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August 2024

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AS WE SEE IT

Difficult Choices



WILLIAM FALOON



In the United States this year, about **43,000** women will suffer agonizing deaths from metastatic **breast cancers**.¹

From the day of diagnosis, women face difficult choices relating to treatments that inflict **side effects**, with <u>none</u> guaranteed to elicit a **cure**.

Be it radiation, chemotherapy, surgery, hormonal and/or checkpoint inhibitors, there are a myriad of known challenges, such as future **cancer** risks, **heart damage**, and **cognitive impairment** (chemo brain).²⁻⁷

A difficult choice for women with **estrogen receptorpositive** tumors is how long to stay on **drugs** that deplete their body of **estrogen**. These drugs are called **aromatase inhibitors**.⁸

Estrogen depletion using *aromatase inhibitors* reduces risks of breast **cancer** recurrence and metastasis.^{5,9} But these drugs deprive the women's bodies of essential functions such as maintaining **bone density**, along with causing **menopausal** symptoms like sleep deprivation and weight gain that can be life-shortening.^{10,11}

The risk of **estrogen receptor-positive** breast cancer <u>recurrence</u> continues far beyond the typical **five-year** standard mark. For some, the risk of recurrence remains elevated for 15 years or more.⁵

This long-term risk of **recurrence** has caused a conundrum as it relates to how many years a woman should continue taking an *aromatase inhibitor*, and what can be done to mitigate the **side effects** of **estrogen depletion.**^{5,10,12}

Recent findings provide a rationale to <u>not</u> overly extend the time that an *aromatase inhibitor* is used.¹⁰ Other studies reveal how to reduce bone **fractures** while <u>lowering</u> risks of cancer **recurrence.**¹²

This article describes some of these **safer** approaches to the "difficult choices" faced by breast cancer patients.





Women in the **two** <u>additional</u> years' treatment group experienced about **60%** <u>fewer</u> cases of **osteoporosis** compared to the **five** additional years' treatment arm.

The **bone fracture** reduction effects shown in the <u>shorter</u>-term use of the estrogen-depleting *aromatase inhibitor* occurred regardless of the use of skeletal supportive **drugs** I discuss next.

Protect Against Skeletal Degeneration

Estrogen helps maintain **bone density** by inhibiting the excess removal (resorption) of bone. It also plays a role in healthy bone remodeling.²²

When estrogen depletion occurs during menopause, risks of osteoporosis and bone fractures increase.²³

When estrogen is virtually eliminated using *aromatase inhibitor* drugs, rapid bone loss often ensues.^{24,25} In addition to skeletal fractures, mounting evidence suggests that as bone is excessively broken down, it releases **growth factors** that can stimulate residual **cancer cell** propagation.²⁶

Maintaining **bone density** is an essential component of breast **cancer treatment**, and there are **choices** as to which class of skeletal-supporting drug to use.²⁷

The **bisphosphonate** class of drugs (Fosamax[®], Aredia[®], Zometa[®], et al.) have proven bone-building properties but induce side effects in some people.^{28,29}

Another bone-building drug called **Prolia**[®] (generic name denosumab) has also demonstrated favorable results but works differently than **bisphosphonates**.

Researchers compared **Prolia**[®] in early-stage **ER+ breast cancer** patients taking an *aromatase-inhibitor* drug to a placebo arm taking <u>no</u> bone-protecting drug.^{11,24} They found in the Prolia[®] group:

- 24% fewer fractures,
- Reduced bone metastases,
- Better cancer-free survival,
- Survival after eight years: 26% Prolia[®] versus 19% placebo, and
- Few side effects.

The researchers of this unprecedented long-term study cited benefits including the low cost of Prolia[®] generics, injectable dosing of only twice a year, reductions in **bone fractures** and improved **overall survival**.

These researchers also commented that while benefits of **aromatase inhibitors** were long ago established in ER+ (and ER/PR+) patients, the increase in **fracture** rate, especially in the aging population, sometimes exceeds the reduction in cancer recurrence.

Scientists have noted that another class of drug (**bisphosphonates**) are also effective in mitigating the bone-damaging effects of anti-estrogen drugs (such as aromatase inhibitors), while improving breast cancer outcomes.

Bisphosphonates have raised more side-effect concerns than Prolia[®], but Prolia[®] can be substituted for bisphosphonates with good results and is well tolerated.³⁰

The downside to Prolia[®] is that upon cessation, rapid bone loss manifests. This means that once Prolia[®] is commenced, patients are likely to be on Prolia[®] or another bone-protecting drug for life.^{12,31} This may be good based on the epidemic of age-related **osteoporosis** and high **fracture** rates in the elderly.³² (Prolia[®] patients can also switch to a bisphosphonate if their doctor concurs.)³³

Both bone-protecting medications (Prolia[®] or bisphosphonates) are effective at preventing **fractures** in postmenopausal women with bone loss, and for women with ER+ breast cancer with higher risk of fractures due to treatment.

Those with ER+ breast cancer treated with an aromatase inhibitor should consider speaking to their

treating physician about **Prolia**[®] or a **bisphosphonate** to maintain bone density in the face of aggressive estrogen depletion.

A review of prior research comparing **Prolia**[®] with **bisphosphonates** to treat **osteoporosis** in postmenopausal women found decreased risk of fractures/ better bone density with **Prolia**[®] in **four** out of **six** studies reviewed, with no major differences in side effects between the groups.³⁰

Be it **Prolia**[®] or a **bisphosphonate**, estrogendeprived breast cancer patients require bone-protecting drugs to reduce **fracture** risks, along with skeletalfriendly lifestyles and nutrients.

The Most Difficult Choices

Upon diagnosis of any type of breast cancer, initial decisions involve lumpectomy or differing degrees of mastectomy, followed by decisions on whole-breast

Reducing Breast Cancer Risks

Lifestyle changes even *after* breast cancer diagnosis improve odds of achieving a complete response and improve overall survival.³⁴⁻³⁷

A recent observational study presented evidence that strong collective adherence to cancer-prevention lifestyle recommendations by the American Cancer Society and the American Institute of Cancer Research is associated with significant reductions in disease recurrence and mortality in high-risk breast cancer patients.³⁵

Their most recent recommendations include: 35,36

- Maintain a healthy body weight.
- Meet the physical activity (PA) guidelines of 150-300 minutes per week of moderate-intensity or 75-150 minutes per week of vigorous-intensity physical activity, and muscle-strengthening activities on two or more days a week.
- Eat a colorful variety of vegetables and fruits, and plenty of whole grains.

- Limit red and processed meats, fast food, and other highly processed food.
- Avoid or limit sugar-sweetened beverages.
- Avoid or limit alcohol consumption to one drink or fewer per day.
- Avoid smoking.

Regarding alcohol consumption before and after breast cancer diagnosis, the research is inconsistent, with some studies showing no impact on mortality amongst breast cancer patients.^{38,39}

The easiest decision, however, relates to **breast** cancer risk reduction strategies.

This includes knowing your risk (i.e. family history), periodic screening (mammogram and clinical breast exam), breast self-exam, and following the American Cancer Society and the American Institute of Cancer Research recommendations.



radiation, differing chemo regimens, and other treatments that offer hope, but no assurance of efficacy.

Toxic **chemotherapy** regimens often induce initial efficacy, but at the cost of **side effects** that include *higher* risks of other **cancers**.

A study published in **2023** found that over a followup of **6.2 years**, breast cancer survivors had a **70%** *higher* risk of any **cancer** and a **45%** *higher* risk of nonbreast cancer compared with the general population.⁴

These secondary cancers manifested in the pancreas, colon, lung, skin, and other tissues. Many of these new cancers, such as the **three-fold** increase in **pre-leukemic** bone marrow dysplasia, correlate with **toxic therapies** used to fight the initial breast malignancy.

In 2020, an estimated **3.9 million** women were living with **breast cancer** in the United States.¹

Thanks to earlier diagnosis and improved treatments many of these **3.9 million** women will likely <u>not</u> die from breast cancer.

Many, however, suffer **side effects** from radiation, hormone ablation, chemo, and other harsh treatments. Women who survive breast cancer but perish years later after drug-induced **bone fractures**, radiation-induced **heart failure** or other toxic treatment effects, are too often overlooked when tabulating cancer statistics.

In other words, a woman suffering chemo- and/or radiation-induced **heart failure** or **secondary cancer** may not be counted as a breast cancer casualty, even

though the fatal disease emanated from *prior* breast cancer treatments.

