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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.
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 overall 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.5,6 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.6 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.
vitamin D supplements, taking which is what most readers of Extension® Magazine headlines that were published around every day.

of cardiovascular diseases and cancer, of the totality of published scientific evidence. The box on the next page enables people to achieve optimal bone health and fracture 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

### 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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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*.*


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).

IN THE NEWS

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 Verderoi, these results, "suggest vitamin D deficiency to be the cause rather than the consequence of atherosclerosis."*  

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.”

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.

Normal aging results in a decline in a cell enzyme called AMPK.

As AMPK levels drop, a cell protein called mTOR increases.

Excess mTOR is associated with undesirable effects related to normal aging.

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A Probiotic Solution to Depression and Anxiety
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. After 30 days, probiotic-taking subjects had the following changes in scoring on standard tests, compared to the placebo group:

- 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.

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.

A New Way to Boost Mood

- About 16.1 million adult Americans suffer from major depression, and 40 million from anxiety.
- 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.
A PROBIOTIC SOLUTION TO DEPRESSION AND ANXIETY

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.5

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
A PROBIOTIC SOLUTION TO DEPRESSION AND ANXIETY

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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


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


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Magnesium Improves Insulin Sensitivity in Type II Diabetics

Nearly half of Americans consume less than the required amount of the mineral magnesium.\textsuperscript{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.\textsuperscript{2}

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.\textsuperscript{2}

The diabetic participants in the study who took magnesium had significant improvement in every indicator of glycemic control.\textsuperscript{2}
Dangers of Low Magnesium

The relationship between type II diabetes and magnesium deficiency is well established. Low magnesium is associated with insulin resistance, which happens when cells are unable to properly utilize insulin to metabolize glucose. Insulin resistance results in high blood sugar, and all too often progresses to type II diabetes.

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.

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.

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

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. 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). 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.

Table: Changes in HbA1c, Insulin, and HOMA-IR

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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. 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.

References

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**Increasing** **bifidobacteria** levels **enhances** digestion and carbohydrate metabolism.

**Strawberry flavored FLORASSIST® Prebiotic Chewable** helps restore healthy **bifidobacteria** levels in as little as 14 days using **XOS** prebiotic fiber.²

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**XOS IN A TASTY STRAWBERRY CHEWABLE**

**RESTORE YOUTHFUL GUT BALANCE**

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Item #01988 • 120 softgels

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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

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References
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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.
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

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

DANGERS OF AN OMEGA-6 TO OMEGA-3 IMBALANCE
In adulthood, supplementation with omega-3 fatty acids from fish oil has been shown to help maintain cognitive function.\textsuperscript{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.\textsuperscript{11}

**Fighting Depression**

Studies have shown that people who suffer from depression have lower levels of omega-3 fatty-acid intake.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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%.\textsuperscript{22}

Another major clinical trial, using 2,000 mg of EPA, also showed robust benefits for heart health.\textsuperscript{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%.
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**.

Call 1-800-208-3444 (24 hours) to obtain the **Omega-3 Index Complete (LC100066)** test.
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-6s 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.

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**References**


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Maintain Optimal Hormone Levels

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Keto Brain and Body Boost provides the brain and muscles the benefits of ketones without the drawbacks of a ketogenic diet.

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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
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.

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.
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 comprehensive prenatal nutrition to help support a healthy pregnancy, and healthy fetal and child development.**
can result in anencephaly, a fatal disorder in which a baby is born without part of the brain and skull.\textsuperscript{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.\textsuperscript{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.

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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{20}

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.\textsuperscript{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.\textsuperscript{15}

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

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A Complete Multivitamin for Moms and Developing Infants

Prenatal Advantage provides vitamins and key nutrients recommended for about-to-become-pregnant, pregnant, and nursing women to optimally support their baby’s overall health.

Scientifically formulated Prenatal Advantage contains:

- **Choline** and **DHA** (docosahexaenoic acid) to promote healthy brain and eye development.

- **Folic acid** and its most biologically active form, called 5-MTHF—to support healthy development.

- **Lutein, zeaxanthin**, and other carotenoids for healthy development of the eyes and brain.

- Full spectrum of vitamins and minerals to ensure against deficiencies.

Take 4 softgels daily, in divided doses with meals, ideally beginning in the months leading up to pregnancy, or as directed by a healthcare practitioner.

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

Item #02319 • 120 softgels

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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.
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.


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

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**What You Need to Know**

- 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%.
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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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**


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REBUTTAL to Recent Trials on Vitamin D and Fish Oil
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\(^\text{®}\)) 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.
REBUTTAL TO RECENT TRIALS ON VITAMIN D AND FISH OIL

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.)
Research shows that higher blood levels of vitamin D and omega-3’s provide important health benefits. Individual dosing of these nutrients varies widely.

That's why people have their blood tested to ensure they are obtaining optimal potencies. These blood tests are available now at extra-discounted prices!

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The comprehensive CBC/Chemistry Panel measures blood sugar, total cholesterol, LDL, HDL, VLDL, kidney/liver function, electrolyte balance, complete blood count, and much more.

This test panel normally costs $35. It is now part of a special $55 offer that includes a 25-hydroxyvitamin D test. This is a savings of 77% on the CBC/Chemistry Panel.


**OMEGA-3 INDEX COMPLETE**

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

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

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* 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

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.
ASK THE DIETITIAN

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. 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.

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. One clinical study showed a reduction in strep throat infections in people who took a daily probiotic lozenge containing S. salivarius K12.

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.

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. 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.

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.
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.

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Natalie Rizzo, MS, RD is a NYC-based media Dietitian, food and nutrition writer, national spokesperson and owner of Nutrition à 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.
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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

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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.
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Milk thistle extract—rich in silymarin—is a powerful weapon to support liver health. Scientific studies demonstrate silymarin's ability to provide potent protection for your liver.¹²

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This unique formula includes phosphatidylcholine, a nutrient that promotes better absorption of milk thistle extract.³

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

References

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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 havemenus 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

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 110ºF/45ºC remove from the heat and let rest in a warm place; it will increase to just under 120ºF/50ºC 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

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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