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August 2025

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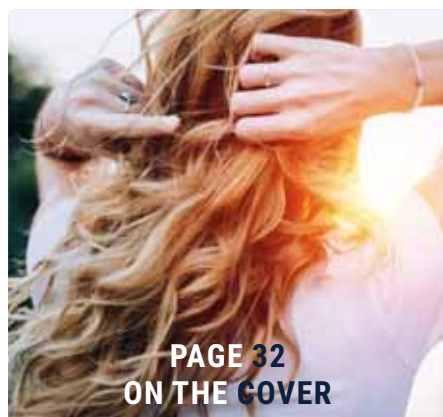
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* Br J Pharmacol. 2004 Mar;141(5):825-30.

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REPORTS



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ON THE COVER

Female Hair Loss

Two **plant extracts** may help *resolve hair loss* and *restore healthy hair growth*.

In clinical trials, one extract *decreased hair loss* by **48%** while the second *reduced hair shedding* by **34%**.

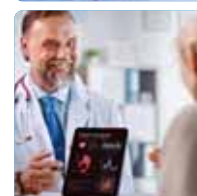
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75 SUPERFOODS

Selenium-rich **Brazil nuts** may *lower* the risk of **cardiovascular disease, cancer**, and overall **mortality**. They may also combat two factors linked to obesity: inflammation and intestinal permeability.



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75

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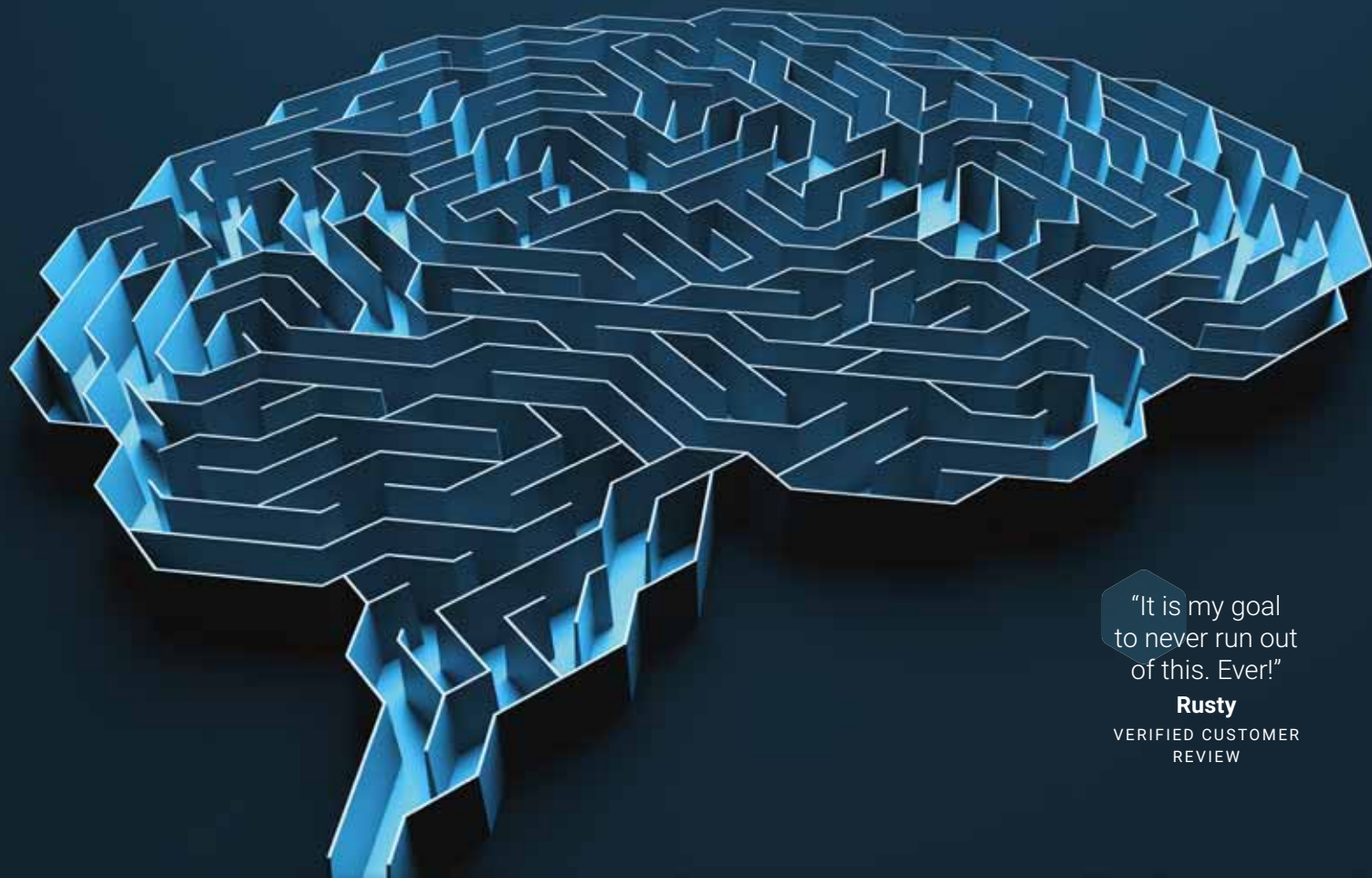
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References: 1. *Nutrients*;14:5235.10.3390/nu14245235. 2. *J Alzheimers Dis.* 2016;49(4):971-90.

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Drug Shortages Impede Cancer Research



WILLIAM FALOON



The United States faces **shortages** of certain generic **drugs**, and this has been going on for decades. These shortages often affect drugs used to treat common **malignancies**.

Cancer patients need precisely timed administration of optimal medications if they are to have a chance for a partial or complete response.

Despite these drugs being **off patent** for decades, there have been ongoing **shortages**¹ that compromise or delay treatments, leading to medication errors and adverse patient outcomes.^{2,3}

According to the **American Medical Association Journal of Ethics**, hospitals and healthcare

providers are forced to make difficult decisions about **rationing** multiple classes of drugs.⁴

These shortages are attributable to several factors, including manufacturing issues, quality control, market consolidation, and supply chain disruptions.^{2,5} The underlying reason, however, revolves around excess regulation that stifles competition and causes certain **generic drugs** to be overpriced and in short supply.^{6,7}





We exposed an egregious example of **price gouging** on the cover of our **September 2014** issue whereby an off-patent topical cream (acyclovir) whose active ingredient cost **8 pennies** was selling in American pharmacies for around **\$600**.⁸

You might wonder why competitors did not make a lower priced acyclovir cream. One reason is expensive barriers to entry for companies that need **FDA** approval for **generic** drugs. It costs **\$1 million-\$3 million** or more for the FDA to approve a generic drug.⁹

Acyclovir is used to treat **herpes** lesions. It reduces pain severity, slightly shortens recovery time, and reduces risk of transmission.^{10,11} The price of acyclovir ointment has come down to around **\$19** today, but this should have happened decades ago.¹²

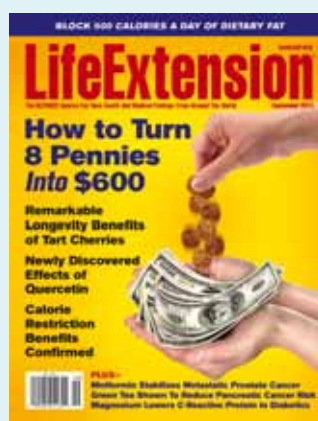
The solution we've long advocated is a two-pronged option whereby consumers, doctors, and hospitals can choose between "FDA certified" or "free market" pharmaceuticals.

Safety could be monitored by independent testing labs that would put their seal of approval on prescription drugs that are made properly, analogous to how **Underwriters Labs** certifies the safety of electrical equipment.

As you'll read on page 66 of this month's issue, **drug shortages** not only impact American patients today, but also torpedo **clinical cancer research**.

For longer life,

William Faloon, Co-Founder
Life Extension



September 2014 cover of *Life Extension Magazine* that revealed cost per tube of the active ingredient in a generic anti-herpes cream (acyclovir) was only **8 pennies** but was selling for **\$600** in the U.S.⁸

The big expenses are the regulatory costs.

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Vitamin K2 (MK7)	100 mcg
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- A clinical trial showed that pomegranate and cacao elevated free testosterone levels up to **48%** from baseline in just eight weeks.³
- Helps support physical strength and other benefits of healthy testosterone levels.†

Just one capsule a day.

Item #02500 • 30 vegetarian capsules

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1. *Rev Urol.* 2004;6 Suppl 6(Suppl 6):S9-S15.
2. *Am J Med.* 2007 Oct;120(10):835-40.
3. Laila Nutraceutical Internal Study. Data on file. 2019.

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† This product is intended to support testosterone levels and does not contain testosterone.
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Individual results are not guaranteed, and results may vary.

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Item #02201

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In the News



Eating More Fruit and Vegetables Reduces Risk of Depression, Twin Study Shows

A study in adult twins found that consuming higher amounts of fruit and vegetables was associated with a reduced risk of depression.*

The study included 3,483 twins from 45 to 90 years old. The researchers used food-frequency questionnaires to assess the association between higher fruit and vegetable intake and depression risk over a period of 5-11 years.

