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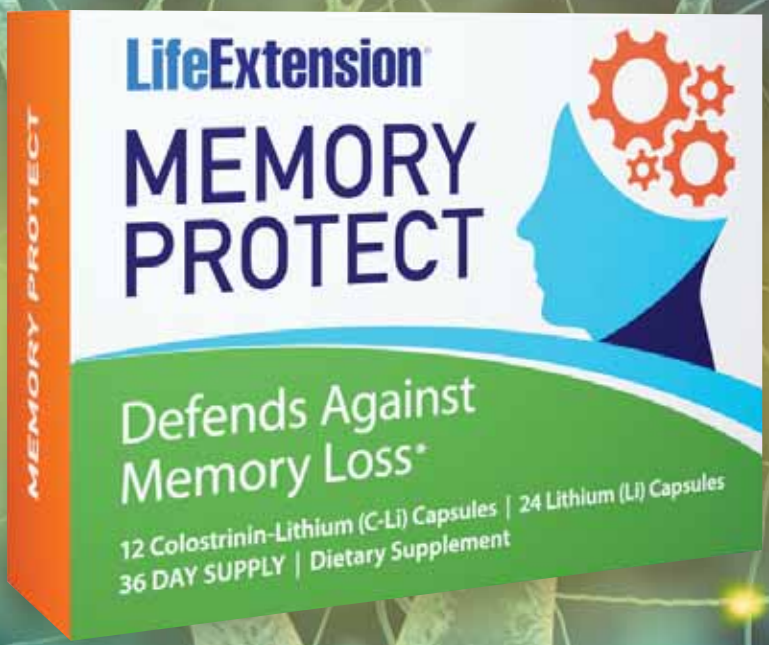


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**PROBIOTIC SOLUTION TO DEPRESSION AND ANXIETY**

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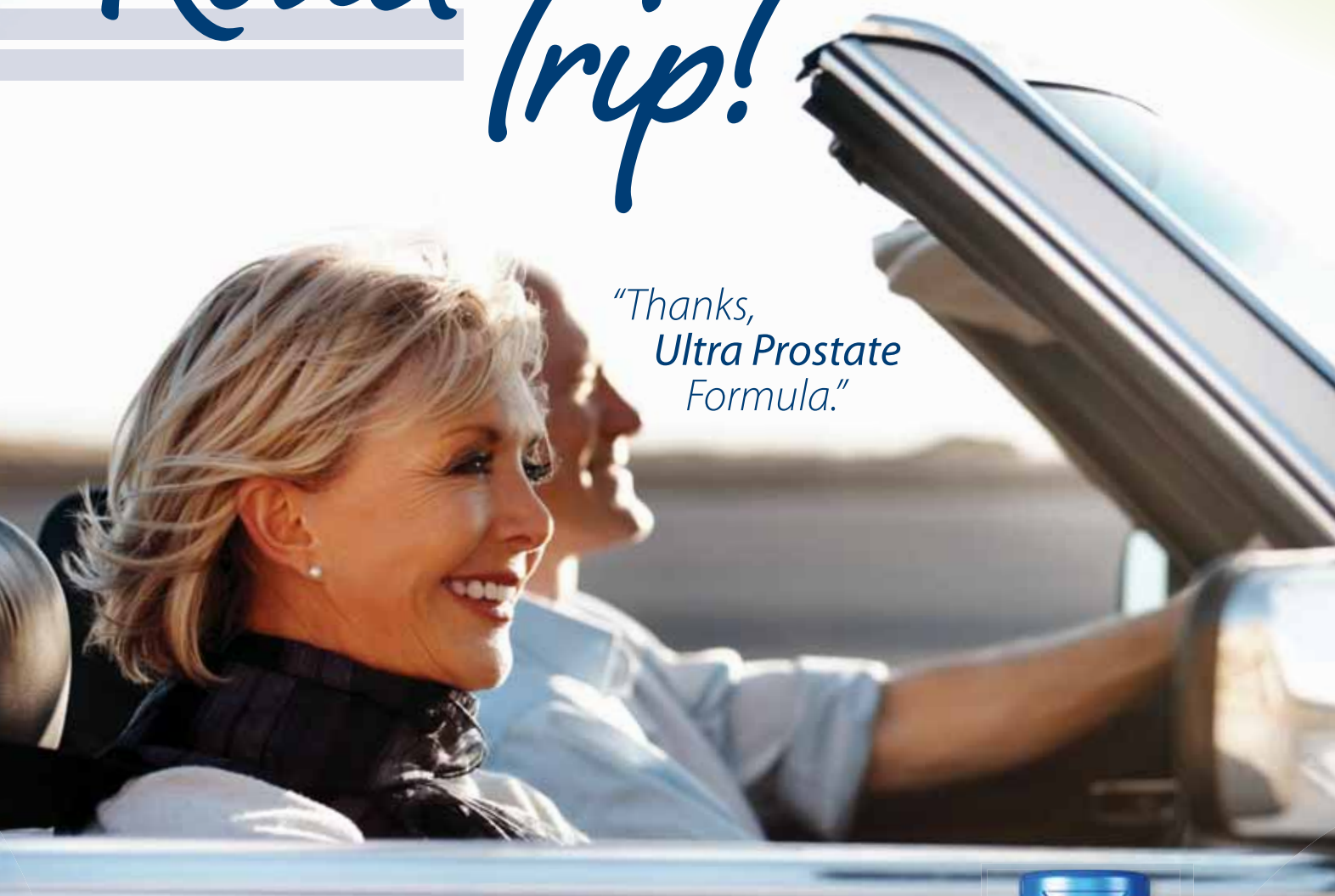

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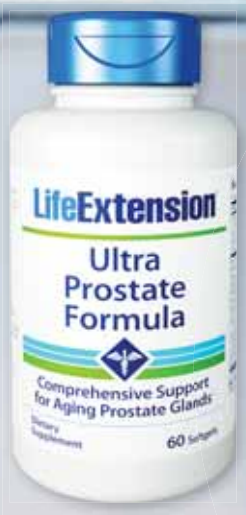


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# Impact of Fish Oil and Vitamin D on Human Health

BY WILLIAM FALOON

Late last year, the media reported top-line results from two large clinical trials.

One used relatively low doses of fish oil and vitamin D, and the other used high doses of an EPA-only, omega-3 drug.[1-3]

The first study, called **VITAL**, showed that relatively low doses of **fish oil** (**1,000 mg** daily) and **vitamin D** (**2,000 IU** daily) did not reduce risk of invasive cancer or of a predetermined combination of cardiovascular endpoints.[1,2]

This is not surprising, because these doses are below those that **Life Extension®** considers necessary to create optimum benefit.

Interestingly, however, even these relatively low doses of **fish oil** and **vitamin D** did show evidence of benefit in several subgroups in the VITAL study:[1,2]

- **25%** reduction in **cancer deaths** in the **vitamin D** group when the first two years of follow-up were excluded,
- **28%** reduction in **heart attack risk**, and **50%** reduction in fatal heart attack risk, in the **fish oil** group, and
- **22%** reduction in **angioplasty** procedures (opening a narrowed coronary blood vessel, often with a stent) in the **fish oil** group.

These favorable aspects of the VITAL study were ignored by most media outlets.

Instead, they focused only on the primary endpoints, which overlooked the statistically significant reduction in heart attack risk, and also overlooked reduced cancer death rates (*after* the first two years of the study were excluded).[1,2]

The daily dose of **vitamin D** used in the VITAL study was **2,000 IU**. This dose raised the mean blood level of *25-hydroxyvitamin D* from a baseline of about **30 ng/mL** to **41 ng/mL**.[2]

Our experience indicates that ***25-hydroxyvitamin D*** blood levels usually need to reach **50 ng/mL** and higher to achieve meaningful benefits.

The daily dose of **EPA/DHA** from **fish oil** in the VITAL study was **840 mg**.[1] This is about **one-third** of the optimal amount of supplemental EPA/DHA most people need to derive health benefits.

So, while this study (VITAL) did not meet the primary endpoints over the five-year study period, even these relatively low doses of fish oil and vitamin D demonstrated interesting findings in some subgroup analyses of cardiovascular and oncological outcomes.

The second study, called **REDUCE-IT™,** tested a **high-dose fish oil** drug comprised only of **EPA**. Compared to the placebo, there was an average **25%** reduced incidence of cardiovascular disorders across a broad spectrum.[3]

The media reported favorably on this study, but did not fully distinguish between **EPA/DHA** fish oil supplements and this expensive **EPA-only** fish oil drug.

I'm going to discuss some intriguing details about these two studies that go beyond the sensationalized headlines.


I try not to fault the news media for the misleading headlines they generate.

In today's soundbite-frenzied world, typical readers only want succinct summaries. Most want to be spared the details and read only a "curbside chat" about findings that can mean the difference between life and death.

In the period around **November 2018**, results from two, large, randomized controlled trials generated news reports about the impact of fish oil and vitamin D on cardiovascular health and cancer risk.[1-3]

The first study, called VITAL,[1,2] showed that relatively low-dose fish oil and vitamin D, did not reduce the primary cardiovascular endpoint, which in this study included several different disease outcomes combined into one (i.e. heart attack, stroke, and death from cardiovascular disease).

This finding caused the majority of media to report only on the primary endpoints of the VITAL trial and proclaim that fish oil and vitamin D do not prevent heart attacks or cancer.

This same study, however, showed evidence of benefit in several subgroup analyses that were compelling enough for other news sources, primarily scientific and medical professional sources, to speculate that some subgroups may achieve beneficial results, especially in regard to heart attack risk but also some aspects of cancer risk.[1,2]

Why the difference? Some reporters focused only on the primary endpoint and either ignored or discounted the rest of the study that showed benefits in various subgroups.

While **primary endpoint** data may have more methodological design relevance, there are reasons why the **subgroup analyses** pertain more to what informed supplement users do today.

For example, a statistically significant beneficial impact was observed in the **heart attack** subgroup, but no benefit was observed in stroke or cardiovascular death (other than death due to heart attack). So, the composite cardiovascular endpoint did not achieve statistical significance.

## Vitamin D and Cancer Risk

Cancer is usually a slowly developing process that can take many years to manifest as a clinically relevant and/or symptomatic disease.

The VITAL study showed that supplementation with **2,000 IU** a day of **vitamin D** over the course of the five-year trial, brought about no reduction in risk of invasive **cancer**.[2]

When the first **two years** of the study were excluded, there was a **25%** reduction in **cancer death rates** in the subgroup analysis.[2]

Because cancer takes time to clinically manifest, excluding the first two years of data in clinical trials yields a more realistic assessment of the actual effect of the intervention.

Although this modest dose of vitamin D did not reduce cancer risk overall, African Americans who received vitamin D experienced a suggestive **23% reduction in cancer risk**.[2] This is an impressive finding, since African Americans—as all people of color—are prone to having inadequate vitamin D blood levels.[4]

## Heart Attack and Fish Oil

While the primary, composite, cardiovascular endpoint of heart attack, stroke, and cardiovascular death showed no over-all benefit, additional analysis revealed robust reductions in heart attack incidence and fatal heart attacks in the fish-oil-only group.

Specifically, the omega-3 fatty acid intervention **lowered the risk of heart attack by 28%** and the **risk of fatal heart attack by 50%** but had no benefit on **stroke** or **cardiovascular deaths** not related to heart disease.[1]

Additionally, omega-3 fatty acids **reduced the rate** of **angioplasty** procedures by **22%**.[1]

Angioplasty technology has advanced significantly in recent years, enabling doctors to insert a catheter directly into severely occluded coronary arteries and insert stents (when warranted) that spare patients the miseries and risks of open heart surgery (coronary artery bypass).

In participants whose consumption of fish was low (defined as less than 3-4 ounces per week), omega-3 fatty acid supplementation led to a **19% reduction in major cardiovascular events,** including a **40% reduction in heart attack**, as well as a trend toward a reduction in death from any cause.[1] This emphasizes the importance and value of omega-3 fish oil supplementation in individuals consuming low amounts of fish.

In our experience, the dose (**840 mg/day**) of **EPA/DHA** is too low to confer a meaningful reduction in over-all cardiovascular risk for most individuals. This was demonstrated by the VITAL study itself, based on a **blood test** called the **omega-3 index**.

## Insufficient Omega-3 Blood Levels

The **omega-3 index** test measures the **percent** of omega-3 in the blood. The optimal range is generally between **8%** to **12%**.

In the VITAL study, the subjects' **omega-3 index** baseline measurements were **2.7%** and increased to **4%** after one year.[1] This **4%** number is half the minimum amount of omega-3 blood level needed to confer meaningful reductions in cardiovascular risk for most people.

Yet even this modest elevation of omega-3 blood levels (from 2.7% to 4%) resulted in benefits for reducing heart attack risk, fatal heart attack, and the need for angioplasty.[1] To put the **low-dose** used in the VITAL study into further context, the American Heart Association recommends **2,000 mg** to **4,000 mg** of **EPA/DHA** a day to lower **triglycerides**.[12]

## Reduced Cancer Deaths

In the VITAL clinical trial, one of the primary endpoints was invasive cancer of any type.[2]

The study randomized 25,871 subjects who were 67 years old on average. Subjects in the vitamin D group did not experience a statistically significant reduction in the frequency of the **primary cancer endpoints.**

The VITAL trial design had some weaknesses as it relates to cancer prevention, as follows:

Baseline blood levels of ***25-hydroxyvitamin D*** were about **30 ng/mL**.[2] This level is ***higher*** than the typical American's, who takes too little vitamin D or does not supplement at all.

This indicates that the study group was ***already*** benefiting from vitamin D and less likely to show further improvement after mean ***25-hydroxyvitamin D*** blood levels increased to mean **41 ng/mL** during the study period.

According to a number of experts, the optimal blood level of ***25-hydroxyvitamin D*** is **50 ng/mL** and higher. There is published data suggesting that *any* level of 25-hydroxyvitamin D over **30 ng/mL** reduces disease risks.[5-8] This means that individuals in the VITAL study group may have *already* been benefitting from vitamin D before they entered the study, since their baseline was around **30 ng/mL**.

The daily vitamin D3 dose of **2,000 IU** used in the VITAL study was likely too low. This is substantiated by research funded by **Life Extension®** 10 years ago showing that **85%** of serious supplement users had blood levels of ***25-hydroxyvitamin D*** below **50 ng/mL**.[9] This is why many people nowadays supplement with an additional **5,000 IU** of (low-cost) vitamin D3.

A primary endpoint of this study was invasive cancer of any type. There was a suggestive **17%** reduction in cancer deaths, which became a **25% reduction** in analyses that excluded the first two years of follow-up.[2]

Since cancer is normally a slowly developing disease, the benefits of nutritional interventions like vitamin D typically become clear only after several years. Those with pre-existing malignancies—meaning they already had them *before* the study started—would not be expected to benefit during the study's first two years.

The amount of supplemental vitamin D needed varies considerably among individuals, based on ***absorption*** and ***body mass***.[10] Heavier people need *higher* vitamin D doses than thin individuals. When vitamin D is taken with a fatty meal, absorption increases by **32%**.[11]

In the VITAL study, each person received the same low vitamin D dose (**2,000 IU/day**) and there is no indication they were told to take it with a fatty meal. These two factors would result in widely differing blood levels of ***25-hydroxyvitamin D*** among study subjects.

The **American Heart Association** suggests this *higher* dose of **EPA/DHA** providing that the fish oil capsules are taken under a physician's care, which is typical of mainstream organizations. The American Heart Association's recommendation is based on a large body of evidence showing **triglyceride-lowering** effects of marine-derived omega-3s.[13-16]

## The REDUCE-IT™ Fish Oil Study

In contrast with the relatively low dose of fish oil used in the **VITAL** study, the **REDUCE-IT™** trial used a therapeutic dose (**4,000 mg/day**) of a drug that consisted only of the **EPA** fraction of fish oil. The name of this fish oil drug is Vascepa®.[3]

A total of 8,179 subjects participated in REDUCE-IT™.

There was a **25%** reduction in the primary cardiovascular endpoint, a composite of cardiovascular death, nonfatal myocardial infarction, nonfatal stroke, coronary revascularization, or unstable angina.[3]

REDUCE-IT™ also observed several other important benefits of **four grams** of EPA daily:[3]

- Cardiovascular death reduced by **20%**
- Fatal or nonfatal heart attacks reduced by **31%**
- Fatal or nonfatal stroke reduced by **28%**
- Urgent or emergent coronary revascularization reduced by **35%**
- Hospitalization for unstable angina reduced by **32%**

The estimated out-of-pocket cost, assuming no insurance coverage, is about **$250 a month** for this **EPA-only** fish oil drug.

## Concern About EPA-Only Fish Oil Drugs

**Vascepa®,** an **EPA-only** drug is marketed to doctors as **fish oil** that lowers **triglycerides** without raising **LDL cholesterol** levels.[17]

To the physician, this may sound appealing compared to a competitive **fish oil drug** called **Lovaza®**, which contains **EPA** and **DHA**.

We are troubled that patients taking the **EPA-only** fish oil drug (Vascepa®) are unlikely to take other fish oil supplements. This ignores the important impact the **DHA** component of the omega-3 family has on other critical life-sustaining processes, especially **brain health**.

## Impact of Contradictory Headlines

Considerable evidence demonstrates disease-risk-reducing effects with proper potencies of **vitamin D** and **fish oil**.[18-21]

Favorable news headlines of VITAL and REDUCE-IT™ studies in November 2018 may have motivated some people to initiate supplementation with these nutrients.

Yet the majority of media reporting was biased against vitamin D and fish oil, in some cases stating that the VITAL study proved them to be worthless.

The same news media sources touted findings from the REDUCE-IT™ trial as **proving** fish oil's efficacy in heart attack prevention.

The media's knee-jerk reactions to create sensational headlines, as opposed to meticulously reviewing the actual studies, created contradictory opinions that will cause an undetermined number of Americans to have less-than-optimal blood levels of **omega-3s** and **vitamin D**.

This misinterpretation translates into needless suffering and premature death.

A further analysis of the VITAL and REDUCE-IT™ studies appears on page 70 of this month's issue.

## Real-World Disease Prevention

There is an old adage that says if you are going to do something, then do it right.

When it comes to fish oil and vitamin D supplements, taking the proper **dose** with a **fatty meal** enables people to achieve optimal **blood levels** and emulate benefits shown in many published studies.

The media create superficial and, in some cases, misleading headlines about important health issues.

Unlike mainstream news outlets, **Life Extension®** meticulously analyzes clinical trial findings and interprets them in the context of the totality of published scientific evidence. The box on the next page reveals some of the contradictory headlines that were published around the time period of September 2018 to January 2019.

As it relates to reducing one's risk of cardiovascular diseases and cancer, a lot more than **modest** doses of fish oil and/or vitamin D are required, which is what most readers of ***Life Extension® Magazine*** practice every day.

For longer life,

William Faloon, Co-Founder
Life Extension® Buyers Club

## References


1. Manson JE, Cook NR, Lee IM, et al. Marine n-3 Fatty Acids and Prevention of Cardiovascular Disease and Cancer. *N Engl J Med.* 2019 Jan 3;380(1):23-32.
2. Manson JE, Cook NR, Lee IM, et al. Vitamin D Supplements and Prevention of Cancer and Cardiovascular Disease. *N Engl J Med.* 2019 Jan 3;380(1):33-44.
3. Bhatt DL, Steg PG, Miller M, et al. Cardiovascular Risk Reduction with Icosapent Ethyl for Hypertriglyceridemia. *N Engl J Med.* 2019 Jan 3;380(1):11-22.
4. Harris SS. Vitamin D and African Americans. *J Nutr.* 2006 Apr;136(4):1126-9.
5. Holick MF. The role of vitamin D for bone health and fracture prevention. *Curr Osteoporos Rep.* 2006 Sep;4(3):96-102.
6. Vieth R. Vitamin D supplementation, 25-hydroxyvitamin D concentrations, and safety. *Am J Clin Nutr.* 1999 May;69(5):842-56.
7. Dawson-Hughes B, Heaney RP, Holick MF, et al. Estimates of optimal vitamin D status. *Osteoporos Int.* 2005 Jul;16(7):713-6.
8. Aloia JF, Patel M, Dimaano R, et al. Vitamin D intake to attain a desired serum 25-hydroxyvitamin D concentration. *Am J Clin Nutr.* 2008 Jun;87(6):1952-8.
9. Available at: https://www.lifeextension.com/magazine/2010/1/startling-findings-about-vitamin-d-levels-in-life-extension-members/page-01. Accessed August 26, 2019.
10. Holick MF, Binkley NC, Bischoff-Ferrari HA, et al. Evaluation, treatment, and prevention of vitamin D deficiency: an Endocrine Society clinical practice guideline. *J Clin Endocrinol Metab.* 2011 Jul;96(7):1911-30.
11. Dawson-Hughes B, Harris SS, Lichtenstein AH, et al. Dietary fat increases vitamin D-3 absorption. *J Acad Nutr Diet.* 2015 Feb;115(2):225-30.
12. Kris-Etherton PM, Harris WS, Appel LJ, et al. Fish Consumption, Fish Oil, Omega-3 Fatty Acids, and Cardiovascular Disease. *Circulation.* 2002 November 19, 2002;106(21):2747-57.
13. Covington MB. Omega-3 fatty acids. *Am Fam Physician.* 2004 Jul 1;70(1):133-40.
14. Calder PC. The role of marine omega-3 (n-3) fatty acids in inflammatory processes, atherosclerosis and plaque stability. *Molecular Nutrition & Food Research.* 2012;56(7):1073-80.
15. Davidson MH. Mechanisms for the hypotriglyceridemic effect of marine omega-3 fatty acids. *Am J Cardiol.* 2006 Aug 21;98(4a):27i-33i.
16. Goodfellow J, Bellamy MF, Ramsey MW, et al. Dietary supplementation with marine omega-3 fatty acids improve systemic large artery endothelial function in subjects with hypercholesterolemia. *J Am Coll Cardiol.* 2000 Feb;35(2):265-70.
17. Available at: https://www.vascepa.com/. Accessed August 26, 2019.
18. Meyer BJ, Groot RHM. Effects of Omega-3 Long Chain Polyunsaturated Fatty Acid Supplementation on Cardiovascular Mortality: The Importance of the Dose of DHA. *Nutrients.* 2017 Nov 30;9(12).
19. Svensson M, Schmidt EB, Jorgensen KA, et al. N-3 fatty acids as secondary prevention against cardiovascular events in patients who undergo chronic hemodialysis: a randomized, placebo-controlled intervention trial. *Clin J Am Soc Nephrol.* 2006 Jul;1(4):780-6.
20. Harris WS, Del Gobbo L, Tintle NL. The Omega-3 Index and relative risk for coronary heart disease mortality: Estimation from 10 cohort studies. *Atherosclerosis.* 2017 Jul;262:51-4.
21. Harris WS, Luo J, Pottala JV, et al. Red blood cell polyunsaturated fatty acids and mortality in the Women's Health Initiative Memory Study. *J Clin Lipidol.* 2017 Jan - Feb;11(1):250-9 e5.