The "**difficult choices**" title of this editorial relates to the myriad of **toxic** therapeutics with which a woman stricken with breast cancer is confronted.

In this month's issue, we reveal recent data sets to provide women with meaningful **choices** to <u>reduce</u> their odds of contracting breast cancer.

For longer life,

William Faloon, Co-Founder Life Extension®

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Optimized Broccoli with Myrosinase improves conversion of the precursor into **sulforaphane**, and its absorption into the bloodstream.^{2,5,6}

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 J Oral Maxillofac Pathol. 2020 May-
- Aug;24(2):405.

Each capsule contains:

Glucoraphanin, a sulforaphane *precursor* found in broccoli seed extract, that is standardized to a high concentration.^{3,4}

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Item #02368 30 vegetarian capsules 1 bottle \$27.75 4 bottles \$26.50 each

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In the News



CoQ10 Improves Early Recovery from Heart Attack

Results from an analysis of a clinical trial revealed a benefit for the use of coenzyme Q10 with standard treatment during early recovery from heart attack in comparison with standard treatment alone.

Investigation of CoQ10's mechanisms of action suggested a healthier inflammatory response among people who consume CoQ10.*

The trial included 120 heart attack patients who underwent stent placement and were treated with antiplatelet therapy and statin drugs. (Statins decrease CoQ10 synthesis.) Sixty-one participants received **30 mg** CoQ10 per day. (A low dose compared to what most supplement users take today.)

At one- and three-month follow-up examinations, trial participants who were given CoQ10 had greater <u>increases</u> in ejection fraction (which is reduced in heart failure) than the control group. At three months, B-type natriuretic peptide (which, when elevated, can indicate heart failure) had <u>declined</u> to a greater extent among those who received CoQ10. These improvements suggest that CoQ10 supported early heart-function recovery.

Editor's Note: Investigation of CoQ10's mechanisms of action in a concurrent mouse study suggested that there was less inflammation in the hearts of mice receiving CoQ10 than in those who did not get it.

* BMC Cardiovasc Disord. 2024 Jan 28;24(1):76.

Green Tea Intake Lowers Risk of Cardiovascular Disease in Diabetics

Overweight/obese diabetics with a high intake of green tea had a lower risk of developing cardiovascular disease, coronary heart disease, and stroke than those who did not consume it.*

Researchers evaluated data from 4,756 overweight or obese diabetic participants in the Comprehensive Research on the Prevention and Control of the Diabetes program, an ongoing epidemiologic study in China. They were followed up for a little more than six years.

Compared with participants who did not consume green tea, those who used **five grams** or more of green tea leaves per day had a **29%** <u>lower</u> risk of cardiovascular disease, a **40%** <u>lower</u> risk of coronary heart disease and a **30%** <u>reduction</u> in the risk of stroke.

Editor's Note: "Green tea possesses a great amount of antioxidant components including free amino acids, caffeine and polyphenols," the authors stated.

* Arch Public Health. 2024 Feb 2;82:18.





Antioxidant Consumption Linked to Less Visceral Fat

A study published in *Nutrition Research* found a link between increased consumption of antioxidants and decreased visceral adipose tissue.* Visceral fat surrounds the organs within the abdomen.

The study included 10,389 participants in the National Health and Nutrition Examination Survey (NHANES) 2011–2018.

Visceral adipose tissue areas were measured with DXA scans. Responses to dietary recall interviews provided information concerning antioxidant nutrient intake. The Composite Dietary Antioxidant Index was calculated from intake levels of vitamins A, C and E, carotenoids, selenium, and zinc.

Higher Composite Dietary Antioxidant Index values were associated with <u>lower</u> visceral adipose tissue areas. Compared with individuals whose values were among the lowest onethird of subjects, those whose values were among the top third had significantly less visceral fat.

Editor's Note: An unhealthy amount of visceral fat is associated with an increased risk factor for diabetes, cardiovascular disease, metabolic-associated fatty liver disease, and some types of cancer, the authors noted.

* Nutr Res. 2024 Jan 26;124:13-20.

Branched Chain Amino Acids Boost Concussion Recovery

A pilot, double-blind, randomized controlled clinical study revealed a benefit for branched chain amino acids in the treatment of concussion.* Branched chain amino acids are among the building blocks of the body's proteins.

The trial included 38 concussion patients aged 11–34. Participants received **15**, **30**, **45** or **54 grams** of branched chain amino acids or a placebo daily for 21 days. Daily neurocognitive tests were conducted, and symptoms, physical and cognitive activity and other factors were evaluated.

At the trial's conclusion, participants who were given branched chain amino acids had decreases in total symptom scores in a dose-dependent manner. Return to physical activity also improved in association with the amount of branched chain amino acids received.

Editor's Note: There was a "significant reduction in total symptom score" (decrease of 4.4 points on a 0-54 scale for every 500 grams of study drug consumed)," researchers concluded, and an increase in "return to physical activity (increase of 0.5 points on a 0-5 scale for every 500 grams of study drug consumed)."

* J Neurotrauma. 2024 April 11.



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[†] Ratings based on results of the 2023 ConsumerLab.com Survey of Supplement Users. More information at www.consumerlab.com/survey.

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Vitamin E (gamma, delta, alpha, beta tocophero	20 mg ols)
Vitamin B1 (thiamine HCI)	75 mg
Vitamin B2 (riboflavin 5'-phosphate)	50 mg
Vitamin B3 (niacinamide, niacinamide ascorbate)	50 mg NE•
Vitamin B5 (D-calcium pantothenate) 50 mg
Vitamin B6 (pyridoxine HCI, pyridoxal 5'-phosphate)	75 mg
Folate (5-MTHF)680 mcg DFE°	
Vitamin B12 (methylcobalamin)	300 mcg
Biotin	300 mcg
lodine (potassium iodide)	150 mcg
Magnesium (magnesium oxide)	100 mg
Zinc (zinc citrate, L-OptiZinc [®] zinc mono-L-methionine sulfate)	25 mg
Manganese (manganese citrate, gluconate)	2 mg
Chromium [Crominex [®] 3+ chromium stabilized with Capros [®] amla extract (fruit), PrimaVie [®] Shilajit]	200 mcg
Molybdenum (amino acid chelate)	100 mcg
Inositol	50 mg
Alpha lipoic acid	25 mg
Bio-Quercetin [®] Proprietary Blend providing 35% quercetin (5 mg) [from sophora concentrate (flower bud)], 30 galactomannans (4 mg) [from fenugre)%
Marigold extract [std. to 5 mg trans-lutein, 155 mcg trans-zeaxanth	11.12 mg in]
Apigenin	5 mg
Boron (amino acid chelate)	3 mg
Lycopene [LycoBeads® natural tomato extract (fruit)]	1 mg
Selenium [as sodium selenite, SelenoExcell® high selenium yeast, Se-methyl L-selenocysteine]	200 mcg
A DAE (rotinal activity aquivalante)	(diatom fol

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How MAGNESIUM Helps Prevent Metabolic Syndrome

BY STEVE PAGE, OT/L, PHD, MS, MOT

Roughly one in three adults in the U.S. has **metabolic syndrome**.¹ This puts them at <u>increased</u> risk of heart disease, stroke, and type II diabetes.²

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MAGNESIUM

N

Few people even know they have it. To be diagnosed with metabolic syndrome, individuals must have at least <u>three</u> of the following conditions:

- Large waist circumference (reflecting excess abdominal fat),
- Elevated blood pressure,
- Impaired fasting blood sugar,
- · Low HDL ("good") cholesterol, and
- High **triglyceride** levels.

Here's the good news: Research shows that oral intake of **magnesium** may be a helpful tool in managing the conditions that make up **metabolic syndrome.** However, **45%** of people in the United States are deficient in dietary magnesium.³

In human studies, magnesium intake:

- Improves blood sugar levels and insulin resistance,⁴⁻⁶
- Reduces elevated blood pressure,⁵
- Lowers markers of inflammation,⁵

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- Reduces triglycerides,^{7,8} and
- Improves cholesterol levels.^{7,8}

Dangers of Metabolic Syndrome

Metabolic syndrome has become a major public health concern. Up to a **third** of Americans already have it,⁹ and millions more are at a high risk with at least *two* of the three conditions that mark it.

