NAD<sup>+</sup>** levels markedly **decline** with age, creating an energy deficit that decreases the body's ability to retain **youthful function**.<sup>4</sup>

To give you an idea how impactful **NAD<sup>+</sup>** can be, by age 50 a typical person may have only **half** the **NAD<sup>+</sup>** they did in youth. By age **80**, **NAD<sup>+</sup>** levels drop to only **1% to 10%** expressed in youth.

Deficiency of **NAD<sup>+</sup>** predisposes us to **accelerated aging** and impedes our ability to fully benefit from **resveratrol**.

Fortunately, it is easy to *restore* your cellular **NAD<sup>+</sup>** to higher ranges.

As a co-factor in cell **energy** transfer, **NAD<sup>+</sup>** plays a critical role in regulating aging processes.

**NAD<sup>+</sup>** is the acronym for **nicotinamide adenine dinucleotide**.

Found in virtually all living cells, **NAD<sup>+</sup>** is essential to sustaining life.<sup>4</sup>

A fascinating aspect of **NAD<sup>+</sup>** is its dual role in protecting against factors that age us. This includes mitigating chemical stress, inflammation, DNA damage, and failing mitochondria.

At the same time, **NAD<sup>+</sup>** promotes longevity by facilitating DNA repair and providing cellular benefits associated with caloric restriction and exercise.<sup>5</sup>

In other words, while a decline in **NAD<sup>+</sup>** levels may negatively influence lifespan, *restoring* **NAD<sup>+</sup>** is increasingly being viewed as a cutting-edge tool to promote longevity.

There is growing evidence that supplementing with a vitamin-like **precursor** of **NAD<sup>+</sup>** called **nicotinamide riboside** can promote longevity in life forms ranging from simple worms to mammals like mice.<sup>5-11</sup>

One study showed an average **5%** increase in the lifespan of old mice—even though supplementation did not begin until the mice were nearing the end of their natural lifespan (24 months).<sup>11</sup>

That would be the equivalent of gaining nearly an **additional four years** of life based on today's average human expectancy of **78.8 years**.<sup>12</sup>

A rigorous scientific review of **NAD<sup>+</sup>** reveals that its longevity benefits arise from eight different, but interrelated, functions.

This article briefly summarizes each **anti-aging** mechanism played by **NAD<sup>+</sup>** in your body.

### Anti-Aging Mechanism #1:

#### **NAD<sup>+</sup> May Contribute to Longer Telomeres**

NAD<sup>+</sup> is required for functioning of the *sirtuin* proteins that contribute to longevity—and specifically to maintaining the length of critical *telomeres*.

Telomeres are stretches of repetitive DNA strands that cap the ends of chromosomes. Like the burning of a fuse, telomeres at the ends of our chromosomes steadily shorten every time a cell replicates itself. Once telomeres reach a critically short length, **cell renewal** virtually stops, leading to accelerated aging or death of the cell.<sup>13</sup>

Telomere shortening is both a marker of cellular aging and a predictor of shortened lifespan.<sup>14</sup>

Researchers have been searching for drugs and other interventions that might lengthen telomeres, in order to extend lifespan and/or health span. To date, exercise and weight loss have been reliably shown to be effective at telomere lengthening.<sup>15-17</sup>

Certain other nutrients, such as **resveratrol**, may activate sirtuins and contribute to extending lifespan, but emerging evidence suggests sirtuins function best with an ample supply of NAD<sup>+</sup>.

**Conclusion:** The possibility of extending telomere length with NAD<sup>+</sup> holds out hope for slowing the aging process and improving longevity.

### Anti-Aging Mechanism #2:

#### **NAD<sup>+</sup> Promotes DNA Repair**

Even though DNA is protected by its chromosomal shelter, it is highly vulnerable to damage.

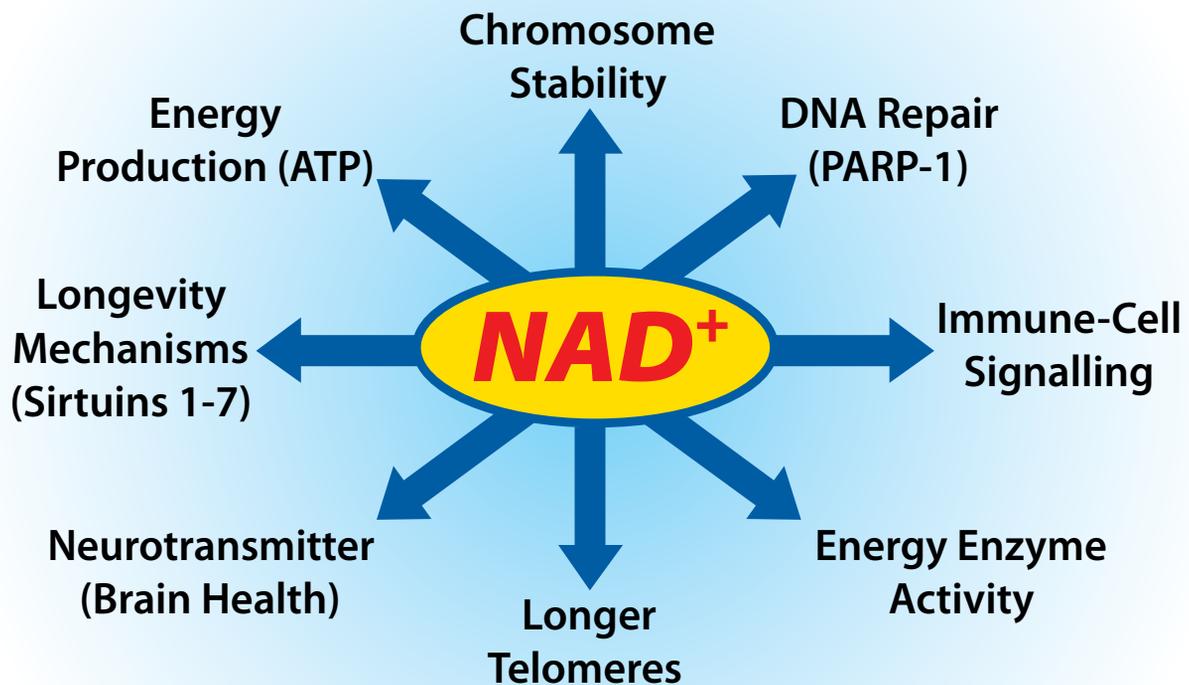
This can lead to broken DNA strands and mutations in crucial genes. Accumulated DNA damage contributes to the aging process and can result in specific lifespan-shortening diseases like cancer and poor immune function.<sup>18</sup>

When DNA is damaged, it activates an enzyme known as **PARP-1** that carries out **DNA repair** within cells.<sup>19</sup> To carry out its function, PARP-1 consumes enormous amounts of NAD<sup>+</sup>. As NAD<sup>+</sup> is depleted, the ability of PARP-1 to repair DNA is significantly hindered.<sup>19-28</sup>

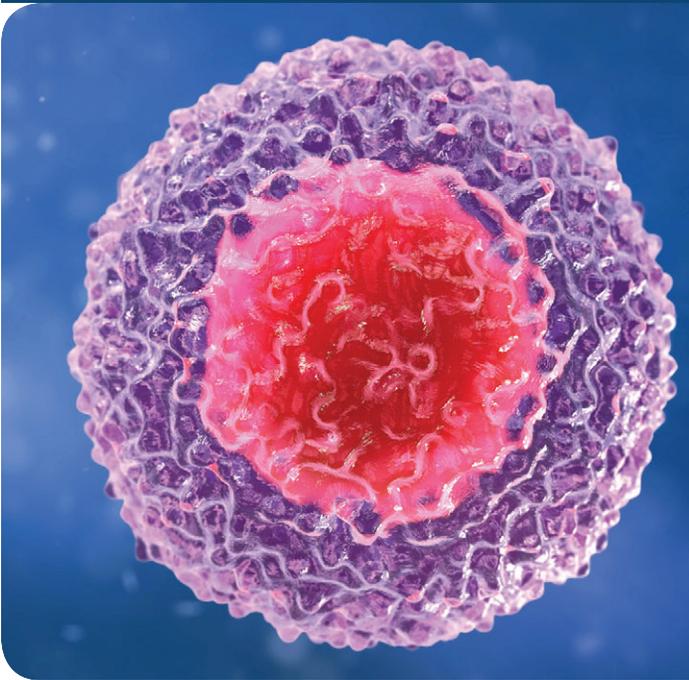
The good news is that replenishing NAD<sup>+</sup> to cells can restore **DNA repair** and prevent cell death under stress.<sup>26,29</sup> In two different animal models of neurodegenerative disease, increasing cellular NAD<sup>+</sup> reduced the severity of the disorder, normalized neuromuscular function, delayed memory loss, and **extended lifespan**.<sup>30</sup>

**Conclusion:** Improving DNA repair with NAD<sup>+</sup> may slow cellular aging, reduce the persistence of cancer-causing mutations, and play an important role in preventing inflammatory conditions such as atherosclerosis.<sup>31,32</sup>

## Life Sustaining Benefits of NAD<sup>+</sup>



With advanced age, cell NAD<sup>+</sup> levels plummet to near **zero**. Normal aging may one day be classified as "**NAD<sup>+</sup> deficiency syndrome**." Fortunately, there are proven ways to boost NAD<sup>+</sup> levels.



### Anti-Aging Mechanism #3:

#### **NAD<sup>+</sup> Modulates Immune-Cell Signaling**

As we age, our immune cells begin to lose their focus. Some become *overactive*, contributing to autoimmune disease, while others *slow down*, which increases the risk of infection. This process, called **immunosenescence**, is intimately related to mitochondrial function and energy balance,<sup>33</sup> both of which depend on NAD<sup>+</sup> activity.

Intracellular levels of NAD<sup>+</sup> regulate immune and inflammatory pathways, including the cytokine TNF-alpha, a critical signaling molecule.<sup>34,35</sup>

**Conclusion:** Adequate intracellular NAD<sup>+</sup> is vital for youthful cellular energy, a critically important factor in fending off immunosenescence and maintaining defenses against infections and autoimmune disease.

### Anti-Aging Mechanism #4:

#### **NAD<sup>+</sup> Induces Energy-Intensive Enzymes**

A universal feature of aging is the loss of cellular energy, which results in diminished ATP levels and inadequate cellular fuel necessary to power your body.<sup>23,36,37</sup>

One cause of this energy loss is a breakdown in the efficiency of the **electron transport chain**, the main pathway through which we extract energy from food (and of which NAD<sup>+</sup> is an essential component).<sup>23,38</sup> Disorders ranging from obesity and diabetes to bone loss have been associated with loss of this vital pathway.<sup>38,39</sup>

Studies now show that *restoring* electron transport chain function by raising levels of NAD<sup>+</sup> is a rapid and

## Restore Cellular Energy with NAD<sup>+</sup>

- NAD<sup>+</sup> is required for proper cellular energy utilization, but its levels decline with age.
- It is also required for eight fundamental processes, each of which contributes to accelerated aging when NAD<sup>+</sup> levels drop.
- NAD<sup>+</sup> is unstable and cannot be used as a supplement, but nicotinamide riboside is a useful precursor to NAD<sup>+</sup> that is capable of restoring cellular NAD<sup>+</sup> levels.
- Studies show that nicotinamide riboside supplementation can slow cellular aging and improve many of the metabolic defects common to the aging process, including obesity, diabetes, cardiovascular disease, and neurodegenerative conditions.
- Supplementation with nicotinamide riboside offers a way of supporting essential body systems.

efficient means of promoting the essential enzymes involved in energy extraction and sustaining youthful cell function. This helps to reduce physiological decline and provides protection from age-related disease.<sup>22,40</sup>

**Conclusion:** Improving the energy-extraction process in all cells with NAD<sup>+</sup> increases their capacity to do the work they are specialized for. It also protects mitochondria from early death, a benefit that is associated with reduced cellular aging and lowered risks for cardiovascular and brain disease.<sup>41-45</sup>

### Anti-Aging Mechanism #5:

#### **NAD<sup>+</sup> Promotes Chromosome Stability**

Our chromosomes are complex structures housing our DNA. Access to DNA strands for “reading out” genetic instructions requires biochemical control of those proteins to make sure each gene functions properly.<sup>46</sup>

But like any complex molecular structure, chromosomes can become *unstable*. Eventually, this triggers errors in the ways our genes are interpreted—which ultimately contributes to deleterious changes in cell function and structure. Aging is accelerated in the presence of increased chromosome instability.<sup>47-49</sup>

The enzymes involved in sustaining stable **chromosomal structures** require NAD<sup>+</sup> in order to function properly.

In animal models showing that NAD<sup>+</sup> contributes to longevity, a major factor has been shown to be sufficient availability of the nutrient.<sup>46,50,51</sup> And studies show that when enzymes that require NAD<sup>+</sup> are inactive, chromosome structure suffers and cells replicate abnormally.<sup>50</sup>

**Conclusion:** NAD<sup>+</sup> supplementation is a promising cutting edge strategy to improve chromosome stability, a treatment that may slow down cellular aging (**senescence**) and lower the risk of cancer.

### Anti-Aging Mechanism #6:

#### **NAD<sup>+</sup> Is a Neurotransmitter**

Neurotransmitters are brain chemicals that relay signals between nerve cells. In doing so, they help regulate body-wide functions such as mood, appetite, and stress.

NAD<sup>+</sup> has been found to meet all criteria for a neurotransmitter.<sup>52,53</sup>

Evidence for NAD<sup>+</sup>'s neurotransmitter function has now been found in intestinal and blood vessel smooth muscles, as well as in the brain itself.<sup>52</sup>

**Conclusion:** Ample NAD<sup>+</sup> nutrition appears essential for sustaining brain health.

### Anti-Aging Mechanism #7:

#### **NAD<sup>+</sup> Activates Sirtuins**

Proteins called **sirtuins** are major regulators of cellular aging because they influence fundamental functions such as DNA repair and inflammatory responses. They also influence whether cells enter a replicative cycle or instead die a programmed death (apoptosis).<sup>53</sup>

Compounds that activate sirtuins are eagerly sought as chemical "fountains of youth." Familiar supplements like **resveratrol** and quercetin have been evaluated as promising **sirtuin activators**.<sup>2,54-56</sup>

NAD<sup>+</sup> is required for **sirtuins** to function.<sup>57-59</sup>

**Conclusion:** Sirtuin activation has shown great promise in fighting cardiovascular disease and preserving aging brain function, but these longevity-promoters cannot function without sufficient NAD<sup>+</sup>.<sup>4,54</sup>

### Anti-Aging Mechanism #8:

#### **NAD<sup>+</sup> Supports Energy Production**

NAD<sup>+</sup> was first discovered as an important part of the process that channels chemical energy from foods to the ATP fuel our cells require. Recent studies have revealed that NAD<sup>+</sup> is *itself* a form of "energy currency" similar to ATP.<sup>60</sup>





NAD<sup>+</sup> is also a functional signaling molecule in processes related to energy production, including PARP-1 and sirtuins. When DNA damage occurs, PARP-1 consumes large quantities of NAD<sup>+</sup>, leading to reduced energy production. In addition, high levels of NAD<sup>+</sup> can activate sirtuins, permitting them to carry out their metabolic and stress-protective responses and contributing to longevity.<sup>23</sup>

**Conclusion:** Supporting efficient energy production and adequate ATP levels requires consistent and abundant NAD<sup>+</sup>. This is critical because waning energy supplies contribute to the aging process.