Compared to low intake, defined as **less than half a serving** per day, high intake of fruit and vegetables, about **two servings per day** (although that number still falls well below the recommended daily intake of at least five servings per day), was associated with a modest reduction in the risk of depression.

The authors attributed the beneficial relationship between fruit and vegetable intake and depression as most likely due to “the high levels of dietary fiber, vitamins and micronutrients contained in fruit and vegetables.” They added that, “*The importance of the gut microbiome and its potential influence on depression via inflammation, both systemic and neuroinflammation, is becoming increasingly well understood.*”

Editor’s note: “Our previously published meta-analyses of four population-based studies of adults aged 45+ years found higher fruit intakes were associated with a **15%** reduced odds of incident depression, and higher vegetable intakes with **9%** reduced odds,” the authors noted.

* *Sci Rep.* 2024 Nov 29;14(1):29711.

Fish Oil Can Lower Triglycerides in People with Diabetes

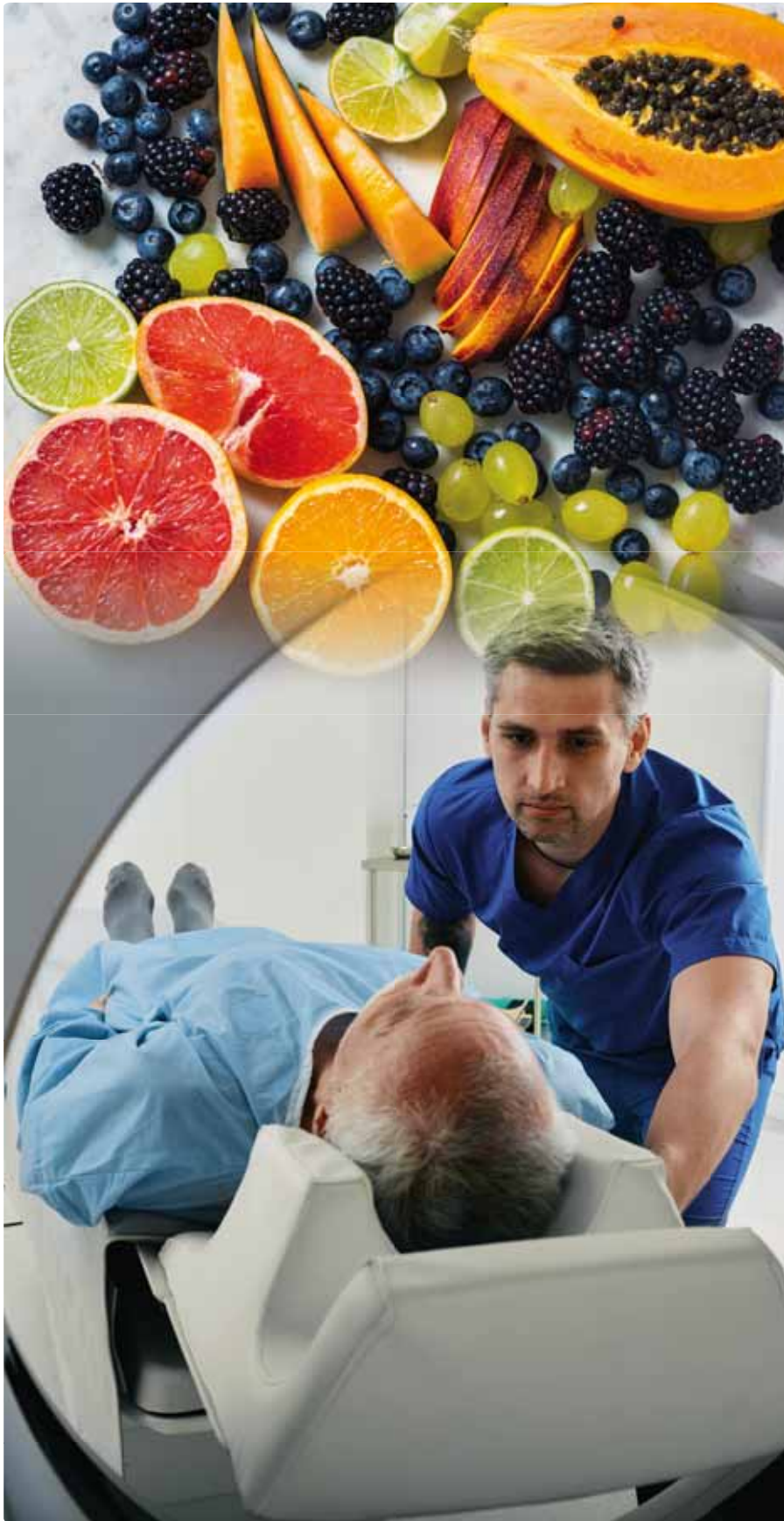
A reduction in triglycerides was found among people with diabetes taking fish oil, which contains the omega-3 fatty acids EPA and DHA, compared with those given a placebo, according to a new clinical trial.*

The trial included 309 men and women with type II diabetes and high triglycerides. Participants were randomized to receive **4 grams** fish oil or placebo for 12 weeks. At the end of the 12-week trial triglycerides decreased by an average of **21%** in the fish oil group, while there was no significant difference in the placebo group.

Editor's Note: "These findings have important implications for the development of personalized dietary interventions to effectively manage high triglycerides and related metabolic disorders," the authors stated.

* *Med.* 2025 Jan 10;6(1):100496.





Vitamin C Doubles Survival Time in Late-Stage Pancreatic Cancer Patients

High-dose, intravenous vitamin C, when added to conventional chemotherapy, doubled survival time in patients with late-stage, metastatic pancreatic cancer, a study published in *Redox Biology* reported.*

In this phase 2 clinical trial, 34 people with pancreatic cancer were randomized into two groups. One group received standard chemotherapy alone and another group received the chemotherapy plus intravenous infusions of **75 grams** of vitamin C three times per week.

Those who received chemotherapy alone survived an average of **eight months**, while those who received chemotherapy plus intravenous vitamin C survived an average of **16 months**—double the amount of time.

Editor's note: Adding high-dose vitamin C did not increase the frequency or severity of adverse events, the authors noted. Not all vitamin C studies show these remarkable results.

* *Redox Biol.* 2024 Nov;77:103375.

Lower Cost of Generic Drugs

A new business model for selling generic drugs could dramatically lower drug costs, according to a study published in the *New England Journal of Medicine Catalyst*.*

CivicaScript is a not-for-profit generic drugs supplier in the U.S. whose goal is to lower the cost of certain high-cost generic medications. CivicaScript's proposed model contracts directly with manufacturers to produce generic drugs and sells them to pharmacies and health plans at a fixed cost-plus price. This model avoids middlemen and keeps markups low.

To test the effectiveness of this model, researchers evaluated the cost of **abiraterone acetate**, a generic drug used to treat metastatic prostate cancer. They compared payments between CivicaScript and other manufacturers over a four-month period.

The results showed that CivicaScript was able to provide this drug at a price that was **64%** lower for patients (saving them around \$81 per month) and **95%** lower for 14 insurers (saving the health plans an average of \$1,796 per patient per month).

Abiraterone acetate generally costs thousands of dollars per month per patient. CivicaScript was able to provide a one-month's supply (120 250-mg tablets) for \$171. This price is slightly above wholesale in order to cover pharmacy dispensing fees.

Editor's note: "These data show that when you align the interests of patients, health-care institutions and society, there is great potential to create a more equitable, cost-effective healthcare system," said report co-author Carter Dredge.

* *NEJM Catalyst*. 2025;6(6):CAT.24.0417.





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1. *Nutrients*. 2021 Apr 9;13(4):1238.
2. *J Int Soc Sports Nutr*. 2017;14:18.
3. *Open Access J Sports Med*. 2017;8:213-26.

4. *J Cachexia Sarcopenia Muscle*. 2016 Sep;7(4):413-21.
5. *Eur J Appl Physiol*. 2013 Apr;113(4):987-96.

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SENOLYTICS

Remove Aged Cells

BY STEVEN TOWNSEND

Cells have a built-in program to beneficially self-destruct (via apoptosis) that is part of the body's maintenance system.¹

With age, however, not all of aged “senescent” cells are eradicated.

Instead of undergoing normal elimination, **senescent cells** linger in a toxic dysfunctional state.

The accumulation of damaged **senescent cells** can accelerate aging processes and contribute to development of chronic diseases.²

Scientists have conducted research into compounds (called **senolytics**) that remove **senescent cells**, which have shown promising regenerative effects.³⁻⁵

Enlightened people today utilize plant-based **senolytics** like **fisetin**, **theaflavins** and **quercetin** that target pathways that block favorable programmed cell death (apoptosis).

Turning “on” youthful apoptosis helps rid the body of accumulated **senescent cells**.