Metabolic syndrome refers to a cluster of disorders including abdominal obesity, high blood pressure, low HDL cholesterol, high triglycerides and high blood sugar.¹

That's a drastic problem. People with metabolic syndrome are at much higher risk for chronic diseases, including **cardiovascular disease**, **type II diabetes**, **fatty liver**, and some types of cancers.²

Moreover, while metabolic syndrome is very common in **older adults**,¹⁰ it is increasingly being seen at *younger* ages as well.¹¹

When health care practitioners choose medical treatment for metabolic syndrome, that means they will be treating each contributing condition separately, frequently resulting in a "cocktail" of medications. This may include drugs for **high blood pressure**, **high cholesterol**, and additional medications for other conditions.²

However, the generally recommended first-line treatment targets lifestyle, including improving **diet** and engaging in regular **exercise**.²

But there's another factor that's often overlooked: ensuring adequate intake of **magnesium**.

Importance of Magnesium

Magnesium insufficiency and deficiency are contributors to metabolic disease, including type II diabetes.^{12,13} **Magnesium** is found in low concentrations in a variety of foods, including spinach, almonds, cashews, avocado, black beans, and pumpkin and chia seeds.¹⁴

Magnesium is required for the proper function of hundreds of *enzymes* that regulate protein synthesis, muscle and nerve function, and more.¹⁴

Magnesium has shown a remarkable ability to help prevent or reverse multiple risk factors for **metabolic syndrome**.

Combating Metabolic Syndrome

High blood sugar is a common condition seen in metabolic syndrome. Magnesium helps regulate blood sugar^{5,14} by binding to insulin receptor proteins on cells, enabling **glucose** uptake.⁵ This *reduces* sugar in the bloodstream.¹⁵ Deficiency of magnesium negatively impacts these functions.

This may explain why people who consume <u>more</u> magnesium have <u>lower</u> incidences of **type II diabetes**.^{16,17} One meta-analysis of population studies including **637,922** people found that the risk of developing type II diabetes was *reduced* by as much as **13%** for every **100 mg** per day *increase* in magnesium intake.¹⁸

A review of controlled clinical trials confirmed that taking oral magnesium improves **blood sugar levels** and **insulin resistance** in those at high risk for type II diabetes.⁴



Human Studies Test Magnesium

Magnesium

In a clinical trial of individuals with prediabetes, participants were randomized to receive **382 mg** of magnesium or placebo. After four months, the group supplementing with magnesium had about **11.6%** <u>lower</u> fasting blood glucose levels, and an **8.8%** <u>decrease</u> in post-meal glucose as compared to the placebo group.¹⁹

In addition, magnesium helps relax the muscle cells in blood vessel walls,²⁰ reducing high **blood pressure**.²¹ Elevated blood pressure is another condition associated with **metabolic syndrome** and is a risk factor for stroke and early mortality.²²

In a meta-analysis of **34** clinical trials, oral intake of **magnesium** (median dose: **368 mg** daily) reduced **systolic** (top number) and **diastolic** blood pressure in a median time period of just three months.²¹

Obesity can cause low-grade chronic inflammation.²³ **Inflammation** and obesity are drivers of metabolic syndrome.²⁴ Studies have shown an association between *low* magnesium intake with *increased* inflammation and increased risk of cardiovascular diseases, high blood pressure and type II diabetes. A meta-analysis of seven observational studies showed that dietary magnesium intake is inversely associated with **C-reactive protein** levels (a marker of inflammation).²⁵

A meta-analysis of randomized-controlled trials showed that magnesium supplementation reduced **C-reactive protein** levels in individuals with elevated levels of this maker of inflammation.²⁶ WHAT YOU NEED TO KNOW

Help Ward Off Metabolic Syndrome

- Metabolic syndrome is a cluster of conditions that include a large waist circumference (indicating excess abdominal fat), elevated blood pressure, high blood sugar, low HDL cholesterol, and high triglycerides.
- Having <u>three</u> or more of these conditions increases risk for heart disease, type II diabetes, stroke, and premature death.
- Oral intake of the mineral magnesium can help prevent or reverse the conditions that make up metabolic syndrome.
- In clinical studies, magnesium intake reduced high blood sugar and blood pressure, lowered triglycerides and markers of inflammation, and improved cholesterol levels.

An additional large review found that taking **oral magnesium** improved multiple risk factors for heart disease and metabolic syndrome, including:²⁷

- Reducing fasting blood glucose levels,
- Lowering triglyceride levels,
- Reducing LDL (bad) cholesterol,
- Increasing HDL (good) cholesterol, and
- Lowering systolic blood pressure levels.

Given all these benefits, magnesium can be a helpful tool in managing metabolic syndrome.

Summary

Having **metabolic syndrome** increases the likelihood of developing type II diabetes, heart disease, strokes, and other chronic conditions. **Magnesium** levels are frequently low among those with metabolic syndrome and its risk factors.

Clinical studies show that oral intake of **magnesium** can help improve multiple conditions that make up **meta-bolic syndrome**, including abnormal blood pressure, blood sugar, cholesterol, and triglyceride levels.

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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PROTECT & ENERGIZE Your Aging Cells



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

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

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

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Fisetin The Healthy Aging Flavonoid

Fisetin, a flavonoid found in strawberries and apples, is currently being studied for its effectiveness as a **senolytic** in humans.¹

Fisetin has low bioavailability due to its breakdown in the small intestines.

Bio-Fisetin[®] solves this problem by enclosing fisetin with a compound from the fenugreek herb.

A **human** trial showed **bioavailability** of this fisetin compound increased up to **25 times** compared to fisetin by itself.²

"I believe this product is another arrow in my quiver of products I use to be my best." Raymond

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Senescent Cells

Senolytic

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Senolytic Activator[®] contains nutrients designed to target senescent cells for normal elimination.

This formula contains a patented **fisetin** that is <u>more</u> **bioavailable** than regular fisetin.

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- THEAFLAVINS (polyphenols from black tea)
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- APIGENIN (a natural flavonoid)
- BIO-FISETIN[®] (up to 25 times greater bioavailability)

The suggested dose of the **Senolytic Activator**[®] is **3 capsules** once a week. Each bottle lasts 3 months and costs very little.

Choose the Right Fish Oil for Your Needs

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In addition to ultra-pure fish oil, Super Omega-3 provides olive oil polyphenols and sesame lignans to extend the stability of DHA in the blood.

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120 Entraction (Deltany Supercontrols

SUPER OMEGA-3 EPA/DHA Fish oil, Sesame Lignans & Olive Extract (Enteric Coated Softgels for Sensitive Stomachs)

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Revitalize Skin with VEGAN PROCOLLAGEN



Collagen forms **70%** of the skin's underlying scaffolding known as the dermis.¹ It is required to maintain youthful-looking **skin**.^{2,3}

With **age**, our internal **collagen** production markedly declines.^{3,4}

Collagen loss weakens skin structures, leading to dryness, sagging, and **wrinkles**.²

Scientists have developed a **vegan** approach to collagen replenishment known as **procollagen** with inducer compounds that promote the body's production of collagen.

In **2024**, the *Journal of Functional Foods* published the results of a **clinical trial** showing that in just eight weeks, this plant-derived **procollagen**:

- Decreased wrinkles by 14%,
- Enhanced **smoothness** by **13%**, and
- Increased (skin) collagen density by 8%.

These benefits of **collagen** were provided using **vegan** ingredients.
The Secret to Youthful Skin

Collagen, the most abundant protein in the human body³ is essential for **youthful-looking** skin.

Type 1 is the main collagen found in skin, making up **80%-90%** of the subsurface layer of the skin by weight.⁶ **Collagen** gives skin a smooth appearance, firmness, and resilience.⁷

It also provides flexibility. It is integrated with fibers of **elastin**, a protein that allows the skin to stretch and return to its original shape.

Around **age 25**, the cells that produce **collagen fibers** slow down. The remaining fibers can stiffen, break, and lose shape.^{3,7}

With advancing age, the ability to replenish collagen declines by about **1%-1.5%** *each year*.⁷

Collagen decline accelerates even faster in women *after* **menopause**.⁸ Smoking, lack of sleep, excess alcohol, and sun exposure also <u>decrease</u> collagen levels.^{3,9-11}

The result of collagen loss is **visible skin aging**, including thinning, sagging, and wrinkles.¹²

A Vegan Collagen Biomimetic

To boost collagen levels, people frequently take **oral collagen**, which is chiefly derived from cows (*bovine* collagen), chicken, or fish (*marine* collagen).

When these collagens are ingested, they are broken down into **amino acids**, which are then absorbed and used by the body.^{3,13}

Although the amino acid profile in **animal** collagen is *similar* to that of **humans**, there may be a challenge due to people's sensitivities and dietary preferences.⁵ Scientists have developed a **vegan alternative** that has *exactly the same* amino acid profile as the most abundant collagen found in **human skin**, known as human **type 1 collagen**.