## Divergent Media Headlines About VITAL and REDUCE-IT™ Study Results

### VITAL Study Headlines

Here are headlines from major media sources describing findings from the **VITAL** study that evaluated lower-dose fish oil and vitamin D on cardiovascular and cancer risk. Note how some of them contradict each other:

- **Fish-oil Drugs Protect Heart Health, Two Studies Say**. *Washington Post*, November 10, 2018
- **New Study: Fish Oil and Vitamin D Pills No Guard Against Cancer or Serious Heart Trouble**. *USA Today*, November 10, 2018
- **Vitamin D and Fish Oils Are Ineffective for Preventing Cancer and Heart Disease**. *The New York Times*, November 10, 2018
- **Big Studies Give Mixed News on Fish Oil, Vitamin D**. *Medical Xpress*, November 10, 2018
- **Fish Oil and Vitamin D Supplements May Not Help Prevent Heart Attacks and Cancer, Study Says**. *Time*, November 10, 2018
- **Vitamin D and Fish Oil Supplements Mostly Disappoint in Long-Awaited Research Results**. *NPR,* November 10, 2018
- **Vitamin D, Omega-3 Supplements Do Not Prevent Cancer or Heart Disease, Study Says**. *CNN*, November 10, 2018
- **Fish Oil Cuts Heart Attack Risk, Vitamin D Lowers Odds of Cancer Death**. *Reuters*, November 12, 2018
- **Eating More Fish or Taking Omega-3 Fish Oil Supplements Can Cut Heart Attack Risk, Studies Find**. *CBS News*, November 12, 2018
- **Fish, Fish Oil May Lower Your Heart Attack Risk**. *HealthDay*, November 12, 2018
- **Should You Keep Taking Those Fish Oil and Vitamin D Pills?** *NPR,* November 15, 2018
- **When Do Fish Oils Yield Good Results? The VITAL Study**. *Pharmacy Times,* November 16, 2018
- **Should You Give Up on Vitamin D and Omega-3s? Not So Fast**. *The Globe and Mail*, November 16, 2018
- **Fish Oil, Vitamin D Fall Short of Expectations**. *The Business Journals*, November 19, 2018
- **Fish Oil: Hunting for Evidence to Tip the Scales**. *Wall Street Journal*, January 2, 2019
- **The Slippery Slope of Fish Oil Supplements**. *Philly Voice,* January 16, 2019
- **Vitamin D Supplements Aren't Living Up to Their Hype**. *Science News*, January 27, 2019

### REDUCE-IT™ Study Headlines

Here are headlines from major media sources describing findings from the **REDUCE-IT™** study that evaluated higher-dose, EPA-only fish oil on cardiovascular risks. These headlines were published around the same time as the **VITAL** study results:

- **Fish Oil Drug May Prevent Heart Attack and Strokes in High-Risk Patients**. *New York Times*, September 25, 2018
- **Health Watch: Super Fish Oil May Cut Risk of Heart Disease and Stroke**. *CBS N.Y.,* September 25, 2018
- **REDUCE-IT: 25% Reduction in MACE with High-Dose EPA**. *Medscape,* September 25, 2018
- **Commentary: A Heartwarming Breakthrough for Patients At Risk Of Heart Disease**. *Chicago Tribune,* October 1, 2018
- **Drug with Fish Oil Cuts Risk Of Heart Attack, Stroke, Study Finds**. *NBC News*, November 10, 2018
- **Big Fish Oil Study Unveiled in Chicago Shows Promise in Heart Disease Prevention**. *Chicago Sun-Times,* November 10, 2018
- **Vascepa® (icosapent ethyl) 26% Reduction in Key Secondary Composite Endpoint of Cardiovascular Death, Heart Attacks and Stroke Demonstrated in REDUCE-IT™ Supports 25% Overall Reduction in Five-Point Major Adverse Cardiovascular Event Primary Composite Endpoint**. *AP News*, November 10, 2018
- **Detailed Results Show Amarin Fish Oil Drug Offered A Major Cardiovascular Benefit—But Come with A Blemish**. *STAT News,* November 10, 2018
- **REDUCE-IT: 'A New Era' in CVD Prevention with High-Dose EPA**. *Medscape,* November 10, 2018
- **Icosapent Ethyl Reduces Cardiovascular Death Risk 20% in REDUCE-IT Trial**. *MD Magazine*, November 11, 2018
- **Vascepa and Statins Significantly Reduce Cardiovascular Events**. *Diagnostic and Interventional Cardiology*, November 13, 2018
- **Fish Oil Drug Vascepa Looks Heart Healthy—but Is It Really?** *Daily Beast*, November 20, 2018

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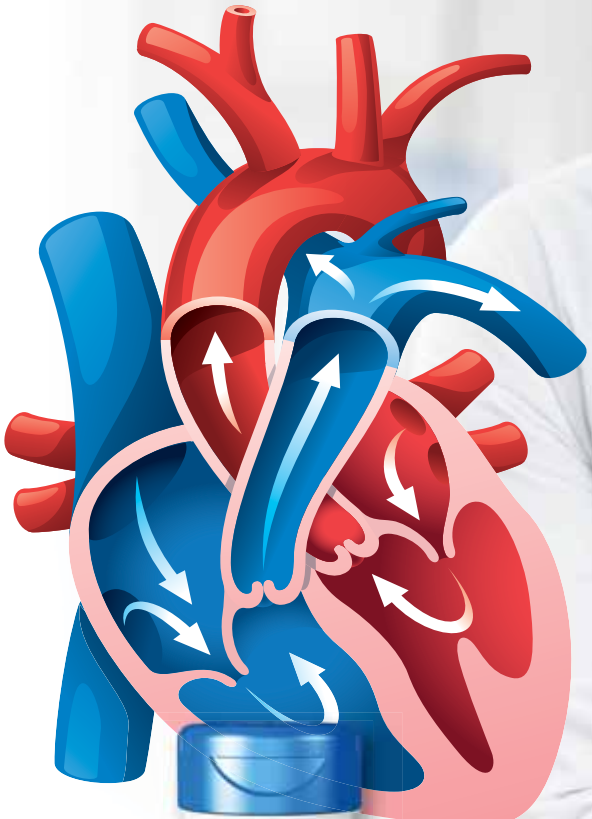


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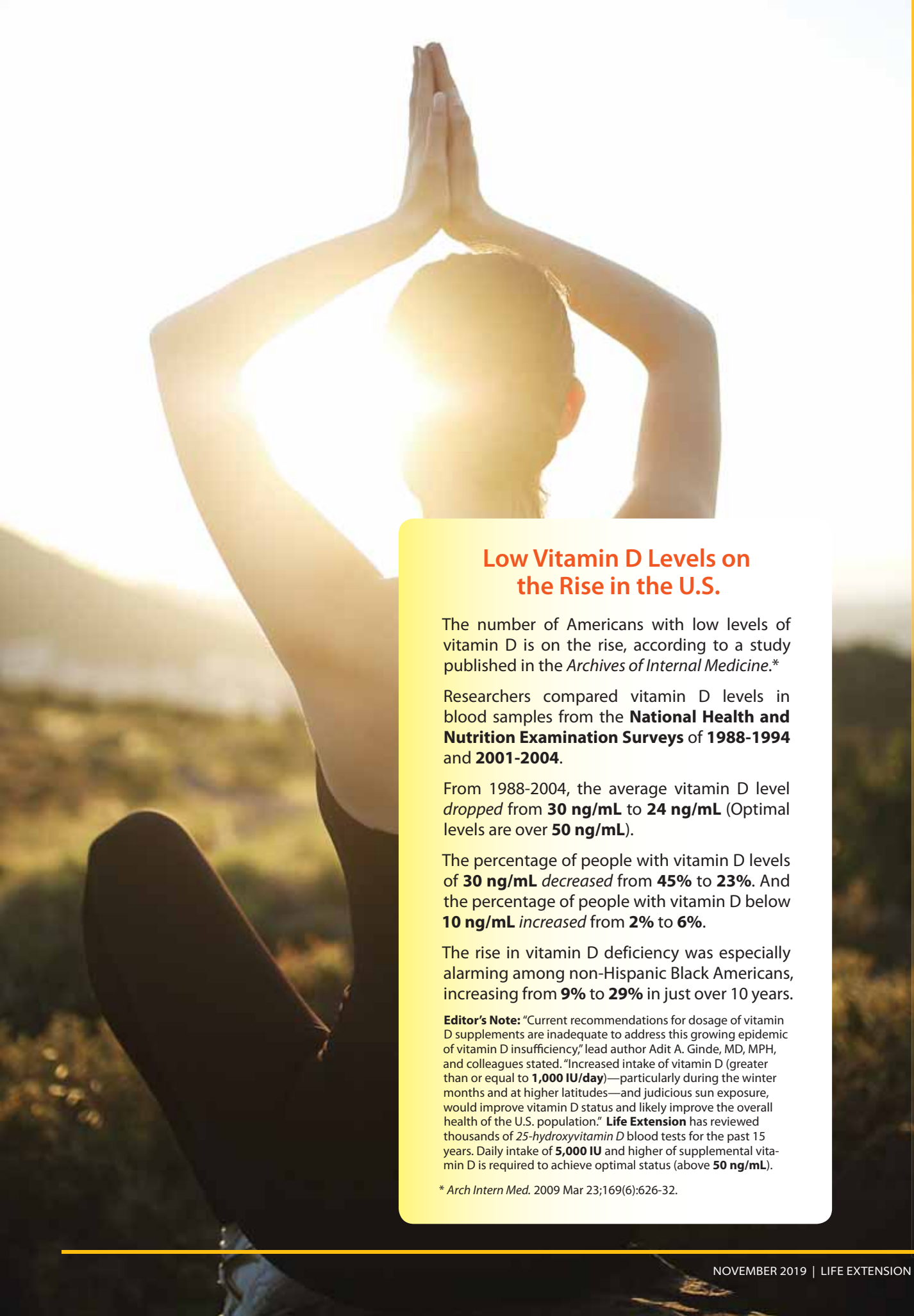


## Low Vitamin D Levels on the Rise in the U.S.

The number of Americans with low levels of vitamin D is on the rise, according to a study published in the *Archives of Internal Medicine*.*

Researchers compared vitamin D levels in blood samples from the **National Health and Nutrition Examination Surveys** of **1988-1994** and **2001-2004**.

From 1988-2004, the average vitamin D level *dropped* from **30 ng/mL** to **24 ng/mL** (Optimal levels are over **50 ng/mL**).

The percentage of people with vitamin D levels of **30 ng/mL** *decreased* from **45%** to **23%**. And the percentage of people with vitamin D below **10 ng/mL** *increased* from **2%** to **6%**.

The rise in vitamin D deficiency was especially alarming among non-Hispanic Black Americans, increasing from **9%** to **29%** in just over 10 years.

**Editor's Note:** "Current recommendations for dosage of vitamin D supplements are inadequate to address this growing epidemic of vitamin D insufficiency," lead author Adit A. Ginde, MD, MPH, and colleagues stated. "Increased intake of vitamin D (greater than or equal to **1,000 IU/day**)—particularly during the winter months and at higher latitudes—and judicious sun exposure, would improve vitamin D status and likely improve the overall health of the U.S. population." **Life Extension** has reviewed thousands of *25-hydroxyvitamin D* blood tests for the past 15 years. Daily intake of **5,000 IU** and higher of supplemental vitamin D is required to achieve optimal status (above **50 ng/mL**).

* *Arch Intern Med.* 2009 Mar 23;169(6):626-32.

## Deficiency in Vitamin D Linked to Heart Disease

Research presented at the American College of Cardiology's 63rd Annual Meeting added more evidence to the link between low levels of vitamin D and heart disease.*

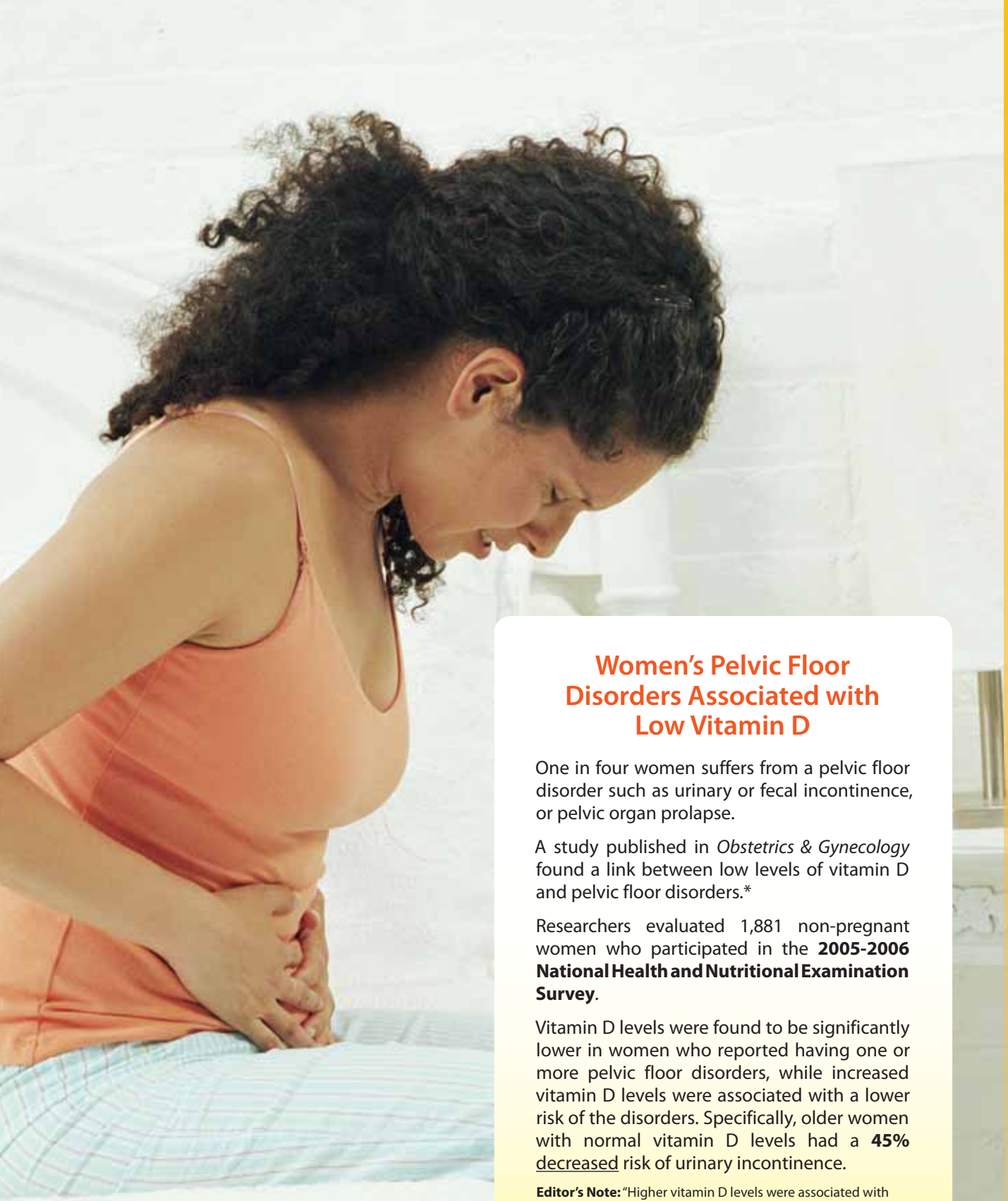
After examining nearly 1,500 patients, researchers found that **70%** of those undergoing angiography (a test to detect blocked arteries) were deficient in vitamin D.

In addition, the individuals deficient in vitamin D had a **32%** greater risk of **coronary artery disease**, and a nearly **20%** increased risk of having the most **severe** level of disease.

Coronary artery disease is the most common form of heart disease and occurs when the arteries become hard and narrow, slowing blood flow to the heart. It is typically caused by a buildup of plaque inside arteries, called **atherosclerosis**.

**Editor's Note:** According to study investigator Dr. Monica Verdoia, these results, "suggest vitamin D deficiency to be the cause rather than the consequence of atherosclerosis."

* American College of Cardiology 63rd Annual Scientific Session. 2014 Mar.



## Women's Pelvic Floor Disorders Associated with Low Vitamin D

One in four women suffers from a pelvic floor disorder such as urinary or fecal incontinence, or pelvic organ prolapse.

A study published in *Obstetrics & Gynecology* found a link between low levels of vitamin D and pelvic floor disorders.*

Researchers evaluated 1,881 non-pregnant women who participated in the **2005-2006 National Health and Nutritional Examination Survey**.

Vitamin D levels were found to be significantly lower in women who reported having one or more pelvic floor disorders, while increased vitamin D levels were associated with a lower risk of the disorders. Specifically, older women with normal vitamin D levels had a **45%** decreased risk of urinary incontinence.

**Editor's Note:** "Higher vitamin D levels were associated with a decreased risk of any pelvic floor disorder in all women," said lead researcher Samuel Badalian, MD, PhD. "Given the increase in the number of patients with pelvic floor disorders, further evaluation of the role of vitamin D is warranted."

* *Obstet Gynecol.* 2010 Apr;115(4):795-803.

## Higher Levels of Vitamin D Connected to Lower Blood Glucose in Women

An association was found between *higher* serum vitamin D levels and lower levels of blood glucose in women, according to an article published in *Menopause*, the journal of The North American Menopause Society.* Higher glucose levels are linked to an increased risk of developing type II diabetes.

Conducted by researchers at the University of Sao Paulo School of Public Health in Brazil, the study included 680 women aged 35 to 74, whose fasting blood samples were analyzed for levels of glucose and *25-hydroxyvitamin D*. Vitamin D levels of less than **30 ng/mL** were detected in **65.4%** of the participants.

Having a vitamin D level of less than **30 ng/mL** was associated with a **29%** greater chance of having a blood glucose level of **100 mg/dL** or more, compared to having a higher level of the vitamin.

**Editor's Note:** "There is now evidence that a higher serum level of 25-hydroxyvitamin D (25[OH]D) is associated with a lower risk of developing type II diabetes mellitus, because it provides better glycemic control, possibly by promoting greater insulin sensitivity, and also by improving pancreatic beta cell function," the authors stated.

* *Menopause.* 2019 Jul;26(7):781-784.

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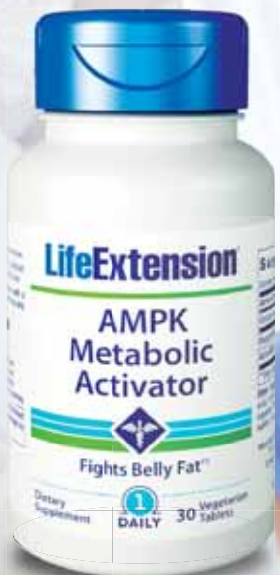


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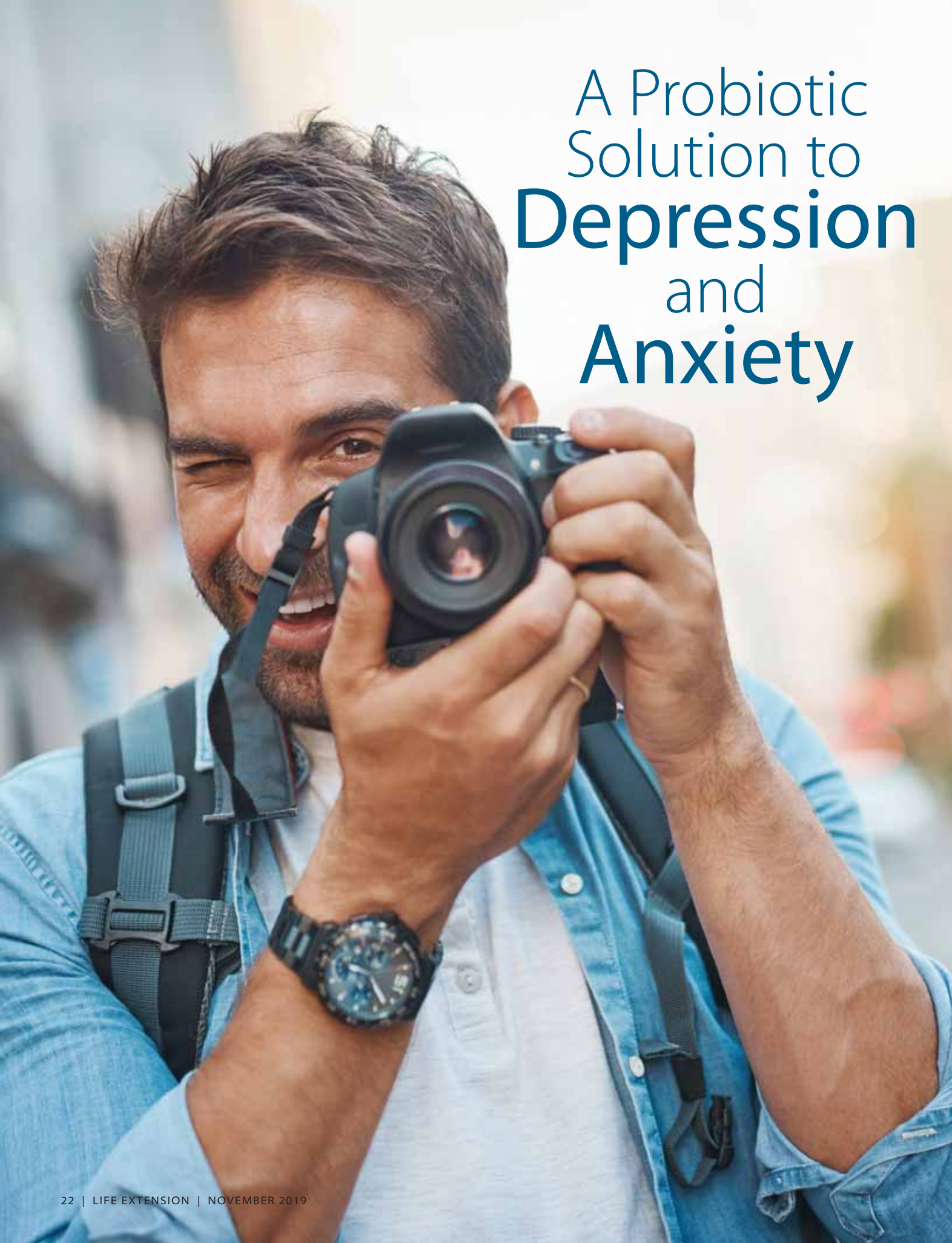

# A Probiotic Solution to **Depression** and **Anxiety**

BY MICHAEL DOWNEY

Many people who suffer from **depression** and **anxiety** are resistant to conventional treatments.

Data from the National Health and Nutrition Examination Survey (NHANES) for the **2011-2014** period show that anti-depressant **drug** use increased **65%** since **1999**.[1]

Individual responses to depression treatments vary greatly from one person to another.

Among those taking antidepressants, **30%-50%** find their initial treatment doesn't work,[2,3] and two-thirds experience at least one side effect—including nausea, weight gain, fatigue, sexual dysfunction, and in some cases, suicidal thoughts.[3,4]

Scientists have found a new way to relieve mood disorders: **probiotics**.

Two unique strains of these helpful bacteria have been found to significantly reduce stress, anxiety, and depression.

One human study showed a **50%** improvement in **depression** scores with these two probiotics, and another showed a **55%** improvement in **anxiety** scores—all without side effects.[5,6]

Scientists have now combined these probiotics with an extract of the spice **saffron** that has been shown to be equally as beneficial as anti-depressant drugs to reduce depression—without side effects.[7-10]

The result is a safe, powerful new way to relieve depression and anxiety and boost overall mood.

## Microorganisms and Mood

Probiotics are beneficial bacteria that keep the microorganisms in your gut balanced.

Decades of research have established that they promote digestive, immune, and oral health. But more recent research reveals that probiotics also support *psychological* well-being.[5,6,11-16]

It may sound incredible. But it works. Here's how:[11]

- The **intestinal *neural system*** is composed of **200-600 million neurons**, cells that receive, process, and transmit information.[17]
- Gut microorganisms can secrete many kinds of **neurotransmitters**, chemicals that send signals from one neuron to another.[18] They include **GABA** (**gamma-aminobutyric acid**), which relieves anxiety and boosts mood.
- Certain intestinal bacteria increase brain levels of **BDNF** (**brain-derived neurotrophic factor**), a growth factor known to promote neuron development, survival, and function, and support synapse health. Some neurotransmitter changes during the stress state are believed to be caused not by stress itself, but by undesirable intestinal microorganisms.
- Stress can reduce **intestinal barrier function**, causing "leaky gut" and enabling pro-inflammatory molecules to enter the blood and immune system. That, in turn, negatively affects mood.
- Taking specific **probiotic strains** can improve and redistribute species of microbes to relieve anxiety and depression.