The Problem of Cellular Senescence

Senescent cells have structural and functional abnormalities that make them different from normal, healthy cells.^{2,6,7}

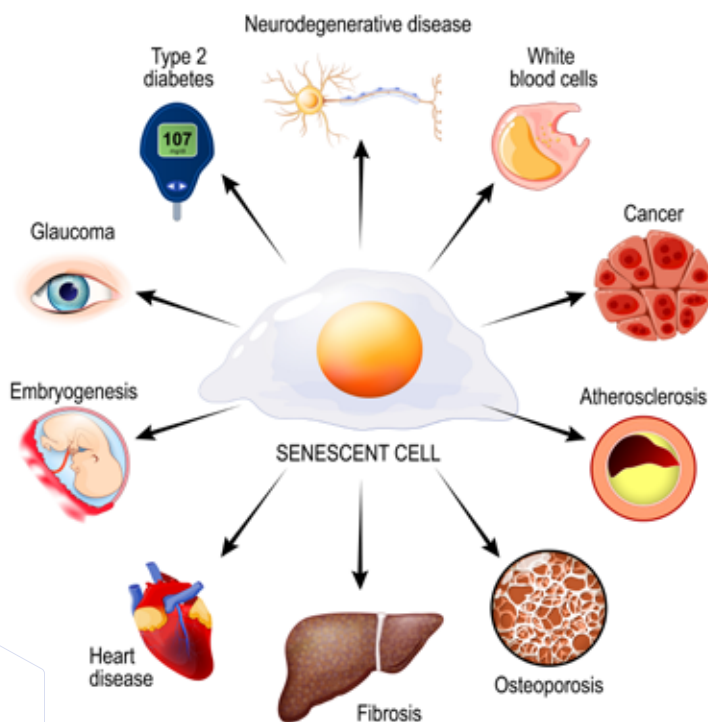
As these damaged (senescent) cells accumulate with age, they secrete compounds that promote local and systemic degeneration. Their resistance to apoptosis has earned them the nickname “zombie cells.”⁸

Compounds secreted by senescent cells are called **senescence-associated secretory phenotypes** (SASPs). They **degrade** surrounding tissues and contribute to chronic **inflammation**.^{6,9}

This **low-grade inflammation**, also known as **inflammaging**, is a significant contributor to loss of function and chronic disease.¹⁰

The buildup of **senescent cells** and **inflammaging** has been shown in clinical and preclinical settings to **accelerate the aging process** and increase the risk of age-related diseases, including:

- Cardiovascular disease,^{6,11}
- Osteoarthritis,^{2,7,11}
- Type 2 diabetes,¹²
- Cognitive decline and dementia,^{2,7,11} and
- Cancer.^{2,6,7,11}



Senolytic Therapy

Researchers at a major research hospital have made significant contributions to ways to combat cellular senescence.^{13,14} They found that compounds called **senolytics** activated a kind of “switch” in senescent cells, causing them to die without affecting healthy cells.^{2,13} They also found that the removal of senescent cells may delay aging-associated disorders.¹³

They termed these interventions **senolytic therapy**. By targeting senescent cells for removal, senolytic compounds aim to delay age-associated diseases and restore tissue function.

In animal models, using senolytics to eliminate senescent cells has demonstrated remarkable health effects, including:

- Improving markers associated with aging,^{9,15,16}
- Extending the life of elderly mice by about **10%**, which is analogous to a 75-year-old human living an extra **7.5 years**,¹⁷
- Halting or even reversing atherosclerotic plaque development, the most common cause of cardiovascular disease in mice,^{14,16}
- Reducing inflammation associated with obesity and improving metabolic health,^{15,18} and
- Protecting against osteoarthritis.^{16,19}

Intermittent treatment with senolytics (formulated with the drug dasatinib and the nutrient quercetin) reduced senescent cells, improved physical function, and increased post-treatment survival by **36%**, lowering the mortality hazard by **65%** in aged mice.⁵

Early **human studies** of senolytic therapies have shown promise as well.

In one pilot study of patients suffering from **idiopathic pulmonary fibrosis**, a progressive lung disease, senolytic therapy with a cocktail of dasatinib (**100 mg** per day) and quercetin (**1250 mg** per day) for three consecutive days per week over a total of three weeks, led to a clinically meaningful improvement in physical function, including gains in walking distance and gait speed.²⁰

In a phase 2 randomized controlled trial of 60 postmenopausal **women** who had a high burden of **senescent cells**, intermittent senolytic therapy for 20 weeks with dasatinib and quercetin significantly increased markers of bone formation and increased **bone mineral density**.²¹

Plant-Derived Senolytics

Scientists have spent years testing plant-derived nutrients for their senolytic properties to aid in the safe removal of senescent cells.³⁻⁵ These damaged cells not only contribute to aging but can accelerate the aging process throughout the body, contributing to degenerative diseases such as cancer and arthritis.^{2,6} These nutrients help activate the senolytic process in the body without the use of pharmaceuticals. The following compounds have been found to be particularly promising:

- **Fisetin**, a polyphenol found in fruits such as strawberries and apples, is one of the *most potent plant-derived senolytics* yet discovered. In an animal study, old mice given fisetin eliminated about **70%** of **senescent cells** and experienced an increase in lifespan of nearly **10%**.¹⁷ In other preclinical studies, fisetin has demonstrated other health-promoting effects, including reducing body weight, improving metabolic health, protecting the brain against degenerative diseases, and reducing cancer incidence.^{22,23}
- **Quercetin**, an anti-inflammatory nutrient found in many fruits and vegetables.²⁴ On its own, it removed senescent cells in the kidneys of mice, improving function and decreasing the fibrosis (scarring) that leads to **kidney failure**.²⁵
- **Theaflavins**, polyphenolic compounds found in black tea, have been known and studied for anti-cancer properties, cognitive function improvement, and anti-inflammatory effects.²⁶ Theaflavins have shown anticancer effects by inducing apoptosis in several cancer cell lines. They work by targeting survival pathways of senescent cells involving a protein called **BCL-2** that stops senescent cells from dying.²⁷ In one mouse model study, theaflavins were shown to have significant senolytic activity in ameliorating ionizing radiation-induced cell injury.²⁸
- **Apigenin** is a polyphenol found in various foods such as parsley, celery, and chamomile. It has been shown to *block* the pro-inflammatory compounds senescent cells produce, decreasing harmful chronic inflammation,^{29,30} and has also been shown to improve physical and cognitive function in animal models of premature aging.³¹

What You Need To Know

How Senolytics may Slow Aging and Chronic Disease

- Some aging, dysfunctional cells become **senescent**, spreading pro-inflammatory compounds and refusing to die off to make room for new, healthy cells.
- Senescent cells have been found to contribute to loss of function and progression of **age-related disease** in tissues and organs throughout the body.
- **Senolytics** are compounds that can eliminate senescent cells by turning on the “cellular switch” that allows them to die, while leaving healthy cells unharmed.
- In early preclinical and clinical studies, **senolytic therapy** has been effective at reducing senescent cells, improving tissue function, and reducing risk for disease.
- Several plant-derived compounds have been found to possess potent senolytic activity, including **fisetin**, **quercetin**, **theaflavins**, and **apigenin**.
- A combination of these senolytics may work in different ways to reduce the number of senescent cells in the body and block their harmful effects.



Senolytics

Senolytics are compounds (medications or dietary products) that help clear **senescent cells** from the body.

What Are Senescent Cells?

They are old or damaged cells that have stopped dividing but remain in the body.

Over time, they build up and release inflammatory chemicals.

This inflammation can harm surrounding tissues and contribute to age-related diseases, like **cancer**, **arthritis**, and **frailty**.

How Senolytics Help:

Senolytics specifically target and eliminate senescent cells.

By reducing these cells, senolytics lower inflammation and may improve tissue health.

This could help slow aging and reduce the risk of diseases linked to aging.

Taken together, these senolytic nutrients may work in different ways to help wipe away senescent cells *and* reduce the toxic impact of those that remain.

There is much discussion in the longevity field about the best way to use senolytic therapies.

Right now, taking these treatments intermittently may work best for clearing out senescent cells.^{2,20,32,33} In one preclinical study, a drug that blocked the inflammatory signals released by senescent cells was more effective when used on an occasional basis rather than being used daily.³⁴

Early research suggests that taking high doses of compounds like fisetin, quercetin, theaflavins, and apigenin once a week could be an effective approach.

Summary

Aged cells can become dysfunctional and toxic to healthy cells around them. This **cellular senescence** occurs throughout the body and is a major contributor to accelerated aging and risk for age-related disease.

Scientists have discovered that some compounds have a **senolytic** effect, removing senescent cells from tissues, reducing associated inflammation, and improving tissue health and function.

Some of the most potent plant-derived senolytic compounds identified include **fisetin**, **quercetin**, **theaflavins**, and **apigenin**.

Early studies have found **senolytic therapies** to be effective in reducing senescent cell numbers and improving health. Scientists are optimistic that senolytics can help rejuvenate tissues, slowing loss of function associated with aging and reducing risk for chronic disease. ■

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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* J Functional Foods. 2024;112:105955.



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Fight Female HAIR LOSS

Hair loss isn't just a problem for men.