This precise combination of amino acids is known as a **human type 1 collagen biomimetic**.

This formulation does not contain collagen. It is a **procollagen** (a collagen precursor) that **mimics** the effects of supplementation with animal collagen while using only sustainable, allergen-free, **vegan** ingredients.

Stimulating Collagen Production

Although this procollagen delivers the right **amino acids** in the right proportions, scientists needed to ensure that the **human** body would optimally *assemble* these building blocks into **collagen**.

To make this happen, <u>three</u> **inducing** compounds were added that have been shown in preclinical studies to **stimulate** collagen synthesis.^{5,14,15}

These three inducing agents are:

- Vitamin C,
- Ginseng root extract, and
- Gotu kola (Centella asiatica) leaf extract.

In a cell study, **human skin fibroblasts** (the cells mainly responsible for collagen synthesis) were treated with this combination of amino acids *and* inducing compounds.

After **48 hours**, the **collagen** in the fibroblasts had increased by **135%**,¹⁶ showing that this formulation induced <u>new</u> **collagen synthesis**.



COLLAGEN

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WHAT YOU NEED TO KNOW

Rejuvenating Skin

Based on these results, scientists proceeded with **human** trials.

In a pilot study, adults who took **3.9 grams** of this **vegan procollagen** daily had a **5%** increase in collagen density and a **13%** *decrease* in skin **wrinkles** after four weeks.¹⁷

In another pilot study, adults who took **5 grams** of the procollagen daily for four weeks had:¹⁸

- 14% greater collagen density,
- 16% less roughness,
- 16% less skin redness,
- 14% decrease in wrinkles, and
- 7% increase in skin hydration.

No adverse effects were observed.

Turning Back the Clock

Encouraged by these findings, scientists conducted a larger clinical trial of this vegan procollagen and published the results in 2024.

A Vegan Alternative to Collagen

- Collagen keeps skin smooth, hydrated, and youthful looking.
- Starting around age 25, collagen production decreases about 1%-1.5% per year, leading to wrinkles, roughness, and dry, sagging skin.
- Most oral collagen is derived from cows, chicken, or fish. A new, oral procollagen is entirely vegan, and is used by the human body to make its own collagen.
- This procollagen formula contains an amino acid profile identical to that of human skin type 1 collagen, plus three inducing compounds that promote the body's own collagen synthesis.
- Human studies showed that taking 5 grams of this vegan alternative decreased wrinkles by 14%, increased skin smoothness up to 16%, and improved hydration, elasticity, and redness.

They divided 90 adults into three groups. Daily, before breakfast:⁵

- Group 1 took a placebo,
- Group 2 took 5 grams of fish collagen, and
- Group 3 took 5 grams of vegan procollagen.

Wrinkles were measured using forehead skin.

After **eight weeks**, compared to baseline, those who had taken the **procollagen** had:⁵

- 8% increase in skin collagen density,
- 14% decrease in skin wrinkles,
- 6% increase in skin elasticity,
- 13% improvement in skin smoothness, and
- 6% increase in skin hydration.

Of those showing wrinkle reduction in the **procollagen** group, most (63%) had a remarkable average 33% *reduction* in the size of the **wrinkles**.⁵

Overall, the improvements were **superior** to placebo results and similar to the results for marine collagen, making it an effective **vegan alternative** to collagen.

Summary

Collagen loss results in **wrinkles**, sagging, and other signs of skin aging.

Scientists developed an oral **vegan procollagen** containing the *identical* amino acid profile found in human skin type 1 collagen.



They added **inducing compounds** to *stimulate* the body's own collagen synthesis.

Human trials showed that this formula safely produces a **13%-14% decrease** in skin **wrinkles** in just eight weeks. Smoothness, hydration, elasticity, and redness also improved.

This **procollagen** represents an effective **vegan** alternative to animal-based collagen products. •

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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* BMC Complement Altern Med. 2019;19:97. Capros® is patent protected and a registered trademark of Natreon, Inc.

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Vegan Pro Collagen is an *alternative* to animal collagen with an amino acid profile *identical* to **human type I collagen**.

The formula contains **amino acids** <u>plus</u> a combination of **ginseng extract**, **vitamin C**, and **gotu kola extract** that have been shown to support normal collagen production.*

Vegan Pro Collagen helps <u>reduce</u> the appearance of skin aging and wrinkles.

A **clinical trial** showed that this vegan formulation <u>decreased</u> **wrinkles** up to 14%, enhanced skin texture up to 13% and <u>increased</u> skin **collagen density** by 8% in just **eight weeks**.*

Vegan Pro Collagen is a *sugar-free*** powder, with natural orange flavor and other flavors.

*J Functional Foods. 2024;112:105955.

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Reduce the Risk of BREAST CANCER

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BY RHONDA STEIN

Breast cancer is the most common malignancy affecting women *and* the leading cause of cancer **deaths** in women worldwide.¹

Many **risk factors** <u>increase</u> the likelihood of developing breast cancer.

Modifiable factors that increase risk include poor diet, sedentary lifestyle, and obesity.²

Conversely, ingestion of healthy foods and beverages has shown protective benefits.³⁻¹⁰

Making the right lifestyle changes can <u>reduce</u> **women's risk** of developing breast cancer.^{11,12}

Non-Modifiable Risks

Roughly **one of every three** new cancers diagnosed annually in women is **breast cancer**.¹³

Some forms are easily treatable. But more advanced and aggressive types can be deadly. The **five-year** survival rate of metastatic breast cancer is about **30%**.¹⁴

Some risk factors for developing breast cancer, like **female sex** and **older age**, can't be changed. Some other *non-modifiable* risk factors include:¹

- Genetics: Women with inherited mutations of the BRCA1 or BRCA2 genes are at increased risk for breast cancer. In women who have a first-degree relative diagnosed with breast cancer this risk is doubled.¹⁵
- Race/ethnicity. The risk of <u>developing</u> breast cancer is highest among white non-Hispanic women, while the rate of **mortal**ity from breast cancer is higher in African American women.¹



Risk Factors You Can Change

Modifiable risk factors *can* be altered, decreasing the risk of developing breast cancer. They include the following.^{16,17}

DRINKING AND SMOKING

Excessive **alcohol** intake is linked to breast cancer risk.¹ Alcohol may induce greater estrogen imbalances in women, exposing breast tissue to more of the hormone's stimulatory effects that encourage tumor growth.^{18,19}

While cigarettes are known for causing lung cancer, toxic chemicals in **smoke** can also contribute to breast cancer. Active smoking, especially in postmenopausal women, is associated with a **16%** higher risk of developing breast cancer.²⁰ In addition to this, even in non-smokers, passive smoking significantly adds to the risk of breast cancer.^{1,20}

SEDENTARY LIFESTYLE

There is growing evidence that the amount of **physical activity** has a significant association with breast cancer risk.^{11,20,21}

In post-menopausal women, those with a *higher* level of **regular exercise** have a significantly *lower* risk of developing breast cancer.²² One large observational study showed that the most active women had a **25%** reduction in the risk of breast cancer compared to women who had the least physical activity.²³

Another observational study showed a **15%** reduction in breast cancer risk in women with a level of physical activity equivalent to brisk walking for one hour per day, compared to women whose activity was equal to less than one hour of walking per week.²⁴

An observational study evaluated the association between physical activity in high-risk women before and after diagnosis and survival outcomes. It found that women who were physically active before and after diagnosis had a **41%** reduced risk of cancer **recurrence** and a **49%** reduced risk of cancer **death**.²⁵

BEING OVERWEIGHT

The risk of developing breast cancer is significantly *higher* in those who are **overweight** or **obese**. Overweight women also tend to develop more **aggressive** forms of breast cancer and have greater rates of mortality and tumor recurrence.¹ WHAT YOU NEED TO KNOW

Prevent Deadly Breast Cancer

- Breast cancer is the most common cancer affecting women and is the leading cause of cancer death in women worldwide.
- Ways to decrease risk for breast cancer include quitting smoking, losing weight, improving diet, curbing alcohol consumption, and increasing exercise.
- Certain nutrients may also reduce risk for breast cancer, including vitamin
 D, sulforaphane from cruciferous vegetables, selenium, green tea, and other plants.

POOR DIET

Consuming excessive amounts of highly processed foods, fats, red meat, and refined sugars is linked to greater breast cancer risk.