### How to Boost NAD<sup>+</sup>

NAD<sup>+</sup> is biologically unstable, which makes it unsuitable for oral supplementation. Fortunately, there's a solution.

About a decade ago, researchers discovered that the compound **nicotinamide riboside** is rapidly converted by natural cellular enzymes into **active** NAD<sup>+</sup>.

Studies show that supplementing with nicotinamide riboside is an effective means of raising cellular NAD<sup>+</sup> levels.<sup>6,22,61</sup>

Nicotinamide riboside is readily available for oral supplementation, and it is highly bioavailable.<sup>62</sup> These benefits make nicotinamide riboside the leading oral candidate to boost cellular NAD<sup>+</sup>, and research is revealing just how effective it is.<sup>63</sup>

### The Metabolic Benefits of Boosting NAD<sup>+</sup>

**Nicotinamide riboside** boosts NAD<sup>+</sup> and appears useful in preventing diseases associated with abnormal energy utilization. These include obesity, diabetes, and atherosclerosis, which are components of **metabolic syndrome**.

A mouse study revealed that prediabetic mice given **nicotinamide riboside** have better glucose tolerance, less weight gain and liver damage, and slower development of fatty livers. Similarly, in diabetic mice, nicotinamide riboside markedly reduced blood sugar, weight gain, and liver fat, while also preventing diabetic nerve damage.<sup>64</sup>

**Nicotinamide riboside** is especially beneficial in combatting nonalcoholic fatty liver disease (NAFLD), which is considered the liver manifestation of metabolic syndrome. Interventions that reduce NAFLD generally improve all-around metabolic health.

Studies in animal models of NAFLD have shown that nicotinamide riboside supplementation corrects biochemical and microscopic liver changes in mice fed a high-fat diet.<sup>65,66</sup>

In another study of obesity induced by a high-fat diet, supplementation with nicotinamide riboside increased NAD<sup>+</sup> levels, activated sirtuins, and protected against the oxidative stresses and other damage induced by the diet (many of NAD<sup>+</sup>'s longevity mechanisms mentioned above).<sup>22</sup>

## Additional NAD<sup>+</sup> Benefits

Brain tissue is highly sensitive to alterations in NAD<sup>+</sup> levels.<sup>67</sup> A mouse study showed that supplementation with nicotinamide riboside increased NAD<sup>+</sup> levels in the brain, slowed cognitive decline in mice with Alzheimer's, and enhanced the *plasticity* in neurons that underlies learning and memory.<sup>67</sup>

Regular exercise is a panacea for most of the age-accelerating processes in our bodies. Recent studies are showing that **nicotinamide riboside** helps improve exercise performance by improving **mitochondrial** dynamics and muscle function.<sup>68</sup>

And in animals that had undergone removal of part of their livers, researchers showed that nicotinamide riboside supplementation promoted new DNA synthesis, cell replication, and increased liver mass—a vivid demonstration of its healing powers.<sup>69</sup>

## Summary

**NAD<sup>+</sup>** beneficially enhances eight core cellular anti-aging mechanisms.

When these cell functions are impaired, the consequence is accelerated aging that contributes to disorders as diverse as Alzheimer's and osteoporosis.

Restoring cell NAD<sup>+</sup> levels has been shown to preserve youthful function—and even reverse some age-induced deterioration.

**Nicotinamide riboside** has been shown not only to restore NAD<sup>+</sup> levels in tissues, but also to provide more NAD<sup>+</sup> activity than can be obtained from diet alone.

Supplementation with **nicotinamide riboside** can slow cellular aging and improve many metabolic defects common to degenerative processes, including diabetes, declining heart function and neurodegenerative conditions. ●

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

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# BOOST BRAIN PERFORMANCE

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Cognitex® is designed to improve cerebral performance and supports brain and nervous system function.

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- Spatial short-term memory 42%
- Recall 15%
- Recognition 11%
- Attention 12%
- Visual learning 33%
- Activities of daily living by over 10%

### Cognitex® with Pregnenolone & Brain Shield® (Gastrodin)

Item #01897 • 90 softgels

|           | Retail Price | Super Sale Price    |
|-----------|--------------|---------------------|
| 1 bottle  | \$62         | <b>\$41.85</b>      |
| 4 bottles |              | <b>\$35.78 each</b> |

\* J Diet Suppl. 2011 Jun; 8(2):158-68

**Caution:** Do not take this product if you have breast cancer, prostate cancer, or other hormone-sensitive diseases. If you are taking anti-coagulant or anti-platelet medications, or have a bleeding disorder, consult with your health care provider before taking this product.

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# POWER UP!

## TURN ON YOUR CELLULAR ENERGY

**Optimized NAD<sup>+</sup> Cell Regenerator™** combines **250 mg of nicotinamide riboside** with **resveratrol** and other **plant extracts**.

For **resveratrol** to deliver functional results, it requires **NAD<sup>+</sup>**.

**NAD<sup>+</sup>** levels **plummet** with **age** but increase in response to **nicotinamide riboside**.

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



**Optimized NAD<sup>+</sup> Cell Regenerator™**  
Item #02145 • 30 vegetarian capsules

|           | Retail Price | Super Sale Price |
|-----------|--------------|------------------|
| 1 bottle  | \$50         | \$33.75          |
| 4 bottles |              | \$30.60 each     |

**NAD<sup>+</sup> Cell Regenerator™**  
Item #02144 • 30 vegetarian capsules

|           | Retail Price | Super Sale Price |
|-----------|--------------|------------------|
| 1 bottle  | \$42         | \$28.35          |
| 4 bottles |              | \$25.20 each     |



For full product description and to order **NAD<sup>+</sup> Cell Regenerator™** or **Optimized NAD<sup>+</sup> Cell Regenerator™ with Resveratrol**, call **1-800-544-4440** or visit **www.LifeExtension.com**

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**Upgraded Formula!**

# LIFE EXTENSION MIX™

*Tablets, Capsules, or Powder... Less Units to Swallow*

Few people consistently eat enough **plant** foods to protect against age-related decline.

Commercial multivitamins do not provide vital plant components needed for good health.<sup>1-3</sup>

**Life Extension Mix™** is superior to other multi-vitamins—partly because it provides a broad array of **fruit** and **vegetable** extracts.

Rounding this out are high-potency **vitamins, minerals, botanical extracts**, and more.

When **Life Extension Mix™** was launched in **1983**, it provided an efficient way to obtain critical nutrients in one formula.

**Life Extension Mix™** has been upgraded over the past **34 years** to reflect new findings in the scientific literature.

During **Super Sale**, the full dose can be obtained for as little as **\$1.20** a day!

**Life Extension Mix™** now provides **ashwagandha** extract, that is demonstrating new health benefits you will soon learn about.

The new **Life Extension Mix™** requires only **12** capsules/day (compared with 14 in its previous version) or just **8** tablets/day compared to previous 9 tablets!



**LIFE EXTENSION MIX™**  
240 TABLETS • ITEM #02254

|            | RETAIL PRICE<br>EACH BOTTLE | SUPER SALE<br>EACH BOTTLE |
|------------|-----------------------------|---------------------------|
| 1 BOTTLE   | \$74.00                     | \$49.95                   |
| 4 BOTTLES  |                             | \$43.20                   |
| 10 BOTTLES |                             | \$37.80                   |

The tablet version of Life Extension Mix™ contains **190 mg** of niacin and **1 mg** of copper per serving. There is an extra-niacin version that provides **862 mg** of niacin at no additional charge (02257). Niacin maintains healthy cholesterol, triglyceride, and fibrinogen levels in those within normal ranges. Those with underlying liver disease sometimes cannot tolerate niacin. The suggested dose is 8 tablets per day in divided doses with meals.



**LIFE EXTENSION MIX™**  
360 CAPSULES • ITEM #02254

|            | RETAIL PRICE<br>EACH BOTTLE | SUPER SALE<br>EACH BOTTLE |
|------------|-----------------------------|---------------------------|
| 1 BOTTLE   | \$78.00                     | \$52.65                   |
| 4 BOTTLES  |                             | \$45.00                   |
| 10 BOTTLES |                             | \$39.60                   |

The encapsulated version of Life Extension Mix™ used by many customers provides **1 mg** of copper. These capsules are also available without copper (02264). The suggested dosage is 12 capsules per day in divided doses with meals.



**LIFE EXTENSION MIX™**  
12.70 OZ POWDER • ITEM #02256

|            | RETAIL PRICE<br>EACH BOTTLE | SUPER SALE<br>EACH BOTTLE |
|------------|-----------------------------|---------------------------|
| 1 BOTTLE   | \$72.00                     | \$48.60                   |
| 4 BOTTLES  |                             | \$41.40                   |
| 10 BOTTLES |                             | \$36.00                   |

The powder version of Life Extension Mix™ contains **1 mg** of copper. The suggested dose is three scoops per day in divided doses with meals. Now with convenient measuring scoop that enables more precise dosing.

(No **soy allergens** in any **Life Extension Mix™** formula)

**For full product description and to order your supply of LIFE EXTENSION MIX™, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)**

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# The Most Complete Multivitamin

## BioActive Vitamins, Minerals, and Vegetable/Fruit Extracts

### Vegetable-Fruit Complex

|  |         |
|--|---------|
| Broccoli concentrate blend<br>(providing sulforaphane, glucosinolates, and D-glucarate)  | 725 mg  |
| Green tea extract (decaffeinated) (45% EGCG)   | 325 mg  |
| Ashwagandha extract (32% oligosaccharides, 10% glycoside conjugates)   | 125 mg  |
| Olive juice extract (providing polyphenols, hydroxytyrosol, tyrosol, oleuropein)   | 12.5 mg |
| Grape seed proanthocyanidin extract (Leucoselect®)   | 25 mg   |
| Grape (proanthocyanidin) extract (BioVin®)   | 25 mg   |
| Luteolin (from orange extract)   | 8 mg    |
| Lycopene from LycoBeads® (natural tomato extract)  | 3 mg    |
| Lutein (marigold extract) [465 mcg trans-zeaxanthin]   | 15 mg   |
| Silymarin from Milk thistle extract  | 100 mg  |
| Bromelain (from pineapple)   | 15 mg   |
| Citrus Bioflavonoids (50% hesperidin)  | 200 mg  |
| Acerola fruit extract 4:1  | 300 mg  |
| Bilberry extract (MirtoSelect®)  | 30 mg   |
| Pomegranate extract (30% punicalagins) (POMELLA®)  | 85 mg   |
| Sesame seed lignan extract   | 10 mg   |
| Fruit/Berry Complex blend<br>(proprietary blend of concentrated blackberry, blueberry, cherry, cranberry, elderberry, persimmon, plum powders) | 200 mg  |
| Wild Blueberry anthocyanin extract (fruit)   | 150 mg  |
| trans-Pterostilbene (from pTeroPure™)  | 0.5 mg  |
| Cyanidin-3-Glucoside (C3G) (from blackcurrant extract)   | 1.25 mg |
| CherryPure® Tart Cherry proanthocyanidin powder  | 85 mg   |
| Delphinidins (from Delphinol® Maqui berry [Aristotelia chilensis] extract)   | 2 mg    |
| Apigenin   | 5 mg    |

### Water-Soluble Vitamins and Enzymatic Activators

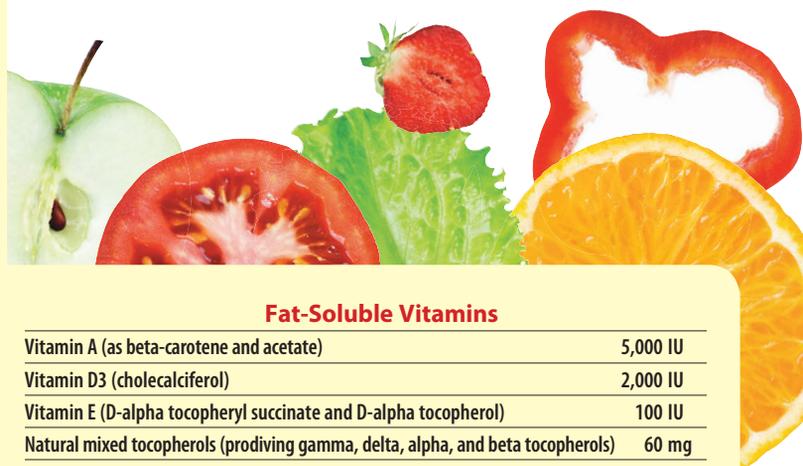
|   |                  |
|---|------------------|
| Vitamin C (ascorbic acid, calcium, magnesium & niacinamide ascorbates, ascorbyl palmitate, acerola extract) | 1,000 mg         |
| Folate (as L-5-methyltetrahydrofolate calcium salt)   | 400 mcg          |
| Biotin  | 3,000 mcg        |
| Trimethylglycine (TMG)  | 100 mg           |
| Vitamin B1 (thiamine HCl)   | 125 mg           |
| Vitamin B2 (riboflavin, riboflavin-5'-phosphate)<br>supplying: riboflavin 5'-phosphate                      | 50 mg<br>2 mg    |
| Vitamin B3 (niacinamide, niacin, niacinamide ascorbate)   | 190 mg           |
| Vitamin B5 (D-calcium pantothenate)<br>supplying: pantethine  | 600 mg<br>5 mg   |
| Vitamin B6 (as pyridoxal 5'-phosphate, pyridoxine HCl)<br>supplying: pyridoxal 5'-phosphate                 | 105 mg<br>100 mg |
| Vitamin B12 (methylcobalamin)   | 600 mcg          |
| Inositol  | 250 mg           |

### Here's how customers can obtain Life Extension Mix™ at substantial savings:

The retail price of a four-week supply of the new **Life Extension Mix™** (240 tablets) is **\$74**. The price for one bottle during **Super Sale** is **\$49.95**. (Item #02255)

If a customer buys four bottles, the price is reduced to **\$43.20** per bottle.

When a customer buys 10 bottles during **Super Sale**, the price goes down to just **\$37.80 per bottle**.