It affects about **half** of all women in their lifetime.^{1,2}

Thinning hair or bald spots can negatively affect a woman's **emotional well-being** and **quality of life**.²⁻⁴ The few medications approved for hair loss can be unpleasant to use and have unwanted side effects.⁵

Scientists have identified two well-tolerated **plant-derived** ingredients that have been shown to combat **hair loss**.

In a clinical trial, women with thinning hair and hair loss who took gluten-free **wheat ceramides** had a stunning **48% decrease in hair loss** from baseline and a **12.5%** improvement in **hair growth** as compared to placebo.⁶

In another clinical trial, women with hair loss who took **saw palmetto oil** reduced hair shedding by **34%** and increased hair thickness from baseline.⁷

Together, these oral extracts may help resolve the top causes of hair loss in women and restore healthy hair growth.



Understanding Female Hair Loss

Hair grows in cycles. Usually, most hair is in the **anagen** (growth) phase, while approximately **10%** is in the **telogen** (resting) phase.^{8,9}

The most common types of hair loss in women are:

- **Telogen effluvium**, which occurs when a greater proportion of hair transitions from the growth (anagen) phase to the shedding or resting (telogen) phase. This condition can result in the loss of up to **35%** of scalp hairs, compared to the typical daily shedding of 50–150 hairs (about **10%**). It may be triggered by physiological or psychological stressors such as trauma, illness, malnutrition, or childbirth.⁹
- **Female pattern hair loss**, progressive hair loss also known as **androgenetic alopecia**. This disorder, in which hair gradually gets thinner at the top of the head,¹⁰ is increasingly common with age, affecting about **40%** of women by age 50.¹¹

Hormonal changes, such as the drop in estrogen and increase in androgens (particularly **dihydrotestosterone DHT**) around **menopause**, can contribute to female pattern hair loss.¹²

Elevated levels of **DHT** contribute to the progressive shrinkage of hair follicles, resulting in thinning hair, reduced follicular density, and eventual baldness.¹³



Female hair loss typically presents a different pattern than male-pattern baldness, characterized by diffuse thinning at the crown and a noticeable widening of the central part.¹⁴

Scientists have identified plant-derived extracts that, when taken orally, may help maintain healthy hair life-cycle and **reduce hair loss**.

Ceramides Halt Hair Loss

Ceramides are a type of lipid or fat. A hair strand's outermost layer contains ceramides that help protect and **strengthen** hair.¹⁵

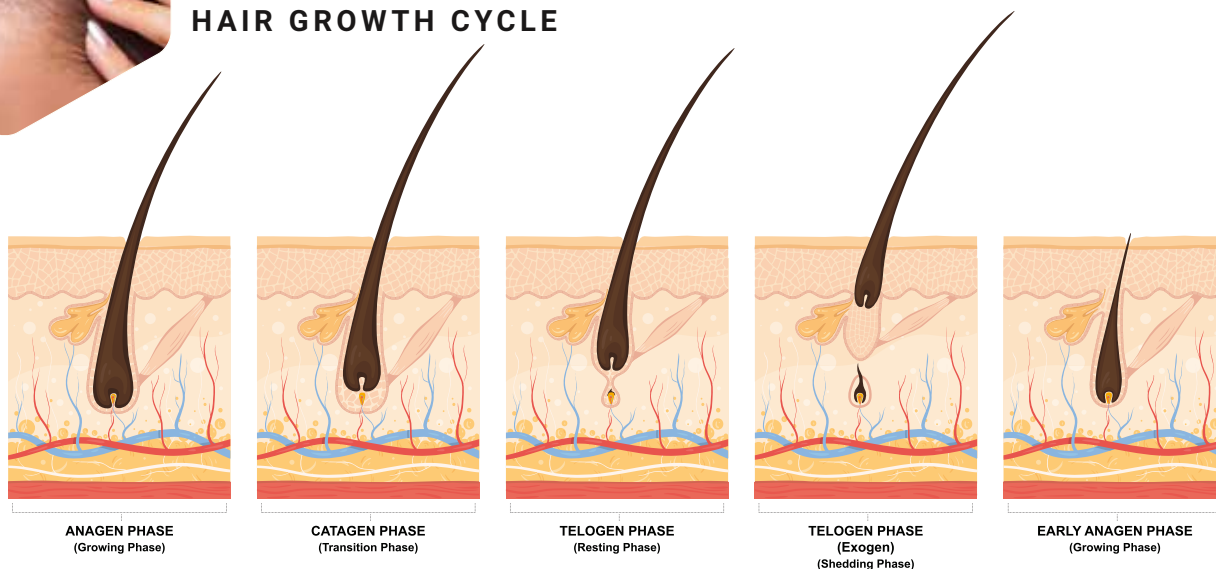
Preclinical research has found that ceramides may also promote cellular signaling to stimulate **hair growth**.¹⁶⁻¹⁸

Scientists have developed a **gluten-free wheat extract** rich in **ceramides** and **digalactosyldiglycerides**, another plant lipid that promotes the absorption of ceramides in the gut.¹⁹

In a clinical trial, 66 healthy women aged 24 to 64 with more than **15%** of total hair in the telogen phase took **30 mg** of an **oral wheat ceramide extract** or a placebo daily. The participants initially reported brittle, thinning hair and experienced mild to moderate hair loss.⁶

Hair characteristics were evaluated at 56 and 84 days using a **phototrichogram**. This is a noninvasive imaging technique that monitors **hair growth** and **loss** through periodic scalp imaging and analysis. The **phototrichogram** assesses hair growth phases.

HAIR GROWTH CYCLE



This **clinical trial** also used hair pull tests to measure shedding, while additional assessments evaluated hair diameter, strength, growth, sebum levels, density, and volume.

Within just two months, the extract group exhibited significant signs of healthier hair. After three months, the treatment group showed significantly *greater improvements* than the **placebo** group, including:

- **48%** decrease in hair loss (per hair pull test) from baseline,
- **12.5%** greater increase in hair growth compared to placebo, and
- **12%** reduction in scalp oil from baseline among participants with oily hair.

Overall, up to **90%** of women who took the **ceramide extract** reported that their hair was healthier, citing faster growth with fewer split ends. A subgroup analysis of postmenopausal women found that those who received the extract experienced similar improvements.

Fight Hormonal Hair Loss

Saw palmetto is a plant rich in beneficial compounds including **fatty acids** and **beta-sitosterol**.^{20,21}

Preclinical research suggests saw palmetto oil may help combat hair loss, especially **androgenetic alopecia**, by:^{20,22-24}

- **Reducing** the body's production of **DHT** (dihydrotestosterone), a hair loss promoter,
- **Blocking** cellular uptake of DHT, and
- **Decreasing** DHT **binding** to receptors.

Excess DHT increases hair loss by shortening the growth phase and lengthening the shedding phase of the hair lifecycle.^{8,20}

Saw palmetto inhibited **5-alpha reductase**—the enzyme that converts testosterone to **DHT**—and it also exhibited anti-inflammatory and pro-angiogenic effects in laboratory studies. Scientists formulated a saw palmetto oil standardized to contain **2%–3%** beta-sitosterol and **85%** total fatty acids, which was tested in a clinical study.⁷



What You
Need
To Know

Good Hair Days Ahead

- **Hair loss** affects roughly **50%** of all women.
- The top causes of female hair loss are **telogen effluvium**, shedding that is often triggered by a major stressor, and **androgenetic alopecia**, female pattern hair loss linked to hormonal imbalance.
- In a clinical trial of women with telogen effluvium, a gluten-free **wheat ceramide extract** reduced hair loss by **48%** and increased hair growth and health.
- In another clinical trial, women with androgenetic alopecia who took standardized **saw palmetto oil** had a **34%** decrease in hair shedding and an increase in hair thickness.
- Combined, these oral plant-based extracts address the top causes of hair loss in women.

Saw Palmetto Stops Shedding

A **double-blinded, placebo-controlled trial** recruited 80 healthy men and women (ages 18–50) with mild-to-moderate androgenetic alopecia. Participants were randomized into four arms and received daily treatments for 16 weeks:⁷

- **100 mg** oral standardized form of **saw palmetto oil**
- Oral placebo

Participants were evaluated using hair comb and hair pull tests, self-assessment of perceived efficacy, and objective evaluation via global photographic assessment scores. Hair density, thickness, and the anagen/telogen ratio were measured through **phototrichogram** analysis.

After four months, those receiving saw palmetto, compared to placebo, exhibited:

- **11.3% increase** in **hair density**,
- **34% decrease** in **hair shedding** (per a hair comb test),
- **16.6% decrease** in **hair loss** (per a hair pull test), and
- **18.9% reduction** in blood levels of **DHT**.

Some improvements were observed as early as two months and became more pronounced over time. Both men and women experienced similar outcomes.

Combining **saw palmetto** and **wheat ceramides** may help stop many cases of female hair loss and boost hair growth.

Summary

Hair loss affects about **half** of women, whether due to a sudden uptick in shedding or progressive hair loss on the top of the head.