A **healthy diet** high in vegetables, fruits, legumes, whole grains, and lean protein is associated with *lower* risk.¹

One study found that for each **10%** increase in **highly processed foods** in the diet, there is an **11%** increase in risk of developing **breast cancer**.²⁶

Protective Nutrients

Some foods, beverages and nutrients are associated with protective roles against **breast cancer**. Increasing their intake may reduce risk *and* improve outcomes in women already diagnosed with cancer.

GREEN TEA

Catechins, health-promoting polyphenols that can be found in tea leaves, demonstrate **anticancer** activity. A meta-analysis showed a reduction of **27%** in recurrence of breast cancer among those who drank more than **three cups** of green tea a day compared to non-drinkers.²⁷

Green tea polyphenols such as epigallocatechin gallate (EGCG) have been shown to reduce **breast density** in younger women after 12 months of green tea extract supplementation.²⁸

This is important because dense breast tissue is an independent risk factor of breast cancer incidence and makes early detection with standard mammography more difficult.²⁹

In a study including about 500 women with the aggressive **triple negative form** of breast cancer, follow-up information on tea consumption was gathered at 18, 36 and 60 months after diagnosis.

Women who consumed tea during five years after diagnosis had **46%** <u>reduced</u> risk of combined recurrence and breast cancer mortality, and **43%** <u>lower</u> overall mortality risk, as compared to non-tea drinkers.³⁰

Two meta-analyses of clinical studies have shown **14%-18%** reduced risk of breast cancer in women who consumed *higher* amounts of tea as compared to those consuming the lowest.^{31,32}

FLAVONOIDS

Flavonoids are plant-derived compounds with numerous health benefits, including anti-inflammatory, and anticancer activity.^{4,7,33-38}

In addition to green tea **catechins**, **apigenin**,³⁸ **fisetin**,³⁵ and **quercetin**⁶ have all demonstrated cancerfighting activity in preclinical models.

SELENIUM

The mineral **selenium** has been studied for decades for its potential to help prevent or manage cancer.

A meta-analysis of 18 observational studies including **thousands** of women found that those with *higher* body levels of selenium have a *lower* risk of developing **breast cancer**.³⁹

In women with breast cancer, those in the highest quartile of dietary intake of selenium had a **31%** <u>reduced</u> risk of **death** from the disease as compared to the lowest quartile.⁴⁰ In another study, **82%** of women in the *highest* quartile of serum levels of selenium had a five-year survival rate, while only **68%** of women in the *lowest* quartile reached a five-year survival. The risk of mortality for patients in the <u>lowest</u> quartile of serum selenium was **2.5 times** greater than those in all other quartiles.⁴¹

CRUCIFEROUS COMPOUNDS

Intake of **cruciferous vegetables**, including broccoli, kale, cabbage, and brussels sprouts, is associated with a lower risk of breast cancer.^{8,10}

These foods provide nutrients that have demonstrated potent anticancer activity in preclinical studies, including **sulforaphane**,⁸ **I3C** (**indole-3-carbinol**),^{5,10} and **DIM** (**3,3'-diindolyImethane**).^{5,10}

The concentration of **sulforaphane** found in broccoli sprouts is up to *100 times* higher than mature plants. The compounds in different parts of broccoli cells mix together to release sulforaphane for assimilation into the bloodstream.⁴²

VITAMIN D

Several studies show that maintaining higher **vitamin D** levels protects against developing breast cancer *and* improves survival in women with cancer.⁴³⁻⁴⁶

In one analysis, women with vitamin D levels of **60 ng/mL** or more had an **82% lower risk** of breast cancer than women with low vitamin D levels.⁴⁴



High blood levels of vitamin D in breast cancer patients are associated with a **42%** <u>lower</u> risk of mortality as compared to lower blood levels.⁴³

A meta-analysis found that every **4 ng/mL** increase in vitamin D blood levels decreased the risk of breast cancer death by **6%**.⁴⁷ This implies that boosting *25-hydroxyvitamin* D blood levels from **30 ng/mL** to **50 ng/mL** might decrease risk of death by around **30%**.

OTHER NUTRIENTS

Curcumin from turmeric and **resveratrol** from red grapes and other plants successfully block breast cancer development and spread in animal and cell models.^{9,48}

Preclinical studies have also found that **curcumin** can make breast cancer cells more sensitive to chemotherapy drugs.^{9,49}

Carotenoids, pigments found in many fruits and vegetables, have anticancer activity.⁵⁰ They include lycopene, astaxanthin, lutein, and zeaxanthin.

One study that followed over 32,000 women for more than **20 years** found that higher blood levels of **carotenoids** were associated with up to a **28% lower risk** of breast cancer. In women who did develop cancer, those with the highest carotenoid levels were less likely to suffer **recurrence** or **death**.⁵¹

Maintaining adequate levels of these nutrients and making other lifestyle changes may help reduce the risk of breast cancer.

Summary

Avoiding smoking, reducing alcohol intake, improving diet, losing weight, and increasing exercise can significantly **reduce breast cancer risk**.

Ensuring adequate intake of vitamin D, cruciferous vegetables, selenium, and other nutrients may also help reduce risk, according to published biomedical studies.

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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Bilberry

Defend Your Eyes Against GLAUCOMA

BY PATRICK SUAREZ

Glaucoma is the leading cause of **blindness** in adults in the U.S.^{1,2}

Increased pressure within the eye, called intraocular pressure, is a risk factor and diagnostic measure for the optic nerve damage that is the underlying vision-robbing pathology of glaucoma.¹

Scientists have identified two plant-derived extracts, **bilberry**^{3,4} and **French maritime pine bark**,^{5,6} with impressive health benefits. Taken alone <u>or</u> with glaucoma medications, this extract blend helps maintain healthy **eye pressure**.^{3,7-9}

In one **clinical study**, this combination was shown to *reduce* **intraocular pressure** as much as **24%** —with reductions of **40%** when combined with standard therapy.⁸

A Leading Cause of Vision Loss

Glaucoma is an eye disease that results in gradual vison loss. It affects approximately **80 million** people worldwide.¹

People who are in the early stages of **glaucoma** generally have no symptoms. Glaucoma is caused by damage to the **optic nerve**.¹

It most commonly results from a problem with the drainage system of the eyes, resulting in fluid retention in the eyeball and excess pressure. Over time, this pressure damages the retina and the **optic nerve** (that carries visual information from the eye to the brain).

The result is reduced visual acuity, sometimes leading to permanent blindness.¹⁰

Preventing Glaucoma

There is no cure for **glaucoma**.² But *reducing* elevated intraocular pressure may help prevent progression of glaucoma and vision loss.

Open angle glaucoma is the most common type, and accounts for **90%** of glaucoma cases. This happens as the eye's drainage channels become blocked and intraocular pressure rises.¹¹

Additionally, endothelial dysfunction and vascular structural changes can alter blood flow within the tissues and elevate intraocular pressure, leading to open angle glaucoma.^{10,12,13}

Once the **optic nerve** is damaged, it can't be repaired even if the raised intraocular pressure is corrected.¹⁴

This makes it essential to find a way to reverse high intraocular pressure *before* it causes the irreversible damage of glaucoma.

Together, two plant-based extracts have shown an ability to reduce this intraocular pressure: **bilberry** and **French maritime pine bark**.

Eye Health Extracts

Bilberries are relatives of blueberries that grow mostly in Europe. They contain high concentrations of health-promoting compounds, particularly **anthocyanins**.¹⁵

Bilberry extracts offer protection from many common eye conditions. Studies indicate that bilberry extracts (alone or in combination with other nutrients) help protect against disorders like **cataract**¹⁶ and **glaucoma**,¹⁷ improve parameters of **dry eye syndrome**,⁴ and help improve symptoms related to **eye fatigue**.¹⁸

Scientists have developed a standardized extract of bilberry that contains at least 36% anthocyanins.⁸

Improved blood flow to the eye may be supportive of maintaining healthy blood flow and pressure. A study showed **bilberry extract** could counteract hyperpermeability of capillaries in the eye. This effect increases ocular blood flow, which may <u>reduce</u> **intraocular pressure**.³



Another extract, derived from the bark of the **French maritime pine tree**, contains a potent mixture of beneficial compounds, including **procyanidins**.^{5,19} This pine bark extract has been found to benefit patients suffering from **diabetic retinopathy** and **retinal microhemorrhages**.^{6,20}

French maritime pine bark extract has been shown to improve the function of the **endothelium** (the delicate layer of cells lining the blood vessels).²¹⁻²³ A clinical study found a high prevalence of microvascular endothelial dysfunction in open angle glaucoma patients, compared to controls.¹³

Reduced Eye Pressure

A **combination** of bilberry <u>and</u> pine bark extract has been studied for its ability to relieve the eye pressure that leads to **glaucoma**.