### Fat-Soluble Vitamins

|   |          |
|---|----------|
| Vitamin A (as beta-carotene and acetate)  | 5,000 IU |
| Vitamin D3 (cholecalciferol)  | 2,000 IU |
| Vitamin E (D-alpha tocopheryl succinate and D-alpha tocopherol)                 | 100 IU   |
| Natural mixed tocopherols (providing gamma, delta, alpha, and beta tocopherols) | 60 mg    |

### Amino Acid Complex

|                     |        |
|---------------------|--------|
| N-acetyl-L-cysteine | 600 mg |
| Taurine             | 200 mg |

### Mineral Complex

|   |         |
|---|---------|
| Magnesium (as magnesium oxide, arginate, citrate, taurinate, glycinate, ascorbate)          | 420 mg  |
| Calcium (as Calcium ascorbate, D-Calcium pantothenate, Ca D-glucarate, dicalcium phosphate) | 140 mg  |
| Selenium (from Se-methyl L-selenocysteine)  | 25 mcg  |
| Selenium (from SelenoExcell® high selenium yeast)   | 25 mcg  |
| Selenium (from sodium selenite)   | 150 mcg |
| Zinc (as zinc citrate, L-OptiZinc® zinc mono-L-methionine sulfate)                          | 35 mg   |
| Boron (as boron amino acid chelate)   | 3 mg    |
| Copper (as copper bisglycinate chelate TRAACS®)   | 1 mg    |
| Chromium as Crominex® 3+ chromium stabilized with Capros® and PrimaVie® Shilajit)           | 500 mcg |
| Potassium (as potassium citrate)  | 35 mg   |
| Molybdenum (as molybdenum amino acid chelate)   | 125 mcg |
| Manganese (as manganese gluconate, citrate)   | 1 mg    |
| Iodine (potassium iodide)   | 150 mcg |

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# Beyond Heart Health

## More Reasons to Take Fish Oil

Clinical trials have focused on the cardiovascular benefits of **omega-3** fatty acids derived from **fish oil**.

More recent data show the biological effects that **omega-3s** confer extend beyond cardiovascular issues and impact virtually every aspect of our health.

A meta-analysis published last year found that the **highest** consumption of **omega-3s** from fish oil was associated with a **14% reduction** in the risk of dying from *any* cause, compared to the lowest category of consumption.<sup>1</sup>

**Fish-oil** benefits range from improved cognition to reduction of metabolic disorders.

In this article, we describe recent studies that evaluate the effects of **fish oil** on **human** health and longevity.

## Fish Oil Reduces Death Rates

In **2017**, a study was published that looked at the effects of **fish-oil** ingestion on human **mortality** rates. The implications from this report pertain to us all.

This analysis revealed a significant **14% reduction** in the risk of dying from *any* cause in the group consuming the highest, versus the lowest amount of omega-3 fish oil.

Epidemiologists call this “all-cause mortality,” and it serves as an important metric in evaluating the overall effect of any intervention on lifespan.<sup>1</sup>

To study the longer-term effects of omega-3 consumption, the researchers combined data from more than **one million subjects** whose fish and fish-oil consumption had been evaluated in 23 separate studies. A separate sub-analysis of six studies involving over **400,000** participants yielded information on **omega-3** fats from **fish**, specifically.<sup>1</sup>

The researchers undertook this study to resolve lingering questions. Regular consumption of the major omega-3s in fish oil (EPA + DHA) has been found to reduce specific health threats like heart arrhythmias, and risk factors for disease and death, like endothelial dysfunction, lipid disturbances, and inflammation.<sup>2</sup>



Data on **all-cause mortality**, however, had been clouded by differences in study design and populations.<sup>1</sup>

In this **2017** published analysis, researchers found a modest but significant **6%** reduction in all-cause mortality risk among those eating the most fish compared with those having the lowest fish consumption.

That’s encouraging, but not everyone can manage the US government recommendations of two fish servings per week.<sup>3</sup>

For this reason, the researchers also evaluated the pooled data from six of the 23 studies relating to intake of the most relevant components of fish, the omega-3s **EPA** and **DHA**.<sup>1</sup>

They found a greater impact against the risk of dying from *any* cause among those subjects consuming the **most** omega-3s. They showed that all-cause mortality risk was **14% lower** in those consuming the most EPA/DHA. This is more than double the figure calculated for fish consumption alone.<sup>1</sup>

Further analysis revealed a **7%** reduction in overall risk of dying for each additional **200 mg** of **fish oil** consumed per day.<sup>1</sup>

From this enormous study, it is clear that people who consume more fish oil are at substantially lower risk of dying from any cause—a worthwhile finding in its own right.

But people die from specific causes that include cardiovascular disorders, obesity, diabetes, fatty liver, cancer, neurodegenerative diseases, and even major depression.

Underlying these degenerative conditions are pathological processes like **inflammation**, which we know is strongly associated with most age-related illnesses.

Here, we examine specific ailments that rob us of life quality, and, when severe enough, of life quantity as well.

## Anti-Inflammatory Fats

Studies have shown that omega-3 fatty acids like EPA and DHA have benefits in metabolic disorders such as obesity and diabetes, in neurological disorders like depression and Alzheimer’s, as well as in cancer and autoimmune disease.

Omega-3s favorably affect this wide variety of conditions because they reduce the body’s overall burden of **inflammation**.<sup>4</sup>

Chronic inflammation plays a key role in the diseases associated with aging.<sup>5</sup> By combatting inflammation, omega-3s help us combat numerous age-related issues.

This is especially evident in metabolic disorders.



## What You Need to Know

### The Many Benefits of Fish Oil

- Fish oils, rich in anti-inflammatory omega-3 fats, are well-established as cardioprotective nutrients.
- New evidence supports the benefits of omega-3 supplementation in a wide range of metabolic disorders, including obesity, diabetes, metabolic syndrome, and fatty liver disease.
- Omega-3s have been shown to help with depression and some types of dementia, perhaps largely through their powerful anti-inflammatory effects.
- Even cancer, autoimmune disease, and kidney disorders are showing signs of responding favorably to omega-3 supplements.
- Like many inflammation-fighting strategies, fish oil may work best before major clinical disease is evident, highlighting the importance of prevention.

### Metabolic Disorders

**Metabolic syndrome** is a cluster of conditions that includes some combination of high blood pressure, belly fat, high blood sugar, and abnormal lipid profiles. Metabolic syndrome is associated with a sharp increase of risk for heart disease, stroke, and diabetes.<sup>6</sup>

Omega-3 supplements show remarkable effects on the causes<sup>7</sup>—and the consequences—of **metabolic syndrome**. And one of the main driving forces behind metabolic syndrome is **obesity**.

Obesity is a major risk factor for chronic illnesses, in large part because in obese individuals, fat cells churn out massive amounts of inflammation-inducing proteins (called cytokines).<sup>8</sup> These cytokines play a role in promoting insulin resistance as well as two related diseases: non-alcoholic fatty **liver disease** and type II **diabetes**.<sup>9-12</sup>

Omega-3 oils from fish exert beneficial effects against obesity. A study published in **2016** concluded that fish-oil supplementation reduced waist circumference and blood pressure.<sup>13,14</sup>

Human studies confirm that supplementing with omega-3s each day may reduce weight, body mass index (BMI), waist/hip ratio, and total fat mass—when combined with sensible diet and exercise.<sup>15,16</sup>

Omega-3s achieve these effects through mechanisms that include enhancing oxygen consumption (indicating increased fuel-burning), boosting levels of the protective signaling molecule *adiponectin* (which mitigates insulin resistance and inflammation), and favorably modulating the gut microbiome.<sup>16-18</sup>

**Type II diabetes** is a common consequence of obesity, because the inflammation it causes leads to insulin resistance, high blood sugar, and worsening obesity—creating a vicious cycle.<sup>19</sup>

Fish-oil supplementation has been shown to have remarkable benefits in people with type II diabetes. These include decreasing fasting blood sugar, markers of sustained high blood sugar (e.g., hemoglobin A1c), and insulin requirements, as well as reducing episodes of dangerously low blood sugar.<sup>14,20</sup>

## Fatty Liver Disease

**Non-alcoholic fatty liver disease (NAFLD)** is a major consequence of obesity and diabetes that occurs when fat cells build up in the liver causing massive amounts of inflammation.<sup>21</sup>

When not properly controlled, NAFLD can progress to **non-alcoholic steatohepatitis (NASH)**, a more serious condition in which the liver becomes damaged or scarred.<sup>22</sup>

Human studies show that supplementing with omega-3s has substantial benefits in patients with the condition.

For example, omega-3s have been found to significantly improve liver blood flow, decrease deposits of liver fat, reduce liver enzyme levels in the blood (a marker of liver-cell injury), and lead to significant increases in insulin sensitivity.<sup>23-27</sup>

### Not All Fish-Oil Preparations Are the Same

Quality counts with all supplements, but it is especially critical when considering fish-oil.

The sources, processing, shipping, and final concentration of fish-oil products are critical indicators of their quality—and many fall short.

Before choosing a fish-oil supplement, you should consider two important categories:

1. Concentration and value
2. Freshness and sustainability

As an example, a readily-available commercial “natural fish oil” supplement sold at a major US pharmacy chain offers an enormous jar of softgels at an apparently reasonable price. But if you take a closer look, you’ll see that the recommended dose contains **3,600 mg** of “total fish oil,” but **only 1,080 mg** of “total omega-3” fats—and there are no details about exactly how much EPA and DHA is present.

That means that just **30%** of the **daily dose** may be composed of beneficial EPA/DHA.

To achieve desired intake, you would need to take six large softgels of the commercial product, risking fishy burps and other unpleasant side effects.

In addition, few major fish-oil distributors reveal their geographical location, the amount of processing, or the environmental impact of their operations. Many processing plants are located far from the harbors where fresh fish are brought. And few fish-oil operations are owned or operated by the fishermen who bring home the harvest, limiting their personal and ethical investments in the product.

#### A High-Quality Fish Oil

A partnership between a “lipid technology” expert and the two largest fishing companies in Chile (a major source of ocean fish worldwide) began active production in 2012.<sup>56</sup>

This partnership has a pilot processing plant on-site, where fishing boats arrive daily to unload the freshest possible catch. The operation has a tiny ecological footprint and is in compliance with the very latest sustainable fisheries recommendations and certifications.

Achieving a high concentration of the active EPA and DHA forms of omega-3 is a *priority*. At their new seaside plant, fish are harvested, and oil is extracted with a process called **selective crystallization**, which achieves final concentrations of EPA and DHA in the range of **60% to 85% of the product** (compared with **30%** in most commercial products). This high concentration means smaller softgels are packed with more essential omega-3 fatty acids.

A daily dose of the new fish-oil composition (two softgels, taken twice daily with meals), provides a total **3,580 mg** of fish oil that supplies **1,500 mg** EPA and **1,000 mg** DHA. That means **70% of the daily dose is composed of the beneficial omega-3 fats**.

**Omega-3s** are a virtual necessity for sustaining heart, brain, and overall body health. Choose fish oil as selectively as you would choose fish for the table—wholesome, sustainably harvested, and fresh.



Studies also show an over **98% reduction** in the risk of having more severe liver disease after treatment with **DHA**, compared with a placebo group.<sup>27,28</sup>

One study also showed that omega-3 supplementation not only slowed the progression of NAFLD to NASH, but **reversed** some of the structural damage that had already occurred in the liver.<sup>29</sup> This is a landmark finding, considering this type of liver damage is considered *irreversible*.

Finally, in a **2017** review of clinical trials in which NAFLD was treated with fish-oil supplementation, 12 separate trials reported **decreased liver fat** or other markers of NAFLD. The authors suggested that longer treatment duration and improved patient compliance may be important factors for success.<sup>30</sup>

### Powerful Brain Protection

Omega-3s play vital roles in the brain's very structure and function.<sup>31-34</sup>

The amount of omega-3 fats in the brain dwindles as we age.<sup>35</sup> This leads to losses of brain **plasticity**, which is the ability to rapidly form new connections and retain new impressions and memories.<sup>33</sup> It is also correlated with the diminished ability to use glucose as fuel—an energy deficit that has been linked to mental slowing and neurological impairment.<sup>34</sup>

The good news is that supplementing with omega-3s can favorably alter brain structure and function. And what's more, supplementing with omega-3s improves age-related conditions associated with inflammatory changes, such as memory impairments and Alzheimer's.<sup>36-38</sup>

### Combat Cognitive Impairment

Cognitive impairment, **dementia**, and **neurodegenerative diseases** are now recognized as inflammatory conditions.

The inflammatory changes may begin years—perhaps *decades*—before symptoms occur,<sup>36-38</sup> which reinforces the importance of supplementing with **fish oil** *before* major symptoms arise.

For example, in a study of adults with mild cognitive impairment (which often precedes dementia), a daily supplement of **720 mg EPA/480 mg DHA** improved basic cognitive aptitude, speed of perception, and working memory compared with people receiving a **placebo**.<sup>39</sup>

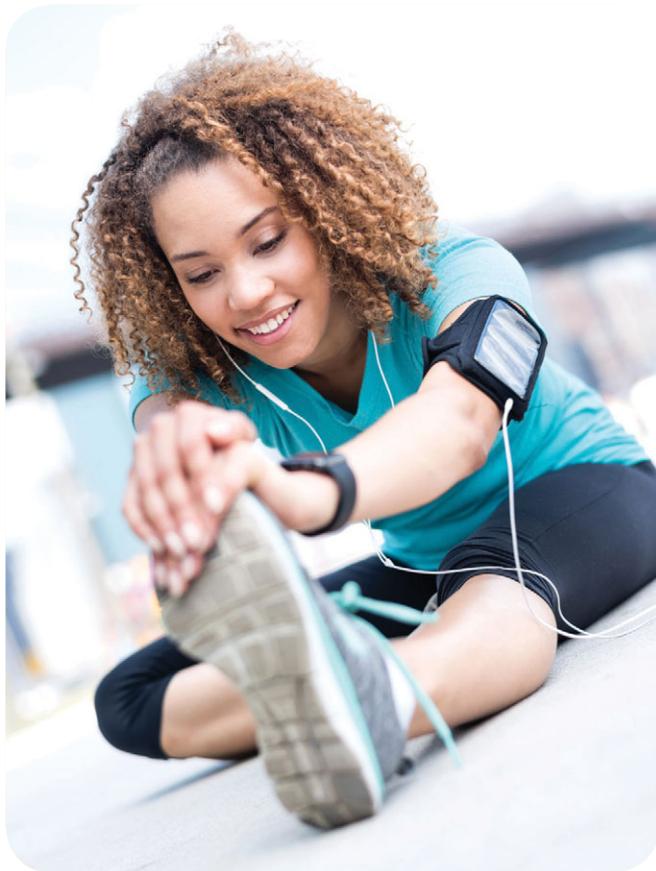
In a study of healthy adults between 50 and 75 years old, supplementation with **1,320 mg EPA/880 mg DHA** daily for 26 weeks improved **memory performance** and ability to recall object locations.<sup>38</sup>

### Late-Breaking Findings on Omega-3 Fats

New studies on omega-3 fats suggest still more mechanisms of action—and ultimately more roles for these versatile nutrients in preventing disease and promoting good health. Here is a summary of their findings:

- The long-chain omega-6 and omega-3 fatty acids are molecular precursors of the endocannabinoid signaling compounds.<sup>57</sup> The brain-signaling *endocannabinoid system* is involved in regulation of appetite, pain sensation, mood, and memory.<sup>58</sup>
- Blood levels of total omega-3 and DHA fats are strongly correlated with diversity in the **gut microbiome**, the intestinal community of microbes that is intimately related to our health.<sup>59</sup> Greater diversity is nearly always associated with greater disease resistance and better health.
- In a further exploration of relationships between omega-3 fats and the microbiome, researchers leveraged omega-3's anti-inflammatory powers, coupling them with a probiotic formulation to reduce the inflammation-induced side effects of chemotherapy.<sup>60</sup> In a group of patients with colorectal cancer, this approach improved quality of life, relieved some chemotherapy side effects, and reduced key markers of inflammation.