Standardized **wheat ceramide extract** and **saw palmetto oil**, when taken orally, have both been clinically shown to reduce hair loss and renew hair growth in women.

Significant improvements in hair growth commonly start within just **two months** of using the ingredients. ■

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

Good Vs. Bad Ceramides

You may have heard that having high **ceramide** levels can be unhealthy.

That's because the type of ceramides generated from a calorie-dense Western diet high in **long-chain saturated fats** are linked with inflammation, cardiovascular disease, and metabolic disorders.^{25,26}

By contrast, *plant-derived* ceramides called **phytoceramides**, like those present in **wheat extract**, are rich in **healthy unsaturated fats** and are associated with better overall health, including healthy hair.²⁷



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PHENOTYPIC AGE PROJECT BLOOD TEST PANEL

To Calculate Biological Age

The **Phenotypic Age Project Panel** contains the following tests at a special, bundled price:

CBC/Chem/Lipids Panel

Helps assess cardiovascular health and overall well-being by measuring cholesterol, triglycerides, blood cell count, markers of kidney, liver, and metabolic function.

C-Reactive Protein (High Sensitivity)¹

Measures the degree of inflammation occurring in your body—high levels of which are associated with cardiovascular disease, Alzheimer's, and diabetes. Inflammation is a major factor in the process of degenerative aging.

Hemoglobin A1C²

Provides a better picture of your average blood glucose during the past few months by evaluating long-term blood sugar control, a critical factor in one of the leading theories of aging.

Insulin³

Measures fasting insulin to help indicate insulin resistance, a precursor to type 2 diabetes.

Biological Age (Phenotypic Age) Report^{*4,5}

A complimentary calculation of your biological age, referred to as "Phenotypic Age." This calculation is an approximation of phenotypic age, based on statistical models of mortality risk among the NHANES III & IV cohorts.

This *limited-time* blood test offer includes the biomarkers needed to calculate **Phenotypic Age**, along with additional important metabolic markers associated with the aging process.

And this special panel includes your **Biological Age Report*** at no extra cost. You'll also have free access to our Wellness Specialists to help review your results.

For a limited time, July 1-31, this special offer costs just \$75.
Item # LCX00001 • Sale price \$75

For full product description and to order **Phenotypic Age Project Panel Blood Test Special**, call 1-800-544-4440 or visit www.LifeExtension.com

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

*The information provided from this calculation is provided FOR INFORMATIONAL PURPOSES ONLY. Many factors may impact your biomarker results and report, including transient factors such as an infection. Further, the report is based on statistical models that are still in development, and the value of any insights is not fully understood. This report is not a substitute for medical advice and is not intended to provide medical advice. The results should not be used to diagnose, treat, prevent, or cure any disease. Any health-related decisions informed by the test results you receive should be made with the consultation of a qualified, licensed, healthcare provider.

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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

"Good stuff."

Scott

VERIFIED CUSTOMER
REVIEW

Item #02414
30 vegetarian capsules
1 bottle \$11.25
4 bottles \$10 each



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



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Healthy Aging

AMINO ACID

NEW
25 MG
DOSE



Item #02540
30 vegetarian capsules
1 bottle \$28.50
4 bottles \$26 each

L-ergothioneine, an amino acid found in mushrooms, is delivered directly to our cells and mitochondria.

Mega L-Ergothioneine provides a powerful dose of highly bioavailable¹ L-ergothioneine and may support healthy aging by:

- Promoting plasma ergothioneine levels¹
- Providing sustained ergothioneine levels¹ with **high bioavailability** and efficient absorption
- Supporting overall well-being²
- Offering cellular protection against oxidative stress^{1,3}

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Just one daily vegetarian capsule of **Mega L-Ergothioneine** provides a full **25 mg** of L-ergothioneine.

This new strength provides **25 mg** of **L-ergothioneine** per capsule, which is equivalent to the amount found in approximately **10 to 23** cups of white button mushrooms.³⁻⁵

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

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Menopause Relief

For Hot Flashes
and 10 Other
Menopause
Discomforts

Menopause Relief contains a proprietary extract of Siberian rhubarb that in clinical studies has been shown to provide relief for up to **11 menopause discomforts** on the menopause rating scale, including:

- Hot flashes
- Night sweats
- Irritability
- Muscle discomfort
- Mood swings
- Sleep disturbances
- Exhaustion
- Sexual function
- Joint discomfort
- Urinary discomfort
- Vaginal dryness

ESTROGEN
FREE

CAUTION: Consult with your healthcare practitioner if you have, or have a history of, estrogen-dependent tumors.



Item #02204

30 enteric-coated
vegetarian tablets

1 bottle **\$18.75**

4 bottles \$16.75 each

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Hair so Nice, They'll Look Twice!

Hair Growth for Men is a **plant-derived** formula that *supports* the normal growth cycle for **healthy hair**.

In a clinical trial, a proprietary blend of **black rice seed** (*Oryza sativa*) and **prickly pear** (*Opuntia Ficus Indica*) flower extracts helped to:¹

- Support hair health
- Promote hair fullness and density

This formula also features a standardized **saw palmetto** oil that in a 4-month clinical trial demonstrated support for:²

- Fuller hair with more density
- Reduced hair shedding
- Healthy hair appearance

Just one **Hair Growth for Men** softgel daily can help maintain healthy hair.

For full product description and to order
Hair Growth for Men, call **1-800-544-4440** or
visit **www.LifeExtension.com**



Item #02538
30 softgels
1 bottle **\$21**

4 bottles \$19 each

References: 1. *J Cosmo Tricho.* 2023;9(3):207. 2. *Clin Cosmet Investig Dermatol.* 2023 Nov 11;16:3251-3266.
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Fuller, Stronger Hair

NEW



Item #02541 | 30 softgels

1 bottle \$22.50

4 bottles \$20.50 each

Hair Growth for Women is an oral formula with two scientifically studied **plant extracts** that:^{1,2}

- Help **maintain** existing hair,
- Support normal **hair growth** cycle,
- Support healthy **scalp oil** levels,
- Support **hair density** and **volume** for fuller hair, and
- Maintain already normal **DHT** levels (a hormone linked to maintaining hair follicle health).

In separate **clinical trials**, these standardized extracts show *reduced hair loss*—by up to **48%** in one study.¹

Another study showed a **hair loss** reduction of up to **20%**.² Some users noticed results in as little as two months.

For full product description and to order **Hair Growth for Women**,
call **1-800-544-4440** or visit **www.LifeExtension.com**

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The Cardiovascular Benefits of **Taurine**



BY MICHAEL DOWNEY

Taurine is an **amino acid** found in nearly all tissues.¹

In animals, adding **taurine** helped them live longer^{2,3} and stay healthier.^{2,4-6}

This is likely a result of taurine's protection against cell damage,^{5,7} repairing energy problems in cells,^{7,8} protecting DNA,⁷ and reducing long-term inflammation;⁵ which are common malfunctions that accompany aging.² However, taurine's role in aging humans remains a topic of ongoing research.

Scientific research has long focused on the **cardio-vascular** benefits of taurine.^{7,9-13}

In Japan, taurine has been safely and successfully used for **four decades** to improve **heart function** and **exercise capacity** in patients with heart failure.⁸

Clinical studies have shown its potential to decrease elevated **cholesterol**, **blood pressure**,^{13,14} and **triglycerides**,¹³ which are risk factors for cardiovascular disease.

What is Taurine?

While most amino acids serve as building blocks for proteins, taurine does not.

Instead, taurine acts as a “free” amino acid in body tissue, assisting with a variety of processes, such as the regulation of calcium and potassium.¹⁵ Taurine also supports the health of **cells** and **mitochondria**, the energy-generating “powerhouses” of the cell.⁸

Taurine is especially abundant in the heart, where it constitutes approximately **50%** of the total free amino acids in the heart.¹⁵

Animal studies have linked taurine to overall healthy aging. For example, taurine intake boosted the median **lifespan** of middle-aged mice by **10%-12%**. Elderly mice given taurine had an even more dramatic **25%** increase in life expectancy.²

While taurine supplementation in humans shows promise in supporting cardiovascular and metabolic health, effects on aging are from animal studies; additional research is on-going to clarify taurine’s role in aging humans.



How Taurine Works

Research evidence has demonstrated that taurine may deliver many of its cardiovascular benefits by:

- Modulating calcium and potassium channels, which influence cardiac electrical activity and vascular tone. It can relax arteries by opening calcium-activated potassium channels.¹¹
- Improving **myocardial energetics**, how well the heart muscle uses and produces energy to pump blood,¹⁶⁻¹⁸
- Reducing the effects of **angiotensin II**, a hormone that causes blood vessels to tighten and the body to retain salt, which can worsen heart failure,^{19,20}
- Reducing damage to cardiac, endothelial, and other cells by enhancing nitric oxide (NO) availability and by boosting antioxidant enzymes,^{21,22}
- Boosting anti-inflammatory activity (likely by reducing the effects of the renin-angiotensin system),¹⁰
- Inhibiting **cardiomyopathy**, a set of pathologies that make the heart muscle weak, thick, or rigid,²³ and
- Helping to slow the development of atherosclerosis.²⁴

Cardiac Benefits

Taurine plays a key role in the functioning of the **cardiovascular system**.