This interaction between the gut and the brain is known as the **gut-brain axis**. It explains how microorganisms residing in our intestine can affect how we feel.[11,16,19,20]

The use of probiotic strains to alter mood is so promising, scientists have dubbed the field **psychobiotics**.[12-14]

## Probiotics Regulate Stress

Studies have found that a combination of two unique strains of probiotics relieves symptoms of **stress**, **anxiety**, and **depression**.[5,6]

The two probiotics are ***Lactobacillus helveticus*** **R0052** and ***Bifidobacterium longum*** **R0175**.

Working through the **gut-brain axis**, they lead to:

- Greater production of the anxiety-relieving neurotransmitter **GABA**,[21]
- Increased levels in the **hippocampus**, the brain's memory-processing region, of **doublecortin**, a protein important in the movement and differentiation of neurons. Doublecortin is also a marker for new brain-cell formation in an experimental model of chronic stress,[22]
- Decreased levels of **pro-inflammatory cytokines** and increased production of **anti-inflammatory** cytokines,[5,6,23] and
- A tightening of the "leaky gut" induced by stress.[22]

To test these effects, researchers compared these two probiotics with **Valium**® (diazepam), a drug known for its calming effects.[5]

In an experimental model of anxiety, rats were divided into three groups, receiving either a saline solution, the probiotic combination (*L. helveticus* R0052 and *B. longum* R0175), or Valium® an hour before being exposed to the anxiety-inducing intervention.[5]

The animals receiving Valium® *and* those taking probiotics showed significantly *decreased* anxiety and stress during the two-week study, compared with the saline group. In this study, the **probiotic combination** had similar **anxiety-reducing** properties to those of this well-established **drug**.[5]

## Dramatic Results in Human Studies

Next, scientists conducted randomized, placebo-controlled **human** trials on the **probiotics**.

One study was conducted on 55 volunteers, aged 30-60, with **mild depression** or **anxiety**. Each day, some participants took a placebo, while others took **3 billion CFUs** (colony forming units, a measure of the number of microorganisms) of the **probiotic** combination.[5]

After 30 days, probiotic-taking subjects had the following changes in scoring on standard tests, compared to the placebo group:[5]

- **50%** improvement in depression scores,
- **36%** improvement in hospital anxiety and depression scale,
- **49%** improvement in global severity index, a measure of overall psychological distress,
- **60%** improvement in anger-hostility scores, and
- **13%** decrease in urinary free **cortisol**, a hormonal measure of chronic stress.

The probiotic group also displayed reductions in self-blame and improvements in problem-solving skills.[5]

A follow-up study was conducted on 25 of this trial's participants whose urinary free cortisol was below the median at baseline. That means, to begin with, they had lower stress levels.[6]

## A New Way to Boost Mood

- About **16.1 million** adult Americans suffer from major depression, and **40 million** from anxiety.[29]
- Antidepressants are effective, but individual responses vary greatly from one person to another, and they often cause harsh side effects, including nausea, weight gain, and sexual problems.
- Scientists seeking safer therapies have demonstrated that two, unique **probiotic** strains, ***Lactobacillus helveticus*** **R0052** and ***Bifidobacterium longum*** **R0175**, work on the **gut-brain axis** to alleviate depression and anxiety — without side effects.
- Research also shows that **saffron extract** alleviates symptoms of depression as effectively as drugs, but without unwanted effects.
- For the first time, these two probiotics have been combined with an optimized form of saffron to powerfully and safely relieve symptoms of depression and anxiety and improve mood.



Even this low-stress group demonstrated marked improvements in mood with probiotic supplementation, including **55%** improvement in anxiety scores and **50%** improvement in depression scores.

Unlike prescription medication for anxiety and depression, the probiotics didn't cause any significant side effects.[6]

Another human study assessed the impact of the two probiotics on **stress-induced digestive symptoms**.[24] About **60%** of patients with depression and anxiety have intestinal disturbances.[9]

This double-blind, controlled, randomized study enrolled participants aged 18-60 who self-reported at least two symptoms of stress. They were given either a placebo or the probiotic combination at the same dosage as in the other studies.[24]

After three weeks, probiotic-treated subjects, compared to the placebo group, had **7.6 times** the reduction in stress-induced abdominal pain, **2.1 times** the reduction in stress-induced nausea and vomiting, and **2.9 times** the reduction in flatulence and gas.[24]

Once again, the probiotics were found to be safe and did not cause unpleasant side effects.


## Saffron Boosts Mood

The spice **saffron** has long been used in traditional Persian (Iranian) medicine to treat depression.[9,25] Preclinical research suggests that it may act as an **antidepressant**.[26]

Unlike the probiotics, which work on the gut-brain axis, saffron extract acts *directly* on the brain to relieve depression and anxiety. Saffron may beneficially modulate **neurotransmitters** that are important for mood.[7,10,27,28] These include:

- ***Serotonin***, thought of as the body's natural "feel-good" chemical,
- ***Dopamine***, that contributes to feelings of pleasure and satisfaction, and
- ***Norepinephrine***, that increases alertness, arousal, and attention.

After reporting on the antidepressant effects of saffron in mice,[26] researchers conducted a double-blind, randomized human trial. Forty adults diagnosed with **major depression** were divided into two groups. One took **30 mg** of saffron twice daily. The other took a placebo.[25]

After six weeks, people taking **saffron** improved their scores on the Hamilton Depression Rating Scale (which has been used for years to assess depression) by approximately **56%**, compared to the placebo group's improvement of approximately **22%**.[25]

There were no significant differences in side effects between the groups.[25]

## Saffron vs. Antidepressant Drugs

In a series of head-to-head tests, scientists set out to compare a **saffron extract** with three common **antidepressant drugs**.

### Tofranil®

In a double-blind trial, scientists randomly divided 30 patients who suffered from depression into two groups. One took **30 mg** of saffron daily. The other received **100 mg** of the antidepressant **Tofranil®** (imipramine) daily.[10]

After six weeks, the saffron and Tofranil® were found to be **equally beneficial** in the treatment of mild to moderate depression.[10]

There were no significant differences in side effects except that the Tofranil® group suffered dry mouth and unwanted sedation.[10]

### Prozac®

To compare the potency of saffron to the antidepressant **Prozac**® (fluoxetine), scientists conducted a double-blind study with 40 adults with depression. They were randomly assigned to receive either daily doses of saffron extract (**30 mg**) or Prozac® (**20 mg**).[9]

Six weeks later, saffron was shown to be **as effective** as Prozac® in the treatment of mild to moderate depression, with no significant differences in side effects.[9]

### Celexa®

And in another randomized study of 66 patients who had "major depressive disorder [*and*] anxious distress",[7] scientists compared saffron to the antidepressant **Celexa**® (citalopram).

One group took **30 mg/day** of saffron while the other took **40 mg/day** of Celexa®.[7]

After six weeks, both groups showed **similar**, **significant improvements** in scores for both depression and anxiety.[7] Frequency of side effects was not significantly different between the two groups.

No serious side effects were seen with saffron in *any* of these studies. And **no sexual side effects** of any kind, which are common with antidepressants, were found for saffron.[7,9,10]

## Unique Combination of Antidepressant Ingredients

For the first time, scientists have *combined* the mood-boosting **probiotics** *Lactobacillus helveticus* R0052 and *Bifidobacterium longum* R0175 with **saffron extract** for maximum antidepressant and anti-anxiety benefits. The researchers used dosages based on clinical studies demonstrating safe efficacy.

To optimize this formula, a unique form of **saffron extract** was developed after studying the results of several clinical trials. It is an **80%** ethanolic extract, standardized to **11%** crocin and **2%** safranal—the percentages of these active compounds found to be most beneficial in the trials.

## Summary

Findings from laboratory and **human** studies have identified two **probiotic** strains that can significantly reduce **depression** and **anxiety**, without the side effects that often come with antidepressant drugs.

Clinical studies also show that **saffron extract** significantly improves depression scores and is equally as beneficial as common antidepressant drugs, also without unwanted effects.

These two **probiotics** and **saffron** have been combined to provide a unique option to combat anxiety and depression. ●

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

## References


1. Available at: https://www.cdc.gov/nchs/products/databriefs/db283.htm. Accessed August 6, 2019.
2. Alboni S, Poggini S, Garofalo S, et al. Fluoxetine treatment affects the inflammatory response and microglial function according to the quality of the living environment. *Brain, Behavior, and Immunity*. 2016 2016/11/01/;58:261-71.
3. Available at: https://www.consumerreports.org/cro/2013/09/best-treatments-for-depression/index.htm. Accessed August 6, 2019.
4. Available at: https://www.mayoclinic.org/diseases-conditions/depression/in-depth/antidepressants/art-20049305. Accessed August 13, 2019.
5. Messaoudi M, Lalonde R, Violle N, et al. Assessment of psychotropic-like properties of a probiotic formulation (Lactobacillus helveticus R0052 and Bifidobacterium longum R0175) in rats and human subjects. *Br J Nutr.* 2011 Mar;105(5):755-64.
6. Messaoudi M, Violle N, Bisson JF, et al. Beneficial psychological effects of a probiotic formulation (Lactobacillus helveticus R0052 and Bifidobacterium longum R0175) in healthy human volunteers. *Gut Microbes.* 2011 Jul-Aug;2(4):256-61.
7. Ghajar A, Neishabouri SM, Velayati N, et al. Crocus sativus L. versus Citalopram in the Treatment of Major Depressive Disorder with Anxious Distress: A Double-Blind, Controlled Clinical Trial. *Pharmacopsychiatry*. 2017 Jul;50(4):152-60.

8. Shahmansouri N, Farokhnia M, Abbasi SH, et al. A randomized, double-blind, clinical trial comparing the efficacy and safety of Crocus sativus L. with fluoxetine for improving mild to moderate depression in post percutaneous coronary intervention patients. *J Affect Disord*. 2014 Feb;155:216-22.
9. Noorbala AA, Akhondzadeh S, Tahmacebi-Pour N, et al. Hydro-alcoholic extract of Crocus sativus L. versus fluoxetine in the treatment of mild to moderate depression: a double-blind, randomized pilot trial. *J Ethnopharmacol.* 2005 Feb 28;97(2):281-4.
10. Akhondzadeh S, Fallah-Pour H, Afkham K, et al. Comparison of Crocus sativus L. and imipramine in the treatment of mild to moderate depression: a pilot double-blind randomized trial [ISRCTN45683816]. *BMC Complement Altern Med.* 2004 Sep 2;4:12.
11. Liu L, Zhu G. Gut-Brain Axis and Mood Disorder. *Front Psychiatry.* 2018;9:223.
12. Zhou L, Foster JA. Psychobiotics and the gut-brain axis: in the pursuit of happiness. Neuropsychiatr Dis Treat. 2015;11:715-23.
13. Kali A. Psychobiotics: An emerging probiotic in psychiatric practice. *Biomed J*. 2016 Jun;39(3):223-4.
14. Sarkar A, Lehto SM, Harty S, et al. Psychobiotics and the Manipulation of Bacteria-Gut-Brain Signals. *Trends Neurosci*. 2016 Nov;39(11):763-81.
15. Dinan TG, Stanton C, Cryan JF. Psychobiotics: a novel class of psychotropic. *Biol Psychiatry.* 2013b Nov 15;74(10):720-6.
16. Rieder R, Wisniewski PJ, Alderman BL, et al. Microbes and mental health: A review. *Brain Behav Immun*. 2017 Jan 25.
17. Furness JB, Callaghan BP, Rivera LR, et al. The enteric nervous system and gastrointestinal innervation: integrated local and central control. *Adv Exp Med Biol.* 2014;817:39-71.
18. Strandwitz P. Neurotransmitter modulation by the gut microbiota. *Brain Res*. 2018 Aug 15;1693(Pt B):128-33.
19. Kelly JR, Minuto C, Cryan JF, et al. Cross Talk: The Microbiota and Neurodevelopmental Disorders. *Front Neurosci.* 2017;11:490.
20. Clark A, Mach N. Exercise-induced stress behavior, gut-microbiota-brain axis and diet: a systematic review for athletes. *J Int Soc Sports Nutr.* 2016;13:43.
21. Lallemand. Unpublished Supplier Communication: GABA production. 2017, data on file.
22. Ait-Belgnaoui A, Colom A, Braniste V, et al. Probiotic gut effect prevents the chronic psychological stress-induced brain activity abnormality in mice. *Neurogastroenterol Motil.* 2014 Apr;26(4):510-20.
23. Arseneault-Breard J, Rondeau I, Gilbert K, et al. Combination of Lactobacillus helveticus R0052 and Bifidobacterium longum R0175 reduces post-myocardial infarction depression symptoms and restores intestinal permeability in a rat model. *Br J Nutr.* 2012 Jun;107(12):1793-9.
24. Diop L, Guillou S, Durand H. Probiotic food supplement reduces stress-induced gastrointestinal symptoms in volunteers: a double-blind, placebo-controlled, randomized trial. *Nutr Res.* 2008 Jan;28(1):1-5.
25. Akhondzadeh S, Tahmacebi-Pour N, Noorbala AA, et al. Crocus sativus L. in the treatment of mild to moderate depression: a double-blind, randomized and placebo-controlled trial. *Phytother Res*. 2005 Feb;19(2):148-51.
26. Karimi GR, Hosseinzadeh H, KHALEGH PP. Study of antidepressant effect of aqueous and ethanolic extract of Crocus sativus in mice. *Iranian Journal Of Basic Medical Sciences.* 2001;4(3):11-5.
27. Hausenblas HA, Heekin K, Mutchie HL, et al. A systematic review of randomized controlled trials examining the effectiveness of saffron (Crocus sativus L.) on psychological and behavioral outcomes. *J Integr Med.* 2015 Jul;13(4):231-40.
28. Ettehadi H, Mojabi SN, Ranjbaran M, et al. Aqueous Extract of Saffron (Crocus sativus) Increases Brain Dopamine and Glutamate Concentrations in Rats. 2013.
29. Available at: https://adaa.org/about-adaa/press-room/facts-statistics. Accessed August 7, 2019.


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MacuGuard® Ocular Support provides lutein, *trans*-zeaxanthin, and *meso*-zeaxanthin to help maintain structural integrity of the macula and retina.[1-5]

Alpha-carotene is included based on new evidence that it helps support the macular pigment.[1]

People supplementing with saffron showed an improvement in vision as measured by their seeing an average of two additional lines on the eye chart commonly used by doctors to test vision.[1]

This formula provides the optimal dose of saffron along with cyanidin-3-glucoside to support healthy vision.[6-8]




## MacuGuard® Ocular Support with Saffron

Item #01992 • 60 softgels
1 bottle **$18.75**
4 bottles $17.50 each

**Each bottle lasts for two months.**

**References**
1. *JAMA Ophthalmol.* 2015;133(12):1415-24.
2. *Nutrients.* 2013 April;5(4):1169-85.
3. *Nutrition.* 2011 Sep;27(9):960-6.
4. *Free Radic Biol Med.* 2012;53(6):1298-307.
5. *J Ophthalmol.* 2015;2015:523027.
6. *Evid Based Complement Alternat Med.* 2012;2012:429124.
7. *Invest Ophthalmol Vis Sci.* 2010;51(12):6118-24.
8. *J Agric Food Chem. 2003* Jun 4;51(12):3560-3.

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# Magnesium

## Improves Insulin Sensitivity in Type II Diabetics

BY STAN LOWE

Nearly half of Americans consume less than the required amount of the mineral **magnesium**.[1]

At the same time, we face an epidemic of rising **blood-sugar** levels.

Research has shown that *increased intake* of **magnesium** can help lower the *risk* of developing diabetes.

A new study shows that magnesium can also help those who *already* have **type II diabetes**.

This human trial demonstrated that supplementing with magnesium improved insulin sensitivity by **28%**. It also lowered a marker of glucose-induced tissue damage, called **hemoglobin A1c**, in middle-aged people with type II diabetes.[2]

The diabetic participants in the study who took **magnesium** had significant improvement in *every* indicator of **glycemic control**.[2]

## Dangers of Low Magnesium

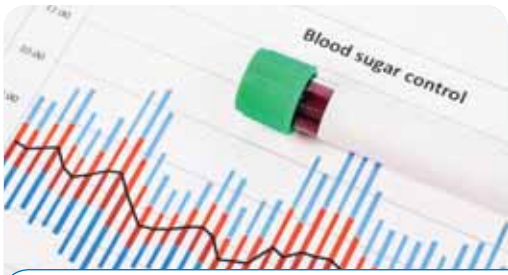
The relationship between type II diabetes and magnesium *deficiency* is well established.

Low **magnesium** is associated with **insulin resistance**,[3] which happens when cells are unable to properly utilize **insulin** to metabolize **glucose**.[2,4]

Insulin resistance results in **high blood sugar**, and all too often progresses to **type II diabetes**.[5,6]

The opposite of insulin resistance is youthful **insulin sensitivity**, when cells respond well to insulin.

The ability to decrease insulin *resistance* and increase insulin *sensitivity* is the key to **glycemic control** (keeping blood sugar in a target range).




Reducing exposure to high blood sugar can help prevent many of the long-term consequences of uncontrolled diabetes, including heart disease, stroke, kidney disease, blindness, and neuropathy.[2,7]

## Magnesium Lowers Insulin Resistance in a Human Study

A study done in late **2018** showed that **magnesium** plays a vital role in controlling **blood sugar**.

Researchers conducted a randomized, controlled clinical trial on 40 patients with **type II diabetes**. After a dietary stabilization period to ensure that all subjects began the study with a similar nutritional status, each subject received either **250 mg** of **magnesium** daily or a placebo.[2]

Both groups were advised to stick to a healthy diet, with specific guidance on avoiding added sugars.[2]

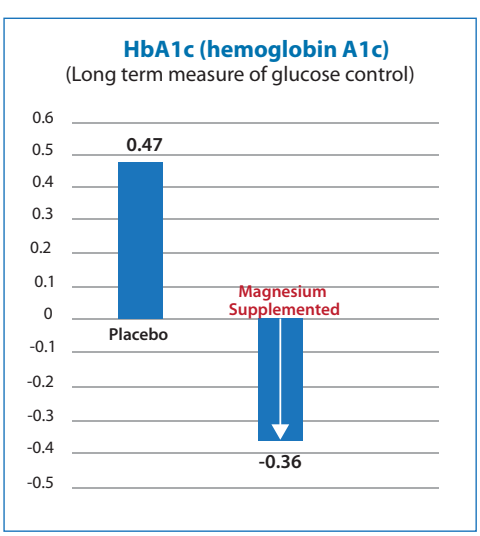
The trial lasted for three months, and various measures of **glycemic control**—including indicators of blood sugar, insulin production, and insulin resistance—were tested at the start and the end of the study.[2]

The **placebo** group showed *decreases* in measures of glycemic control. In other words, those patients' ability to manage high blood sugar got *worse*.

Significant *improvements* in **glycemic control** were seen in the group taking **magnesium**.

The magnesium-supplemented group had *lower* blood sugar, *lower* **hemoglobin A1c** (a marker of long-term glucose control), and *improved* insulin sensitivity by **28%** as seen by measurement of HOMA-IR (homeostasis model assessment of insulin resistance).[2] In the placebo group not supplementing with magnesium, insulin sensitivity worsened by **39%**.

High levels of insulin are associated with increased **cancer risk**. Because sensitivity to insulin was increased in the magnesium group, they *made* less excess insulin, likely lowering that risk.[8-10]

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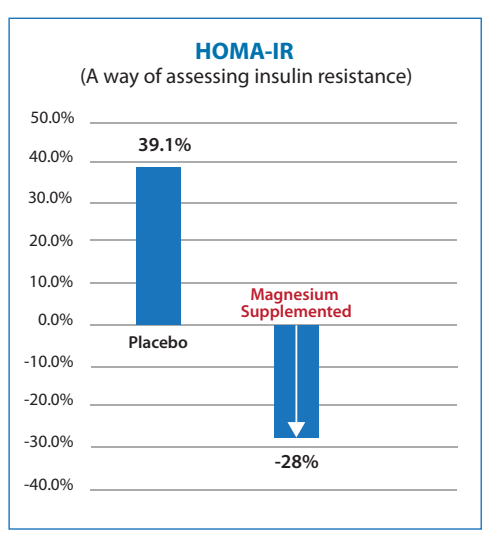


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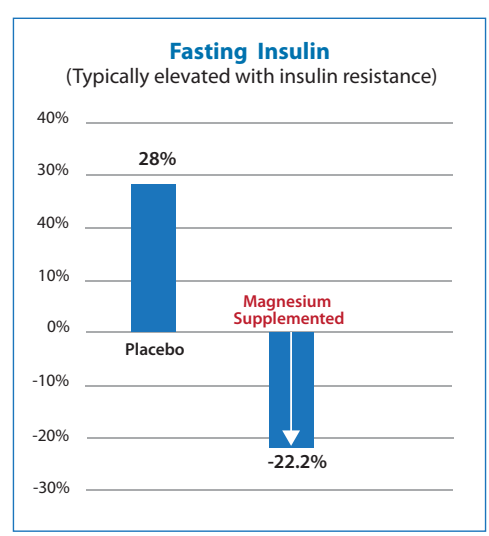



*p* <0.001

Significant decreases in HbA1c, insulin, and in HOMA-IR are seen in magnesium supplemented individuals over the three-month study, compared to the placebo group.[2] A decrease in HOMA-IR means that insulin sensitivity *improved*.

## Summary

Improving **insulin sensitivity** is one of the most important ways to reduce the harmful impact of **type II diabetes**.

When cells are sensitive to insulin, it means they can respond appropriately to insulin's blood-sugar-lowering signal.

This new study shows that **magnesium** improves **insulin sensitivity** in type II diabetics.

People who took **250 mg per day** of magnesium had significant improvements in multiple measures of **glycemic control**, including lower blood sugar, insulin, and hemoglobin A1c.

Subjects who took a placebo had a worsening of all glycemic control indicators.

This study adds to a large body of evidence that magnesium intake is critical for keeping blood sugar under control and for lowering the risk for diabetes-associated disorders.