### Defeat Depression

Depression comes in many different forms and can arise for any number of reasons. Studies consistently show that omega-3s have benefits against depression, regardless of the cause.

For example, one study evaluated the impact of omega-3s on women with major depression associated with menopause. After eight weeks of taking **930 mg EPA/750 mg DHA** daily, the average standardized depression score fell by **56%**.

Even more compelling data from this same study showed that **45%** of participants reported feeling normal and experiencing no depression by the end of the trial.<sup>40</sup> As an added benefit, the women experienced a reduction in the frequency of hot flashes with supplementation.

In a more recent study, young adults with symptoms of depression were randomly assigned to take either a placebo or **1,000 mg EPA/400 mg DHA** daily.<sup>41</sup> After just 21 days, scores on the depression inventory (a self-reported test that measures the *severity* of depression) fell significantly in supplemented subjects, but not in the placebo group. This study found that **67%** of the patients taking omega-3s “no longer met the criteria for being depressed.”<sup>41</sup>

A human and an animal study both suggest that the antidepressant effects of fish oil/omega-3s may be a result of **anti-inflammatory** activity.<sup>42,43</sup>

### Additional Omega-3 Benefits

The ability of omega-3 fats/fish oil to fight inflammation and induce favorable gene expressions in various tissues is now attracting the attention of researchers in virtually all fields of medicine.

Here are just a few highlights of some recent studies:

- **Cancer** is highly dependent on inflammatory changes for its promotion once a malignant cell has developed.<sup>44-46</sup> Animal and human studies are revealing multiple ways in which omega-3 fats may quell cancer-associated inflammation, with far-reaching effects, in colorectal, breast, pancreatic, and blood system cancers.<sup>47-50</sup>
- **Autoimmune diseases** are a group of destructive disorders characterized by out-of-control inflammation and the immune system attacking one’s own tissues. These conditions are relatively common in the elderly. Current treatments are less than adequate, often requiring high doses of immunosuppressive drugs. A pair of studies has shown impressive results of fish oil/omega-3 supplementation in patients with rheumatoid arthritis, a notoriously painful autoimmune disease for which conventional treatments can be highly problematic.<sup>51-53</sup>
- **Chronic kidney disease** and its progression are closely linked with high levels of inflammation, making it an ideal target for omega-3 intervention. Two recent papers examined the role of omega-3 supplementation in chronic kidney disease. One showed that omega-3 fats were an effective solution for one of the most frustrating and even disabling symptoms of this disease, chronic itching, also known as pruritus. In another study, omega-3 supplementation resulted in longer **telomeres**, which are the longevity-associated chromosomal “clocks” that shorten as we age.<sup>54,55</sup>

These findings are almost certainly the tip of a very large iceberg, as researchers pursue potential benefits of omega-3s in a host of inflammation-related disorders.

## Summary

Peer-reviewed published studies continue to document the anti-inflammatory value of omega-3 supplements in some of the most troubling symptoms and chronic diseases of aging.

Metabolic disorders such as obesity, diabetes, and fatty liver are yielding to treatment with omega-3s, as are numerous brain-related conditions including major depression and dementia.

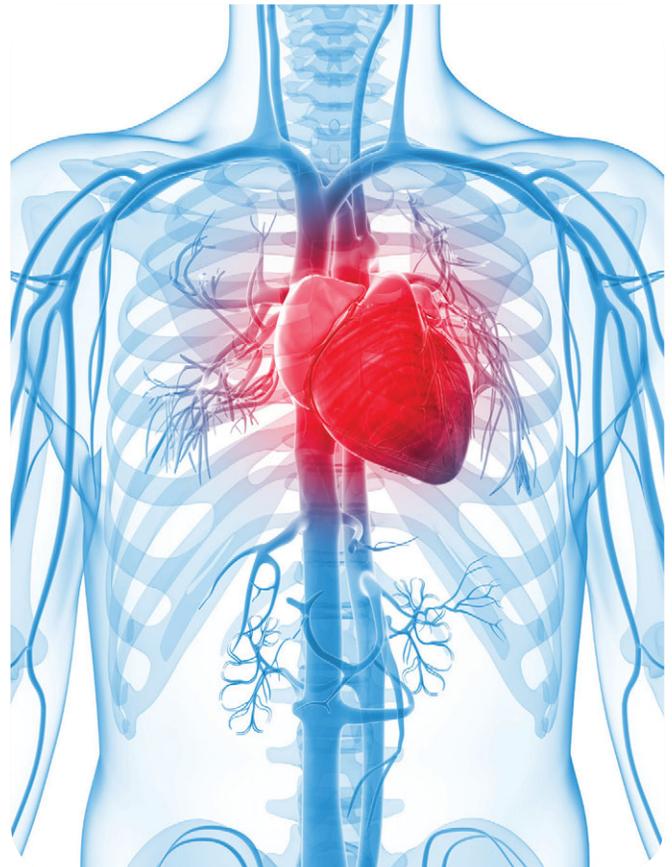
Evidence is also accumulating about roles of omega-3s in inflammation-dependent conditions such as cancer, autoimmune disease, and chronic kidney disease.

Supplementing with fish oil ensures you remain on the higher end of the omega-3 scale that has been shown to reduce human mortality rates, along with many chronic conditions of older age. ●

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

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The **wild green oat extract** in **Dopa-Mind™** is for aging individuals who wish to:

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#### References

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## Dopa-Mind™

Item #02006 • 60 vegetarian tablets

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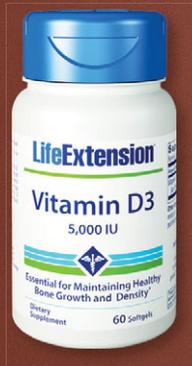
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# Green Tea

## Protects Against Colorectal Cancer

**Colorectal cancers** are the third most common cancer that affects both men and women, and the second leading cause of cancer-related deaths in the US.<sup>1</sup>

The numbers of deaths have been declining in recent years, thanks to early screenings and **colonoscopies**.

More can be done to help prevent the 50,000 deaths attributable to colorectal cancer yearly.<sup>2</sup>

One of the most promising discoveries is that **green tea** and its most active polyphenol constituent, **epigallocatechin gallate** (EGCG) has potent actions against colorectal cancer.

In the past year, new research findings have been published on green tea's effects on colorectal cancer.

Together, these studies tell a compelling story about green tea's potential cancer-preventive properties.



## Green Tea vs. Colorectal Cancer

Researchers decided to pool data from dozens of studies that evaluate green-tea consumption and the risk for colorectal cancers.<sup>3</sup>

Published in 2017, this ambitious study combined 29 separate epidemiological studies, with a total of more than **1.6 million** individuals.

This meta-analysis had two main findings:

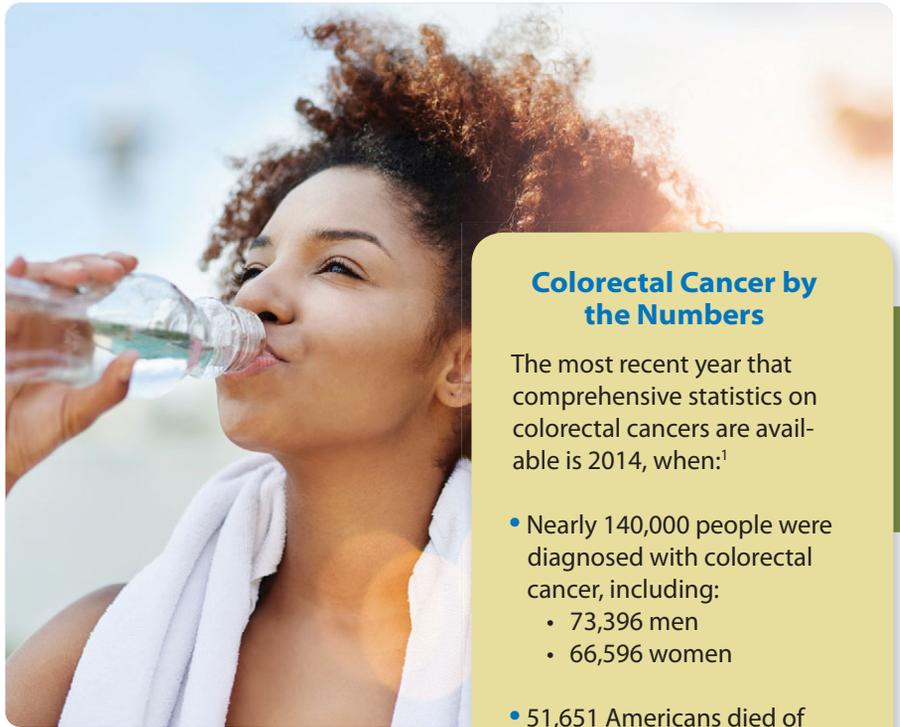
- First, it **showed** that green tea consumption is associated with protection against colorectal cancers, demonstrating a **7%** overall reduction in risk.<sup>3</sup>
- The second finding showed that among female green-tea drinkers, for every cup per day of tea consumed, colorectal cancer risk was reduced by **32%**. This established a dose-response relationship—meaning the more you drink, the more protection you get.<sup>3</sup>

This large study helps clarify green tea's association with colorectal cancer protection in humans.

## Animal Studies Show Cancer Reduction

In an effort to better understand the impact of green tea on reducing the risk of colon cancer, researchers designed two studies with mice. Both sought to determine whether green tea reduced the presence of tumors in the colon.

The scientists conducting the first study had already shown that a green tea polyphenol extract significantly *inhibited the formation* of precancerous lesions in the colon.<sup>4</sup>



## Colorectal Cancer by the Numbers

The most recent year that comprehensive statistics on colorectal cancers are available is 2014, when:<sup>1</sup>

- Nearly 140,000 people were diagnosed with colorectal cancer, including:
  - 73,396 men
  - 66,596 women
- 51,651 Americans died of colorectal cancer, including:
  - 27,134 men and
  - 24,517 women

The good news is that rates of both colorectal cancer incidence and mortality have been gradually falling, but only by around **3%** per year overall.<sup>14</sup> This is largely attributable to increasing rates of screenings and colonoscopies.

Next, they wanted to assess green-tea extract's impact on colorectal tumors themselves. To determine this, they treated rats with a chemical that induces colorectal cancer.<sup>4</sup> The rats were also fed a high-fat diet, which is known to promote colorectal cancers.

Half the animals were supplemented with green-tea polyphenol extracts for 34 weeks, while the other half served as unsupplemented controls.<sup>4</sup>

The study showed that, while most of the **control animals** developed colorectal cancers, significantly fewer of the supplemented rats did.<sup>4</sup>

And of the supplemented animals that did develop tumors,

- there were **55%** fewer tumors in each animal,
- the tumors were **45%** smaller,
- and the tumors that did develop were more likely to be benign than malignant.<sup>4</sup>

In addition to these direct impacts on tumors, the green-tea polyphenol extract had numerous other anti-cancer benefits.

For example, the supplemented animals had significantly lower levels of pro-inflammatory signaling molecules, lower expression of a tumor-promoting gene regulator called *beta-catenin*, and higher levels of tumor-cell death.<sup>4</sup>

This study establishes that green tea polyphenols prevent inflammation-promoted colorectal cancers in a standard animal model.

### Diminishing the Diet/Cancer Connection

The second animal study demonstrated a property of green-tea extract that is particularly important for today's American population because it diminishes the impact that poor diet has on cancer.<sup>5</sup>

Once again, the mice in this study were given a cancer-inducing chemical and then treated with a green-tea extract. This study found that green-tea extract reduced the occurrence of precancerous lesions.

And it was found to be even **more** effective in the group of mice fed a typical western diet high in fat and simple sugars. It also prevented weight gain and fasting glucose elevations only in that "poor diet" group. This was a key finding because these kinds of poor dietary choices are linked to increased cancer risk through increased insulin production and chronic inflammation.<sup>6,7</sup>

So green-tea extracts appear capable of helping to overcome the harmful impact of poor dietary habits on the promotion of colorectal cancers—truly encouraging news.

### Study Affirms Green Tea's Colorectal Cancer Prevention

A new study not only validates the findings from epidemiological and animal studies, it also provides insight into **how** green tea protects against colorectal cancers.

First, in a basic lab study, researchers showed that the green tea polyphenol EGCG suppressed the activity of deadly colorectal **cancer stem cells**.<sup>8</sup>

Like all stem cells, cancer stem cells are extremely robust. And

because they divide infrequently, they are relatively resistant to chemo- and radiation therapies. Cancer stem cells are widely held to be responsible for the recurrence of treated cancers, functioning in essence as malignant "seeds" that can restart the malignant process even after the bulk of a tumor has been destroyed.<sup>9-11</sup>

The way EGCG suppressed cancer stem cells was by downregulating a fundamental signaling pathway called **Wnt/beta-catenin**.<sup>8</sup> This pathway is crucial in controlling the development of stem cells into functioning cells in tissues. Abnormal activation of the Wnt/beta-catenin pathway is a potent cancer promoter.<sup>12,13</sup>

This pathway is already a target for pharmaceutical drug developers. Now, the authors of this study suggest that EGCG's ability to suppress this signaling pathway could make it a promising agent for colorectal cancer intervention.<sup>8</sup>

### Follow the Logic

It's nearly impossible to perform a human study demonstrating direct reduction in cancer occurrence because it would be unethical to expose human subjects to cancer-inducing chemicals. But scientists often use logic chains to draw strong conclusions about the likelihood that a substance—in this case, **green tea**—will have similar protective effects in humans as demonstrated in animal studies.

The logic here is powerful:

1. People who drink larger amounts of green tea have lower rates of cancer than those who drink less.
2. Animals that are given green tea and then exposed to cancer-causing chemicals develop fewer and smaller cancers when treated with green-tea extracts.



3. Those green tea-treated animals demonstrate significant reductions in known tumor-promoting pathways and signaling molecules that occur in humans as well.
4. Humans supplemented with green tea extracts demonstrate similar changes in the identical pathways, indicating a reduction in colorectal cancer risk produced by green tea.