A review describing the functional role of taurine in cardiac health concluded that it can enhance **cardiac contractility** (the heart’s ability to contract and pump blood effectively) and overall heart function, especially **left ventricular function**, which is a primary factor in how well the heart pumps oxygen-rich blood to the body.¹⁵

In **animal** studies, taurine intake improved:¹⁵

- Contractility,
- Stroke volume (amount pumped per beat), and
- Cardiac output (amount of blood pumped per minute).



A study investigating the effects of taurine deficiency in rats found that taurine deficiency resulted in **atrophic cardiac remodeling**. The structural changes were associated with impaired cardiac function, including decreased ejection fraction as well as systolic and diastolic dysfunction.²⁵

In **human** studies, taurine intake led to improvements in:^{18,26,27}

- Heart function, including left ventricular function, and
- Exercise tolerance.

In Japan, **taurine** was approved as a treatment for patients with **heart failure** in 1985. Since then, it has been used to improve heart function and increase exercise capacity. It has also become a topic of interest for scientists worldwide due to its potential benefits in aging, mitochondrial diseases, metabolic syndrome, cancer, cardiovascular diseases, and neurological disorders.⁸

What You
Need
To Know

Keep the Heart Healthy

- The amino acid **taurine** is found throughout the body.
- Studies show that it can improve multiple aspects of **heart** and **blood vessel function**. It has been successfully used as part of treatment for heart failure patients in Japan for decades.
- In human studies, taking oral taurine boosted heart function and decreased triglycerides, blood pressure, and cholesterol, reducing risk factors for atherosclerosis and **cardiovascular disease**.
- Taking oral taurine can support cardiovascular health and promote healthy aging.

Vascular Effects

Taurine may provide vascular benefits in several different ways. Preclinical research has shown that it supports the production of endothelial **nitric oxide** (NO), which is a compound that, when released from the endothelium (inner arterial lining) leads to vasodilation, improved blood flow, and a decreased risk of endothelial *dysfunction*.^{21,28}

Other research suggests that taurine may be able to reduce the risk of **atherosclerosis** (the buildup of plaque in the arteries) and cardiovascular events by modulation of lipids, and lowering inflammation.

In animal models, taurine supplements have shrunk atherosclerotic plaques and improved blood vessel function.^{24,29,30}

In a randomized double-blind placebo-controlled trial, 120 people with prehypertension were randomized to receive **1.6 grams** of taurine or placebo daily for 12 weeks. Those who supplemented with taurine had significantly improved vasodilation and, on average, systolic pressure fell by **7.2 mm Hg**, which was over two-and-a-half times more than the placebo group.¹²

Meta-analyses which combined the results of multiple randomized-controlled trials have found a range of vascular benefits from **taurine supplementation**:

- Reduced **systolic** and **diastolic** blood pressure to a clinically significant degree. The average reductions were about **3 mmHg** each in an analysis of studies evaluating blood pressure changes in dosages of **1,000-6,000 mg** daily over periods ranging from one day to 12 weeks. The studies included a range of subjects, from young healthy and recreationally active to elderly and diseased.¹⁴
- Lowered **triglycerides**, **cholesterol**, and **blood pressure** in an analysis of people with metabolic or liver dysregulation receiving **500-6,000 mg** daily for 15 days to six months.¹³
- In participants of varying age, health, and training status, taurine enhanced endurance exercise performance in analyses that evaluated **1,000-6,000 mg** dosages daily for up to two weeks. The greatest performance improvements were observed in the elderly with heart failure.²⁶

All of these effects may help reduce the risk for **cardiovascular disease**.

People today are supplementing with **1,000-6,000 mg** a day of taurine.³¹ Those with kidney impairment should avoid high taurine doses as it can overwhelm the ability of weakened kidneys to efficiently clear taurine.



Highest Taurine Intake, Lowest Cardiovascular Disease

Scientists conducted a worldwide epidemiological study that included **25 countries** and over **14,000 people**.³²

They found that residents of Okinawa, Japan had the:

- **Highest** intake of seafood and thus of taurine,
- **Lowest** rate of heart disease, and
- **Longest** average lifespan.

Summary

Cells throughout the body require the amino acid **taurine** to function optimally.

In clinical studies, taurine improved **heart function** and reduced cholesterol, blood pressure, and triglycerides, supporting optimal cardiovascular health. ■

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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Rejuvenate Your Microbiome for Healthy Aging



Item #02539

30 vegetarian capsules

1 bottle \$22.50

4 bottles \$20.50 each

Florassist® Probiotic Youthful Gut promotes a healthy lifespan with three targeted **probiotics** and a **postbiotic**.

In **clinical trials**, these three **probiotics**:¹⁻⁴

- Encourage a more “**youthful**” gut microbiome
- Promote a healthy inflammatory response
- Support **healthy aging** processes
- Help support cholesterol levels already within the normal range

Youthful Gut contains: PoZibio® HT § *L. paracasei* D3-5, *L. plantarum* ECGC 13110402, *L. rhamnosus* IMC 501, and *L. paracasei* IMC 502 (9 Billion CFU†)

For full product description and to order
Florassist® Probiotic Youthful Gut,
call **1-800-544-4440** or visit **www.LifeExtension.com**

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PoZibio® is protected under US Patent No.11,622,981 and is a registered trademark of Postbiotics, Inc.
L. plantarum ECGC 13110402 is LPLDL.
† Colony forming units at time of manufacture. § Heat treated.

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

GO WITH THE FLOW



Ultra Prostate Formula is designed to address essential factors involved in prostate health: function, hormone metabolism, and nighttime flow.

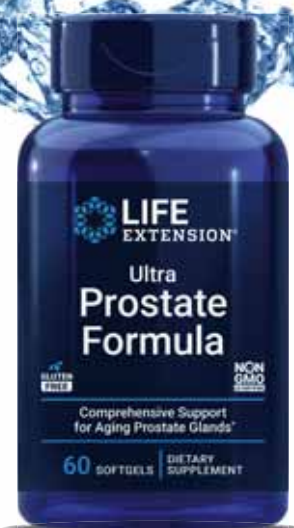
It is our most advanced prostate-health supplement.

Item #02029

60 softgels

1 bottle **\$29.25**

4 bottles \$27 each



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

AprèsFlex® is a registered trademark of PLT Health Solutions—Laila Nutraceuticals LLC. HMRlignan™ is a trademark used under sublicense from Linnea S.A. Lyc-O-Mato® is a registered trademark of Lycored Corp. Graminex® is a registered trademark of Graminex LLC.

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"I like what I
see when I look
in my mirror!"

Nancy
VERIFIED CUSTOMER
REVIEW

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



Revive Hair, Skin, and Nails from Within

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

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

Rejuvenating nutrients include:

- **VERISOL® Bioactive Collagen Peptides®**—Stimulates the formation of new collagen and elastin to promote skin suppleness and elasticity¹
- **Cynatine® HNS Plus**—Provides solubilized keratin, zinc, B vitamins, biotin, and copper
- **Biotin**—Supports nail strength and integrity²
- **Silicon**—For the formation of collagen and keratin molecules³

Item #02322 • 120 tablets

1 bottle **\$24.75**

4 bottles \$22.50 each

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

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

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eye

PRESSURE SUPPORT



"It's AWESOME."

Chrissy

VERIFIED CUSTOMER REVIEW

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

Item #01514

30 vegetarian capsules

1 bottle **\$30**

4 bottles \$27.50 each



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

Mirtogenol® is a registered trademark of Horphag Research, Ltd. Mirtoselect® is a registered trademark of Indena, S.p.A., Milan, Italy. Pycnogenol® is a registered trademark of Horphag Research, Ltd. Pycnogenol® is protected by U.S. patent #9,125,925 and other international patents.

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



Discover a European Secret for Beautiful Legs

Youthful Legs helps your legs stay healthy by:¹⁻⁴

- Supporting healthy blood flow.
- Maintaining healthy leg vein function.
- Promoting vascular health.



Item #02252

60 softgels

1 bottle **\$16.50**

4 bottles \$15 each



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

Taurine

A Wellness Trip for Your
Heart & Mind



Item #01827

1000 mg

90 vegetarian capsules

1 bottle **\$9.75**

4 bottles \$9 each



"An absolute must-have in any supplement plan."

Donald

VERIFIED CUSTOMER
REVIEW

Healthy aging is your destination

Taurine is one of the most abundant **amino acids** in the body.

It supports a healthy **heart** and **brain**, muscle mass and exercise performance.

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

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



share a
longer
life



Selenium promotes the body's production of **glutathione**, a powerful cellular antioxidant. It also encourages healthy cell division, thyroid health, and immune function.

Super Selenium Complex combines three complementary forms of selenium with vitamin E for additional antioxidant protection.

Item #01778

100 vegetarian capsules

1 bottle **\$10.50**

4 bottles \$9 each

Each bottle provides a supply that lasts more than three months.