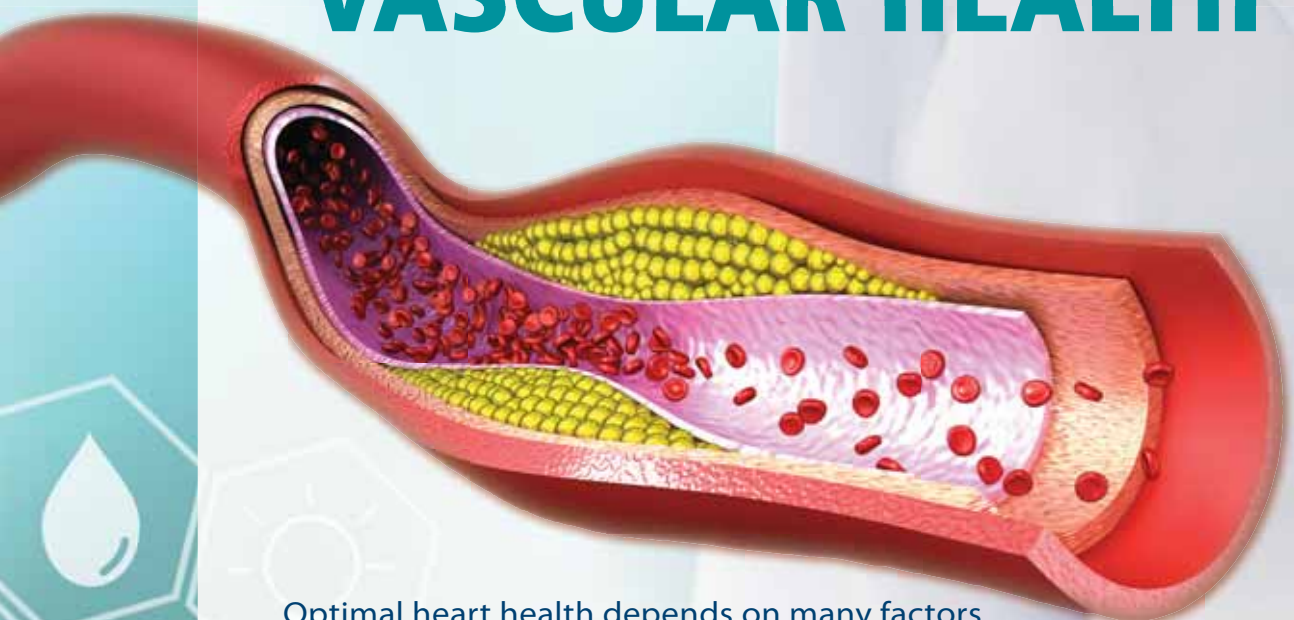
While diabetics must pay careful attention to their diet, maintain physical activity, and usually need prescription drugs like **metformin**, supplementing with low-cost **magnesium** can provide significant, added, protective benefits. ●

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

## References

1. Costello RB, Elin RJ, Rosanoff A, et al. Perspective: The Case for an Evidence-Based Reference Interval for Serum Magnesium: The Time Has Come. *Adv Nutr*. 2016 Nov;7(6):977-93.
2. ELDerawi W, Naser IA, Taleb MH, et al. The Effects of Oral Magnesium Supplementation on Glycemic Response among Type 2 Diabetes Patients. *Nutrients*. 2018 Dec 26;11(1).
3. Chutia H, Lynrah KG. Association of Serum Magnesium Deficiency with Insulin Resistance in Type 2 Diabetes Mellitus. *Journal of laboratory physicians*. 2015 Jul-Dec;7(2):75-8.
4. Kolterman OG, Gray RS, Griffin J, et al. Receptor and postreceptor defects contribute to the insulin resistance in noninsulin-dependent diabetes mellitus. *J Clin Invest*. 1981 Oct;68(4):957-69.
5. Hines IN, Hartwell HJ, Feng Y, et al. Insulin resistance and metabolic hepatocarcinogenesis with parent-of-origin effects in AxB mice. *Am J Pathol*. 2011 Dec;179(6):2855-65.
6. American Diabetes A. Diagnosis and classification of diabetes mellitus. Diabetes Care. 2010 Jan;33 Suppl 1:S62-9.
7. Hill J. Preventing type 2 diabetes: a role for every practitioner. *Community Pract*. 2012 Oct;85(10):34-6.
8. Ahmadieh H, Azar ST. Type 2 diabetes mellitus, oral diabetic medications, insulin therapy, and overall breast cancer risk. *ISRN Endocrinol*. 2013;2013:181240.
9. Albanes D, Weinstein SJ, Wright ME, et al. Serum insulin, glucose, indices of insulin resistance, and risk of prostate cancer. *J Natl Cancer Inst*. 2009 Sep 16;101(18):1272-9.
10. Dankner R, Shanik MH, Keinan-Boker L, et al. Effect of elevated basal insulin on cancer incidence and mortality in cancer incident patients: the Israel GOH 29-year follow-up study. *Diabetes Care*. 2012 Jul;35(7):1538-43.

# BOOST AND PROTECT YOUR VASCULAR HEALTH



Optimal heart health depends on many factors including proper functioning of the **endothelium**—the thin layer of cells lining the interior of the entire circulatory system.

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**References**

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


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   (to inhibit LDL oxidation)
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   (protects against lipid peroxidation)
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   (a source of EPA/DHA)


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# OPTIMIZE **DIGESTION** and **INTESTINAL** BALANCE

Digestive enzymes are essential to the body's ***absorption*** and optimal utilization of food and all its nutrients.[1,2]

The body's production of digestive enzymes decreases with age, leading to poor digestion and bloating, as well as other discomforts—especially after eating a large meal.

**Enhanced Super Digestive Enzymes** provides specific ***enzymes*** required to support the reactions that break down food proteins, fats, carbohydrates, and other nutrients.

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This ***probiotic*** creates a protective shield that resists digestion in the stomach, allowing it to fully colonize in the intestines to support digestive health and suppress less beneficial bacteria to improve digestive comfort.[3,4]

For full product description and to order **Enhanced Super Digestive Enzymes** or **Enhanced Super Digestive Enzymes with Probiotics**, call **1-800-544-4440** or visit **www.LifeExtension.com**

## Enhanced Super Digestive Enzymes


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4 bottles $15 each

## Enhanced Super Digestive Enzymes with Probiotics


**Item #02022** • 60 vegetarian capsules

1 bottle **$21**

4 bottles $18 each


**References**

1. *Altern Med Rev*. 2008 Dec;13(4):307-14.
2. *JOP*. 2005 May 10;6(3):206-15.
3. Available at: http://www.sabinsa.com/newsroom/articles/bacillus-coagulans-probiotic-of-choice-nutracos-march-april-2012.pdf. Accessed September 30, 2015.
4. Available at: http://www.sabinsa.com/newsroom/WhitePapers/Probiotics_For_Health_And_Well_Being_Nutra.pdf. Accessed September 30, 2015.


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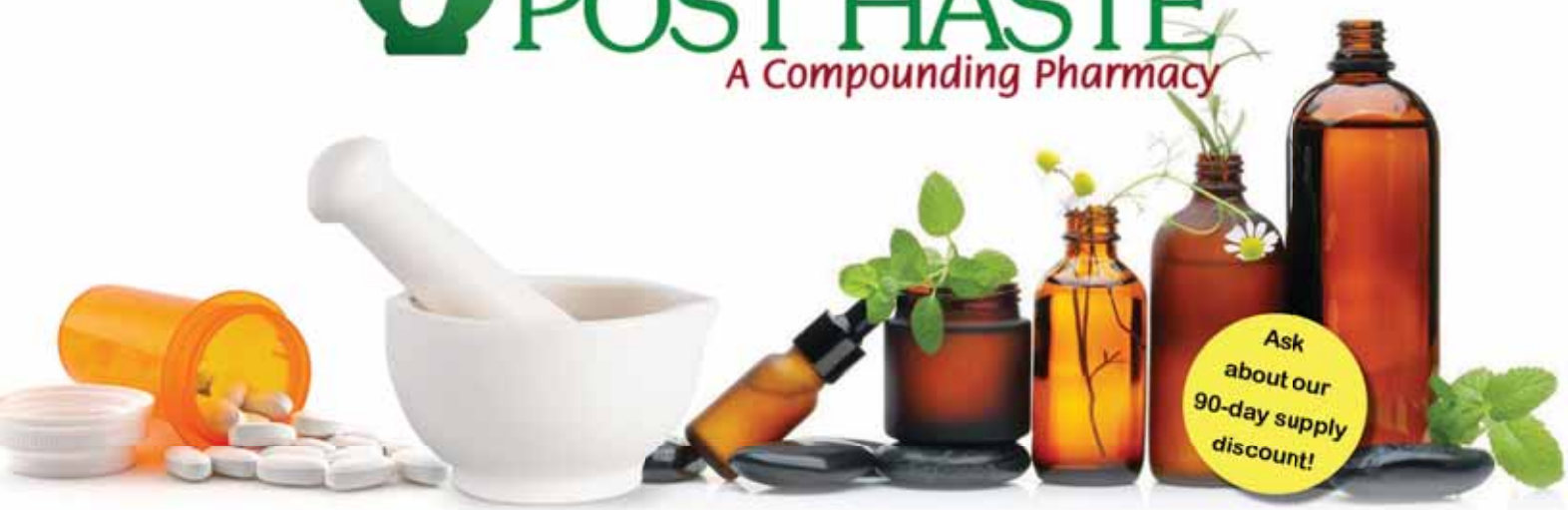


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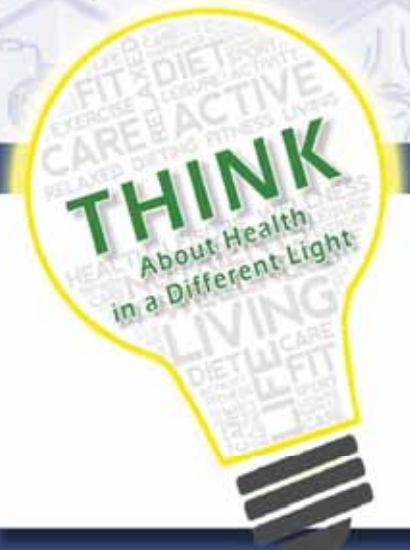


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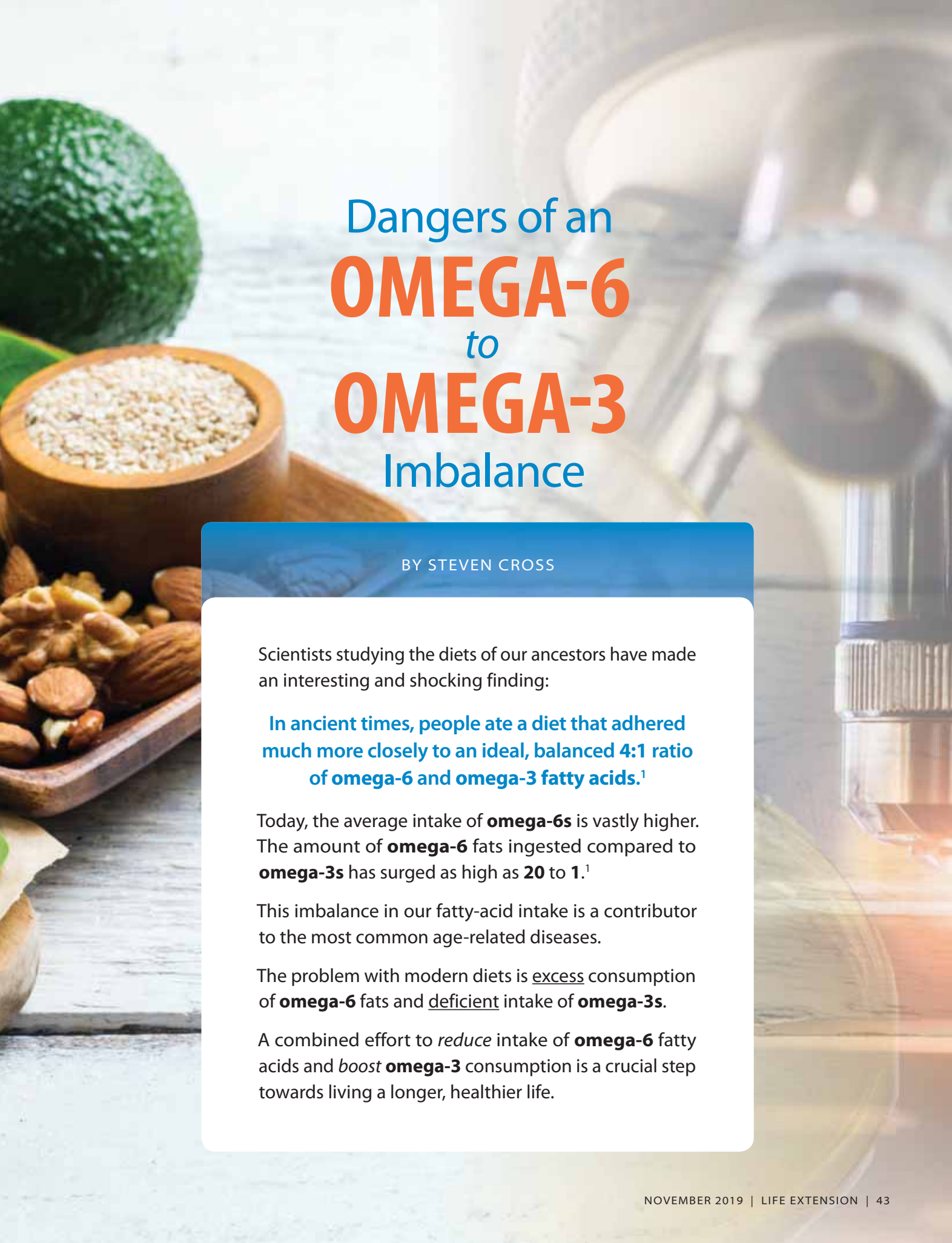


# Dangers of an OMEGA-6 *to* OMEGA-3 Imbalance

BY STEVEN CROSS

Scientists studying the diets of our ancestors have made an interesting and shocking finding:

**In ancient times, people ate a diet that adhered much more closely to an ideal, balanced 4:1 ratio of omega-6 and omega-3 fatty acids.**[1]

Today, the average intake of **omega-6s** is vastly higher. The amount of **omega-6** fats ingested compared to **omega-3s** has surged as high as **20** to **1**.[1]

This imbalance in our fatty-acid intake is a contributor to the most common age-related diseases.

The problem with modern diets is excess consumption of **omega-6** fats and deficient intake of **omega-3s**.

A combined effort to *reduce* intake of **omega-6** fatty acids and *boost* **omega-3** consumption is a crucial step towards living a longer, healthier life.

## Behind the Imbalance

Some early, human populations had diets low in **omega-6 fats** and *high* in sources of **omega-3 fats**, such as people living near oceans and rivers.

Today, a huge percent of calories in most diets comes from foods high in **omega-6s**.

For instance, most processed foods contain oils and fats high in omega-6s, like sunflower, cottonseed, soybean, and corn oils.

Unless people go out of their way to avoid these oils *and* increase their intake of fish, fish oil, and other sources of omega-3s, they will wind up with a dangerous imbalance of omega-6s to omega-3s.

Ideally, one should ingest equal amounts of omega-6s to omega-3s, but this is nearly impossible with modern diets.

## *High* Omega-6 and Low Omega-3 Intake

The abundance of omega-6 fatty acids in modern diets, combined with an insufficient amount of omega-3 fats, plays a major role in age-related disorders including cardiovascular disease, obesity, dementia, and metabolic syndrome.

But ***omega-3 fatty acids*** can help *prevent* many of these problems. Omega-3s *reduce* production of several *proinflammatory* compounds and help quell chronic inflammation.[1,2]

In fact, intake of two omega-3s primarily found in fish, **EPA** and **DHA**, has been shown to protect against many forms of chronic disease—and even to ***reduce overall mortality***.[1,3,4]

## Omega-3s and the Brain

**Omega-3 fatty acids** are supremely important for both the brain and nervous system.

One reason is that they are a key component of brain **cell membranes**.

These membranes generate and conduct the electrical impulses that play a role in everything from simple movement, to language, reasoning, and memory formation and recall.

In addition, these signals cannot be conducted properly without **myelin**, which insulates the fibers of nerve cells. Myelin *also* requires ample **omega-3** fatty acids to function optimally.

Omega-3s also increase levels of **brain-derived neurotrophic factor**. This hormone-like protein promotes ***brain plasticity***, which helps the brain respond to changes, form new memories, recover from injury, and maintain cognitive function.[5]

Brain-derived neurotrophic-factor levels tend to drop with age, contributing to cognitive decline and risk for Alzheimer's and Parkinson's disease, along with other neurodegenerative illnesses.[6]

Increasing omega-3 fatty-acid intake *boosts* levels of **brain-derived neurotrophic factor**.[7,8]

As a result of all these roles, omega-3s have a powerful impact on brain function.

We've long known that adequate omega-3 intake is required for normal brain development. But research is increasingly finding that lower intake of omega-3s in early life is associated with abnormalities, including **autism** and **attention deficit hyperactivity disorder** (ADHD).[9,10]

In adulthood, supplementation with **omega-3 fatty acids** from **fish oil** has been shown to help maintain cognitive function.[11,12]

In one study, taking fish oil containing **1,700 mg DHA** and **600 mg EPA,** daily for six months, slowed the rate of cognitive decline in patients suffering from mild **Alzheimer's disease**.[11]

## Fighting Depression

Studies have shown that people who suffer from **depression** have lower levels of **omega-3** fatty-acid intake.[13,14]

As a result, investigators have begun studying omega-3 supplementation as a potential treatment for depression.

In one of the most recent studies, **pregnant women** — who are at risk for post-partum depression — were randomized to take either omega-3 fatty acids (containing **1,206 mg EPA** and **609 mg DHA**) or a placebo.[15] Those taking the fish oil saw a *decrease* in symptoms of depression, while no change was observed in the placebo group.

## Helping the Heart

Fish oil has been studied extensively for its cardiovascular benefits.

In **June 2019**, the **FDA** affirmed a new, **qualified health claim** for fish oil, noting that consumption of the omega-3 fatty acids **EPA** and **DHA** may reduce the risk of high blood pressure and coronary heart disease.[16]

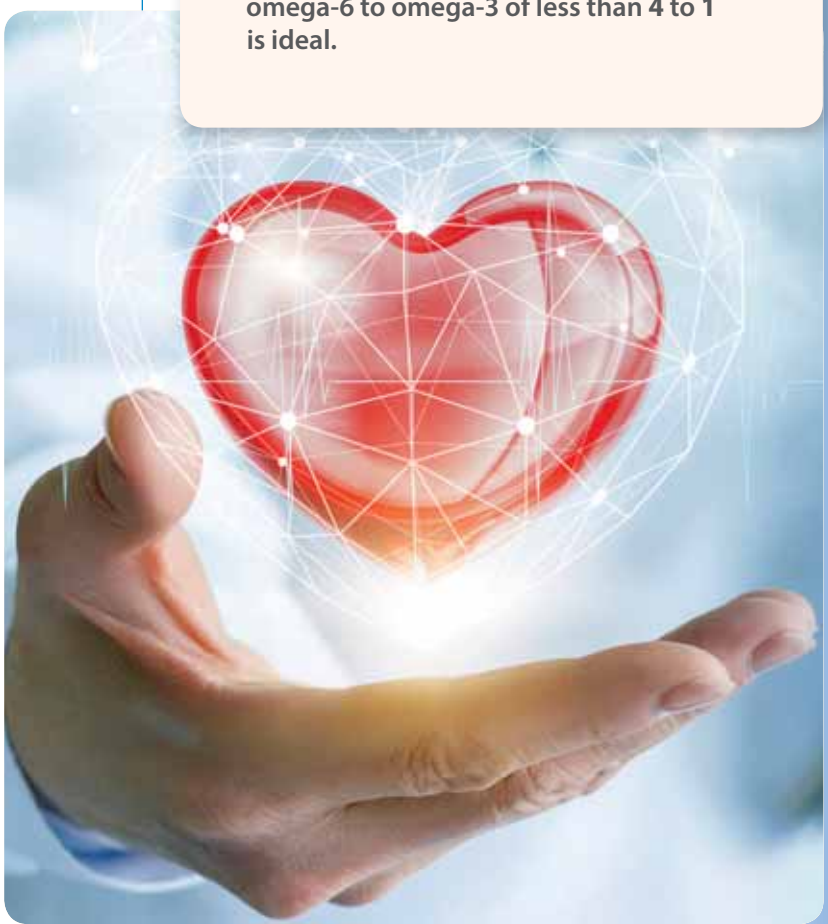
Observational studies and clinical trials have both demonstrated that daily doses of **2,000 mg** of fish oil, or more, can benefit the heart.[17-21]

In one clinical trial, patients at **high risk** for cardiovascular events like heart attack and stroke were randomized to receive either **2,000 mg** of fish oil (containing **930 mg EPA** and **750 mg DHA**) or a placebo. The fish oil was found to **reduce heart attacks by 70%** and other coronary events by **60%**.[22]

Another major clinical trial, using **2,000 mg** of **EPA**, also showed robust benefits for heart health.[17] In subjects at high risk for cardiovascular events, omega-3s reduced the rate of death due to cardiovascular causes by **20%**, reduced heart attacks by **31%**, and reduced strokes by **28%**.

## Increasing Omega-3 Intake to Promote Health

- **Humans once ate a more optimal diet, containing a 4 to 1 ratio of omega-6 to omega-3 fatty acids.**
- **Most modern diets are extremely unbalanced, with omega-6 intake drastically outweighing omega-3 intake.**
- ***Omega-3s reduce* chronic inflammation and have proven benefits for brain and heart health.**
- **Increasing intake of fish-oil-derived omega-3s can help restore fatty-acid balance, reducing risk for cardiovascular disease, cognitive dysfunction and dementia, depression, metabolic syndrome, and other age-related conditions.**
- **Life Extension believes that a ratio of omega-6 to omega-3 of less than 4 to 1 is ideal.**



What You Need to Know

Additionally, using a measurement of the percentage of total fats in red blood cells that are the healthy, omega-3 fats EPA and DHA, a study published in *Atherosclerosis* found that those with an **omega-3 index** of **8%** or greater, compared to those with levels below **4%,** were estimated to have about a **30% lower risk of death**.[23]

Not all studies on **fish oil** show these robust benefits.[24,25] This issue of ***Life Extension® Magazine*** contains a rebuttal to those studies, exposing fundamental flaws that render their findings questionable.

## Metabolic Syndrome

**Metabolic syndrome** refers to a cluster of disorders including abdominal obesity, high blood pressure, high cholesterol and triglyceride levels, and high blood sugar levels, that are caused by insulin resistance. Metabolic syndrome increases the risk for heart disease, stroke, and **type II diabetes**.

In both healthy, older adults *and* in those with existing metabolic disorders, omega-3 supplementation has been shown to reduce total **triglycerides**, the fat-storage compounds.[26,27]

In addition, in individuals with some degree of existing metabolic disorder, fish oil improved **insulin sensitivity**. That reduces blood sugar and lowers the risk of developing diabetes.[28]

## Summary

Most Americans' diets are severely lacking in **omega-3 fatty acids**.

Some of our ancestors evolved with a more optimal diet, containing a **4** to **1** ratio of **omega-6** to **omega-3** fatty acids, which is about the best that most people can do with modern food choices.

In a frightening statistic, most people today are consuming a dangerously high **20** to **1** ratio of omega-6 to omega-3 fats. This may help explain why modest-dose fish oil did not reduce heart attack risk in certain studies.

If a person takes just **1,000 mg** of EPA/DHA from **fish oil**, and then ingests **20,000 mg** of pro-inflammatory **omega-6s**, it will be hard to find a statistical benefit.

### How to Know Your Omega-3 Score

An at-home test called **Omega-3 Index Complete** takes the guesswork out of achieving optimal omega-3 levels. This simple, finger-stick test will show your omega-6 to omega-3 ratio along with other valuable information about your omega-3 status.

The **Omega-3 Index Complete** test normally costs $99, but you can obtain it for only **$69** if you order by **November 29, 2019**.

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This widespread imbalance of omega-6s to omega-3s creates many health problems. These include increased risk for blood clots, atherosclerosis, metabolic disease, chronic inflammation, and deteriorating cognitive function.

***Increasing* omega-3** fatty acid intake and ***decreasing* omega-6s** is critical to restoring this balance and reducing risk for chronic disease.