## Summary

Evidence has been growing for years that green tea and its principal constituent, EGCG, have cancer-preventive effects.

Recent published studies now provide compelling evidence not only that such an effect exists, but also showing how it works.

In addition to regular screening, green-tea extracts appear capable of reducing the risk of colorectal cancer. ●

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

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- Boost brain function<sup>4</sup>
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- Maintain healthy cholesterol levels already within normal range<sup>6</sup>

Each cost-effective bottle lasts over three months!

#### References

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#### Mega Green Tea Extract Decaffeinated

Item #00954 • 100 vegetarian capsules

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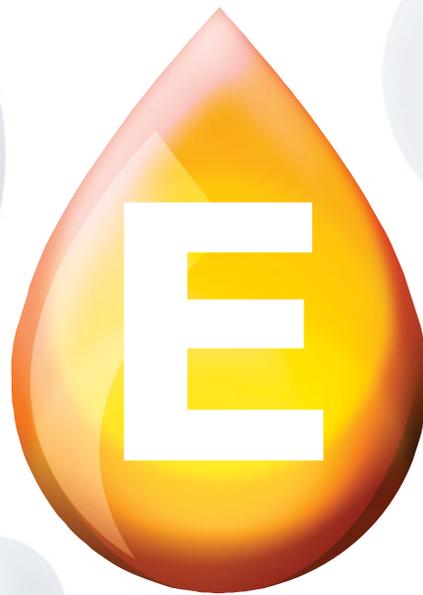


Note: **EGCG** is the acronym for **epigallocatechin gallate**, which is the polyphenol in green tea that has demonstrated the most robust health benefits.



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

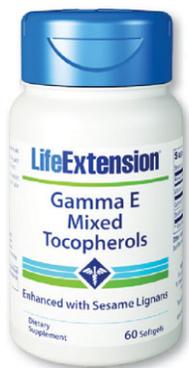
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# Lentils

BY GARRY MESSICK

Lentils are seeds that grow in pods, and are a part of the legume family of foods, which also includes peanuts, beans, peas, and chickpeas. They come in a variety of shapes and colors and are a staple in the cuisine of Asia and the Middle East. Often eaten in soups, salads, and stews, lentils are a remarkably nutritious food and it's a good idea to include them in a healthy diet regimen due to their numerous health benefits. For instance...

## Weight Management

Lentils are a good food for weight-loss, because they are abundant in soluble fiber, which helps satisfy hunger and keeps you feeling full.

Research has consistently found a link between high consumption of pulses (seeds, including lentils) and healthy body weight. Pulse intake is inversely related to obesity risk and a high body mass index.<sup>1</sup>

## Blood Sugar

The fiber content also helps stabilize blood glucose levels by slowing absorption of carbohydrates, as well as promoting regularity and keeping constipation and irritable bowel syndrome at bay.<sup>2,3</sup>

## Gut Bacteria

Moreover, the soluble fiber provided by lentils helps promote the growth of healthy bacteria that are essential for the digestive tract.<sup>3</sup>

Black, brown, and green lentils are the varieties that provide the most fiber, because they come with intact husks.

## Cholesterol Reduction

A review of 26 US and Canadian studies that included a total of more than 1,000 subjects found that a three-quarter-cup serving of legumes such as lentils was linked to a significant **5%** reduction in LDL cholesterol.<sup>4</sup>

Doctors such as internist Robert Graham, MD, have expressed enthusiasm for the results.

*"By making a small dietary change, such as consuming one serving a day of beans, chickpeas, lentils, and peas—as most of the world does already—we can make a modest risk reduction in our incidence of heart disease by lowering our 'bad cholesterol' LDL, especially in men,"*<sup>5</sup> said Dr. Graham.

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# Lisa Bartoli, DO,

Fellow of the American  
Osteopathic College of  
Physical Medicine & Rehabilitation

BY JON VANZILE

Lisa Bartoli, DO, specializes in putting people back in motion.

From her days working with Olympic athletes to her clinic in New York City, Dr. Bartoli has built an innovative practice treating musculoskeletal pain and sports injuries. Her comprehensive approach to pain management earned her a position as medical director and team physician for USA Women's Rugby, where she helped elite Olympic athletes prevent injuries and rehabilitate from injuries. Now in private practice, she has adapted her approach to treat a whole new group of patients: "regular" people dealing with pain and injury.

"My practice is all about maintaining function, whether it's an elite athlete or a 90-year-old patient," Bartoli says. "My treatment approach is influenced by my osteopathic training and my fellowship training in integrative medicine. We're taught to view patients from a mind, body, and spiritual perspective. We look at the whole patient and help them be successful."



Lisa Bartoli (far left) at the 2016 Rio Olympics with sports-medicine colleagues Jared Siegmund and Nicole Titmas. The trio worked with the US women's rugby team.

### Acute Injuries and Long-Term Protection

Patients who show up in Dr. Bartoli's office are often suffering from an acute, sports-related injury—or the recurrent symptoms of an old injury that has cropped back up and is causing trouble.

In this situation, many doctors turn first to powerful painkillers and anti-inflammatories. But Dr. Bartoli is careful not to take drastic steps that would interfere with the body's natural healing processes.

"For an acute musculoskeletal injury, we try to avoid NSAIDs for the first 72 hours," she said. "You want that inflammatory cascade. It's a natural part of the healing process and it's important."

Instead, she'll use homeopathic topical treatments like Traumeel® or Topricin®, arnica-based creams that quickly relieve soreness, or acupuncture to reduce the immediate pain and let the body begin healing on its own.

Once those first 72 hours pass, Dr. Bartoli begins to design a longer-term treatment plan. The goal is to empower patients to take control of their own healing process and to "graduate" them out of her

care. As Dr. Bartoli said, although she loves her patients, she would like to see "less of them." Her patients feel the same.

Her approach to rehabilitation is aimed at controlling an old enemy that will be familiar to any reader of *Life Extension*®: inflammation. The first step is often to recommend an anti-inflammatory diet based on whole foods and avoiding foods that include processed sugar or other things known to contribute to inflammation.

"Many of my patients are living with inflammation, and we have to get that under control," she says. "The first thing I do is look at the diet."

She also has favorite supplements she uses to tamp down inflammation, including fish oil, turmeric, curcumin, ginger, and tart-cherry extract. She discovered tart cherry's anti-inflammatory powers during her days working with women's rugby. It was recommended for use by Team USA Sport Dietician Shawn Heuglin.

"They loved it," she said. "They'd line up after practice for their tart cherry and they felt it sped up their recoveries."

Fish oil is also a critical part of any anti-inflammatory program. Rich in EPA and DHA, fish oil has been proven in thousands of studies to reduce inflammatory markers and help reduce the risk of developing inflammatory diseases including coronary artery disease.

Finally, she's a big believer in massage and acupuncture, an ancient practice that relies on the placement of tiny needles along pressure points and energy pathways in the body to relieve muscle strain and reduce inflammation.

"Acupuncture is my secret weapon," she says. "It really helps and can make a huge difference in difficult cases."

Dr. Bartoli avoids prescribing long-term opioids, joking that she is the "queen of old-school medicine." In recent years, opioid prescriptions have skyrocketed as unscrupulous pharmaceutical companies have pushed doctors to expand the list of conditions for which they prescribe these powerfully addictive drugs. Today, almost anyone can secure a prescription for OxyContin®, Percocet®, or any of the other opiates.



“I have fewer than five patients who are on narcotics all the time,” she said. “With all of the addiction, the tools I use have positioned me well to reduce acute pain and lessen reliance on opiates.” This includes over-the-counter painkillers like acetaminophen (Tylenol®) and ibuprofen and naproxen, but she cautions against taking extra doses of acetaminophen, which can cause serious liver damage at higher doses, and long-term use of NSAID’s like ibuprofen and naproxen.

### The Problems with Modern Exercise

There are a lot of ways to end up in Dr. Bartoli’s office. Just living in New York City, where she practices, has its fair share of risks, with high curbs, heavy doors, old buildings and lots of stairs. But one of the quickest ways is to jump on any of the super-intense workout crazes that have been sweeping the fitness world over the past few years.

“People shouldn’t overdo it,” she said. “*Everybody needs exercise, but people need to figure out what form they can tolerate.*”

When asked what kind of exercise people should be extra careful around, she ticks off a number of popular exercise trends that have resulted in many different injuries in her patients. This includes kettle bells, hot yoga, and especially crossfit training. All of these are known for pushing people to their physical limit or have a tendency to rely on volume over form. One study in the *Orthopaedic Journal of Sports Medicine* found that the overall injury rate for crossfit athletes is approximately **20%**.\*

Dr. Bartoli is quick to point out, however, that she “loves weights.”

### Dr. Bartoli’s Supplement List

When it comes to her own supplements, Dr. Bartoli makes sure the basics are covered. Every day, she takes a multivitamin to ensure that she is receiving adequate amounts of the necessary vitamins and minerals. She also takes vitamin D to capitalize on the wide-ranging benefits of this important pro-hormone. And finally, she takes fish oil to provide omega-3 fatty acids. Not only does this help prevent a number of diseases, it’s a powerful anti-inflammatory.



As a former athlete herself, Bartoli walks every day and lifts weights regularly. She recommends that everyone should lift weights, whether they’re 12 or 80 years old.

“But form is paramount,” she said. “Weight lifting is all about form, form, form. It has to be perfect. You should spend the money to receive some good instruction and program development by a certified trainer. You should go slowly at first and take days off in between workouts or body parts to allow recovery. The goal is to go forward, never backward, and injury sets you back.”

Like so many successful doctors, Dr. Bartoli practices what she preaches. Not only does she get regular weight-bearing exercise, along with doing yoga and walking every day, she strives for a clean diet with a robust nutritional profile. She describes herself as a pesca vegetarian who eats only fish and vegetables. She eats seasonally and locally whenever possible, sourcing fresh vegetables through her co-op, and puts “tons of olive oil on everything.”

She also does the occasional medical cleanse.

“I’ll pull a few things out of my diet, like peanuts and tomatoes, and get some local honey to help with allergies,” she says. “I’ll do this for two or three weeks, and then gradually reintroduce foods over a few weeks.”

Whether she’s rehabbing her own sports injuries or designing multifaceted programs for patients, it’s exactly this type of focus on the whole person that makes it possible for Dr. Bartoli to help all of her patients—whether they’re Olympic athletes or elderly patients who can no longer navigate stairs—regain their function and recover faster. ●

### Reference

\* Weisenthal BM, Beck CA, Maloney MD, et al. Injury Rate and Patterns Among CrossFit Athletes. *Orthop J Sports Med.* 2014;2(4):2325967114531177.

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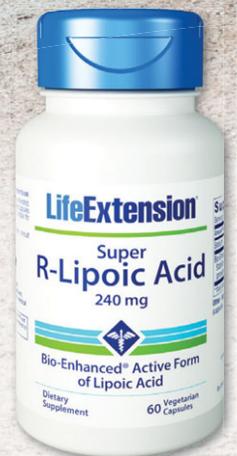


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BY GARRY MESSICK

## Jim Mellon and Al Chalabi

### *Juvenescence: Investing in the Age of Longevity*

Jim Mellon and Al Chalabi are successful investors and entrepreneurs whose interest in longevity research and its related technologies led them to write their new book, ***Juvenescence: Investing in the Age of Longevity***.

The two are so excited about the potential in this area that, along with several other partners, they have started a company called *Juvenescence*, named after their book, with the mission of finding diagnostic and therapeutic agents to treat aging and diseases associated with aging.

In *Juvenescence*, the authors put forth the proposition that the research community is on a fast track to properly understanding

the metabolic pathways involved in cellular aging. Dr. Greg Bailey, a cofounder of the company, writes in the forward that the book will “tell you about the scientists and companies who are working on these products as well as outlining the key pathways.”

The book shines a light on recent scientific progress in understanding the key molecular causes of aging, and explains why this understanding is essential to the development of effective therapeutics.

In their interview with ***Life Extension***<sup>®</sup>, Mellon and Chalabi outline some of the general ideas that make longevity research such a promising field, and touch on a few specific areas of interest.

**LE:** Let's start with the basic idea of aging. What exactly is it?

**JM & AC:** Aging is rigorously described as senescence, the progressive degradation of bodily functions. Sir Peter Medawar, a British pioneer in aging research in the 1940s, described aging as an "unsolved problem of biology." Medawar proposed that some genetic mutations only have deleterious effects late in life and are not "selected out" by evolution, as evolution is concerned primarily with reproductive fitness and not necessarily with the prolongation of life. He suggested that increasing age features a decline in the strength of natural selection.

**LE:** You mentioned senescence. Could you describe that process in cellular terms?

**JM & AC:** Molecules become unbound, genes become inefficient, waste products (cellular debris) build up and we (and other organisms) die. Organisms of all types accumulate damage to cells, tissues, organs, and indeed to all basic molecules, causing genomic instability to set in. Along with this comes shortening of the telomeres, reduced mitochondrial function (limiting energy production), the depletion of the potency of stem cells, and impaired intracellular networks.

**LE:** How do you feel about the prospects for longevity?

**JM & AC:** We really can—and probably will—live much longer than most people think is feasible. Science is advancing so rapidly that it is hard to comprehend the full implications of many of these recent discoveries, so we have tried to distill the ones we're familiar with into our book.

We have spent a year researching, interviewing, collating, filtering, pleading, harassing, and reading, as well as driving 7,000 miles around the US. Finally, we have arrived at our one central conclusion: The current pause in rising lifespans in some developed countries, including in the UK and the US, is only temporary. Babies born today are likely to live well over 100, and probably a lot longer than that. Techniques which are available to us beyond those of the fairly obvious admonitions concerning diet, sleep, exercise, and the avoidance of sugar and tobacco could carry most adults alive today to well over 100. Those techniques are building a bridge to a new world.

**LE:** What do you foresee as being on the horizon?

**JM & AC:** This new world is one where drugs, genetic engineering, cellular enhancements, and organ replacements, amongst other interventions, will add decades to our potential lifespan, taking most people much closer to the maximal life length that only a few supercentenarians currently enjoy.

The bridge that is being built is one made partly of drugs and therapies that address the main diseases of aging, namely cardiovascular disease, cancer, neurodegeneration, diabetes and respiratory disease.

In addition, the development of therapies to remove senescent cells, to restore cellular activity, to improve hormonal balance and to enhance mobility in older people is proceeding apace. If people can hold on to healthy life for the next decade or so, the chances are that they will eventually start to gain more than one year of life expectancy for each year that they live. The old nostrums about three score and ten, about being "illderly"

in old age and of the inevitability of a preordained early expiration while in a diseased state are quickly being debunked.

**LE:** You seem to think the field of anti-aging medicine is about to really take off. Why?

**JM & AC:** First, the research tools available to scientists are improving rapidly, particularly in the field of genomic sequencing, in the management of big data, and in the use of non-animal models to get scientific answers much faster than by conventional means.