In an animal model, this combination reduced **intra-ocular pressure** and protected critical **nerve cells** of the eye against damage and death.²⁴

Clinical Trial

But the most impressive results have been seen in studies of <u>humans</u> at risk for **glaucoma**.

In an initial controlled trial, adults with elevated eye pressure who had not yet shown evidence of glaucoma were either left untreated or given a combination of **80 mg** of **French maritime pine bark** extract and **160 mg** of **standardized bilberry** extract daily for six months.³

After three months, untreated subjects had almost no change, while those receiving the extracts had a nearly **13% decrease** in intraocular pressure.

Those taking the combination also had a significant improvement in **ocular blood flow**.³

A follow-up study compared the two extracts to a common eye pressure-lowering medication, **latanoprost** eye drops. Adults with elevated intraocular pressure received either the extracts, the drops, or both.⁸

In this case, all three groups demonstrated a reduction in intraocular pressure.

While the drops lowered eye pressure by **28%** after four weeks of treatment, the **bilberry-pine bark** blend alone worked more gradually, reducing **intraocular pressure** after six weeks. This improvement progressed so that by sixteen weeks, the extract group had a **24%** reduction in pressure. The extract also had a better safety profile. The medication and extracts *together* reduced eye pressure by almost **40%** by the end of the 24-week study period, which was greater than the medication alone. These changes were accompanied by improvements in ocular blood flow.

WHAT YOU NEED TO KNOW

An Extract Blend for Eye Health

- Glaucoma, usually driven by elevated eye pressure, is a common cause of blindness.
- Lowering eye pressure can help prevent the progression of glaucoma and vision loss.
- Scientists have formulated a blend of standardized bilberry extract and French maritime pine bark extract that supports eye health.
- In a human study, the combination reduced elevated eye pressure by up to 24% and improved ocular blood flow.

Summary

Glaucoma, usually driven by elevated eye pressure, can lead to vision loss and blindness.

A blend of standardized **bilberry** extract and **French maritime pine bark** extract can help reduce eye pressure levels and improve ocular blood flow in those at risk for glaucoma.

Taken alone or with medications, the extracts may help protect against glaucoma development and reduce vision loss in those already suffering from glaucoma. •

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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Eye Support from Carotenoids

The bilberry-French maritime pine bark combination has shown benefits for elevated eye pressure and glaucoma.

Oral intake of **carotenoids**, including **lutein** and **zeaxanthin**, have shown promise to reduce risk for *other* common threats to vision, including cataracts, age-related macular degeneration, and diabetic retinopathy.²⁵

Taking carotenoids with bilberry and French maritime pine bark extracts may offer comprehensive protection against common eye disorders.

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Chamomile Tea

BY LAURIE MATHENA



It is estimated that people drink more than **one million cups** of chamomile tea per day.¹ Some drink it for its airy, floral taste. Others consume it for its variety of health benefits.

Chamomile is one of the oldest and most well-documented medicinal plants in the world.² Various preparations of chamomile have been traditionally used to treat ailments such as muscle spasms, wounds, rheumatic pain, gastrointestinal disorders, and more.^{2,3}

Chamomile tea stands out for its effects on sleep 3 and on blood sugar control.^{2,4}

In postnatal women experiencing poor sleep quality, those who drank chamomile tea for two weeks had significantly improved scores on sleep quality and on symptoms of depression, compared to the control group.⁵

Chamomile contains **50 flavonoids** as its active components, including quercetin, apigenin, and luteolin.³ The flavonoids naringenin and apigenin have been associated with improved sleep quality.^{6,7}

Chamomile tea also shows benefits for blood sugar control. $\ensuremath{^{8}}$

In a single-blind, randomized, controlled clinical trial, 64 people with type II diabetes drank either water or a teaspoon and a half of chamomile tea three times per day (**3 grams/150 L** hot water) immediately after meals for eight weeks.⁴ Those drinking the chamomile tea experienced decreased concentrations of HbA1C, serum insulin levels, total cholesterol, triglycerides, and LDL, compared to the control group. Chamomile tea may play a role in a multi-modal strategy to reduce elevated blood sugar levels.

In an animal study, giving chamomile tea to diabetic rats reduced fasting blood glucose, after-meal blood sugar levels, and HbA1C. The improvement in HbA1c was similar to that of controls that received glibenclamide (a prescription medication for diabetes). The researchers concluded that drinking chamomile tea every day could be "potentially useful in hyperglycemia."⁹

Many other studies in the lab and on animals have indicated that chamomile has wide-ranging effects, including anticancer activity² and preventing osteoporosis caused by steroid treatment.¹⁰ •

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Introducing Life Extension® DOG

We've been passionate about health for over 40 years. We're now proud to offer soft chews for dogs, made with the same quality and attention to detail as all our supplements.

Multivitamin & Probiotics

Vitamins,¹ manganese,² colostrum,³ turmeric,¹ and 6 probiotics^{1,4,5} in this **chicken-flavored** soft chew supplement helps support a dog's overall health and diverse microbiome.



Item #02524 • 90 soft chews Food Supplement 1 jar **\$29.25** | 4 jars \$27.50 each

Stress & Behavior

L-theanine¹ and melatonin¹ in this **bacon-flavored** soft chew supplement helps promote calmness and relaxation so your dog can keep an even keel.

Item #02525 • 120 soft chews Health Supplement 1 jar **\$31.50** | 4 jars \$28.50 each

Hip & Joints

In human and animal studies PEA,⁹ glucosamine,^{1,10} and MSM¹ supplementation have been shown to promote healthy, comfortable joints. This **beef-flavored** soft chew supplement is just what your dog needs to keep moving comfortably.

Item #02523 • 90 soft chews

Health Supplement

1 jar \$36 | 4 jars \$34 each

Skin & Coat This salmon-flavored soft chew

supplement contains **omega**-**3**-rich fish oil for healthy coat and skin. This has been shown in clinical studies to help promote skin and coat health for dogs with sensitive skin⁶ and to maintain a healthy coat.⁶⁻⁸



Item #02522 • 90 soft chews Food Supplement 1 jar **\$29.25** | 4 jars **\$**27.50 each

For full product description and to order Life Extension[®] DOG, call 1-800-544-4440 or visit www.LifeExtension.com/PetCare

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Eye Pressure Support with Mirtogenol® is designed to support blood flow in tiny vessels of the eyes, helping to promote healthy fluid pressure.



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Item #01514 30 vegetarian capsules

1 bottle **\$29.25** 4 bottles \$26.50 each



For full product description and to order **Eye Pressure Support with Mirtogenol®** call **1-800-544-4440** or visit **www.LifeExtension.com**

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LIFE EXTENSION

Eye Pressure

Support

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30 VEGETARIAN DIETARY CAPSULES SUPPLEMENT

NO:N

Maximize the Effects of **VITAMINC**

BY HEATHER L. MAKAR

Humans can't produce their own vitamin C, which is why it's important to get it daily from outside sources.¹

But there's a problem: When people take large doses of vitamin C, most of it is **poorly absorbed** and quickly excreted.^{1,2}

Scientists have found a solution.

To deliver <u>more</u> vitamin C to the body, researchers combined it with plant-based compounds that improve its absorption by nearly **seven times** compared to unformulated regular **vitamin C**.³

This formula also keeps vitamin C levels elevated for *far longer* than standard *vitamin C*, maximizing the amount our bodies can use.³

A Health Enhancer

Vitamin C is a water-soluble nutrient with a variety of health benefits including:

- Supports **immune function** and promotes healthy immune responses,^{1,4,5}
- Improves **cardiovascular health** and function,^{1,4,6}
- Helps protect against viral and other infections,⁷⁻¹⁰
- Promotes **wound healing**,^{1,4,11} and
- Reduces oxidative stress.^{1,4,12}

Studies suggest that higher intake of vitamin C enhances immune function and may help reduce cardiovascular risk.^{4,6,13}



Many people take high daily doses of standard vitamin C to try to get these benefits. However, there are diminishing returns when oral doses get above a certain level, as efficiency of absorption goes down as oral doses go up.

For instance, at doses over **1 gram** per day, less than **50%** is actually absorbed.¹ Even oral doses above **200-400 mg** lead to decreased absorption.²

This means that higher oral doses of <u>unformulated</u> vitamin C lead to only small increases in vitamin C levels in the body.