**Life Extension**® believes that a ratio of less than **4** *omega-6*s to **1** *omega-3* is ideal. ●

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

## References


1. Simopoulos AP. The importance of the ratio of omega-6/omega-3 essential fatty acids. *Biomed Pharmacother.* 2002 Oct;56(8):365-79.
2. Simopoulos AP. An Increase in the Omega-6/Omega-3 Fatty Acid Ratio Increases the Risk for Obesity. *Nutrients.* 2016 Mar 2;8(3):128.
3. Simopoulos AP. Omega-3 fatty acids in inflammation and autoimmune diseases. *J Am Coll Nutr.* 2002 Dec;21(6):495-505.
4. Simopoulos AP. Omega-3 fatty acids and cardiovascular disease: The epidemiological evidence. *Environ Health Prev Med.* 2002 Jan;6(4):203-9.
5. Bathina S, Das UN. Brain-derived neurotrophic factor and its clinical implications. *Arch Med Sci.* 2015 Dec 10;11(6):1164-78.
6. Erickson KI, Prakash RS, Voss MW, et al. Brain-derived neurotrophic factor is associated with age-related decline in hippocampal volume. *J Neurosci.* 2010 Apr 14;30(15):5368-75.
7. Knochel C, Voss M, Gruter F, et al. Omega 3 Fatty Acids: Novel Neurotherapeutic Targets for Cognitive Dysfunction in Mood Disorders and Schizophrenia? *Curr Neuropharmacol.* 2015;13(5):663-80.
8. Wu A, Ying Z, Gomez-Pinilla F. Dietary omega-3 fatty acids normalize BDNF levels, reduce oxidative damage, and counteract learning disability after traumatic brain injury in rats. *J Neurotrauma.* 2004 Oct;21(10):1457-67.
9. Fuentes-Albero M, Martinez-Martinez MI, Cauli O. Omega-3 Long-Chain Polyunsaturated Fatty Acids Intake in Children with Attention Deficit and Hyperactivity Disorder. *Brain Sci.* 2019 May 23;9(5).
10. Martins BP, Bandarra NM, Figueiredo-Braga M. The role of marine omega-3 in human neurodevelopment, including Autism Spectrum Disorders and Attention-Deficit/Hyperactivity Disorder - a review. *Crit Rev Food Sci Nutr.* 2019 Mar 18:1-16.
11. Jerneren F, Cederholm T, Refsum H, et al. Homocysteine Status Modifies the Treatment Effect of Omega-3 Fatty Acids on Cognition in a Randomized Clinical Trial in Mild to Moderate Alzheimer's Disease: The OmegAD Study. *J Alzheimers Dis.* 2019;69(1):189-97.
12. Jovic M, Loncarevic-Vasiljkovic N, Ivkovic S, et al. Short-term fish oil supplementation applied in presymptomatic stage of Alzheimer's disease enhances microglial/macrophage barrier and prevents neuritic dystrophy in parietal cortex of 5xFAD mouse model. *PLoS One.* 2019;14(5):e0216726.
13. Yang Y, Kim Y, Je Y. Fish consumption and risk of depression: Epidemiological evidence from prospective studies. *Asia Pac Psychiatry.* 2018 Dec;10(4):e12335.
14. Li F, Liu X, Zhang D. Fish consumption and risk of depression: a meta-analysis. *J Epidemiol Community Health.* 2016 Mar;70(3):299-304.
15. Nishi D, Su KP, Usuda K, et al. Plasma estradiol levels and antidepressant effects of omega-3 fatty acids in pregnant women. *Brain Behav Immun.* 2019 Feb 15.
16. Available at: https://www.fda.gov/food/cfsan-constituent-updates/fda-announces-new-qualified-health-claims-epa-and-dha-omega-3-consumption-and-risk-hypertension-and. Accessed June 20, 2019, 2019.
17. Bhatt DL, Steg PG, Miller M, et al. Cardiovascular Risk Reduction with Icosapent Ethyl for Hypertriglyceridemia. *N Engl J Med.* 2019 Jan 3;380(1):11-22.
18. Koh KK, Quon MJ, Shin KC, et al. Significant differential effects of omega-3 fatty acids and fenofibrate in patients with hypertriglyceridemia. *Atherosclerosis.* 2012 Feb;220(2):537-44.
19. Kumar S, Sutherland F, Teh AW, et al. Effects of chronic omega-3 polyunsaturated fatty acid supplementation on human pulmonary vein and left atrial electrophysiology in paroxysmal atrial fibrillation. *Am J Cardiol.* 2011 Aug 15;108(4):531-5.
20. Moertl D, Hammer A, Steiner S, et al. Dose-dependent effects of omega-3-polyunsaturated fatty acids on systolic left ventricular function, endothelial function, and markers of inflammation in chronic heart failure of nonischemic origin: a double-blind, placebo-controlled, 3-arm study. *Am Heart J.* 2011 May;161(5):915 e1-9.
21. Nodari S, Triggiani M, Campia U, et al. n-3 polyunsaturated fatty acids in the prevention of atrial fibrillation recurrences after electrical cardioversion: a prospective, randomized study. *Circulation.* 2011 Sep 6;124(10):1100-6.
22. Svensson M, Schmidt EB, Jorgensen KA, et al. N-3 fatty acids as secondary prevention against cardiovascular events in patients who undergo chronic hemodialysis: a randomized, placebo-controlled intervention trial. *Clin J Am Soc Nephrol.* 2006 Jul;1(4):780-6.
23. Harris WS, Del Gobbo L, Tintle NL. The Omega-3 Index and relative risk for coronary heart disease mortality: Estimation from 10 cohort studies. *Atherosclerosis.* 2017 Jul;262:51-4.
24. Manson JE, Cook NR, Lee IM, et al. Marine n-3 Fatty Acids and Prevention of Cardiovascular Disease and Cancer. *N Engl J Med.* 2019 Jan 3;380(1):23-32.
25. Manson JE, Cook NR, Lee IM, et al. Vitamin D Supplements and Prevention of Cancer and Cardiovascular Disease. *N Engl J Med.* 2019 Jan 3;380(1):33-44.
26. Thota RN, Acharya SH, Garg ML. Curcumin and/or omega-3 polyunsaturated fatty acids supplementation reduces insulin resistance and blood lipids in individuals with high risk of type 2 diabetes: a randomised controlled trial. *Lipids Health Dis.* 2019 Jan 26;18(1):31.
27. Xyda SE, Vuckovic I, Petterson XM, et al. Distinct influence of omega-3 fatty acids on the plasma metabolome of healthy older adults. *J Gerontol A Biol Sci Med Sci.* 2019 Jun 4.
28. Gao H, Geng T, Huang T, et al. Fish oil supplementation and insulin sensitivity: a systematic review and meta-analysis. *Lipids Health Dis.* 2017 Jul 3;16(1):131.

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# Improving Odds *of* Creating Super Babies

BY STEPHANIE CLARKSON

Pregnancy can be one of the most joyous times in a woman's life. But it can also be nerve-racking.

There are rules about what to eat (fruit and veggies galore) and what *not* to eat (no sushi or soft cheeses).

Doctors routinely recommend taking **prenatal vitamins** to ensure the mother *and* developing fetus are getting the essential nutrients they need.

After all, a pregnant woman's dietary intake is the *sole* source of nourishment, providing the building blocks for her growing baby.

It's not just about basic vitamins and minerals.

There are other critical nutrients—including **DHA, choline, lutein,** and **zeaxanthin**—that help ensure the healthy development of the baby's **eyes** and **brain**. Proper nutrients also reduce risk of fetal anomalies and pregnancy-related disorders.

Doctors and scientists advise that pregnant women obtain the vitamins, minerals, and other nutrients they need from a **comprehensive prenatal** formula. This helps ensure a healthy pregnancy and promote proper development of the fetus.

When reading this article, some individuals might wish they could travel back in time and provide their mothers with **nutrients** that were not readily available in earlier decades.

The published scientific data demonstrates that a mother can favorably impact a child's intellectual capacity following an optimal prenatal regimen.

One study showed that children exposed to tobacco smoke (prenatal and environmental) are almost **three times** more likely to have a learning disability than children who are not exposed.[1]

## Deficiencies Are Common

Many women may assume that if they eat well, they're getting what they need to support a pregnancy. But insufficient intake of important nutrients is surprisingly common.

According to a recent study in Western Europe, the dietary intake of critical prenatal nutrients by women of child-bearing age—before conception—was grossly insufficient. About **half** of the women had poor intake of **folate**, **67%** had insufficient **vitamin D**, and **more than half** did not consume enough fish-oil-derived **omega-3 fatty acids**.[2]

Another observational study showed that **26%** of women in the U.S. had at least one deficiency, and many had *multiple* nutrient deficiencies.[3] That number went up to **41%** in women aged **19** to **50**—and was as high as ***47%*** in pregnant or breastfeeding women.

That means almost **50%** of all women of childbearing age are not getting adequate nutrition for optimal fetal development and a healthy pregnancy.

## Why You Need a Prenatal Vitamin

Many nutrients provide the **building blocks** for critical structures in the embryo and fetus.

For example, the fish-oil-derived omega-3 fatty acid **DHA** and the essential nutrient **choline** are both needed for normal **brain development**. And both are frequently under-consumed in western diets.

**Folate** is an essential nutrient required for healthy development of the **brain and spinal cord**. Without adequate folate, *permanent* abnormalities of fetal growth can occur.

The choices a woman makes during pregnancy can have a lasting impact on the long-term health of her child.

Most people know that a pregnant woman's drinking alcohol, smoking, and abusing drugs can permanently harm her child's health. Inadequate nutrition during pregnancy can also have a deleterious impact on a child's health, and raise the risk for several chronic diseases throughout life.[4]

Lack of adequate nutrients also puts the expectant **mother** at risk. **Preeclampsia** (a pregnancy complication characterized by high blood pressure), premature delivery, gestational diabetes, and stunted fetal growth have all been tied to **deficiencies** of various **nutrients**.[5-8]

## A Question of Timing

Many of the most critical fetal developments occur only *weeks* into a pregnancy, before many women even know they're expecting, including the early formation of the **brain *and* spinal cord**.

For this reason, it's vital that women who are *trying* to get pregnant or even think they *could* get pregnant pay special attention to their diet and the nutrients they're taking.

Women who **breastfeed** continue to be the sole source of nutrition for their babies for several months after delivery as well and should continue monitoring their nutritional intake.

## Choline and DHA: Building Blocks for a Healthy Brain

Much of the brain is composed of fatty substances, particularly **phospholipids**. They make up the crucial membranes of nerve cells, which conduct electrical signals throughout the body.

Two of the most important building blocks for these phospholipids are **omega-3 fatty acids** and **choline**.[9,10]

The omega-3 fatty acid **DHA** (**docosahexaenoic acid**), derived from fish oil, is one of the most abundant in the brain and is crucial for brain development *and* brain health throughout life.

Unfortunately, the vast majority of women of childbearing age in the U.S. get less than the recommended intake of **DHA** and **choline**.[11]

That's a serious concern for women who are pregnant or breastfeeding. Deficiencies of DHA and choline can lead to major problems for fetal and infant **brain and eye development**.

In animals, low choline intake by pregnant females delays the development of the brain, resulting in smaller brain volume at birth and visual and cognitive problems.[11,12] It also disrupts eye development, leading to persistent vision problems.[10]

But *increasing* intake of DHA and choline *boosts* brain and eye development and improves their function.[9,11,13]

## Folate Reduces Risk of Birth Defects

One of the most important processes in the development of the nervous system is the formation of the **neural tube**. This critical step occurs just *weeks* after conception.[14]

The neural tube forms from a plate of tissue that folds in on itself and eventually develops into both the **brain and spinal cord**. The closure of the tube is a delicate process. If conditions are not just right, it can fail—and the results can be catastrophic.[14]

**Spina bifida** occurs when the *tail* end of the neural tube doesn't close properly, and the spinal cord fails to develop. In its most severe forms, it can result in paralysis of the legs along with digestive and urinary problems that last throughout life and shorten life expectancy.[14]

If the *head* end of the tube fails to close, development of the brain is compromised. At its worst, this

## Providing Prenatal Support

- **Throughout pregnancy and while a woman breastfeeds, many essential nutrients are absolutely required for the healthy development of the baby.**
- **In addition to increased requirements for most vitamins and minerals, several specific nutrients, like DHA, choline, lutein,** and **zeaxanthin** **are particularly important for normal growth of a baby's eyes, brain, and spinal cord.**
- **Nutritional deficiencies are common in women of childbearing age and are associated with increased risk for pregnancy complications, birth defects, and developmental problems.**
- **Doctors and scientists advise getting omprehensive prenatal nutrition to help support a healthy pregnancy, and healthy fetal and child development.**

What You Need to Know

can result in **anencephaly**, a fatal disorder in which a baby is born without part of the brain and skull.[14]

In the maternal diet, lack of adequate **folate**, also known as **folic acid**, is one of the major risk factors for these neural tube defects.[14]

Approximately half of women of childbearing age get inadequate **folate** in their diet. Taking folate—especially in its most *biologically active form*, called **5-MTHF**—may significantly reduce risk for neural tube defects.

Because these anomalies occur so early in gestation, folate supplementation should begin *before* conception.

## Carotenoids Support Eye and Brain Development

**Carotenoids** are pigments found in many vegetables, herbs, and fruits. One of the best known is **beta-carotene**, that can be converted into **vitamin A** and is essential for normal function of the eyes.

Two other carotenoids, **lutein** and **zeaxanthin**, have been recognized more recently as having critical roles in development of the **eyes and brain**. They are transferred to the fetus through the placenta and to infants through breast milk.[15]

In the retina of the eye they absorb blue light, which could otherwise cause damage to delicate eye structures. They are also neuroprotective and appear to have an impact on several aspects of eye and brain function.[15]

Studies have found that levels of **lutein** and other carotenoids in the retina of the eye correlate with cognitive performance in both young children and the elderly.[16-19]

Carotenoids don't just benefit the baby. Ample intake has also been shown to support a healthy pregnancy, reducing the risk of preeclampsia, gestational diabetes, premature birth, and fetal growth delay.[5,6,20]

In fact, higher levels of **lutein** were associated with a reduced risk of **preeclampsia**, one of the most common disorders of pregnancy and one which can be fatal to the mother.[20]

*Adequate nutrition during pregnancy is crucial to the healthy development of the child and to the health of the mother.*

## Comprehensive Vitamin and Mineral Intake

Women who are pregnant or breastfeeding are usually encouraged to take a multivitamin, ensuring adequate levels of an array of essential vitamins and minerals. **Vitamin A, vitamin C, vitamin D,** the **B vitamins**, and many others are all important for developing tissues.

But typical multivitamins supply recommended daily intake for an *average* person and are not designed to meet the unique needs of a *pregnant* woman.

## Summary

Adequate nutrition during pregnancy is crucial to the healthy development of the child *and* to the health of the mother.

Sufficient amounts of specific nutrients are absolutely required for the healthy, normal development of a fetus and nursing baby, and decrease the risk for birth defects, developmental problems, and pregnancy complications.

Starting before pregnancy and continuing for as long as the mother breastfeeds, women should ensure they are getting *all* the necessary vitamins, minerals, and nutrients that support healthy development of a baby's eyes, brain, and other vital bodily structures. ●

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

## References

1. Anderko L, Braun J, Auinger P. Contribution of tobacco smoke exposure to learning disabilities. *J Obstet Gynecol Neonatal Nurs.* 2010 Jan-Feb;39(1):111-7.
2. Looman M, van den Berg C, Geelen A, et al. Supplement Use and Dietary Sources of Folate, Vitamin D, and n-3 Fatty Acids during Preconception: The GLIMP2 Study. *Nutrients.* 2018 Jul 25;10(8).
3. Bird JK, Murphy RA, Ciappio ED, et al. Risk of Deficiency in Multiple Concurrent Micronutrients in Children and Adults in the United States. *Nutrients.* 2017 Jun 24;9(7).
4. Gluckman PD, Hanson MA, Cooper C, et al. Effect of in utero and early-life conditions on adult health and disease. *N Engl J Med.* 2008 Jul 3;359(1):61-73.
5. Agarwal A, Aponte-Mellado A, Premkumar BJ, et al. The effects of oxidative stress on female reproduction: a review. *Reprod Biol Endocrinol.* 2012 Jun 29;10:49.
6. Al-Gubory KH, Fowler PA, Garrel C. The roles of cellular reactive oxygen species, oxidative stress and antioxidants in pregnancy outcomes. *Int J Biochem Cell Biol.* 2010 Oct;42(10):1634-50.
7. Berti C, Cetin I, Agostoni C, et al. Pregnancy and Infants' Outcome: Nutritional and Metabolic Implications. *Crit Rev Food Sci Nutr.* 2016;56(1):82-91.
8. Richard K, Holland O, Landers K, et al. Review: Effects of maternal micronutrient supplementation on placental function. *Placenta.* 2017 Jun;54:38-44.
9. Lauritzen L, Brambilla P, Mazzocchi A, et al. DHA Effects in Brain Development and Function. *Nutrients.* 2016 Jan 4;8(1).
10. Trujillo-Gonzalez I, Friday WB, Munson CA, et al. Low availability of choline in utero disrupts development and function of the retina. *FASEB J.* 2019 Aug;33(8):9194-209.
11. Mun JG, Legette LL, Ikonte CJ, et al. Choline and DHA in Maternal and Infant Nutrition: Synergistic Implications in Brain and Eye Health. *Nutrients.* 2019 May 21;11(5).
12. Mudd AT, Getty CM, Sutton BP, et al. Perinatal choline deficiency delays brain development and alters metabolite concentrations in the young pig. *Nutr Neurosci.* 2016 Dec;19(10):425-33.
13. Fang X, Jeon J, Kinder H, et al. The Effect of Maternal Supplementation of Lutein and Docosahexaenoic Acid on Behavior and Brain Structures in Offspring in a Pig Model (P11-005-19). *Current Developments in Nutrition.* 2019 Jun;3(Supplement_1).
14. Pitkin RM. Folate and neural tube defects. *Am J Clin Nutr.* 2007 Jan;85(1):285S-8S.
15. Zielinska MA, Wesolowska A, Pawlus B, et al. Health Effects of Carotenoids during Pregnancy and Lactation. *Nutrients.* 2017 Aug 4;9(8).
16. Barnett SM, Khan NA, Walk AM, et al. Macular pigment optical density is positively associated with academic performance among preadolescent children. *Nutr Neurosci.* 2018 Nov;21(9):632-40.
17. Saint SE, Renzi-Hammond LM, Khan NA, et al. The Macular Carotenoids are Associated with Cognitive Function in Preadolescent Children. *Nutrients.* 2018 Feb 10;10(2).
18. Vishwanathan R, Iannaccone A, Scott TM, et al. Macular pigment optical density is related to cognitive function in older people. *Age Ageing.* 2014 Mar;43(2):271-5.
19. Walk AM, Khan NA, Barnett SM, et al. From neuro-pigments to neural efficiency: The relationship between retinal carotenoids and behavioral and neuroelectric indices of cognitive control in childhood. *Int J Psychophysiol.* 2017 Aug;118:1-8.
20. Cohen JM, Kramer MS, Platt RW, et al. The association between maternal antioxidant levels in midpregnancy and preeclampsia. *Am J Obstet Gynecol.* 2015 Nov;213(5):695 e1-13.

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# *Update on* Vitamin D *and* Fish Oil Supplementation

BY HARRY FULTON

**Vitamin D** and **fish oil** are some of today's most popular **dietary supplements**.

One reason many people take them is widespread news coverage showing marked reductions of degenerative disorders in response to ***higher*** intake of these nutrients.

Since it is no longer "news" that **fish oil** and **vitamin D** favorably influence human health, some media sources run tabloid-like headlines that often misinterpret findings from clinical trials.

A clinical trial called VITAL used modest **potencies** of **EPA/DHA** from fish oil and vitamin D3 that did not meet challenging primary clinical endpoints. This caused many media sources to proclaim there to be no value in supplementing with these **low-cost** nutrients.

That's regrettable because people who need them the most, i.e. those living in difficult socioeconomic circumstances, are often more adversely impacted by a lack of these kinds of protective nutrients.

This article describes studies in which **higher potencies** of **omega-3s** or **vitamin D** have demonstrated remarkable health benefits.

## Vitamin D and Cancer

An explosion of research in recent decades has demonstrated that vitamin D impacts almost *every* aspect of health, including protection from cancer and cardiovascular disease.

As new studies have been published, many experts have revised their recommendations upward for daily vitamin D intake and blood levels.

Many now suggest that a target *25-hydroxyvitamin D* blood level of **50 ng/mL** to **80 ng/mL** is ideal for **optimal protection from cancer**. This level is *far* above what aging individuals obtain from sun exposure and dietary sources.

Recommendations for *higher* vitamin D target levels are based on a growing body of evidence that individuals with low levels of vitamin D are at the greatest risk of developing cancer and dying from the disease—while those with the *highest* levels have *reduced* cancer incidence.

Vitamin D **deficient** women have been found to have greater odds of developing breast cancer and a **253%** increase in risk for colon cancer, compared to those with the *highest* vitamin D levels.[1,2] One study found that higher levels of vitamin D in men prior to a prostate cancer diagnosis were associated with improved survival rates.[3]

Another study evaluated individuals being treated for advanced colorectal cancer.[4] During chemotherapy treatment, these patients were randomized to either receive a low (standard) dose of vitamin D (**400 IU** per day) or a high dose (starting at **8,000 IU** per day and later decreasing to **4,000 IU** per day).

The *higher* dose resulted in better outcomes. During the follow-up period, the individuals receiving higher doses were **36%** less likely to suffer from cancer progression or to die, than those given the lower (**400 IU/day**) dose.

These studies and others suggest a dose-response relationship: The *higher* the level of vitamin D, the *lower* the risk of cancer or dying from cancer.

One study found a **12%** reduction in mortality from breast cancer for every **8 ng/mL** increase in vitamin D blood level.[5]

Other studies have estimated a **10%** decrease in death due to colon cancer for every **8 ng/mL** increase in vitamin D. Overall risk of cancer was as much as **35%** lower in those with *25-hydroxyvitamin D* levels of **55 ng/mL** or higher.[6,7]

Several types of studies, including geographical ecological studies, observational studies, laboratory studies of mechanisms, and clinical trials have tested the vitamin D and cancer-prevention connection.

Some clinical trials reveal that even low-dose vitamin D3 may reduce cancer risk.

One study published in *The American Journal of Clinical Nutrition* evaluated the impact of vitamin D3 and calcium supplementation on cancer risk reduction in postmenopausal women.

The study found that improving calcium and vitamin D status by supplementation of **1,100 IU**/day of vitamin D3 plus **1,450 mg**/day of calcium reduced all-cancer risk.[8]

Another study involving more than 36,000 postmenopausal women found that supplementation with **1,000 mg**/day of calcium and **400 IU**/day of vitamin D *significantly* decreased the risk of total, breast, and invasive cancers by **14%** to **20%**.[9]

## Vitamin D and Cardiovascular Disease

A similar link between vitamin D levels and **cardiovascular disease** has been demonstrated in medical research.

Several studies have shown that lower vitamin D levels are associated with high blood pressure, elevated blood glucose, atherosclerotic plaque in blood vessels, arterial stiffness, and higher rates of cardiovascular events.[10-19]

In humans, vitamin D supplementation can reduce some of these markers of blood vessel disease. For example, **4,000 IU** daily was shown to **reduce arterial stiffness**.[15,19]

One study evaluated the association of **vitamin D** and **strokes**, which often result from cardiovascular disease. Vitamin D status was measured in 3,316 patients with evidence of blood vessel disease who were followed for almost eight years. What scientists found was a dramatic *increase* in the number of fatal strokes for every incremental *decrease* in vitamin D blood level.[20]

## Omega-3 Fatty Acids and Cardiovascular Disease

Several studies have shown a close link between high levels of **omega-3 fatty acids** from fish oil and protection from aspects of **cardiovascular disease**.