Second, because so much information has now been discovered about the pathways, genes, and proteins that are implicated in aging and so much chemistry has been done on what might interfere with them, the trials of therapies designed to influence lifespan are imminent. Some compounds which might influence lifespan are available right now, even if anti-aging properties can't yet be definitively claimed for them.

One of the problems of aging research is that people live a long time and trials involving humans have to be designed over long periods, making them expensive and time-consuming. That's why alternative models of aging are so useful and computer simulations are becoming increasingly vital to getting to the important points of discovery.

Scientists in the field of biomedical gerontology (longevity and anti-aging) have been working hard to identify the many genes and pathways that are implicated in aging and in determining which ones are more important than others. A great deal of progress has been made here, and such things as mTOR, IGF-1/insulin signaling, Sestrins, FOXO3A, sirtuins, ApoE, CETP, daf-2, and

AMPK, to name a few, are now revealed as being important to the aging process.

**LE:** Could you expand a little on AMPK and its activation via metformin?

**JM & AC:** Metformin is an anti-diabetic drug that increases insulin sensitivity as well as activating the enzyme AMPK (adenosine monophosphate activated kinase), thereby positively modulating glucose levels and levels of circulating lipids in the body. It also seems to regulate a variety of processes relating to aging.

AMPK seems to play a critical role in the regulation of our energy balance, particularly in restoring mitochondrial function. Exercise and caloric restriction have an effect in activating AMPK, as does metformin. AMPK also appears to inhibit the mTOR pathway, which is an important clue to metformin's role in anti-aging. And mTOR has been linked to several age-related diseases such as cancer, cardiovascular disease, and Alzheimer's.

**LE:** You mentioned alternative models of aging. Can you give an example?

**JM & AC:** There is now a vast array of research into two of the most popular proxies of aging, worms and yeast. Data from both species indicate that a commonality, or conservation, of the mechanisms that cause late-life decline exists in both of them. This is even though their evolutionary paths diverged at least a billion years ago.

Humans also appear to have these conserved pathways linked to aging. "Conserved" simply means that some of the DNA sequences appear to have remained relatively unchanged far back in time,

as revealed by the "tree of life," the so-called phylogenetic tree. This is in spite of speciation, which is the division of organisms into different species over a long evolutionary period.

It is the prospect of manipulating our fundamental biology and of overcoming the conservation of pro-aging genetics that makes longevity such an exciting area. For the first time in history, a concerted and significant effort is being made to unravel the roles that the multitude of bewildering pathways, genes, and other factors, play in aging.

**LE:** One area of research that you find promising is parabiosis, the practice of joining a young organism to an older one.

**JM & AC:** Tom Rando of Stanford University announced in 2005 that heterochronic (different stages of development) parabiosis, where two mice of different ages were conjoined by surgery, restored the livers and muscles of the older one. The positive effect of blood transfusions from young to old may be because older people have a lesser supply of blood stem cells in their bone marrow than the supply that younger people enjoy. These blood stem cells are progenitors for our red and white blood cells, and so a diminished quantity of them leads to anemia and a weakening of the immune system.

Additional benefits to the older subject include improved cardiac muscle tissue, enhanced cognition and what is known as remyelination (bolstering the sheaths of axons in the central nervous system)... there is no doubt that regeneration occurs in the older animal during this process, which is encouraging for longevity research.

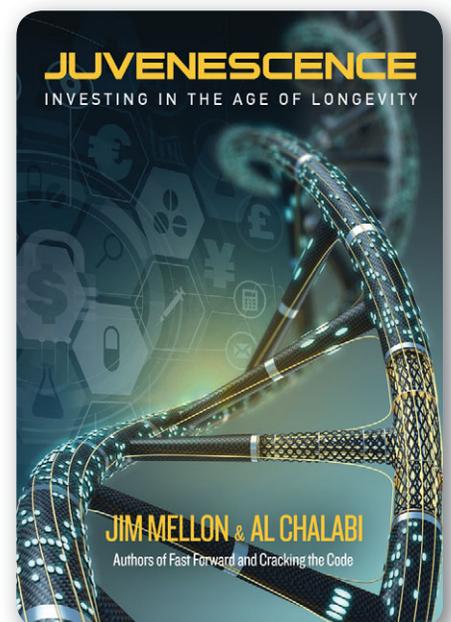
**LE:** Your view of the potential for increased human longevity is quite optimistic, isn't it?

**JM & AC:** Just a few years ago, the possibility of ultra-long life (over 110) becoming commonplace was envisioned only by people thought to be "crackpots" or "charlatans." But today, one by one, the challenges to such ultra-long lifespans are being overcome. The ramparts protecting aging as a defined and immutable condition are being stormed. ●

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MICHAEL OZNER, MD



## Michael Ozner, MD

### REDUCING THE RISK OF HEART DISEASE

Michael Ozner was named one of the top cardiologists in America, and has written multiple books including the best-selling *The Complete Mediterranean Diet* and *Heart Attack Proof*.

Dr. Ozner has focused his career on eradicating heart disease, America's number one killer. His research on the benefits of the Mediterranean diet and his emphasis on prevention first has saved millions of lives. In this interview, Dr. Ozner gives an assessment of our next steps in conquering heart disease.

**LE:** Heart disease is still the number-one killer in America, even with all the billions spent on cardiac prevention and medications. What is the next step for reducing this devastation?

**MO:** Our priority needs to be how we can prevent heart disease in the first place, instead of focusing on treatment of existing disease. By the time a patient is referred for cardiac catheterization or open-heart surgery, there has already been a failure in the system. We need to focus much earlier, when the disease process is silent and the damage cascade has yet to begin. If we can do this, we can finally notch significant

victories in the battle against cardiovascular disease—including heart attack and stroke. Cardiovascular disease remains the leading cause of death in the United States, but it's also largely preventable. We're only going to prevent this disease if we start early enough.

**LE:** Where do we begin?

**MO:** It's amazing how much of our current thinking on lipid control is based on outdated science. The problem is that the approach of current medicine misses the boat when it comes to diagnosis of those at risk of heart attack. We've had a major shift in our recent cholesterol guidelines, toward *risk* and away from *cause*. This was not a move in the right direction, because it's better to go after the cause, not just try to reduce the risk when disease becomes entrenched. You have to identify the enemy as early as possible to get at the root of the matter. The enemy in this case is not actually cholesterol—which is vital for health—but the *type* and *number* of cholesterol-carrying particles, called *lipoproteins*, floating in the bloodstream. If the bloodstream is laden with an increasing number of atherogenic (atherosclerosis-producing) lipoproteins, eventually these lipoproteins may infiltrate the artery wall, setting off an immune-system response that can lead to arterial disease and possibly heart attack and stroke. If we want to get to the root cause, we need to reduce the number of atherogenic lipoproteins.

**LE:** Most people would assume that their physician is requesting this type of information in their annual blood tests during their physical.

**MO:** Well, they're not. Most physicians order a basic lipid panel that includes total cholesterol, LDL cholesterol, HDL cholesterol and triglycerides. Although this basic panel is helpful in evaluating risk, we need to dig deeper and look at the number of potentially harmful (atherogenic) particles. The good news is that we already have the technology to accurately measure the number of dangerous lipoproteins—even if it's not in wide use. The **apolipoprotein B (apo B) blood test** is used to measure the number of potentially dangerous particles that can lead to the atherosclerotic process. A second test, the **LDL-P test**, can also be used since it measures the total number of LDL particles. Either of these two relatively inexpensive tests provides a much more accurate assessment of cardiac risk than our current focus on LDL cholesterol.

**LE:** Can you tell us more about the importance of testing for apo B?

**MO:** Because of the obesity epidemic, insulin resistance and diabetes, there's often discordance between LDL cholesterol numbers and apolipoprotein B levels. If your LDL cholesterol (LDL-C) is perfectly normal, but you have too many apo B particles crashing the artery wall, you can still drop dead of a heart attack. Multiple large scale clinical trials have shown that measurement of particle number (apo B or LDL-P) is superior to total cholesterol or LDL-C in predicting heart-attack risk. Once we accept that measuring apo B gives a better indication of cardiac risk we can then take the next logical step: driving those numbers down to prevent heart disease in the first place. The good news is that we are able to lower elevated cholesterol and apo B levels with a healthy lifestyle and medications (if necessary) and thereby reduce the risk of heart attack and stroke.



**LE:** Besides particle numbers, what role does high blood pressure play as a risk factor for heart disease?

**MO:** High blood pressure is an important risk factor for cardiac health, but again, there's significant controversy over the current guidelines.

**LE:** Have there been studies supporting the reduction of blood pressure levels below these guidelines?

**MO:** The recent SPRINT trial showed that getting blood pressure lower than current guidelines translates to decreased overall cardiovascular mortality, mainly driven by a significant reduction of stroke risk.

The SPRINT trial was published in the *New England Journal of Medicine*. This rigorous study compared the rate of cardiac events among almost 10,000 nondiabetic patients with high blood pressure who were separated into two treatment groups. The first group was aggressively treated, with a treatment goal of reducing blood pressure to **120 mmHg**, while the second group followed the current guidelines of aiming for **140 mmHg**. At the end of the five-year follow-up period, the conclusions were clear. SPRINT showed that among adults with hypertension but without diabetes, lowering systolic blood pressure to a target goal of less than **120 mmHg** resulted in significantly lower rates of fatal and nonfatal cardiovascular events and death from any cause. This remains controversial within the cardiology community—with many cardiologists continuing to aim for the older standards. However, during my recent symposium (*Cardiovascular Disease Prevention 2017*), a general consensus emerged that a target goal

of systolic BP less than **130 mmHg** was acceptable, until further trials confirm the SPRINT conclusions.

*Note: Based upon published population-based data on cardiovascular outcomes, Life Extension® believes an optimal blood pressure target is 115/75 mmHg. However, rapid and aggressive blood pressure reduction in patients with kidney disease, as well as older patients, should be avoided. Older patients usually do not tolerate rapid, aggressive blood pressure reduction, and may require higher blood pressure for optimal organ perfusion (e.g. kidney, brain). Frequent monitoring, including blood tests for kidney function and electrolyte levels (e.g. potassium), should accompany aggressive blood pressure control with prescription Rx medications.*

Once again, we know how to reduce and prevent elevated blood pressure through a combination of diet, exercise, stress management, weight control, proper sleep and medications. The challenge is getting the medical community to accept that previous guidelines aren't stringent enough and help educate patients about getting dangerously elevated blood pressure under control long before a heart attack, stroke, or heart failure occurs.

**LE:** What role do certain supplements, such as fish oil or omega-3 fatty acids, play in achieving heart health?

**MO:** Omega-3 fatty acids reduce inflammation, lower blood pressure, lower resting heart rate, reduce triglycerides, improve insulin sensitivity, and reduce the risk of arrhythmias and sudden cardiac death. You need only look at Japan for proof, where people eat much more coldwater fish on average and have higher blood levels of omega-3 fatty acids and much lower levels of cardiac disease.

Ultimately, it's important to test your blood for omega-3 fatty acid levels using the omega-3 index, which measures for the levels of EPA and DHA in red blood cells. We need to do better in spreading the message on the importance of omega-3 fatty acids. The average American has an omega-3 index of **4% to 5%**, compared to an average omega-3 index of **9% to 10%** in Japan. I recommend aiming for an omega-3 index of **8% to 10%**.

**LE:** We are in the middle a diabetes epidemic, which is a direct path to heart disease. What role does insulin resistance play in the prevention strategy?

**MO:** Numerous clinical studies have been published in prominent medical journals showing a clear link between insulin resistance and cardiometabolic disease. Even with this increased awareness, we're still doing a poor job of recognizing insulin resistance. Once again, the issue is that we aren't catching this insidious disease process early enough but waiting until it's already advanced. Many people go to the doctor and get a fasting blood glucose level test, and if it's normal, they think they're fine. We know that's not necessarily true. In fact, a normal blood glucose reading might actually mean that the pancreas beta-cells, where insulin is produced, are working overtime to produce enough insulin to clear excess glucose from the blood. This can lead to "beta-cell strain" and, if left unchecked, can result in beta cell dysfunction and ultimately beta-cell failure, which can lead to insulin-dependent type II diabetes.

Prediabetes is generally diagnosed when the fasting blood-glucose measures between **100 mg/dL** and **125 mg/dL**. Readings over **125 mg/dL** indicate type II diabetes.

If you wait until you have prediabetes, you have done harm to your insulin-producing beta cells. It only makes sense to catch people before they have prediabetes. To identify issues before blood glucose levels starts to rise, you can measure fasting insulin levels. If they're elevated, it suggests the pancreas is overproducing insulin to maintain normal blood glucose levels. The earlier we intervene with lifestyle changes (diet and exercise) to prevent the progression to diabetes, the better.

**LE:** Right along with insulin resistance is the obesity epidemic that carries risk factors for so many diseases. Aside from being unattractive, excess weight, especially belly fat, is extremely harmful. Can you discuss this connection?

**MO:** The issue of insulin resistance is closely related to an area of intense interest among cardiovascular researchers: adiposopathy, or the accumulation of "sick fat." This condition starts with a flawed lifestyle—especially a diet high in sugar and refined starches, saturated and trans fats, and highly processed food. This unhealthy dietary pattern combined with a lack of exercise results in excessive fat production in the liver. This excess fat is then carried to the fat (adipose) cells for storage.

As people eat a high-fat and high-sugar diet, their triglycerides often rise. Elevated triglycerides are stored in fat cells (adipocytes) and as these cells begin to swell and increase in size, adipocyte dysfunction and insulin resistance result. Over time, this leads to increased mobilization of free fatty acids that are released into the bloodstream and have a harmful effect on the liver, pancreas, arteries and other organs.



We know adiposopathy often begins in the belly, with accumulated belly fat. So one of the best diagnostic tests is measurement of waist circumference. Men with a waist circumference greater than 40" and women with a waist circumference greater than 35" are at greater risk. Like so many of the issues we have discussed, the best approach to adiposopathy is to prevent it in the first place. And lifestyle is always the first and most important step.

**LE:** Increasingly, we are seeing products in the supermarket that are labelled with "plant sterols" that claim to lower cholesterol. What are your thoughts on this?

**MO:** This is a very controversial topic. Consumers need to be aware of the science and not fall for the hype. You are correct, plant sterols (phytosterols) occur naturally in plants and have become increasingly popular as a way to lower cholesterol. They are added to certain foods (e.g. margarine, yogurt, fruit juices) which advertise plant sterols as a natural way to reduce harmful cholesterol levels.

It turns out that for many people, plant sterols can be toxic and actually promote heart disease over the long-term. The issue is the function of two sterol transporters called ABCG5 and ABCG8. These two transporters work to transport plant sterols out of the cells that line the gut and back into the gut lumen so they can be excreted. If there is a genetic defect in ABCG5 and ABCG8, these plant sterols can enter the bloodstream and have a potentially devastating effect on the arteries, including accelerated atherosclerosis and premature heart attack.