Increased Bioavailability

Researchers have developed a delivery system that overcomes these problems, boosting the absorption and optimizing blood levels of vitamin C.³

There are two parts to this formulation:³

- First, vitamin C is encapsulated in liposomes, small structures made of plant-derived phospholipids (compounds that make up cell membranes). This encapsulation of vitamin C by liposomes improves the absorption of vitamin C into the bloodstream by nearly seven times over traditional vitamin C.
- To protect the liposomes, researchers used a second plant-derived compound, a **hydrogel** formed of indigestible fiber called **galactomannans**, derived from fenugreek seeds. This hydrogel surrounds and shields the liposomes, ensuring *sustained absorption* of the vitamin C released in the gut.

This **liposomal hydrogel vitamin C** has shown remarkable results in elevating vitamin C levels in the body.

With traditional vitamin C, blood levels peak about **one hour** after ingestion, then rapidly drop back to baseline levels.

With liposomal hydrogel vitamin C, blood levels continue to rise up to *four hours* after ingestion and reach a **higher peak**, indicating improved absorption and availability to tissues.

A single daily dose of liposomal hydrogel vitamin C leads to higher **around-the-clock** vitamin C levels in the blood.



WHAT YOU NEED

Strong Immune Support

High circulating vitamin C in the blood can enhance health in several ways. One of the most notable is its support of **immunity**.^{4,14,15}

Vitamin C unlocks functions in the immune system that cannot be activated without sufficient levels of this vitamin, such as controlling inflammation and protecting against cell-damaging oxidants.^{5,10}

Some of the specific ways vitamin C promotes healthy immunity are by:

- Enhancing the ability of **neutrophils**, a first-responder immune defense, to reach the site of infection. In one study of participants with low levels of vitamin C, daily vitamin C intake <u>increased</u> neutrophil response by 20%.¹⁶
- Promoting lymphocyte growth, maturation, survival, and antibody defense.^{17,18} Lymphocytes are part of the innate immune system and include NK (natural killer) cells, B cells, and T cells.

Improved Vitamin C Bioavailability

- Vitamin C plays a critical role in supporting immunity, cardiovascular health, strong connective tissues, and more.
- Traditional vitamin C is poorly absorbed and metabolized quickly. When high doses of this form are taken, much of it is excreted unused.
- Encapsulating vitamin C in a liposomal hydrogel delivery system increases absorption by nearly seven times compared to standard vitamin C, keeping levels high all day long.
- Supporting collagen synthesis. Protein collagen is an important structural part of the body's physical barriers against infection from bacteria, viruses, and other microbes.
 Vitamin C is *required* for collagen to correctly form in the body, even when taking oral collagen.⁵

These and other actions can help fight against **infections**.¹⁰ For example, vitamin C intake has been shown in some studies to reduce the incidence, duration, and severity of **colds**.^{4,13-15}

Why Getting Enough Vitamin C Matters

Elevating and sustaining vitamin C levels in the body can offer additional health benefits, including:

- Antioxidant Activity: Vitamin C can help prevent or reduce oxidative damage, a major contributor to aging and age-related diseases.¹²
- Wound Healing: Vitamin C's role in the synthesis of collagen, which provides strength to connective tissues throughout the body, helps keep tissues in peak form and accelerates wound healing after injury.¹⁹⁻²¹
- **Cardiovascular Protection:** People with the highest blood levels of vitamin C are less likely to die from cardiovascular causes than those with the lowest levels.²² In patients with heart failure, vitamin C intake improves the flow of blood through arteries.⁴

Liposomal hydrogel vitamin C can maximize the ability of vitamin C to deliver these and other benefits.

Summary

Vitamin C supports a robust immune response and resilient cardiovascular health, and confers other benefits. Traditional vitamin C is poorly absorbed and much of

its common oral dosage is excreted unused. Encapsulating vitamin C in a protective **liposomal hydrogel** delivery system increases its absorption by nearly **seven times** and keeps levels elevated around the clock.



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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PQQ (pyrroloquinoline quinone) supports the growth of <u>new</u> mitochondria.

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Together, **CoQ10** and **PQQ** help reenergize aging cells throughout the body.

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Vitamin D3

Essential for Maintaining Healthy Bore Growth and Density 60 SOFTOELS DETARY

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* Biomed Pharmacother. 2016(3);78:50-9.

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VEGETARIAN LE CERTIFIED

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

It also maintains vitamin C levels throughout the day.¹

Just <u>one</u> vegetarian tablet daily provides **around-the-clock** vitamin C support.

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

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- 01963 Calcium Citrate with Vitamin D
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- 02396 Cognitex® Elite
- 02397 Cognitex® Elite Pregnenolone

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EYE HEALTH

01923

01514

01992

01993

01873

01918

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- 01097 Ultra Soy Extract
- 01561 Zinc Lozenges

INFLAMMATION HEALTH SUPPORT

- 01639 5-LOX Inhibitor with AprèsFlex[®]
 02324 Advanced Curcumin Elite[™] Turmeric Extract, Ginger & Turmerones
- 01709 Black Cumin Seed Oil
- 02310 Black Cumin Seed Oil and Curcumin Elite™
- 02467 Curcumin Elite[™] Turmeric Extract 30 veg capsules
- 02407 Curcumin Elite™ Turmeric Extract 60 veg capsules
- 01804 Cytokine Suppress® with EGCG
- 02223 Pro-Resolving Mediators
- 56886 Restore Activ Joint Muscle & Tissue
- 01203 Specially-Coated Bromelain
- 00407 Super Bio-Curcumin® Turmeric Extract

JOINT SUPPORT

- 02404 Arthro-Immune Joint Support
- 02238 ArthroMax[®] Advanced NT2 Collagen[™] & AprèsFlex[®]
- 02138 ArthroMax® Elite
- 00965 Fast-Acting Joint Formula
- 02430 Fast Acting Relief
- 00522 Glucosamine/Chondroitin Capsules
- 02420 Glucosamine Sulfate
- 02424 Joint Mobility
- 01600 Krill Healthy Joint Formula
- 02529 Lower Back Relief
- 00451 MSM (Methylsulfonylmethane)
- 02231 NT2 Collagen™

KIDNEY & BLADDER SUPPORT

00862 Cran-Max[®] Cranberry Whole Fruit Concentrate 01424 **Optimized Cran-Max®** 01921 Uric Acid Control 01209 Water-Soluble Pumpkin Seed Extract LIVER HEALTH & DETOXIFICATION

01922	Advanced Milk Thistle • 60 softgels
01925	Advanced Milk Thistle • 120 softgels
02240C	Anti-Alcohol Complex
01651	Calcium D-Glucarate
01571	Chlorophyllin
02402	FLORASSIST [®] Liver Restore [™]
02521	Glutathione
01541	Glutathione, Cysteine & C
01393	HepatoPro
01608	Liver Efficiency Formula
01522	Milk Thistle • 60 veg capsules
01534	N-Acetyl-L-Cysteine
01884	Silymarin
02261	SOD Booster

02361 SOD Booster

LONGEVITY & WELLNESS

- 00457 Alpha-Lipoic Acid
- 01625 AppleWise
- 02414 Bio-Fisetin[™]
- 01214 **Blueberry Extract**
- 01438 Blueberry Extract and Pomegranate
- 02270 **DNA Protection Formula**
- 02431 **Essential Youth - L-Ergothioneine**
- 02119 GEROPROTECT[®] Ageless Cell[™]
- 02415 **GEROPROTECT®** Autophagy Renew
- 02401 **GEROPROTECT®** Stem Cell
- 02211 Grapeseed Extract
- 02527 Healthy Aging Powder
- 00954 Mega Green Tea Extract (decaffeinated)
- 00953 Mega Green Tea Extract (lightly caffeinated)
- 01513 Optimized Fucoidan with Maritech® 926
- Optimized Reservatrol Elite[™] 02230
- 01637 Pycnogenol® French Maritime Pine Bark Extract
- 02210 Resveratrol Elite[™]
- 02301 Senolytic Activator®
- 01208 Super R-Lipoic Acid
- 01919 X-R Shield

LUNG HEALTH

02512 Healthy Lungs

MEN'S HEALTH

- 02209 Male Vascular Sexual Support
- 00455 Mega Lycopene Extract
- 02306 Men's Bladder Control
- 02515 Men's Vitality Packs
- PalmettoGuard® Saw Palmetto and Beta-Sitosterol 01789
- 01790 PalmettoGuard® Saw Palmetto/Nettle Root Formula and Beta-Sitosterol
- 01373 Prelox[®] Enhanced Sex for Men
- 01940 Super MiraForte with Standardized Lignans
- 02500 **Testosterone Elite**
- 01909 Triple Strength ProstaPollen™
- 02029 Ultra Prostate Formula