Like vitamin D, the *highest* blood levels of omega-3s have been shown to be the *most protective*. For example, individuals with the highest omega-3 blood levels are **50%** less likely to suffer from congestive **heart failure** than those with low levels.[21] Overall survival in patients with existing heart failure is **35%** better in those with *higher* omega-3 levels.[22]

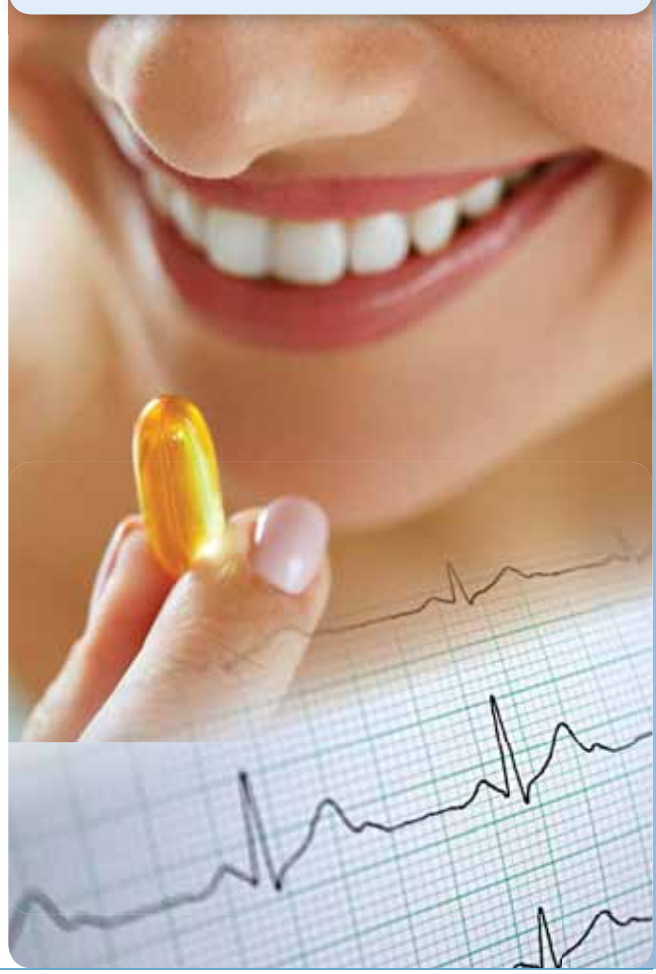
A study in *Atherosclerosis* found that an omega-3 index of **8%** or higher, far above the **4%** achieved by the dosing in the VITAL trial, was protective against fatal heart disease.[23] Compared to those with an index below **4%**, these optimal levels (**8%** and higher) reduced risk of death from coronary heart disease by about **30%**.

Another study, published in the journal *Preventive Medicine,* found that the greatest protection from death by cardiovascular causes was found in individuals with an omega-3 index greater than or equal to **8%**.[24]

Moreover, studies with long follow-up periods have found that an omega-3 index of **8%** or higher **reduces the risk of death from *any cause***, with a **7%** lower overall risk of dying gained by each additional **200 mg** of fish oil consumed per day.[25,26]

## Vitamin D and Fish Oil Update

- **The health benefits of omega-3s and vitamin D supplementation are well documented.**
- **Research shows that vitamin D and omega-3s offer protection against cancer and cardiovascular disease.**
- **Life Extension recommends doses of 5,000 IU to 8,000 IU of vitamin D and 2,400 mg of EPA/DHA from fish oil daily to maintain optimal levels. Regular blood testing is important to guide adjustments to these doses to achieve the maximum benefits.**
- **Experts suggest maintaining blood levels between 50 ng/mL and 80 ng/mL for vitamin D and an omega-3 index of 8% to 12%.**



What You Need to Know

In one study, researchers enrolled patients at high risk of experiencing cardiovascular events. Those who were randomized to receive **2,000 mg** of a supplement containing **930 mg** of EPA and **750 mg** of DHA (two omega-3 fatty acids) had a **70%** reduction in heart attacks, and a **60%** decrease in other coronary events.[27]

Several other studies using daily doses of **2,000 mg** to **4,000 mg** of fish oil have also shown benefits for various cardiovascular disease outcomes.[28-30]

It is important to note that comprehensive management of cardiovascular disease risk requires a comprehensive assessment of risk factors beyond cholesterol and blood pressure.

A paradigm shift is crucially needed to move away from focusing on a single number for **LDL-cholesterol** to focusing on the **complete patient**, by taking into account a range of biomarkers that can yield additional insight.

Although lowering low-density lipoprotein cholesterol (LDL-C) is a primary target for cardiovascular disease risk reduction, lifestyle related factors, such as tobacco use, obesity and sedentary routines, are also very important.[31]

In addition, many other risk factors, such as insulin resistance, hormonal imbalances, hypercoagulable states, hyperhomocysteinemia, vascular inflammation, hyperglycemia, and others also play important roles.[32]

Nutrients like magnesium, CoQ10, fish oil omega-3s, vitamin K2, and others also play an important, underappreciated role in cardiovascular health.[30,33-48]

Further, advanced testing of **lipoprotein fractionation** identifies the full spectrum of lipoprotein **particles**, along with direct quantification of particles in each lipoprotein subclass fraction.

The sub-particles of LDL have a set of distinct properties including size and density. The **small LDL particles** are much more strongly related to risk than the larger LDL particles. Advanced lipoprotein subclass testing (such as the NMR blood test) provides additional information not otherwise identified through routine lipid testing for total cholesterol, LDL, HDL and triglycerides.

## Omega-3 Fatty Acids and Cancer

Fish oil consumption, both from the diet and supplementation, has a profound effect on **cancer**. It appears to reduce the abnormal changes in cells that can lead to tumors, and to reduce the growth and aggressiveness of existing cancers.

Research has even found that factors which predispose cells to tumor growth are reduced with omega-3 supplementation. In one trial, **4,000 mg** of an omega-3 supplement each day protected the skin from the harmful effects of solar radiation.[49] The damage caused by sun exposure was reduced, including a **36%** improvement in sunburn protection and significant reduction of DNA damage, which can contribute to skin cancer.

In another study, **2,000 mg** of omega-3s daily reduced the number of precancerous cells on colonoscopy inspection.[50] This indicates a minimized risk for colon cancer.

Another clinical trial used a dose of **5,000 mg** of fish oil daily in men with prostate cancer, leading up to surgery.[51] When the patients underwent surgery, pathologists found that those men who received fish oil supplementation demonstrated a significant **reduction in proliferation of cancer cells**. Less aggressive tumors typically equate to better control with treatment—and better long-term survival.

Omega-3 fatty acids also help support *treatment* for cancer. Studies of lung cancer patients found that supplementation with fish oil prevented some adverse effects associated with cancer treatment, such as weight loss, and boosted the response of the cancer to chemotherapy.[52,53]

Various animal and human studies show that omega-3s are protective against cancer, improve response to cancer treatment, and even reduce cancer relapse after treatment.[54-56]

The benefits of vitamin D and omega-3 fatty acids discussed are just a sampling of those related to cardiovascular disease and cancer. Additionally, these nutrients are beneficial for brain health and cognition, eyesight, metabolic health, overall longevity, and more.

## Summary

Research has shown that vitamin D and omega-3s impact almost every aspect of health, including protection from cancer and cardiovascular disease.

**Life Extension** recommends doses of **5,000 IU** to **8,000 IU** of vitamin D and **2,400 mg** of **EPA/DHA** from fish oil daily to maintain optimal levels. Regular blood testing is important to guide adjustments to these doses to achieve the maximum benefits.

Experts suggest maintaining blood levels between **50 ng/mL** and **80 ng/mL** for vitamin D and an omega-3 index of **8%** to **12%**. ●

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

## References


1. Abbas S, Linseisen J, Slanger T, et al. Serum 25-hydroxyvitamin D and risk of post-menopausal breast cancer--results of a large case-control study. *Carcinogenesis.* 2008 Jan;29(1):93-9.
2. Holick MF. Vitamin D and sunlight: strategies for cancer prevention and other health benefits. *Clin J Am Soc Nephrol.* 2008 Sep;3(5):1548-54.
3. Li H, Stampfer MJ, Hollis JB, et al. A prospective study of plasma vitamin D metabolites, vitamin D receptor polymorphisms, and prostate cancer. *PLoS Med.* 2007 Mar;4(3):e103.
4. Ng K, Nimeiri HS, McCleary NJ, et al. Effect of High-Dose vs Standard-Dose Vitamin D3 Supplementation on Progression-Free Survival Among Patients With Advanced or Metastatic Colorectal Cancer: The SUNSHINE Randomized Clinical Trial. *JAMA.* 2019 Apr 9;321(14):1370-9.

5. Hu K, Callen DF, Li J, et al. Circulating Vitamin D and Overall Survival in Breast Cancer Patients: A Dose-Response Meta-Analysis of Cohort Studies. *Integr Cancer Ther.* 2018 Jun;17(2):217-25.
6. Ekmekcioglu C, Haluza D, Kundi M. 25-Hydroxyvitamin D Status and Risk for Colorectal Cancer and Type 2 Diabetes Mellitus: A Systematic Review and Meta-Analysis of Epidemiological Studies. *Int J Environ Res Public Health.* 2017 Jan 28;14(2).
7. Maalmi H, Ordonez-Mena JM, Schottker B, et al. Serum 25-hydroxyvitamin D levels and survival in colorectal and breast cancer patients: systematic review and meta-analysis of prospective cohort studies. *Eur J Cancer.* 2014 May;50(8):1510-21.
8. Lappe JM, Travers-Gustafson D, Davies KM, et al. Vitamin D and calcium supplementation reduces cancer risk: results of a randomized trial. *Am J Clin Nutr.* 2007 Jun;85(6):1586-91.
9. Bolland MJ, Grey A, Gamble GD, et al. Calcium and vitamin D supplements and health outcomes: a reanalysis of the Women's Health Initiative (WHI) limited-access data set. *Am J Clin Nutr.* 2011 Oct;94(4):1144-9.
10. Bennett AL, Lavie CJ. Vitamin D Metabolism and the Implications for Atherosclerosis. *Adv Exp Med Biol.* 2017;996:185-92.
11. Chen FH, Liu T, Xu L, et al. Association of Serum Vitamin D Level and Carotid Atherosclerosis: A Systematic Review and Meta-analysis. *J Ultrasound Med.* 2018 Jun;37(6):1293-303.
12. Fondjo LA, Sakyi SA, Owiredu W, et al. Evaluating Vitamin D Status in Pre- and Postmenopausal Type 2 Diabetics and Its Association with Glucose Homeostasis. *Biomed Res Int.* 2018;2018:9369282.
13. Grubler MR, Marz W, Pilz S, et al. Vitamin-D concentrations, cardiovascular risk and events - a review of epidemiological evidence. *Rev Endocr Metab Disord.* 2017 Jun;18(2):259-72.
14. McGreevy C, Barry M, Davenport C, et al. The effect of vitamin D supplementation on arterial stiffness in an elderly community-based population. *J Am Soc Hypertens.* 2015 Mar;9(3):176-83.
15. Raed A, Bhagatwala J, Zhu H, et al. Dose responses of vitamin D3 supplementation on arterial stiffness in overweight African Americans with vitamin D deficiency: A placebo controlled randomized trial. *PLoS One.* 2017;12(12):e0188424.
16. Schottker B, Haug U, Schomburg L, et al. Strong associations of 25-hydroxyvitamin D concentrations with all-cause, cardiovascular, cancer, and respiratory disease mortality in a large cohort study. *Am J Clin Nutr.* 2013 Apr;97(4):782-93.
17. Vimaleswaran KS, Cavadino A, Berry DJ, et al. Association of vitamin D status with arterial blood pressure and hypertension risk: a mendelian randomisation study. *Lancet Diabetes Endocrinol.* 2014 Sep;2(9):719-29.
18. Weng S, Sprague JE, Oh J, et al. Vitamin D deficiency induces high blood pressure and accelerates atherosclerosis in mice. *PLoS One.* 2013;8(1):e54625.
19. Zaleski A, Panza G, Swales H, et al. High-Dose versus Low-Dose Vitamin D Supplementation and Arterial Stiffness among Individuals with Prehypertension and Vitamin D Deficiency. *Dis Markers.* 2015;2015:918968.
20. Pilz S, Dobnig H, Fischer JE, et al. Low vitamin d levels predict stroke in patients referred to coronary angiography. *Stroke.* 2008 Sep;39(9):2611-3.
21. Mozaffarian D, Lemaitre RN, King IB, et al. Circulating long-chain omega-3 fatty acids and incidence of congestive heart failure in older adults: the cardiovascular health study: a cohort study. *Ann Intern Med.* 2011 Aug 2;155(3):160-70.
22. Jiang W, Oken H, Fiuzat M, et al. Plasma omega-3 polyunsaturated fatty acids and survival in patients with chronic heart failure and major depressive disorder. *J Cardiovasc Transl Res.* 2012 Feb;5(1):92-9.
23. Harris WS, Del Gobbo L, Tintle NL. The Omega-3 Index and relative risk for coronary heart disease mortality: Estimation from 10 cohort studies. *Atherosclerosis.* 2017 Jul;262:51-4.
24. Harris WS, Von Schacky C. The Omega-3 Index: a new risk factor for death from coronary heart disease? *Prev Med.* 2004 Jul;39(1):212-20.
25. Harris WS, Luo J, Pottala JV, et al. Red blood cell polyunsaturated fatty acids and mortality in the Women's Health Initiative Memory Study. *J Clin Lipidol.* 2017 Jan - Feb;11(1):250-9 e5.
26. Wan Y, Zheng J, Wang F, et al. Fish, long chain omega-3 polyunsaturated fatty acids consumption, and risk of all-cause mortality: a systematic review and dose-response meta-analysis from 23 independent prospective cohort studies. *Asia Pac J Clin Nutr.* 2017 20170813;26(5):939-56.
27. Svensson M, Schmidt EB, Jorgensen KA, et al. N-3 fatty acids as secondary prevention against cardiovascular events in patients who undergo chronic hemodialysis: a randomized, placebo-controlled intervention trial. *Clin J Am Soc Nephrol.* 2006 Jul;1(4):780-6.
28. Koh KK, Quon MJ, Shin KC, et al. Significant differential effects of omega-3 fatty acids and fenofibrate in patients with hypertriglyceridemia. *Atherosclerosis.* 2012 Feb;220(2):537-44.
29. Nodari S, Triggiani M, Campia U, et al. n-3 polyunsaturated fatty acids in the prevention of atrial fibrillation recurrences after electrical cardioversion: a prospective, randomized study. *Circulation.* 2011 Sep 6;124(10):1100-6.
30. Moertl D, Hammer A, Steiner S, et al. Dose-dependent effects of omega-3-polyunsaturated fatty acids on systolic left ventricular function, endothelial function, and markers of inflammation in chronic heart failure of nonischemic origin: a double-blind, placebo-controlled, 3-arm study. *Am Heart J.* 2011 May;161(5):915 e1-9.
31. Available at: https://emedicine.medscape.com/article/2500031-overview#showall. Accessed August 28, 2019.
32. Fonseca V, Desouza C, Asnani S, et al. Nontraditional risk factors for cardiovascular disease in diabetes. *Endocr Rev.* 2004 Feb;25(1):153-75.
33. Knapen MH, Braam LA, Drummen NE, et al. Menaquinone-7 supplementation improves arterial stiffness in healthy postmenopausal women. A double-blind randomised clinical trial. *Thromb Haemost.* 2015 May;113(5):1135-44.
34. Baggio E, Gandini R, Plancher AC, et al. Italian multicenter study on the safety and efficacy of coenzyme Q10 as adjunctive therapy in heart failure. CoQ10 Drug Surveillance Investigators. *Mol Aspects Med.* 1994;15 Suppl:s287-94.
35. Langsjoen PH, Langsjoen AM. Coenzyme Q10 in cardiovascular disease with emphasis on heart failure and myocardial ischaemia. *The Asia Pacific Heart Journal.* 1998 1998/12/01/;7(3):160-8.
36. Langsjoen PH, Langsjoen AM. Supplemental ubiquinol in patients with advanced congestive heart failure. *Biofactors.* 2008;32(1-4):119-28.



37. Mortensen SA, Rosenfeldt F, Kumar A, et al. The effect of coenzyme Q10 on morbidity and mortality in chronic heart failure: results from Q-SYMBIO: a randomized double-blind trial. *JACC Heart Fail.* 2014 Dec;2(6):641-9.
38. Pepe S, Marasco SF, Haas SJ, et al. Coenzyme Q10 in cardiovascular disease. *Mitochondrion.* 2007 Jun;7 Suppl:S154-67.
39. Sander S, Coleman CI, Patel AA, et al. The impact of coenzyme Q10 on systolic function in patients with chronic heart failure. *J Card Fail.* 2006 Aug;12(6):464-72.
40. Singh RB, Wander GS, Rastogi A, et al. Randomized, double-blind placebo-controlled trial of coenzyme Q10 in patients with acute myocardial infarction. *Cardiovasc Drugs Ther.* 1998 Sep;12(4):347-53.
41. Douban S, Brodsky MA, Whang DD, et al. Significance of magnesium in congestive heart failure. *Am Heart J.* 1996 Sep;132(3):664-71.
42. Grober U, Schmidt J, Kisters K. Magnesium in Prevention and Therapy. *Nutrients.* 2015 Sep 23;7(9):8199-226.
43. Shechter M. Magnesium and cardiovascular system. *Magnes Res.* 2010 Jun;23(2):60-72.
44. Heydari B, Abdullah S, Pottala JV, et al. Effect of Omega-3 Acid Ethyl Esters on Left Ventricular Remodeling After Acute Myocardial Infarction: The OMEGA-REMODEL Randomized Clinical Trial. *Circulation.* 2016 Aug 2;134(5):378-91.
45. Marik PE, Varon J. Omega-3 dietary supplements and the risk of cardiovascular events: a systematic review. *Clin Cardiol.* 2009 Jul;32(7):365-72.
46. Nodari S, Triggiani M, Campia U, et al. Effects of n-3 polyunsaturated fatty acids on left ventricular function and functional capacity in patients with dilated cardiomyopathy. *J Am Coll Cardiol.* 2011 Feb 15;57(7):870-9.
47. Fotino AD, Thompson-Paul AM, Bazzano LA. Effect of coenzyme Q(1)(0) supplementation on heart failure: a meta-analysis. *Am J Clin Nutr.* 2013 Feb;97(2):268-75.
48. Belardinelli R, Mucaj A, Lacalaprice F, et al. Coenzyme Q10 improves contractility of dysfunctional myocardium in chronic heart failure. *Biofactors.* 2005;25(1-4):137-45.
49. Rhodes LE, Shahbakhti H, Azurdia RM, et al. Effect of eicosapentaenoic acid, an omega-3 polyunsaturated fatty acid, on UVR-related cancer risk in humans. An assessment of early genotoxic markers. *Carcinogenesis.* 2003 May;24(5):919-25.
50. Courtney ED, Matthews S, Finlayson C, et al. Eicosapentaenoic acid (EPA) reduces crypt cell proliferation and increases apoptosis in normal colonic mucosa in subjects with a history of colorectal adenomas. *Int J Colorectal Dis.* 2007 Jul;22(7):765-76.
51. Aronson WJ, Kobayashi N, Barnard RJ, et al. Phase II prospective randomized trial of a low-fat diet with fish oil supplementation in men undergoing radical prostatectomy. *Cancer Prev Res (Phila).* 2011 Dec;4(12):2062-71.
52. Murphy RA, Mourtzakis M, Chu QS, et al. Nutritional intervention with fish oil provides a benefit over standard of care for weight and skeletal muscle mass in patients with nonsmall cell lung cancer receiving chemotherapy. *Cancer.* 2011 Apr 15;117(8):1775-82.
53. Murphy RA, Mourtzakis M, Chu QS, et al. Supplementation with fish oil increases first-line chemotherapy efficacy in patients with advanced nonsmall cell lung cancer. *Cancer.* 2011 Aug 15;117(16):3774-80.
54. Chagas TR, Borges DS, de Oliveira PF, et al. Oral fish oil positively influences nutritional-inflammatory risk in patients with haematological malignancies during chemotherapy with an impact on long-term survival: a randomised clinical trial. *J Hum Nutr Diet.* 2017 Dec;30(6):681-92.
55. Molfino A, Amabile MI, Monti M, et al. The Role of Docosahexaenoic Acid (DHA) in the Control of Obesity and Metabolic Derangements in Breast Cancer. *Int J Mol Sci.* 2016 Apr 5;17(4):505.
56. Park M, Kim H. Anti-cancer Mechanism of Docosahexaenoic Acid in Pancreatic Carcinogenesis: A Mini-review. *J Cancer Prev.* 2017 Mar;22(1):1-5.

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# REBUTTAL
## *to Recent Trials on*
## Vitamin D *and* Fish Oil

BY SUZANNE SCHIFF

Higher intake and/or blood levels of **vitamin D** and **omega-3 fatty acids** are linked to reduced rates of cancer, cardiovascular events, and other health problems.

A clinical trial published in the ***New England Journal of Medicine*** garnered widespread **media** attention late last year. That's because the study purportedly failed to demonstrate the efficacy of **vitamin D** and/or **fish oil**.[1,2]

**Life Extension®** analyzed the design and results of this trial.

The first glaring flaw was the **potencies** of both nutrients studied were ***insufficient***, and far below what many experts recommend.

And yet, even at these **inadequate** doses, both supplements (vitamin D and fish oil) demonstrated important benefits that were largely **overlooked** by many media sources.

In one arm of the study, there was a **25%** reduction in **cancer deaths** in the **vitamin D group** when the first **two years** of follow-up were excluded. This fact is important because **cancer** can take years to manifest into a clinically relevant disease.

What this means is that ***longer-term*** use (more than two years) of **vitamin D**, even in a modest dose, can reduce the risk of dying from cancer. What's startling is these favorable data (i.e. **25%** cancer mortality reduction) come from the same study the media used to question the value of vitamin D.

Much of the media twisted this study's findings to state that vitamin D provides no benefit against cancer. The reality is that findings from this study indicate that **short-term** supplementation with **vitamin D** did not confer cancer-protection effects.

In this same study, **fish oil** supplementation led to a **28% reduction** in risk for heart attack and a **50% reduction** in *fatal* heart attacks.[1,2] Yet the media chose to report on the primary endpoints in order to discredit these beneficial results.

Contrary to the attacks on **fish oil supplements**, the media reported positively on an expensive **fish oil drug** comprised of the **EPA** fraction of fish oil.

The **fish-oil-drug** study demonstrated robust cardiovascular protection in people with higher blood triglyceride levels. The study found that those receiving the **omega-3 drug** had a **20%** reduced rate of death from cardiovascular causes, a **31%** reduced rate of heart attack, and a **28%** reduced rate of stroke.[3]

If you are confused about contradictory reporting about the same or similar studies, we clarify the nuances in this article, and in the opening editorial on page 7 of this month's issue.

The public deserves to understand the practical realities as they relate to **low-cost** opportunities to enjoy healthy aging.

## The VITAL Trial: What Went Wrong?

The name of the clinical trial that the media used to bash vitamin D and fish oil was **VITAL**.

A key problem with the VITAL trial is ***inadequate dosing***.

By choosing a dose dramatically *lower* than the optimal amounts, researchers doomed the study to failure from the start. In the end, the study findings didn't show the supplements were ineffective, only that the supplements are ineffective (by some measures) when used at *inadequate* **doses**.

The VITAL trial used **2,000 IU** of vitamin D and **840 mg** of **EPA/DHA** from **fish oil** daily.[1,2]

The **Vitamin D Council** (and **Life Extension**®) has long recommended daily doses of **5,000 IU** to **8,000 IU** of **vitamin D**, especially since deficiency in the vitamin is strikingly common in the United States.

More than **75%** of adolescents and adults have inadequate levels of vitamin D.[4-6] In the elderly and other high-risk groups, the percent of **deficient** individuals and the **magnitude** of the **deficiency** can be higher.

Studies of **omega-3** fatty acids have shown a strong cardiovascular protective effect in individuals with the ***highest*** percentage of omega-3s in their blood.[7,8]

**Life Extension** has determined that doses of **2,400 mg** of **EPA/DHA** from fish oil daily are often required to maintain optimal levels. That's almost three times the modest dose (**840 mg**) used in the **VITAL** trial.

The ***blood levels*** of vitamin D and omega-3 fatty acids in the VITAL trial further demonstrate how **inadequate** the **dosing** was.