This disease was already well known in children who were born with significant defects in the transporters. Children with this condition often develop premature heart attacks as teenagers and young adults. The discovery that many adults also have a mild mutation, however, expanded the universe of people who could be adversely affected by sterol accumulation.

This doesn't mean people should avoid eating a wide variety of fruits and vegetables, which naturally contain a small amount

of plant sterols. The consensus among many sterol researchers is to avoid excess plant sterols added to food or supplements for the purpose of cholesterol lowering.

**LE:** This seems like an extremely clear road map for avoiding heart disease. Both physicians and the public need to be partners in this endeavor.

**MO:** That's absolutely correct. We already know much of what we need to know to prevent millions of Americans from suffering and dying of heart disease. The sad truth is that our lifestyles are killing us. We don't get enough exercise, our diets are highly processed, calorie-dense and nutrient-depleted. We're stressed out and often suffer from sleep disorders, and we are suffering from epidemic rates of metabolic disorders like insulin resistance and diabetes.

We need to become proactive in our battle against heart disease. Everyone should develop a heart

disease prevention strategy with their personal treating physician—don't wait until cardiovascular disease strikes and then hope that medications or surgery can bail you out. The second major step is convincing the medical community to emphasize the role of therapeutic lifestyle intervention in maintaining heart health. In addition, clinicians need to use the proper blood biomarkers to identify metabolic derangements that can be corrected before disease becomes established.

Considering the high cost of surgery and expensive invasive procedures, prevention is extremely cost effective, both for individuals and medical systems. When I see the work **Life Extension** is doing by educating the population, that is an enormous step forward and a great contribution.

There is currently a revolution in medicine among the lay public. People want to know how they

can stay healthy without having to take multiple pills every day or undergo risky and expensive surgical procedures. And we know how. It's about prevention. This is evidence-based medicine. It's not hype. It works. We know how to keep people out of the hospital. ●

For further information and videos on heart disease prevention, visit Dr. Ozner's website at [www.drozner.com](http://www.drozner.com)

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Michael Ozner, MD, FACC, FAHA, is one of America's leading advocates for heart disease prevention. Dr. Ozner is a board-certified cardiologist, a fellow of both the American College of Cardiology and the American Heart Association, medical director of Wellness and Prevention at Baptist Health South Florida, a well-known regional and national speaker in the field of preventive cardiology, and a member of **Life Extension's** Scientific Advisory Board. He is symposium director for Cardiovascular Disease Prevention, an annual international meeting dedicated to the treatment and prevention of heart attack and stroke. He was the recipient of the 2008 American Heart Association Humanitarian Award and was elected to Top Cardiologists in America by the Consumer Council of America. Dr. Ozner is also the author of *The Great American Heart Hoax*, *Heart Attack Proof*, and *The Complete Mediterranean Diet*.

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#### Reference

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

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Technology exists to go beyond basic cholesterol blood testing. Sadly, conventional medicine rarely uses these improved methods that provide a better risk assessment for cardiovascular disease. Only cutting-edge doctors are taking advantage of these next-generation tests for their patients.

Insist on getting these tests with your doctor or take advantage of **Life Extension**'s exceptional prices on these potentially lifesaving tests. Leaders in the field of cardiovascular research such as Dr. Michael Ozner are spreading the word, but widespread adoption of these important tests is unfortunately too slow in conventional medicine.

**ApoB** is an important test because it is the primary protein portion of all cholesterol particles other than HDL cholesterol. Thus it provides the total non-HDL cholesterol particle number, meaning all the other particles that are not HDL such as chylomicrons, VLDL, IDL, and LDL particles. Surprisingly, a standard cholesterol test of HDL, LDL and Total Cholesterol reveals nothing about actual particle numbers. It only tells you the amount of HDL and LDL cholesterol in your blood, it does NOT tell you if that amount is being carried by a large number of small particles or a small number of large particles.

ApoB provides the critical particle count number that includes all the chylomicrons, VLDL, IDL, and LDL particles.



Research is clear that the higher ApoB number the greater your cardiovascular risk. For example, a high ApoB in young adults predicts coronary artery calcification in midlife. For these reasons, **Life Extension** suggests everyone test his or her LDL particle count with a simple ApoB test.

The **NMR LipoProfile** supercharges the amount of information related to your cholesterol. It provides an LDL particle count number and it determines the critically important SIZE of the LDL particles. This LDL particle size determination is important because research indicates that small LDL particles are more likely to be glycated, oxidized and cross blood vessel walls

to cause plaque buildup leading to atherosclerosis. Having a high LDL particle number combined with small dense LDL is the worst case scenario for plaque formation and thus cardiovascular disease risk.

## Which one to order?

**ApoB** = excellent and inexpensive screening test to augment standard cholesterol testing for everyone.

**NMR LipoProfile** = more comprehensive and detailed information especially for those with high cholesterol or any family history of cardiovascular disease such as heart attacks or strokes.

**ApoB test \$28**

Item# LC167015  
Best fasting 12-14 hours

**NMR LipoProfile® \$99**

Item# LC123810  
Best fasting 12-14 hours

To order an **ApoB test** (item #LC167015) for **\$28** or an **NMR LipoProfile® test** for **\$99** (item #LC123810), call **Life Extension** today at **1-800-208-3444** or order online at [LifeExtension.com](http://LifeExtension.com)

You'll be sent a list of drawing stations in your area along with a pre-paid requisition.  
You can walk into the drawing station nearest you at your convenience.  
You also have free access to our Wellness Specialists to help review your results.

Blood test services are available only in the continental United States and Anchorage, AK.  
Not available in Maryland. Restrictions apply for residents of MA, NY, NJ, RI, and PA.

# EUROPEAN MILK THISTLE

## Ultimate Protection For Your Liver

**Milk thistle** extract—rich in **silymarin**—is one of nature's most powerful weapons to support liver health. Scientific studies demonstrate silymarin's ability to provide potent protection for your liver.<sup>1,2</sup>

Life Extension®'s European Milk Thistle contains standardized, top-grade potencies of **silymarin**, **silybin**, **isosilybin A**, and **isosilybin B**, providing a full spectrum of liver-supportive compounds. This unique formula includes **phosphatidylcholine**, a nutrient that promotes better absorption of milk thistle extract.<sup>3</sup>

The **silymarin** contained in **European Milk Thistle** is absorbed nearly **5 times** better than silymarin alone, and its bioavailability to the liver is **10 times** better.

### European Milk Thistle Advanced Phospholipid Delivery

Item #01922 • 60 Softgels

|           | Retail Price | Super Sale Price    |
|-----------|--------------|---------------------|
| 1 bottle  | \$28         | <b>\$18.90</b>      |
| 4 bottles |              | <b>\$16.88 each</b> |



#### References

1. *Mol Nutr Food Res.* 2009 Apr;53(4):460-6.
2. *Environ Toxicol.* 2007 Oct;22(5):472-9.
3. *Altern.Med Rev.* 2009;14(3):226-46.

SILIPHOS® is a registered trademark of Indena S.p.A., Italy.

For full product description and to order  
**European Milk Thistle Advanced Phospholipid Delivery**,  
call **1-800-544-4440** or visit **www.LifeExtension.com**



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

# GIVE YOUR BONES A BOOST

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



|           | Retail Price | Super Sale Price    |
|-----------|--------------|---------------------|
| 1 bottle  | \$24         | <b>\$16.20</b>      |
| 4 bottles |              | <b>\$14.85 each</b> |

Item #01727 • 120 capsules

For full product description and to order **Bone Restore with Vitamin K2**, call **1-800-544-4440** or visit **www.LifeExtension.com**

Note: Those taking the anticoagulant drug Coumadin® (warfarin) should use BONE RESTORE without vitamin K2.  
Fruitex B® and OsteoBoron® are registered trademarks of VDF Futureceuticals, Inc. U.S. patent #5,962,049. DimaCal® and TRAACS® are registered trademarks of Albion Laboratories, Inc. Malate is covered by U.S. patent 6,706,904 and 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.

**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  
 EsophaCool™  
 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 PQQ®  
 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® Provinal® Purified Omega-7  
 OMEGA FOUNDATIONS® Vegetarian DHA  
 Organic Golden Flax Seed

**Food**

California Estate Extra Virgin Olive Oil  
 Rainforest Blend Decaf Ground Coffee  
 Rainforest Blend Ground Coffee  
 Rainforest Blend Ground Natural Mocha Flavor  
 Rainforest Blend Natural Vanilla Flavor  
 Rainforest Blend Whole Bean Coffee  
 Stevia Sweetener

**Glucose Management**

CinSulin® with InSea2® 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 GlycoCam®  
 Super Ubiquinol CoQ10  
 Super Ubiquinol CoQ10 with PQQ®  
 Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™  
 Super-Absorbable CoQ10 Ubiquinone with  $\alpha$ -Limonene  
 TMG Powder  
 TMG Liquid Capsules

**Hormone Balance**

DHEA (Dehydroepiandrosterone)  
 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  
 Krill 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

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 Fucoïdan 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 ProstaPollen™  
 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  
 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-Aging Rejuvenating Scalp Serum  
 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  
 HCAActive™ 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

**DEDUCT AN ADDITIONAL 10% ON ALL PRODUCTS DURING SUPER SALE**

**TO ORDER CALL: 1.954.766.8433 or 1.800.544.4440 ■ TO ORDER ONLINE VISIT: [www.LifeExtension.com](http://www.LifeExtension.com)**

| 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       |              |     |       |
| 01974    | ACETYL-L-CARNITINE ARGINATE • 90 veg. caps                                   | 38.00          | 28.50       | 26.00       |              |     |       |
| 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<br>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®<br>120 veg. caps                       | 44.00          | 33.00       | 30.00       |              |     |       |
| 01618    | ARTHROMAX® ADVANCED W/UC-II® & APRÈSFLEX®<br>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> |  |                |             |             |              |     |       |
| 01945    | B-COMPLEX (Bio-Active Complete) • 60 veg. caps                               | 12.00          | 9.00        | 8.00        |              |     |       |
| 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 (Enhanced) • 60 veg. caps                                     | 29.00          | 21.75       | 19.50       |              |     |       |
| 00664    | BETA-CAROTENE • 25,000 IU, 100 softgels                                      | 11.50          | 8.63        |             |              |     |       |
| 01622    | BIFIDO 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       |              |     |       |

**SUBTOTAL OF COLUMN 1**

| ITEM No. | PRODUCT   | Retail Each \$ | YOUR PRICE  |             |              | QTY | Total |
|----------|---|----------------|-------------|-------------|--------------|-----|-------|
|          |   |                | 1 Unit Each | 4 Unit Each | 10 Unit Each |     |       |
| 01710    | BLACK CUMIN SEED OIL W/BIO-CURCUMIN® • 60 softgels                | 32.00          | 24.00       | 22.50       |              |     |       |
| 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)<br>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<br>120 mint chewable tablets       | 45.00          | 33.75       | 28.50       |              |     |       |
| 01700    | CARDIO PEAK™ w/STANDARDIZED HAWTHORN & ARJUNA<br>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™<br>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)<br>500 mcg, 60 veg. caps      | 9.00           | 6.75        | 6.00        |              |     |       |
| 01503    | CINSULIN® W/INSEAL2® 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       |              |     |       |

**SUBTOTAL OF COLUMN 2**

**DEDUCT AN ADDITIONAL 10% ON ALL PRODUCTS DURING SUPER SALE**

**TO ORDER CALL: 1.954.766.8433 or 1.800.544.4440 ■ TO ORDER ONLINE VISIT: [www.LifeExtension.com](http://www.LifeExtension.com)**

| ITEM No.                    | PRODUCT  | Retail Each \$ | YOUR PRICE  |             |              | QTY | Total |
|-----------------------------|--|----------------|-------------|-------------|--------------|-----|-------|
|                             |  |                | 1 Unit Each | 4 Unit Each | 10 Unit Each |     |       |
| 01896                       | COGNITEX® W/BRAIN SHIELD® • 90 softgels                                    | 60.00          | 45.00       | 39.00       | 36.00        |     |       |
| 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       |              |     |       |
| 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/PQQ® (Super Ubiquinol) • 100 mg, 30 softgels                       | 50.00          | 37.50       | 30.00       | 27.00        |     |       |
| 01437                       | COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (Super Ubiquinol) • 100 mg, 30 softgels | 33.00          | 24.75       | 22.00       |              |     |       |
| 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       |              |     |       |
| 00467                       | CURCUMIN® (Super Bio) • 400 mg, 30 veg. caps                               | 20.00          | 15.00       | 14.00       |              |     |       |
| 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       |              |     |       |
| <b>SUBTOTAL OF COLUMN 3</b> |  |                |             |             |              |     |       |

| ITEM No.                    | PRODUCT  | Retail Each \$ | YOUR PRICE  |             |              | QTY | Total |
|-----------------------------|--|----------------|-------------|-------------|--------------|-----|-------|
|                             |  |                | 1 Unit Each | 4 Unit Each | 10 Unit Each |     |       |
| 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       |              |     |       |
| 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       |              |     |       |
| <b>SUBTOTAL OF COLUMN 4</b> |  |                |             |             |              |     |       |

RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS

FEBRUARY 2018

**SUPER SALE SAVINGS ON ALL PRODUCTS**

**DEDUCT AN ADDITIONAL 10% ON ALL PRODUCTS DURING SUPER SALE**

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| ITEM No.                    | PRODUCT   | Retail Each \$ | YOUR PRICE  |             |              | QTY | Total |
|-----------------------------|---|----------------|-------------|-------------|--------------|-----|-------|
|                             |   |                | 1 Unit Each | 4 Unit Each | 10 Unit Each |     |       |
| 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       |              |     |       |
| 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                       | ESOPHACOL™ • 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>                    |   |                |             |             |              |     |       |
| 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       |              |     |       |
| <b>SUBTOTAL OF COLUMN 5</b> |   |                |             |             |              |     |       |

| ITEM No.                    | PRODUCT  | Retail Each \$ | YOUR PRICE  |             |              | QTY | Total |
|-----------------------------|--|----------------|-------------|-------------|--------------|-----|-------|
|                             |  |                | 1 Unit Each | 4 Unit Each | 10 Unit Each |     |       |
| 02133                       | GEROPROTECT™ LONGEVITY A.I.™ • 30 softgels   | 56.00          | 42.00       | 38.00       |              |     |       |
| 01122                       | GINGER FORCE® • 60 liquid caps   | 34.95          | 26.21       |             |              |     |       |
| 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       |              |     |       |
| 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       |              |     |       |
| <b>SUBTOTAL OF COLUMN 6</b> |  |                |             |             |              |     |       |