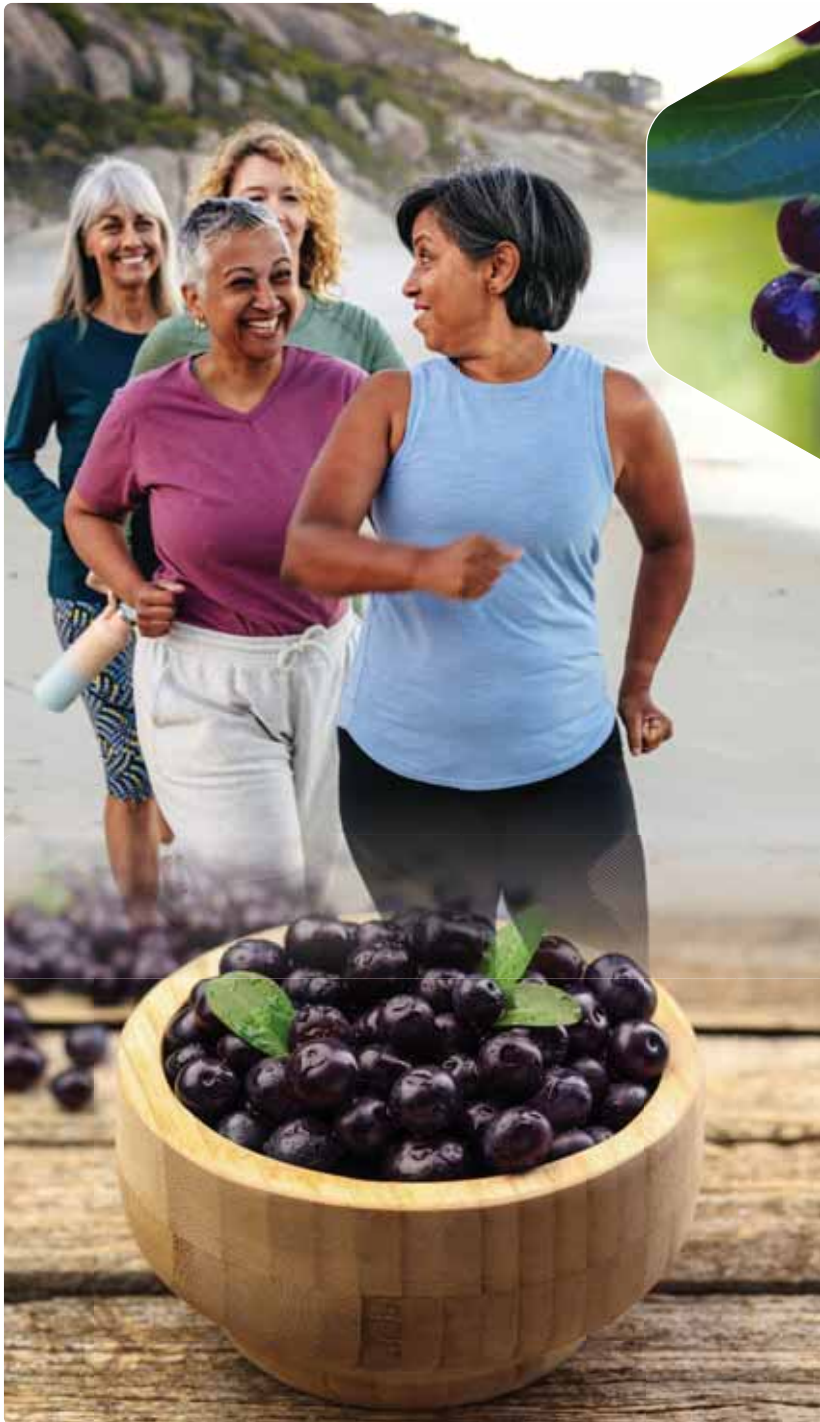


For full product description and to order **Super Selenium Complex**, call **1-800-544-4440** or visit **www.LifeExtension.com**

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What is Maqui Berry?

BY LAURIE MATHENA



Maqui berries are the fruit of trees that grow wild in the rainforests of Chile and in some parts of Argentina.^{1,2}

People indigenous to these areas have long consumed the small, purple **berries** for their health benefits, and the berries have earned a reputation for their free radical scavenging and anti-inflammatory properties.²

Their range of potential benefits includes reducing LDL cholesterol levels,³ reducing free radical damage,⁴ and more.¹

Two key areas in which maqui berries are especially effective include:

1. Relieving **dry eyes**,^{5,6} and
2. Reducing **blood sugar levels**.^{3,7,8}

Dry Eye Relief

Dry eye occurs when the body either produces too few tears or tears that are of poor quality.⁹

In the short term, dry eye causes stinging, itching, and light sensitivity.⁹ Left untreated, it can become severe over time and can even cause permanent eye damage.¹⁰

Eye drops are just a temporary solution, because they cannot replicate the complex structure of real tears and need to be reapplied frequently.

However, extracts from **maqui berry** do what artificial tears cannot: they help the body produce more of its own **tears**.

A pilot clinical trial tested a standardized maqui berry extract's effect on dry eyes in 13 adults. Participants took either **30 mg** or **60 mg** daily for 60 days. Both groups saw a **45% increase** in tear production after 30 days.

By day 60, only the **60 mg** group maintained these improvements. Quality-of-life scores related to dry eye symptoms also improved more significantly in the **60 mg** group, showing a sustained reduction in discomfort. The study suggests that a *higher* dose of **maqui berry extract** is more effective for relieving dry eye symptoms and enhancing tear production.¹¹

A placebo-controlled trial of 74 participants investigated the effectiveness of **60 mg** standardized maqui berry extract in reducing **eye dryness** and **fatigue**. Previous studies have shown that maqui berry's high anthocyanin content can improve dry eye symptoms and reduce inflammation. After four weeks, the maqui berry group experienced reduced eye dryness compared to the placebo group, as well as improvement in eye fatigue.⁵

In a similar randomized trial, 20 patients with dry eye symptoms were randomly assigned to receive a standardized maqui berry extract or a placebo for two months. After two months, the **maqui berry** extract group showed significant **improvements in tear production** and dry eye symptoms compared to placebo. Molecular analysis revealed that the extract reduced proinflammatory cytokines in tear fluid. These findings suggest that maqui berry extract may be an effective adjunctive therapy for managing dry eye disease by reducing ocular inflammation.⁶

Blood Sugar Control

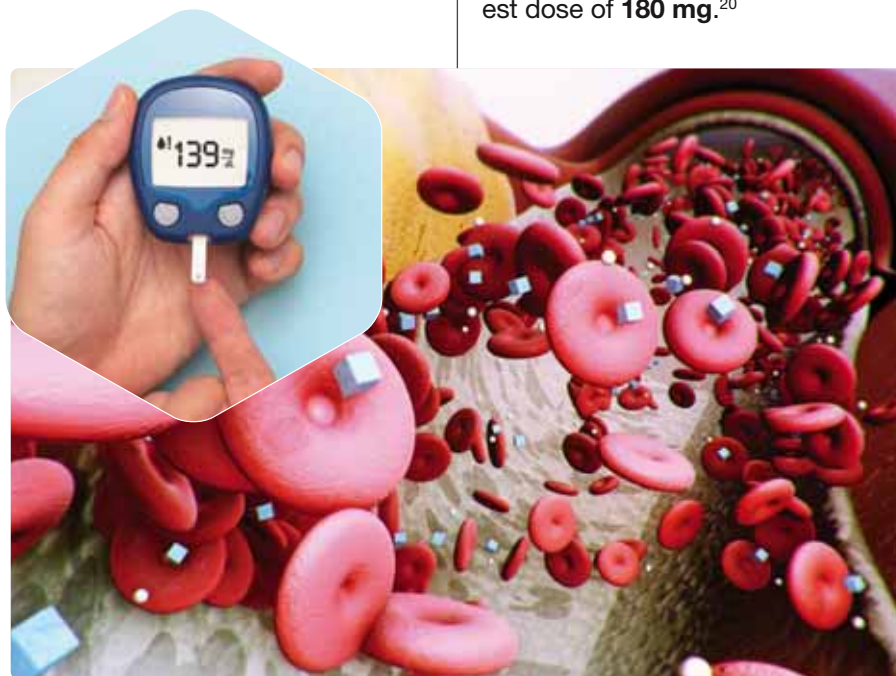
Scientists have discovered that different standardization processes of the maqui berry can yield distinct health benefits. In particular, another standardized form, rich in delphinidins, has been increasingly supported by scientific evidence suggesting that, at higher doses, it may help reduce blood glucose spikes after meals.