## Insufficient Blood Levels

During the VITAL trial, average blood levels of **vitamin D** rose from approximately **30 ng/mL** to **41 ng/mL**. The **omega-3 index** (which measures EPA/DHA in blood) went from **2.7%** to slightly over **4%**.[1,2]

The optimal ranges typically recommended by **Life Extension** are between **50 ng/mL** to **80 ng/mL** for **vitamin D** (*25-hydroxyvitamin D*) and **8%** to **12%** for the **omega-3 index**.

Research is increasingly demonstrating that these *higher* levels are associated with the greatest protection from various forms of disease.

For example, a meta-analysis of clinical trials published last year found that in women over the age of 54, those with **vitamin D** levels *higher* than **58 ng/mL** had a remarkable **82%** lower incidence of **breast cancer** than women with low levels of vitamin D.[9]

Research has also shown a steep relationship between blood levels of **omega-3** fatty acids and healthy outcomes.

One study published in the journal *Preventive Medicine* found that the greatest protection from **death** by **cardiovascular** causes was in individuals with an **omega-3 index** (blood test) greater than or equal to **8%**.[7] That's well above the levels found in most subjects in the VITAL trial (whose omega-3 index score was slightly over **4%**).[7,8]

**Life Extension** recommends periodic ***blood testing*** for vitamin D and the omega-3 index. This can help determine individualized dosing requirements to achieve optimal levels.

## Overlooked Benefits in the VITAL Trial

Media attention on the VITAL trial focused on the lack of benefit for the ***primary*** outcomes it evaluated: i.e. whether vitamin D or omega-3s reduced the risk for developing cancer and cardiovascular disease.

But even at the low doses used, there *were* benefits observed on ***secondary*** outcomes.

The VITAL trial followed subjects for an average of 5.3 years. There was a **25% reduction in cancer deaths** in those receiving vitamin D *when the first two years of follow-up were excluded*.[2]

In other words, some people who died from cancer in the *first* two years of the study were likely already on the path to cancer or had preexisting cancer when the study began.

In these individuals, *any* dose of vitamin D would have been unlikely to make a difference. But in the **longer term**, the rates of cancer deaths dropped in the vitamin D group, suggesting a protective effect against *new* cancers down the road.

Fish oil supplementation also had impressive benefits, including a **28% reduction** in risk for heart attack (myocardial infarction) and a **50% reduction** in *fatal* heart attacks. Subjects in the fish oil group also had a **22% reduction** in the need for angioplasty procedures for coronary artery disease.[1]

When looking at *overall* cardiovascular events, **fish oil** had the greatest positive impact in individuals who reported lower fish consumption in their diet (less than 3-4 ounces of fish per week). In these people, fish oil supplementation resulted in a **19% reduction** in all major cardiovascular events, including a **40% reduction** in heart attacks.[1]

These are extremely significant benefits that were widely **overlooked** in reports about the trial.

## Robust Results in the REDUCE-IT™ Trial

The negative primary findings of the VITAL trial run contrary to the results of many other studies of vitamin D and omega-3 fatty acids. Each year, dozens of new studies are published attesting to the importance of vitamin D and omega-3s for various aspects of health.[10-24]

One of the most notable recent trials was the **REDUCE-IT™** study, the results of which were published this year in the *New England Journal of Medicine*.[3] This large trial randomized subjects at high risk for cardiovascular events to receive **4,000 mg/day** of this EPA-only omega-3 drug or a placebo.

This study demonstrated definitive benefits. Overall, the rate of death due to cardiovascular causes was reduced by **20%**. Heart attacks were reduced by **31%** and strokes by **28%**.

## Vitamin D and Omega 3 Rebuttal

- **Adequate blood levels of vitamin D and omega-3 fatty acids are required to maximize the health benefits associated with these nutrients.**
- **A recent trial that used low doses of vitamin D and omega-3 fatty acids failed to show a benefit for the primary cancer and cardiovascular outcomes they assessed, though benefits were seen for several other outcomes.**
- **Life Extension believes the study was critically flawed due to inadequate dosing for both vitamin D and fish oil supplementation, which was insufficient to raise blood levels of both nutrients to optimal levels.**
- **Based on guidelines set forth by the Vitamin D Council, and numerous studies of the protective effects of high omega-3 levels, Life Extension recommends maintaining blood levels between 50 ng/mL and 80 ng/mL for vitamin D and an omega-3 index of 8% to 12%.**
- **We recommend doses of 5,000 IU to 8,000 IU of vitamin D and 4,000 mg of fish oil daily to maintain these optimal levels. Regular blood testing, available through Life Extension, is important to guide adjustments to these doses to achieve the maximum benefits.**

The researchers found further benefits when evaluating other indicators of the severity of cardiovascular disease. The need for urgent or emergency heart revascularization procedures (such as angioplasty, stenting or bypass surgery) was reduced by **35%**. The need for hospitalizations for chest pain (unstable angina) was **32%** lower in the omega-3 supplement group.

The REDUCE-IT™ trial demonstrated that for high-risk patients, this high-dose EPA fish oil supplement can have a profound impact on cardiovascular health.

A notable difference between the VITAL and REDUCE-IT™ studies was the potency of fish oil omega-3s. VITAL used only **840 mg** of EPA/DHA, whereas REDUCE-IT™ used a drug that contained **4,000 mg** of EPA only. That's almost five times the omega-3s in **REDUCE-IT™** compared to the **VITAL** trial. Yet both studies showed favorable benefits.

Our concern with an **EPA-only** drug is that users may deprive themselves of the **DHA** fraction of fish oil that is needed for critical cellular functions. The high cost of the fish oil **drug** ($250 a month) makes it cost prohibitive for most consumers.

## Summary

Results of the **VITAL** study of **vitamin D** and **omega-3 fatty acids** received negative media attention. But this study was flawed due to woefully inadequate dosing.

Yet even these low potencies showed health benefits in different subgroups that were almost completely ignored in the media.

### The Importance of a Healthy Omega Balance

One major consideration that is missing from studies evaluating the effects of omega-3 fatty-acid supplementation is the further complicating issue of omega-6 fatty acids. Omega-6s are polyunsaturated fatty acids, like omega-3s. However, despite the similarity in name, they have different effects.

While **omega-3s** are critical building blocks in the brain, have cardioprotective effects, reduce abnormal clot formation, and reduce inflammation in the body, excessive intake of **omega-6s** can be *harmful* to health.[25-27]

The problem lies in the fact that our bodies evolved on a diet with an omega-6 to omega-3 ratio closer to an ideal of 4 to 1. Unfortunately, the typical modern diet is now closer to a ratio of ***20*** *to* ***1.*** [25] These excess omega-6s are a hidden menace in our food supply, amplifying our risk for chronic disease.

Modern diets are often loaded with omega-6s from soy and corn oils, including those in salad dressings, and in many processed and packaged foods, chicken and chicken dishes, baked goods and desserts, potato and corn chips, pizza, French fries, and more.[28]

While omega-3 supplements are important, an optimal omega-6 to omega-3 balance requires drastically reducing the intake of omega-6 fatty acids from an average American diet at the same time.

**Life Extension** believes that people should strive for a **<4:1**, i.e. less than 4 grams of omega-6s for each gram of omega-3. Refer to the article on page 42 of this issue for more details about achieving healthier omega-6 to omega-3 balance.

So, when evaluating clinical trials of omega-3s, an overlooked, confounding factor to consider is to what degree the study subjects over-ingested omega-6 fats, which counteract many of the expected benefits of omega-3s.

The **REDUCE-IT™** trial showed robust primary benefits. It used high doses of an expensive (patented) **fish oil drug** that provided only **EPA**, but none of the **DHA** fraction of fish oil.

Most aging individuals require doses of **5,000 IU** to **8,000 IU** of vitamin D and **2,400 mg** of **EPA/DHA** from **fish oil** daily to attain optimal levels.

**Blood tests** (25-hydroxyvitamin D and the omega-3 index) can enable one to achieve optimal vitamin D and omega-3 status. ●

*(References for this article appear on page 76.)*

# OMEGA-3 *and* VITAMIN D Blood Tests

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**Item # LC381822COMBO CBC/Chemistry Panel and Vitamin D. Price: $55. Offer expires November 29, 2019.**

## OMEGA-3 INDEX COMPLETE

The **Omega-3 Index Complete** test measures the **percent** of **omega-3**s in red blood cells (optimal ranges are **8%** and higher) and reveals the critical **omega-6** to **omega-3 ratio**.

Results from this test guide dietary decisions relating to intake of **omega-6 fats** and optimal **omega-3** dosing.

This test is a simple in-home finger-stick test kit.

The regular price of the **Omega-3 Index Complete** test is **$99** but it is discounted to only **$69** during this special offer.

**Item # LC100066* Price: $69 for Omega-3 Index Complete. Offer expires November 29, 2019.**

Just call **1-800-208-3444** toll-free or visit **LifeExtension.com** to order now!

* This test is packaged as a kit. Blood tests available in the continental United States only. Restrictions apply in NY, NJ, RI, and MA. Not available in MD. Kits not available in PA.

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

## References


1. Manson JE, Cook NR, Lee IM, et al. Marine n-3 Fatty Acids and Prevention of Cardiovascular Disease and Cancer. *N Engl J Med.* 2019 Jan 3;380(1):23-32.
2. Manson JE, Cook NR, Lee IM, et al. Vitamin D Supplements and Prevention of Cancer and Cardiovascular Disease. *N Engl J Med.* 2019 Jan 3;380(1):33-44.
3. Bhatt DL, Steg PG, Miller M, et al. Cardiovascular Risk Reduction with Icosapent Ethyl for Hypertriglyceridemia. *N Engl J Med.* 2019 Jan 3;380(1):11-22.
4. Ginde AA, Liu MC, Camargo CA, Jr. Demographic differences and trends of vitamin D insufficiency in the US population, 1988-2004. *Arch Intern Med.* 2009 Mar 23;169(6):626-32.
5. Cashman KD, Dowling KG, Skrabakova Z, et al. Vitamin D deficiency in Europe: pandemic? *Am J Clin Nutr.* 2016 Apr;103(4):1033-44.
6. Snijder MB, van Dam RM, Visser M, et al. Adiposity in relation to vitamin D status and parathyroid hormone levels: a population-based study in older men and women. *J Clin Endocrinol Metab.* 2005 Jul;90(7):4119-23.
7. Harris WS, Von Schacky C. The Omega-3 Index: a new risk factor for death from coronary heart disease? *Prev Med.* 2004 Jul;39(1):212-20.
8. von Schacky C, Harris WS. Cardiovascular risk and the omega-3 index. *J Cardiovasc Med (Hagerstown).* 2007 Sep;8 Suppl 1:S46-9.
9. McDonnell SL, Baggerly CA, French CB, et al. Breast cancer risk markedly lower with serum 25-hydroxyvitamin D concentrations >/=60 vs <20 ng/ml (150 vs 50 nmol/L): Pooled analysis of two randomized trials and a prospective cohort. *PLoS One.* 2018;13(6):e0199265.
10. Patil MB, Ragav ED. A Clinical, Biochemical Profile of Type-2 Diabetes in Women with Special Reference to Vitamin-D Status in Obese and Non-Obese. *J Assoc Physicians India.* 2018 Dec;66(12):21-4.
11. Hwang J, Zmuda JM, Kuipers AL, et al. Serum Vitamin D and Age-Related Muscle Loss in Afro-Caribbean Men: The Importance of Age and Diabetic Status. *J Frailty Aging.* 2019;8(3):131-7.
12. Skrajnowska D, Bobrowska-Korczak B. Potential Molecular Mechanisms of the Anti-cancer Activity of Vitamin D. *Anticancer Res.* 2019 Jul;39(7):3353-63.
13. Yodoshi T, Orkin S, Arce-Clachar AC, et al. Vitamin D deficiency: prevalence and association with liver disease severity in pediatric nonalcoholic fatty liver disease. *Eur J Clin Nutr.* 2019 Aug 23.
14. Wu Y, Hu Z, Cai M, et al. Decreased 25-Hydroxyvitamin D Levels in Patients With Vestibular Neuritis. *Front Neurol.* 2019;10:863.
15. Sordillo JE, Rifas-Shiman SL, Switkowski K, et al. Prenatal Oxidative Balance and Risk of Asthma and Allergic Disease in Adolescence. *J Allergy Clin Immunol.* 2019 Aug 19.
16. Sakamoto A, Saotome M, Iguchi K, et al. Marine-Derived Omega-3 Polyunsaturated Fatty Acids and Heart Failure: Current Understanding for Basic to Clinical Relevance. *Int J Mol Sci.* 2019 Aug 18;20(16).
17. Liao Y, Xie B, Zhang H, et al. Efficacy of omega-3 PUFAs in depression: A meta-analysis. *Transl Psychiatry.* 2019 Aug 5;9(1):190.
18. Gao H, Geng T, Huang T, et al. Fish oil supplementation and insulin sensitivity: a systematic review and meta-analysis. *Lipids Health Dis.* 2017 Jul 3;16(1):131.
19. Moertl D, Hammer A, Steiner S, et al. Dose-dependent effects of omega-3-polyunsaturated fatty acids on systolic left ventricular function, endothelial function, and markers of inflammation in chronic heart failure of nonischemic origin: a double-blind, placebo-controlled, 3-arm study. *Am Heart J.* 2011 May;161(5):915 e1-9.
20. Xyda SE, Vuckovic I, Petterson XM, et al. Distinct influence of omega-3 fatty acids on the plasma metabolome of healthy older adults. *J Gerontol A Biol Sci Med Sci.* 2019 Jun 4.
21. Martins BP, Bandarra NM, Figueiredo-Braga M. The role of marine omega-3 in human neurodevelopment, including Autism Spectrum Disorders and Attention-Deficit/Hyperactivity Disorder—a review. *Crit Rev Food Sci Nutr.* 2019 Mar 18:1-16.
22. Jovic M, Loncarevic-Vasiljkovic N, Ivkovic S, et al. Short-term fish oil supplementation applied in presymptomatic stage of Alzheimer's disease enhances microglial/macrophage barrier and prevents neuritic dystrophy in parietal cortex of 5xFAD mouse model. *PLoS One.* 2019;14(5):e0216726.
23. Yang Y, Kim Y, Je Y. Fish consumption and risk of depression: Epidemiological evidence from prospective studies. *Asia Pac Psychiatry.* 2018 Dec;10(4):e12335.
24. Niroomand M, Fotouhi A, Irannejad N, et al. Does high-dose vitamin D supplementation impact insulin resistance and risk of development of diabetes in patients with pre-diabetes? A double-blind randomized clinical trial. *Diabetes Res Clin Pract.* 2019 Feb;148:1-9.
25. Simopoulos AP. The importance of the ratio of omega-6/omega-3 essential fatty acids. *Biomed Pharmacother.* 2002 Oct;56(8):365-79.
26. Simopoulos AP. An Increase in the Omega-6/Omega-3 Fatty Acid Ratio Increases the Risk for Obesity. *Nutrients.* 2016 Mar 2;8(3):128.
27. Tomic-Smiljanic M, Vasiljevic D, Lucic-Tomic A, et al. Influence of different supplementation on platelet aggregation in patients with rheumatoid arthritis. *Clin Rheumatol.* 2019 May 10.
28. Available at: https://epi.grants.cancer.gov/diet/foodsources/fatty_acids/table3.html. Accessed August 23, 2019.


Natalie Rizzo, MS, RD

# Why Do I Need A Probiotic?

Probiotics are in the news, and you're probably wondering if you should be taking one every day.

"I recommend a mixture of probiotic supplements and probiotic-rich foods to virtually all my clients," says registered dietitian Natalie Rizzo, MS, RD.

Why does she think these types of supplements are so helpful?

It's because there are trillions of live microorganisms called microbiota already living in your body. They are your microbiome, a term which refers to the whole ecology of your digestive tract, including the microorganisms.

A variety of species and strains in your microbiota affect multiple health conditions in positive ways. Probiotics can help augment and balance the microorganisms already living in your digestive tract.

In this interview with ***Life Extension***® Natalie Rizzo, MS, RD, discusses the benefits of probiotics and how to choose one that is right for you.

**LE:** Probiotics are a relatively new field of study. Can you tell us about some areas of research regarding probiotics?

**Rizzo:** It's quite exciting that probiotics and gut health are coming to the forefront. There is much published research that shows how digestive health is connected to immune health, mood, weight loss and more. When I tell clients about this, they seem quite surprised because probiotics are something that may just be appearing on their radar for the first time. Many people know the term "gut health" but don't really know what probiotics do and how they can affect health. Once I explain that our bodies are filled with trillions of microorganisms, a whole new world opens for them.

What's more, all people have a unique mix in the microbiota of their own gut.

**LE:** If these microorganisms live in the gut, how do they affect the immune system?

**Rizzo:** Other parts of the body also have their own unique microbiomes, like the vaginal canal, the mouth, and the skin, but most of our resident microorganisms live in our gut. That's where you'll also find **70%** to **80%** of the body's immune cells.[1] The makeup and activity of those immune cells is influenced by the makeup of microbes in your gut.

More specifically, research has found that probiotics may provide promising solutions to certain common illnesses. For instance, strep throat is caused by a group of bacteria known as type *A streptococcus*, which is responsible for up to about **15%** of throat infections in adults and up to about **30%** in children.[2]

Research has found that the probiotic strain ***S. salivarius*** K12 may have the potential to stop strep throat before it starts. *S. salivarius* K12 produces compounds called **lantibiotics**, which target the organisms that cause strep throat.[3] One clinical study showed a reduction in strep throat infections in people who took a daily probiotic lozenge containing *S. salivarius* K12.[4]

Probiotics play quite an amazing protective role. They may even help combat seasonal allergies.

**LE:** Really? How do the microorganisms in the gut affect seasonal allergies?

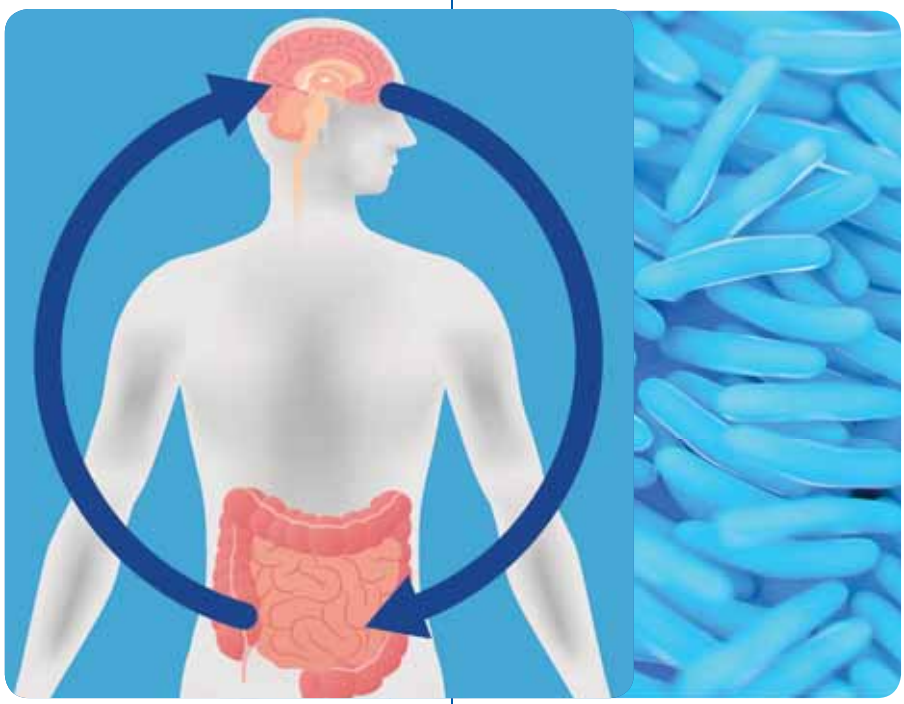
**Rizzo:** An allergic reaction arises when the immune system overreacts to something in the environment, like dust or pollen. Many people reach for an antihistamine that provides temporary relief, but a more effective approach is to try and restore balance within the immune system.

A certain type of immune cells, called **T helper type 2 cells** (Th2), play a role in restoring balance to the immune system. Scientists have discovered that **yeast fermentate**, a form of baker's yeast, and the probiotic strain ***Lactobacillus acidophilus*** **L-92** help restore normal Th2 balance and reduce the immune system's allergic responses.[5]

**LE:** Let's circle back to what you said about some probiotics affecting mood. What does that mean and how does it play a role in health?

**Rizzo:** Depression and anxiety are widespread throughout the U.S., and they are usually viewed as disorders of the brain only. However, scientists have recently discovered that microorganisms living in the gut have an impact on the brain. In fact, this relationship between the biochemical functioning of the brain and probiotics in the gut has been dubbed the **gut-brain axis**.[6] In other words, the gut can affect the brain and vice versa. Researchers have shown that two specific probiotics have a positive impact on mood. They are ***Lactobacillus helveticus*** **strain R0052** and ***Bifidobacterium longum*** **strain R0175**.[7]

For example, a study of adults sought to determine how this probiotic combination may affect anxiety and depression. The participants were given **3 billion colony-forming units** (CFUs, a measure of the number of individual organisms) of the probiotic combination, or a placebo, for 30 days, and the results were really promising. Those who took the probiotic combination experienced a **49%** drop in the Global Severity Index, a measure of overall psychological distress, and a **50%** decrease in depression scores.[8]



LE: That's quite astounding. Are there any other roles for probiotics regarding health benefits?

Rizzo: Actually, our mouths are full of microbes, so probiotics play a huge role in oral health. If the bacteria in the mouth become unbalanced from poor diet and excessive consumption of sweets, disease, smoking, or drugs, it can cause microbial imbalances, resulting in cavities and gum disease. This can cause other health problems throughout the body.

But scientists have identified two strains of good bacteria that can combat poor oral health. First, ***L. plantarum* L-137**, a heat-treated strain of common *Lactobacillus* bacteria, prompts immune-boosting cells to begin a healing process in the mouth.[9] Then, in conjunction with ***S. salivarius* M18**, it works to override and kill harmful bacteria that can cause cavities and gum disease.[10] These strains are a great addition to your daily flossing and brushing routine.

LE: What should someone look for when choosing a probiotic?

Rizzo: Well, now that you know how different strains affect different conditions, I suggest looking for one that is right for you and your specific needs. There are a variety of targeted, condition-specific probiotics with strains for immune health, oral and nasal health, mood, and more. The science of probiotics is rapidly evolving into its own therapeutic category. ●

Natalie Rizzo, MS, RD is a NYC-based media Dietitian, food and nutrition writer, national spokesperson and owner of Nutrition á la Natalie, a successful sports nutrition blog.