**DEDUCT AN ADDITIONAL 10% ON ALL PRODUCTS DURING SUPER SALE**

**TO ORDER CALL: 1.954.766.8433 or 1.800.544.4440 ■ TO ORDER ONLINE VISIT: [www.LifeExtension.com](http://www.LifeExtension.com)**

| ITEM No. | PRODUCT  | Retail Each \$ | YOUR PRICE  |             |              | QTY | Total |
|----------|--|----------------|-------------|-------------|--------------|-----|-------|
|          |  |                | 1 Unit Each | 4 Unit Each | 10 Unit Each |     |       |
| 00020    | LECITHIN • 16 oz granules                                      | 18.00          | 13.50       | 12.00       |              |     |       |
| 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/APRÈSFLEX® • 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                    | 13.00          | 9.75        | 8.50        |              |     |       |
| 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/PQQ®•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       |              |     |       |

**SUBTOTAL OF COLUMN 7**

| ITEM No. | PRODUCT   | Retail Each \$ | YOUR PRICE  |             |              | QTY | Total |
|----------|---|----------------|-------------|-------------|--------------|-----|-------|
|          |   |                | 1 Unit Each | 4 Unit Each | 10 Unit Each |     |       |
| 02144    | NAD+ CELL REGENERATOR™ NICOTINAMIDE RIBOSIDE 250 mg, 30 veg. caps                               | 42.00          | 31.50       | 28.00       |              |     |       |
| 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       |              |     |       |
| 01894    | NATURAL ESTROGEN • 30 veg. tabs   | 30.00          | 22.50       | 20.00       |              |     |       |
| 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        |     |       |
| 02092    | ONCE-DAILY HEALTH BOOSTER • 30 softgels   | 30.00          | 22.50       | 20.00       |              |     |       |
| 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       |              |     |       |

**SUBTOTAL OF COLUMN 8**

RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS

FEBRUARY 2018

**SUPER SALE SAVINGS ON ALL PRODUCTS**

**DEDUCT AN ADDITIONAL 10% ON ALL PRODUCTS DURING SUPER SALE**

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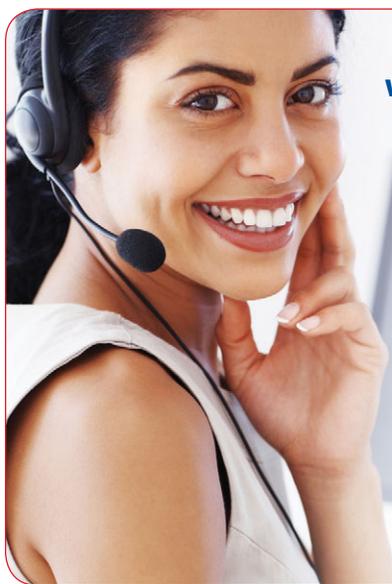
| ITEM No.                    | PRODUCT  | Retail Each \$ | YOUR PRICE  |             |              | QTY | Total |
|-----------------------------|--|----------------|-------------|-------------|--------------|-----|-------|
|                             |  |                | 1 Unit Each | 4 Unit Each | 10 Unit Each |     |       |
| 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        |     |       |
| 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                       | PTEROPURE® 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                       | PYCNOGENOL® 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                       | REGIMINT • 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 FIRING 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       |              |     |       |
| 02169                       | RAINFOREST GROUND COFFEE • 12 oz. bag                              | 13.00          | 9.75        |             |              |     |       |
| 02173                       | RAINFOREST BLEND GROUND COFFEE Natural Mocha • 12 oz. bag          | 15.00          | 11.25       |             |              |     |       |
| 02172                       | RAINFOREST BLEND GROUND COFFEE Natural Vanilla • 12 oz. bag        | 15.00          | 11.25       |             |              |     |       |
| 02171                       | RAINFOREST BLEND WHOLE BEAN COFFEE 12 oz. bag                      | 13.00          | 9.75        |             |              |     |       |
| <b>SUBTOTAL OF COLUMN 9</b> |  |                |             |             |              |     |       |

| ITEM No.                     | PRODUCT  | Retail Each \$ | YOUR PRICE  |             |              | QTY | Total |
|------------------------------|--|----------------|-------------|-------------|--------------|-----|-------|
|                              |  |                | 1 Unit Each | 4 Unit Each | 10 Unit Each |     |       |
| 02170                        | RAINFOREST BLEND 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       |              |     |       |
| <b>S</b>                     |  |                |             |             |              |     |       |
| 01432                        | SAFFRON W/SATIREAL® (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                      | THERALAC® 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        |              |     |       |
| <b>SUBTOTAL OF COLUMN 10</b> |  |                |             |             |              |     |       |

| ITEM No.                     | PRODUCT   | Retail Each \$ | YOUR PRICE  |             |              | QTY | Total |
|------------------------------|---|----------------|-------------|-------------|--------------|-----|-------|
|                              |   |                | 1 Unit Each | 4 Unit Each | 10 Unit Each |     |       |
| 01400                        | <b>TOCOTRIENOLS</b> (Super-absorbable) • 60 softgels                            | 30.00          | 22.50       | 21.00       |              |     |       |
| 01278                        | <b>TOOTH PASTE</b> • 4 oz (Mint) tube   | 9.50           | 7.13        | 6.50        |              |     |       |
| 01917                        | <b>TRANQUIL TRACT™</b> • 60 veg. caps   | 52.00          | 39.00       | 34.50       |              |     |       |
| 01468                        | <b>TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT</b> 60 veg. caps                 | 24.00          | 18.00       | 16.50       |              |     |       |
| 01469                        | <b>TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT w/RESVERATROL</b> • 60 veg. caps | 32.00          | 24.00       | 22.20       |              |     |       |
| 02003                        | <b>TRIPLE ACTION THYROID</b> • 60 veg. caps                                     | 36.00          | 27.00       | 24.00       |              |     |       |
| 01803                        | <b>TRI SUGAR SHIELD®</b> • 60 veg. caps   | 36.00          | 27.00       | 24.00       |              |     |       |
| 01386                        | <b>TRUFIBER™</b> • 180 grams  | 32.95          | 24.71       |             |              |     |       |
| 01389                        | <b>TRUFLORA® PROBIOTICS</b> • 32 veg. caps                                      | 42.95          | 32.21       |             |              |     |       |
| 01722                        | <b>L-TRYPTOPHAN</b> • 500 mg, 90 veg. caps                                      | 33.00          | 24.75       | 22.50       |              |     |       |
| 01721                        | <b>TRYPTOPHAN PLUS</b> (Optimized) • 90 veg. caps                               | 32.00          | 24.00       | 21.75       |              |     |       |
| 02216                        | <b>TWO-PER-DAY</b> • 60 tablets   | 12.00          | 9.00        | 7.50        |              |     |       |
| 02215                        | <b>TWO-PER-DAY</b> • 120 tablets  | 21.00          | 15.75       | 14.00       |              |     |       |
| 02217                        | <b>TWO-PER-DAY</b> • 60 caps  | 12.00          | 9.00        | 8.00        |              |     |       |
| 02214                        | <b>TWO-PER-DAY</b> • 120 caps   | 24.00          | 18.00       | 16.00       |              |     |       |
| 00326                        | <b>L-TYROSINE</b> • 500 mg, 100 tablets   | 13.50          | 10.13       |             |              |     |       |
| <b>U, V</b>                  |   |                |             |             |              |     |       |
| 01921                        | <b>URIC ACID CONTROL</b> • 60 veg. caps   | 24.00          | 18.00       | 16.50       |              |     |       |
| 00213                        | <b>VANADYL SULFATE</b> • 7.5 mg, 100 veg. tablets                               | 15.00          | 11.25       | 9.38        |              |     |       |
| 02102                        | <b>VENOFLOW™</b> • 30 veg. caps   | 52.00          | 39.00       | 36.00       |              |     |       |
| 00408                        | <b>VENOTONE</b> • 60 caps   | 18.95          | 14.21       | 12.00       |              |     |       |
| 01327                        | <b>VINPOCETINE</b> • 10 mg, 100 veg. tablets                                    | 18.00          | 13.50       | 10.50       |              |     |       |
| 00372                        | <b>VITAMIN B3 NIACIN</b> • 500 mg, 100 caps                                     | 7.65           | 5.74        | 4.99        |              |     |       |
| 02028                        | <b>VITAMIN B5</b> • 500 mg, 100 veg. caps (Pantothenic Acid)                    | 11.00          | 8.25        | 7.50        |              |     |       |
| 01535                        | <b>VITAMIN B6</b> • 250 mg, 100 veg. caps                                       | 12.50          | 9.38        | 8.25        |              |     |       |
| 00361                        | <b>VITAMIN B12</b> • 500 mcg, 100 lozenges                                      | 8.75           | 6.56        | 5.44        |              |     |       |
| 01634                        | <b>VITAMIN C w/DIHYDROQUERCETIN</b> 1,000 mg, 60 veg. tablets                   | 10.00          | 7.50        | 6.75        |              |     |       |
| 00927                        | <b>VITAMIN C w/DIHYDROQUERCETIN</b> 1,000 mg, 250 veg. tablets                  | 27.00          | 20.25       | 18.00       |              |     |       |
| 00084                        | <b>VITAMIN C POWDER (BUFFERED)</b> • 454 grams                                  | 28.00          | 21.00       | 19.00       |              |     |       |
| 01736                        | <b>VITAMIN C-MAGNESIUM CRYSTALS (EFFERVESCENT)</b> 180 grams                    | 20.00          | 15.00       | 13.50       |              |     |       |
| 01732                        | <b>VITAMIN D3</b> • 2,000 IU, 1 fl. oz, Mint flavor                             | 28.00          | 21.00       | 18.75       |              |     |       |
| 01753                        | <b>VITAMIN D3</b> • 1,000 IU, 90 softgels                                       | 7.00           | 5.25        | 4.50        |              |     |       |
| 01751                        | <b>VITAMIN D3</b> • 1,000 IU, 250 softgels                                      | 12.50          | 9.38        | 8.44        |              |     |       |
| 01713                        | <b>VITAMIN D3</b> • 5,000 IU, 60 softgels                                       | 10.00          | 7.50        | 6.50        |              |     |       |
| 01718                        | <b>VITAMIN D3</b> • 7,000 IU, 60 softgels                                       | 14.00          | 10.50       | 9.45        |              |     |       |
| 01758                        | <b>VITAMIN D3 W/SEA-IODINE™</b> • 5,000 IU, 60 caps                             | 14.00          | 10.50       | 9.38        |              |     |       |
| 00864                        | <b>VITAMIN D3 LIQUID</b> • 2,000 IU, 1 fl. oz                                   | 28.00          | 21.00       | 18.75       |              |     |       |
| 02040                        | <b>VITAMINS D AND K W/SEA-IODINE™</b> • 60 caps                                 | 24.00          | 18.00       | 16.50       |              |     |       |
| 01863                        | <b>VITAMIN E (Natural)</b> • 400 IU, 90 softgels                                | 28.00          | 21.00       | 19.50       | 18.00        |     |       |
| 01936                        | <b>VITAMIN K2 (Low dose)</b> • 45 mcg, 90 softgels                              | 18.00          | 13.50       | 12.00       |              |     |       |
| <b>W</b>                     |   |                |             |             |              |     |       |
| 01902                        | <b>WAIST-LINE CONTROL™</b> • 120 veg. caps                                      | 42.00          | 31.50       | 28.50       |              |     |       |
| <b>SUBTOTAL OF COLUMN 11</b> |   |                |             |             |              |     |       |

| ITEM No.                     | PRODUCT   | Retail Each \$ | YOUR PRICE  |             |              | QTY | Total |
|------------------------------|---|----------------|-------------|-------------|--------------|-----|-------|
|                              |   |                | 1 Unit Each | 4 Unit Each | 10 Unit Each |     |       |
| <b>X, Y</b>                  |   |                |             |             |              |     |       |
| 01919                        | <b>X-R SHIELD</b> • 90 veg. caps  | 15.00          | 11.25       | 9.75        |              |     |       |
| 00409                        | <b>XYLIWHITE™ MOUTHWASH</b> • 16 oz   | 10.00          | 7.50        |             |              |     |       |
| <b>Z</b>                     |   |                |             |             |              |     |       |
| 01813                        | <b>ZINC HIGH POTENCY</b> • 50 mg, 90 veg. caps  | 7.95           | 5.96        | 5.25        |              |     |       |
| 01561                        | <b>ZINC LOZENGES</b> • 60 veg. lozenges   | 9.00           | 6.75        | 6.00        |              |     |       |
| 01961                        | <b>ZINC LOZENGES (Enhanced)</b> • 30 veg. lozenges  | 12.00          | 9.00        | 6.00        |              |     |       |
| *01051                       | <b>ZYFLAMEND® WHOLE BODY</b> • 120 liquid veg. caps                                       | 72.95          | 54.71       |             |              |     |       |
| <b>BOOKS</b>                 |   |                |             |             |              |     |       |
| 33998                        | <b>THE RIGHT TO TRY</b> by Darcy Olsen • 2016   | 26.99          | 20.24       |             |              |     |       |
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| 33862                        | <b>I'M TOO YOUNG FOR THIS</b> • by Suzanne Somers • 2013                                  | 26.00          | 19.50       |             |              |     |       |
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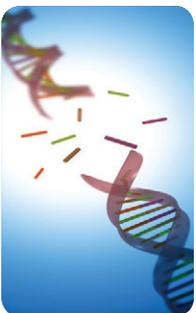
# LifeExtension®

Magazine



### 7 ILLOGICAL POSITION OF AMERICAN HEART ASSOCIATION

The **American Heart Association** states that there is a "**lack of scientific research**" to support use of **fish oil** in the **general population**. We refute this irrational position.



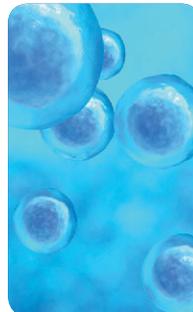
### 50 ANTI-AGING EFFECTS OF NAD<sup>+</sup>

Restoration of **NAD<sup>+</sup>** has been shown in lab experiments to increase lifespan by the **human** equivalent of **4 years**.



### 62 MORE REASONS TO TAKE FISH OIL

Fish oil is associated with **14% reduced** human mortality along with protection against neurodegeneration, metabolic disorders, and persistent inflammation.



### 26 REVERSE MAJOR FACTOR IN DEGENERATIVE AGING

**AMPK** facilitates *life-extending* functions and reduces abdominal fat. Two **plant** compounds help restore youthful **AMPK activity**.



### 40 PROBIOTICS FIGHT WINTER FLU

An innovative **probiotic cocktail** boosts the body's immune defenses against winter cold and flu while reducing the severity of an attack.



### 75 GREEN TEA PROTECTS AGAINST COLORECTAL CANCER

Recent studies show that **green tea** blocks formation of colorectal-cancer stem cells. Green tea extract was found to reduce colorectal cancer risk in humans.