MINERALS

- 01661 Boron
- 02107 Extend-Release Magnesium
- 01677 Iron Protein Plus
- 02403 l ithium
- 01459 Magnesium Caps
- 01682 Magnesium (Citrate)
- **Only Trace Minerals** 01328
- 01504 Optimized Chromium with Crominex® 3+
- 02309 Potassium with Extend-Release Magnesium
- 01740 Sea-Iodine[™]
- 01879 Se-Methyl L-Selenocysteine
- 01778 Super Selenium Complex
- 00213 Vanadyl Sulfate
- 01813 Zinc Caps

MISCELLANEOUS

00577 Potassium Iodide

MOOD & STRESS MANAGEMENT

- 02519 Ashwagandha Plus 02434 Calm-Mag 02312 **Cortisol-Stress Balance** 00987 Enhanced Stress Relief 01683 L-Theanine 02175 SAMe (S-Adenosyl-Methionine) 200 mg, 30 enteric coated vegetarian tablets 02176 SAMe (S-Adenosyl-Methionine) 400 mg, 30 enteric coated vegetarian tablets 02174
 - SAMe (S-Adenosyl-Methionine) 400 mg, 60 enteric coated vegetarian tablets
- 02429 Theanine XR[™] Stress Relief

MULTIVITAMINS

- 02199 Children's Formula Life Extension Mix™
- Life Extension Mix[™] Capsules 02354
- 02364 Life Extension Mix[™] Capsules without Copper
- Life Extension Mix[™] Powder 02356
- Life Extension Mix[™] Tablets 02355
- 02357 Life Extension Mix[™] Tablets with Extra Niacin
- 02365 Life Extension Mix[™] Tablets without Copper
- 02292 Once-Daily Health Booster • 30 softgels
- 02291 Once-Daily Health Booster • 60 softgels
- 02313 **One-Per-Day Tablets**
- 02317 Two-Per-Day Capsules • 60 capsules
- 02314 Two-Per-Day Capsules • 120 capsules
- 02316 Two-Per-Day Tablets • 60 tablets
- 02315 Two-Per-Day Tablets • 120 tablets
- 02428 Whole Food Multivitamin

NERVE & COMFORT SUPPORT

- 02202 ComfortMAX[™]
- 02303 **Discomfort Relief**

PERSONAL CARE

- 02322 Hair, Skin & Nails Collagen Plus Formula
- 01278 Life Extension Toothpaste
- 00408 Venotone
- 02252 Youthful Legs

PRODUCTS

PET CARE

01932	Cat Mix
01931	Dog Mix
02523	DOG Hip & Joints
02524	DOG Multivitamin & Probiotics
02522	DOG Skin & Coat
02525	DOG Stress & Behavior

PROBIOTICS

01622	Bifido GI Balance
01825	FLORASSIST [®] Balance
02421	FLORASSIST [®] Daily Bowel Regularity
02125	FLORASSIST [®] GI with Phage Technology
01821	FLORASSIST [®] Heart Health
02250	FLORASSIST [®] Mood Improve
02208	FLORASSIST [®] Immune & Nasal Defense
02120	FLORASSIST [®] Oral Hygiene
02203	FLORASSIST [®] Prebiotic
02505	FLORASSIST [®] Probiotic Women's Health

SKIN CARE

02423	Daily Skin Defense
01938	Shade Factor™
02129	Skin Care Collection Anti-Aging Serum
02130	Skin Care Collection Day Cream
02131	Skin Care Collection Night Cream
02096	Skin Restoring Ceramides
02528	Vegan Pro Collagen

SLEEP

01512	Bioactive Milk Peptides
02300	Circadian Sleep
01511	Enhanced Sleep without Melatonin
02234	Fast-Acting Liquid Melatonin
01669	Glycine
02308	Herbal Sleep PM
01722	L-Tryptophan
01668	Melatonin • 300 mcg, 100 veg capsules
01083	Melatonin • 500 mcg, 200 veg capsules
00329	Melatonin • 1 mg, 60 capsules
00330	Melatonin • 3 mg, 60 veg capsules
00331	Melatonin • 10 mg, 60 veg capsules
00332	Melatonin • 3 mg, 60 veg lozenges
02201	Melatonin IR/XR
01787	Melatonin 6 Hour Timed Release
	300 mcg, 100 veg tablets
01788	Melatonin 6 Hour Timed Release
	750 mcg, 60 veg tablets
01786	Melatonin 6 Hour Timed Release
	3 mg, 60 veg tabs
01721	Optimized Tryptophan Plus
01445	Quiet Sleep Melatonin • 5 mg, 60 veg capsules
02502	Rest & Renew
02526	Serene Sleep
VITAN	/INS

01533	Ascorbyl Palmitate
00920	Benfotiamine with Thiamine
04045	

- 01945 BioActive Complete B-Complex
- 00102 Biotin

02229	Fast-C [®] and Bio-Quercetin [®]
02075	Gamma E Mixed Tocopherol Enhanced with
	Sesame Lignans
02070	Gamma E Mixed Tocopherol & Tocotrienols
01913	High Potency Optimized Folate
01674	Inositol Caps
02244	Liquid Vitamin D3 • 50 mcg (2000 IU)
02232	Liquid Vitamin D3 (Mint) • 50 mcg (2000 IU)
01936	Low-Dose Vitamin K2
00373	No Flush Niacin
01939	Optimized Folate (L-Methylfolate)
01217	Pyridoxal 5'-Phosphate Caps
01400	Super Absorbable Tocotrienols
02334	Super K
01863	Super Vitamin E
02422	Vegan Vitamin D3
02028	Vitamin B5 (Pantothenic Acid)
01535	Vitamin B6
00361	Vitamin B12 Methylcobalamin
01536	Vitamin B12 Methylcobalamin
	1 mg, 60 veg lozenges
01537	Vitamin B12 Methylcobalamin
	5 mg, 60 veg lozenges
02228	Vitamin C and Bio-Quercetin®
	60 veg tablets
02227	Vitamin C and Bio-Quercetin®
	250 veg tablets
01753	Vitamin D3 • 25 mcg (1000 IU), 90 softgels
01751	Vitamin D3 • 25 mcg (1000 IU), 250 softgels
01713	Vitamin D3 • 125 mcg (5000 IU), 60 softgels
01718	Vitamin D3 • 175 mcg (7000 IU), 60 softgels
01758	Vitamin D3 with Sea-Iodine™
02040	Vitamins D and K with Sea-Iodine™
WEIG	HT MANAGEMENT & BODY COMPOSITION
02479	7-Keto® DHEA Metabolite

00084 Buffered Vitamin C Powder

- 100 mg, 60 veg capsules 02207 AMPK Metabolic Activator 02504 Body Trim and Appetite Control 02478 DHEA Complete
- 01432 Optimized Saffron
- 02511 Thermo Weight Control
- 02509 Waistline Control[™]

WOMEN'S HEALTH

- 01942 Breast Health Formula
- 01626 Enhanced Sex for Women 50+
- 01894 Estrogen for Women
- 02204 Menopause Relief
- 02319 Prenatal Advantage
- 01649 Soy Isoflavones
- 02513 Women's Bladder Support

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- Fully contoured footbed that supports all three arches, allowing pressure to be spread evenly over the foot.



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CAUTION: Temporary flushing, itching, rash, or gastric disturbances may occur. *Br J Pharmacol.* 2004 Mar;141(5):825-30.

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IN THIS EDITION OF LIFE EXTENSION MAGAZINE®





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Women face **difficult choices** regarding breast cancer treatment. New data reveal an optimal time to <u>discontinue</u> **estrogen-blocking** drugs without compromising treatment **efficacy**.

24 HOW MAGNESIUM HELPS PREVENT METABOLIC SYNDROME A review of clinical trials confirmed oral magnesium intake *improves* metabolic syndrome markers, including elevated **blood** sugar and insulin resistance.









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44 REDUCE BREAST CANCER RISKS

Lifestyle changes and certain nutrients can help reduce risks of developing breast cancer.

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66 MAXIMIZE THE EFFECTS OF VITAMIN C

When combined with specific plant compounds, **vitamin C** <u>absorption</u> is improved along with its <u>sustainability</u> in the **bloodstream**.