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

## References


1. Holmgren J, Czerkinsky C, Lycke N, et al. Mucosal immunity: implications for vaccine development. *Immunobiology*. 1992 Feb;184(2-3):157-79.
2. Shulman ST, Bisno AL, Clegg HW, et al. Clinical practice guideline for the diagnosis and management of group A streptococcal pharyngitis: 2012 update by the Infectious Diseases Society of America. *Clin Infect Dis*. 2012 Nov 15;55 (10):e86-102.
3. Hyink O, Wescombe PA, Upton M, et al. Salivaricin A2 and the novel lantibiotic salivaricin B are encoded at adjacent loci on a 190-kilobase transmissible megaplasmid in the oral probiotic strain Streptococcus salivarius K12. *Appl Environ Microbiol*. 2007 Feb;73(4):1107-13.
4. Di Pierro F, Colombo M, Zanvit A, et al. Use of Streptococcus salivarius K12 in the prevention of streptococcal and viral pharyngotonsillitis in children. *Drug Healthc Patient Saf*. 2014;6:15-20.
5. Ishida Y, Nakamura F, Kanzato H, et al. Effect of milk fermented with Lactobacillus acidophilus strain L-92 on symptoms of Japanese cedar pollen allergy: a randomized placebo-controlled trial. *Biosci Biotechnol Biochem*. 2005 Sep;69(9): 1652-60.
6. Alonso C, Vicario M, Pigrau M, et al. Intestinal barrier function and the brain-gut axis. *Adv Exp Med Biol*. 2014;817:73-113.
7. Messaoudi M, Violle N, Bisson JF, et al. Beneficial psychological effects of a probiotic formulation (Lactobacillus helveticus R0052 and Bifidobacterium longum R0175) in healthy human volunteers. *Gut Microbes*. 2011 Jul-Aug;2(4):256-61.
8. Messaoudi M, Lalonde R, Violle N, et al. Assessment of psychotropic-like properties of a probiotic formulation (Lactobacillus helveticus R0052 and Bifidobacterium longum R0175) in rats and human subjects. *Br J Nutr*. 2011 Mar;105(5):755-64.
9. Iwasaki K, Maeda K, Hidaka K, et al. Daily Intake of Heat-killed Lactobacillus plantarum L-137 Decreases the Probing Depth in Patients Undergoing Supportive Periodontal Therapy. *Oral Health Prev Dent*. 2016;14(3):207-14.
10. Burton JP, Drummond BK, Chilcott CN, et al. Influence of the probiotic Streptococcus salivarius strain M18 on indices of dental health in children: a randomized double-blind, placebo-controlled trial. *J Med Microbiol*. 2013 Jun;62(Pt 6):875-84.

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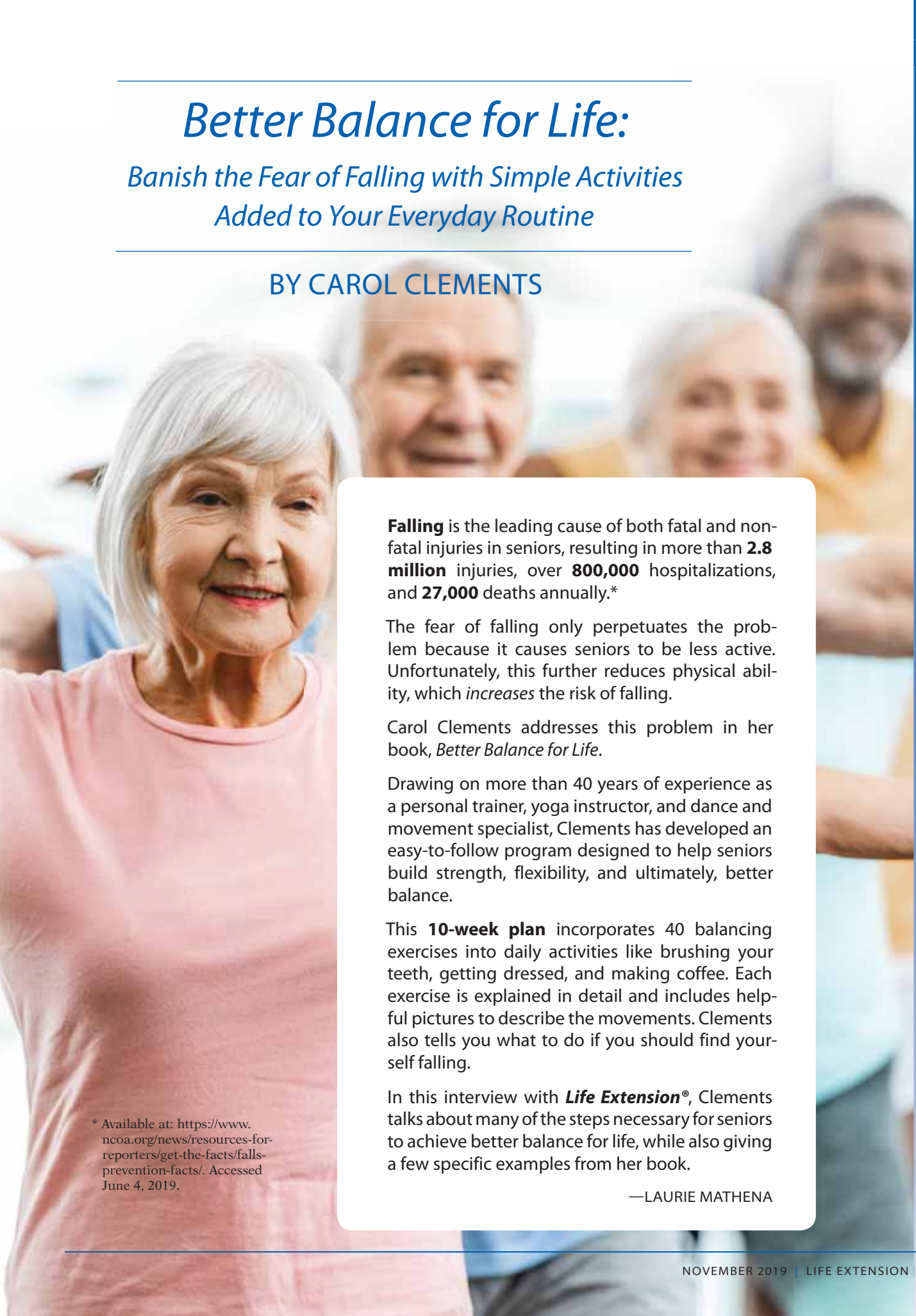
# Better Balance for Life:

## Banish the Fear of Falling with Simple Activities Added to Your Everyday Routine

BY CAROL CLEMENTS



**Falling** is the leading cause of both fatal and non-fatal injuries in seniors, resulting in more than **2.8 million** injuries, over **800,000** hospitalizations, and **27,000** deaths annually.*

The fear of falling only perpetuates the problem because it causes seniors to be less active. Unfortunately, this further reduces physical ability, which *increases* the risk of falling.

Carol Clements addresses this problem in her book, *Better Balance for Life*.

Drawing on more than 40 years of experience as a personal trainer, yoga instructor, and dance and movement specialist, Clements has developed an easy-to-follow program designed to help seniors build strength, flexibility, and ultimately, better balance.

This **10-week plan** incorporates 40 balancing exercises into daily activities like brushing your teeth, getting dressed, and making coffee. Each exercise is explained in detail and includes helpful pictures to describe the movements. Clements also tells you what to do if you should find yourself falling.

In this interview with ***Life Extension***®, Clements talks about many of the steps necessary for seniors to achieve better balance for life, while also giving a few specific examples from her book.

—LAURIE MATHENA

* Available at: https://www.ncoa.org/news/resources-for-reporters/get-the-facts/falls-prevention-facts/. Accessed June 4, 2019.

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Gradually transfer your body weight over the ball, allowing the metatarsals to mold to the shape of the ball. It may not feel entirely pleasant at first, so take it easy and go slowly. For one minute, maintain a bearable amount of your body weight over your forefoot while it is cupped and pressing the ball.

Now, roll the ball directly under the center of your foot and its primary arch. Gradually put weight onto the ball, or as much weight as you can tolerate. For one minute, maintain a bearable amount of your body weight over your arch while it is mashing the ball.

After you have released the stiffness from the bottom of your right foot, take your foot off the ball and stand on the floor. Your toes may feel straighter and longer. Your foot will feel wide, long, and grounded, providing a better base. Give your left foot the same treatment.

**LE:** Initially, you focus on stretching and increasing your body's range of motion. Can you give an example of an exercise from week one?

**Clements:** Whenever you wait for the water to boil, the toaster to toast, or the microwave to heat, take a moment to stretch the back of your body. Stand with the front of your body touching the kitchen counter. Put your hands on the kitchen counter and step away slowly as you lean forward until your back is flat and at a 90-degree angle to your legs (or as close as you can comfortably come to a right angle).

You will be in the shape of an L, legs perpendicular to the floor. Spread your fingers and reach your arms away from your hips while the tail end of your spine reaches in the opposite direction, away from your fingertips. Feel your back getting longer and imagine your breath flowing in between each bone of your spinal column.

If you can't get your back flat, or feel uncomfortable, then bend your knees. If your back feels long and flat, then try straightening your legs. You are stretching to feel the length of your entire back body, including the back of your legs.

To come out of the stretch without putting your back at risk for strain, keep your hands on the countertop and walk all the way in toward the counter before you roll your spine up to vertical position.

**LE:** How does the way you walk impact your balance?

**Clements:** Since gait disorders are a predictor of falling, it's well worth examining how you walk—and exploring how you can unify your body mechanics to walk more powerfully.

When you are walking, use the image of a helium balloon as the back of your head, behind your ears—not under your chin—so that the back of your neck lengthens and your head floats back and up instead of sinking forward. Imagine that your cheekbones are sliding backward, in the direction of behind your shoulders.

A lifestyle of driving, gazing at a screen, and rounding your shoulders may have deflated your head balloon and compressed the back of your neck. This forward head position inhibits the spinal movement needed for a healthy striding gait. Walk and signal the adjustment of your head and neck relationship with the cue "helium balloon."

**LE:** What if some of the exercises are too difficult?

**Clements:** Don't be discouraged if, with your first attempt, you don't achieve the position shown in an illustration. In time you will acquire the flexibility or strength to perform the maneuver

and benefit from the process of getting there. If the activities in a given week seem especially pertinent to your own physical issues, don't hesitate to repeat that week—or select and repeat the activities that seem most helpful.

Most of all, you needn't feel frustrated with what you may perceive as a failure to balance in the activity prescribed. With a secure fixture well within your reach, patiently steady yourself with the lightest motion you can to regain balance, then ease back into the balance challenge again.

Even if you lose your equilibrium, you succeed in turning on your balance system and achieve the goal of practicing balancing. In fact, while practicing, teetering out of the balance is a great rehearsal for a surprise loss of balance in the course of daily life. You are better able to cope because your body knows what to do from experience.

When you stand in an unstable position, sensory nerve endings that give information about your body's position and movement are getting the stimulation and practice they need to stay functional. In a strange way, experiencing losing your balance is the goal.

LE: What's the most important take-home message?

Clements: Don't give up; keep moving. The temptation to give in to the sitting disease may be great. You may yearn to slow down. If you aren't naturally inspired and motivated to keep physically active, then you may have to encourage yourself, force yourself, meet with a partner, do whatever it takes to make it easier or acceptable or mandatory—to move.

The more you move, the better your balance. The better your balance, the greater your confidence. Don't give up hope. Keep trying.

Carol Clements holds a BS and MA in dance therapy, has more than 40 years of experience as a personal trainer, and currently works with older populations. She is an ambassador for the National Osteoporosis Foundation (NOF), the leading health organization dedicated to promoting strong bones for life.

**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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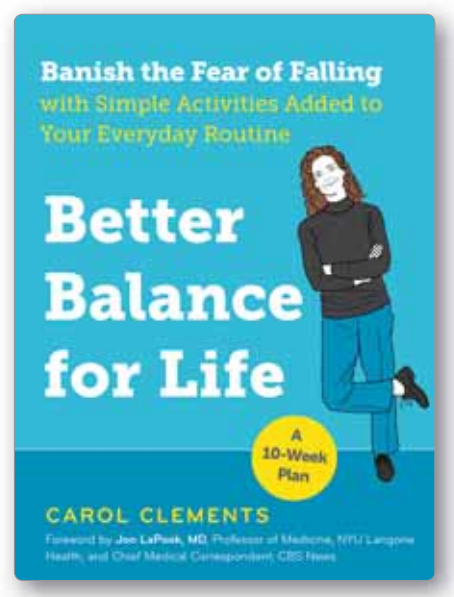

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**References**

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.

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# The Garden Chef

## Recipes and Stories from Plant to Plate

BY PHAIDON EDITORS AND JEREMY FOX

For many chefs, it's not the recipes that dictate the ingredients; *it's the ingredients that inspire the recipes*. In a growing trend, this inspiration is found just steps away from the kitchen, in the chefs' very own gardens.

*The Garden Chef* cookbook highlights recipes from top chefs who are participating in "plot to plate," a movement that focuses on growing and eating your own food.

Whether it's on a sprawling country estate with fruit trees and vegetables, or a rooftop terrace with herbs and spices, growing their own ingredients allows these chefs to have menus as unique as the plants they're growing—and as varied as the soil, climate, and space will allow.

With plot to plate—also called plant to plate—the focus becomes solely those plants that are in season. This provides not only a constantly changing menu, but also a healthier one, since seasonal eating has been shown to produce the healthiest microbiome.*

Of course, it simply tastes better, too.

*The Garden Chef* is more than just a cookbook. It is a peek into the signature recipes inspired by the kitchen gardens of 40 of the world's best chefs. From Iceland to Russia, and Brazil to Australia, chefs from around the world share the stories of their personal garden experiences, along with a hand-picked selection of their own unique plot-to-plate recipes.

On the following pages, ***Life Extension***® features four of these recipes, highlighting the simple fact that food can be just as beautiful as it is flavorful, and just as healthy as it is appetizing.

—Laurie Mathena

* *Science.* 25 Aug 2017.

## Rooftop Heirloom Tomato and Basil Salad

SERVES 4

**VINAIGRETTE**

**best-quality extra-virgin olive oil**
**best-quality Spanish sherry vinegar**

**SALAD**

**900 g assorted heirloom tomatoes**
**red onion, shaved, to taste**
**1 handful Opal basil leaves**
**1 handful Genovese basil leaves**
**50 g domestic blue cheese crumbles (Point Reyes or Maytag)**
**sea salt and cracked black pepper**

VINAIGRETTE: Put the oil and vinegar into a squeeze bottle and shake it vigorously.

SALAD: Cut any small tomatoes in half and big ones into wedges (removing the core).

TO SERVE: Arrange the tomatoes on 4 plates or a large platter. Sprinkle with shaved red onion. Next, place both types of basil on top, tearing large leaves but leaving small leaves whole. Dress the salad with the vinaigrette, season with salt and pepper, and sprinkle with the blue cheese crumbles.

## Minted Pea Soup with Goosefoot

SERVES 4–6 AS AN APPETIZER

**1 tablespoon butter**
**1 clove garlic, minced**
**1 shallot, minced**
**2 tablespoons white rice**
**120 g onion, diced**
**750 ml water (or chicken broth if you prefer)**
**270 g fresh or frozen peas**
**175 g wild goosefoot (Chenopodium berlandieri), coarsely chopped**
**1 tablespoon mint leaves, coarsely chopped**
**juice of 1 lemon**
**salt and freshly ground black pepper**

Put the butter, garlic, and shallot in a soup pot over medium heat and sauté for 2–3 minutes until fragrant. Add the rice and onion and cook for another 5 minutes until the onion softens, then add the water (or chicken broth) and simmer for 15 minutes, until the rice is cooked.

Remove the pot from the heat and add 1 teaspoon of salt, a dash of black pepper, the peas, goosefoot, mint, and lemon juice.

Carefully blend with an immersion (stick) blender until smooth. If you're serving the soup hot, you may need to reheat it. If you're serving it chilled, let cool, then refrigerate for at least 2 hours.

# Steamed Bass with Cockles and Summer Pistou

SERVES 4, AS PART OF A TASTING MENU

**4 x 125 g fillets wild bass, skin scored (increase the size to 200 g portions for larger main-course size)**
**500 g cockles in their shells, well washed**
**12 thick asparagus spears, trimmed, tips removed, and stems sliced into thin rondels**
**2 tablespoons fresh peas**
**2 tablespoons shelled fava (broad) beans**
**Sea salt**

**SUMMER PISTOU**
**handful of basil leaves**
**1 tablespoon grated Parmesan cheese**
**1 tablespoon olive oil**

**TO SERVE**
**squeeze of lemon juice**
**drizzle of light Ligurian or Provençal olive oil**

Season the fish fillets with salt, wrap them tightly in plastic wrap (clingfilm), and refrigerate for 2 hours to set the shape. Take out of the refrigerator 15 minutes before cooking.

Put a pan onto medium heat and throw in the cockles. Cover and cook for 3 minutes, or until the shells have opened. Shake the pan from time to time to help the process. Let the cockles cool in the pan, then strain the juice and reserve. Remove almost all the cockle meat from the shells (keep a few to decorate) and reserve.

SUMMER PISTOU: Combine the pistou ingredients in a mortar and pound to a paste. Alternatively, use a mini food processor.

Sit the fish fillets on a plate (still in their wrapping) and set in a colander over a pan of simmering water. Cover and steam for around 5 minutes, then check the internal temperature with a probe thermometer. When it reaches 110°F/45°C remove from the heat and let rest in a warm place; it will increase to just under 120°F/50°C with the residual heat.

While the fish is resting, heat the reserved cockle juice in a small pan. Add the asparagus rondels, peas, and fava (broad) beans and cook for 2–3 minutes, adding a tablespoon of water if needed.

Meanwhile, heat a little water in a small frying pan or skillet and simmer the asparagus tips for 2 minutes. Drain and add to the pan with the rest of the vegetables. Stir in the pistou, add the cockles, and warm briefly.

TO SERVE: Divide the vegetables and cockles among 4 warm serving bowls. Dress the fish fillets with a little lemon juice and olive oil. Place on top of the cockle pistou and season. Decorate with the reserved cockles in their shells and serve immediately.

## Lamborn Peas, Green Miso, Lemon

**SERVES 2**

**16 Lamborn snap pea pods**
**2 teaspoons Korean green soybean miso paste (*doenjang*) or other high-quality miso**
**4 teaspoons softened unsalted butter**
**pinch of dehydrated anchovy sauce**
**grated zest of 1/2 lemon**
**24 red speckled snow peas (mangetout), trimmed**
**8 Lamborn pea shoots**
**4 teaspoons extra-virgin olive oil**
**12 red speckled snow pea flowers**

Shell the Lamborn snap pea pods. Blanch the peas in a pan of boiling water for 10 seconds, then remove and refresh in a bowl of ice water.

Mix the miso paste, butter, anchovy sauce, and lemon zest together in a bowl, then spread out on 2 serving plates.

Place the blanched peas on top of the miso, dress the snow peas (mangetout) and pea shoots in the extra-virgin olive oil, then place them on top of the peas and miso. Garnish with the red speckled snow pea flowers and serve.

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**Reprinted from *The Garden Chef* (Phaidon 2019).**

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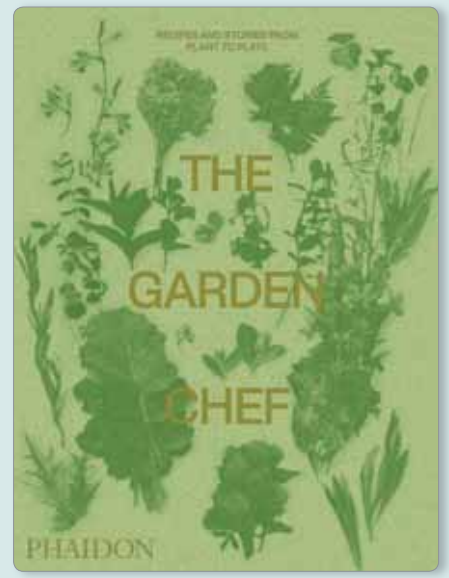

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02129 Skin Care Collection Anti-Aging Serum
02130 Skin Care Collection Day Cream
02131 Skin Care Collection Night Cream
80166 Skin Firming Complex
02096 Skin Restoring Ceramides
80130 Skin Stem Cell Serum
80164 Skin Tone Equalizer
80143 Stem Cell Cream with Alpine Rose
80148 Tightening & Firming Neck Cream
80161 Triple-Action Vitamin C Cream
80162 Ultimate MicroDermabrasion
80173 Ultimate Peptide Serum
80160 Ultra Eyelash Booster
01220 Ultra Rejuvenex®
00676 Ultra RejuveNight®
80101 Ultra Wrinkle Relaxer
80113 Under Eye Refining Serum
80104 Under Eye Rescue Cream
80171 Vitamin C Lip Rejuvenator
80129 Vitamin C Serum
80136 Vitamin D Lotion
80102 Vitamin K Cream

## SLEEP

01512 Bioactive Milk Peptides
02300 Circadian Sleep
01551 Enhanced Sleep with Melatonin
01511 Enhanced Sleep without Melatonin
02234 Fast-Acting Liquid Melatonin
01669 Glycine
02308 Herbal Sleep PM
01722 L-Tryptophan
01668 Melatonin • 300 mcg, 100 veg capsules
01083 Melatonin • 500 mcg, 200 veg capsules
00329 Melatonin • 1 mg, 60 capsules
00330 Melatonin • 3 mg, 60 veg capsules
00331 Melatonin • 10 mg, 60 veg capsules
00332 Melatonin • 3 mg, 60 veg lozenges
02201 Melatonin IR/XR
01787 Melatonin 6 Hour Timed Release 300 mcg, 100 veg tablets
01788 Melatonin 6 Hour Timed Release 750 mcg, 60 veg tablets
01786 Melatonin 6 Hour Timed Release 3 mg, 60 veg tablets
01721 Optimized Tryptophan Plus
01444 Quiet Sleep
01445 Quiet Sleep Melatonin

## VITAMINS

01533 Ascorbyl Palmitate
00920 Benfotiamine with Thiamine
00664 Beta-Carotene
01945 BioActive Complete B-Complex
00102 Biotin
00084 Buffered Vitamin C Powder
02229 Fast-C® and Bio-Quercetin Phytosome
02075 Gamma E Mixed Tocopherol Enhanced with Sesame Lignans
02070 Gamma E Mixed Tocopherol/Tocotrienols
01913 High Potency Optimized Folate
01674 Inositol Caps Liquid Emulsified
02244 Liquid Vitamin D3 • 2,000 IU, 1 fl oz
02232 Liquid Vitamin D3 • 2,000 IU, 1 fl oz, mint
01936 Low-Dose Vitamin K2
01536 Methylcobalamin • 1 mg, 60 veg lozenges
01537 Methylcobalamin • 5 mg, 60 veg lozenges
00065 MK-7
00373 No Flush Niacin
01939 Optimized Folate (L-Methylfolate)
01217 Pyridoxal 5'-Phosphate Caps
01400 Super Absorbable Tocotrienols
02334 Super K
02335 Super K Elite
01863 Super Vitamin E
02028 Vitamin B5 (Pantothenic Acid)
01535 Vitamin B6
00361 Vitamin B12
02228 Vitamin C and Bio-Quercetin Phytosome 1,000 mg, 60 veg tablets
02227 Vitamin C and Bio-Quercetin Phytosome 1,000 mg, 250 veg tablets
01753 Vitamin D3 • 1,000 IU, 90 softgels
01751 Vitamin D3 • 1,000 IU, 250 softgels
01713 Vitamin D3 • 5,000 IU, 60 softgels
01718 Vitamin D3 • 7,000 IU, 60 softgels
01758 Vitamin D3 with Sea-Iodine™
02040 Vitamins D and K with Sea-Iodine™

## WEIGHT MANAGEMENT & BODY COMPOSITION

00658 7-Keto® DHEA Metabolite • 25 mg, 100 capsules
02479 7-Keto® DHEA Metabolite • 100 mg, 60 veg capsules
01509 Advanced Anti-Adipocyte Formula
01807 Advanced Appetite Suppress
02207 AMPK Metabolic Activator
01823 CalReduce Selective Fat Binder
02478 DHEA Complete
01738 Garcinia HCA
29754 HCActive Garcinia Cambogia Extract
01292 Integra-Lean®
01908 Mediterranean Trim with Sinetrol™ -XPur
01492 Optimized Irvingia with Phase 3™ Calorie Control Complex
01432 Optimized Saffron with Satiereal®
00818 Super CLA Blend with Sesame Lignans
01902 Waist-Line Control™
02151 Wellness Code® Appetite Control

## WOMEN'S HEALTH

01942 Breast Health Formula
01626 Enhanced Sex for Women 50+
01894 Estrogen for Women
01064 Femmenessence MacaPause®
02204 Menopause 731™
02319 Prenatal Advantage
01441 Progesta-Care®
01649 Super-Absorbable Soy Isoflavones

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