After-meal glucose spikes are associated with higher rates of cardiovascular disease,^{12,13} impaired cognitive function,^{14,15} and other chronic conditions.^{16,17}

In an advanced preclinical analysis of maqui berries' metabolic effects, scientists discovered that a family of polyphenolic compounds called **delphinidins** act on multiple targets related to metabolic syndrome.¹⁸

Maqui berry extracts are rich in delphinidins. These compounds have been found to reduce post-meal blood glucose levels by stimulating a peptide in the intestines that enhances glucose metabolism.^{3,19}

A study in 36 individuals with non-diabetic high blood sugar found that taking a single dose of standardized maqui berry extract prior to an oral glucose tolerance test was associated with a reduced risk of elevated blood glucose levels in individuals with prediabetes. Participants experienced a lower risk of dysglycemia (abnormal blood sugar levels) across all tested doses, with the most significant effect observed at the highest dose of **180 mg**.²⁰



In one study, people who took **200 mg** of a maqui berry extract 30 minutes before a meal had **15%** lower after-meal glucose levels than those who took a placebo.⁷

Maqui berry's ability to reduce *long-term* glucose levels is also noteworthy.

In a study of 31 individuals with mild prediabetes, **180 mg** of maqui berry extract every day for 90 days reduced HbA1c (a measure of glucose over the past three to four months) by **0.3%** (from **5.65%** to **5.35%**). This reduction brought HbA1c levels down into the normal range, which is **5.6%** or lower.³

Summary

Maqui berries have been scientifically studied for a range of health benefits. An extract of maqui berries is particularly effective at relieving symptoms of dry eye disease, because it helps the body produce more of its own natural tears.

Maqui berry extract also helps maintain healthy blood sugar levels by reducing after-meal blood sugar spikes and HbA1c levels.

These benefits show that maqui berries can help support health and influence quality of life. •

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

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RELIEF

FOR OCCASIONAL MINOR PAIN AND DISCOMFORT*

PEA is a fatty acid found in the body that works at the site of discomfort.

Studies suggest PEA can help relieve minor pain and discomfort from daily exertion or over-use.¹⁻²

Each chewable tablet delivers **600 mg of PEA (palmitoylethanolamide)**.

Take one to two chewables daily as needed.

Item #02303

60 vegetarian chewable tablets

1 bottle **\$25.50**

4 bottles \$23 each

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

References

1. *Br J Clin Pharmacol.* 2016;82:932-942.
2. *Pain Physician.* 2017;20:353-362.



LIFE
EXTENSION®

Discomfort Relief
Berry Flavor

For Occasional Minor
Pain and Discomfort*

60

VEGETARIAN
CHEWABLE
TABLETS

DIETARY
SUPPLEMENT

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

"I use this as a support
for bone health."

Myron

VERIFIED CUSTOMER REVIEW



Just one daily softgel of
Super K provides:

Vitamin K1	1,500 mcg
Vitamin K2 (MK-4)	1,000 mcg
Vitamin K2 (trans MK-7)	100 mcg

CAUTION: If you are taking a vitamin K antagonist (e.g. warfarin), consult your healthcare practitioner before taking a vitamin K supplement.



Item #02334

90 softgels

1 bottle **\$24**

4 bottles \$22 each

Each bottle lasts for
three months.



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

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When
it comes to heart
health.

Go Green.

Your heart will love the benefits of Life Extension® **Mega Green Tea Extract**.

Help maintain already-healthy blood cholesterol, LDL and triglyceride levels.

Our extract is standardized to **98% total polyphenols** with **45% beneficial EGCG**.

Item #00954 or Item #00953

100 vegetarian capsules

1 bottle **\$22.50** • 4 bottles \$18 each



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



"One of my main daily
'go to' supplements."

Lew

VERIFIED CUSTOMER REVIEW

Get MORE Vitamin D

For a strong immune system, bones and heart,
you need the sunshine vitamin. Most people don't
get enough from their diet or time outdoors.

Good thing there's Life Extension® Vitamin D3.

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



Item #01713
125 mcg (5000 IU)
60 softgels

1 bottle \$7.50

4 bottles \$6.50 each

Caution: Individuals consuming more than 50 mcg (2000 IU)/day of vitamin D (from diet and supplements) should periodically obtain a serum 25-hydroxy vitamin D measurement. Do not exceed 10000 IU per day unless recommended by your doctor. Vitamin D supplementation is not recommended for individuals with high blood calcium levels.



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ADVANCED Milk Thistle

ULTIMATE SUPPORT
FOR YOUR LIVER



Advanced Milk Thistle contains standardized, top-grade ingredients of **silymarin**, **silybin**, **isosilybin A**, and **isosilybin B**, providing a full spectrum of liver-supportive compounds.

SILIPHOS® phytosome in **Advanced Milk Thistle** resulted in almost **3.5-fold** greater bioavailability compared to unformulated milk thistle extract.

Item #01922

60 softgels

1 bottle \$21

4 bottles \$18.75 each



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

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*Cry Out
Loud
go ahead,
shed a tear.*

"I'm happy with it!"

Mary

VERIFIED CUSTOMER
REVIEW



Tears are a good thing—until you don't have enough.

Maqui berries (*Aristotelia chilensis*) produce compounds called **delphinidins** that encourage tear production—an up to **45%** increase after 30 days in one study. So where can you get a Maqui Extract with delphinidin? **Tear Support with MaquiBright®.**

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

MaquiBright® is a registered trademark of MAQUI NEW LIFE S.A, Chile and ORYZA OIL & FAT CHEMICAL CO., LTD., Japan.

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

Item #01918
30 vegetarian capsules

1 bottle **\$13.50**
4 bottles \$12 each





DRUG SHORTAGES

BY WILLIAM FALLOON





Cancer is expected to claim **618,000** American lives in 2025, with increasing malignancies occurring in *younger* people.¹

This equates to more than **1,600** cancer-related **deaths** each day.

Despite advances in cancer treatment (and early detection) leading to lower overall **cancer death rates**, the number of new **cancer** cases continues to rise.¹

This increase is attributed to the aging and growth of the population and a rise in the diagnoses

of common cancers, including breast, prostate, endometrial/uterine, pancreatic, kidney, colorectal, and melanoma.²

Persistent **drug shortages** in the United States have affected thousands of cancer patients, who face delayed or canceled chemotherapy appointments.^{3,4} Most cancers don't "wait" before invading and metastasizing into vital organs.

In a 2023 report, more than **90%** of the largest U.S. cancer centers reported **shortages** of chemo drugs.⁵

The National Cancer Institute reported that at least **174** of its **608** clinical trials may be affected by these **drug shortages**. This did not include other clinical trials that need these drugs for studies that researchers would like to start but can't.⁶

A **2024** survey of U.S. cancer centers shows that many continue to face drug shortages, often requiring mitigation strategies to treat patients.⁷

Among 28 cancer centers across the country, **89%** reported that at least one drug was in **short** supply.⁸

These shortages aren't just bad for today's patients. The delays impacting **cancer research** will invariably be felt for years to come.

FDA Advises Against Offshore Drugs

The FDA has repeatedly warned Americans about the purported dangers of purchasing **prescription drugs** from **offshore** pharmacies.

Yet most of the active ingredients in **prescription drugs** sold in the United States are synthesized in offshore countries as follows:

- 1) According to the **FDA**, in 2019 approximately **72%** of active pharmaceutical ingredient manufacturers supplying the U.S. market were located outside the United States.⁹



- 2) In a 2016 report the **Government Accountability Office** indicated that nearly **80%** of the active ingredients used in drugs consumed in the U.S. are manufactured abroad.¹⁰

- 3) The **Pharmaceutical Research and Manufacturers Association** has reported similar figures, emphasizing that the U.S. pharmaceutical supply chain is heavily integrated with global manufacturers.¹¹

In 2022, the FDA inspected only **6%** of nearly 3,000 foreign facilities, many that produce **active ingredients** for the U.S. generic drug market.^{12,13}

Consumers are warned not to purchase lower-priced drugs from **Canada**,¹⁴⁻¹⁶ but drugs sold in Canada are often the same as those sold in American pharmacies.

There is scant FDA oversight of the synthesizing companies that manufacture the active ingredients in your **prescription drugs**.

A group like **Underwriters Laboratories** could do independent inspections to certify more offshore synthesizing labs that adhere to good manufacturing practices... and identify ones that don't.¹⁷

More Generic Competition = Lower Consumer Prices

According to a report generated by the **FDA**, a single generic version of an off-patent drug reduces the price of a branded drug by **31%-39%**. With two competitors, the price drops by **44%-54%**.

With four generic versions the consumer price drop is **73%-79%**. With six or more versions, there can be price reductions of **95%** and greater compared to the previously branded drug.¹⁸

Even at these steep lower prices, making generics could still be profitable if it were not for the high costs and uncertainties involved in gaining/maintaining **regulatory approvals**.

What's happened in some cases is that as profit margins decline in response to generic competition, companies stop making the drug or engage in colluding to create an artificial shortage or engage in price-fixing that drives consumer prices upward.¹⁹⁻²¹

In addition to ongoing **shortages** and unpredictable pricing, U.S. consumers still overpay for many of their generic drugs.²²



Pharma Companies Pay Huge Price-Fixing Penalties

In August 2023, two drug companies pleaded guilty to price-fixing of generic drugs and collectively paid over **\$280 million** in criminal penalties.¹⁹

In October 2021, three generic pharma companies paid **\$447 million** in civil penalties that included illegal **price-fixing** of various generic drugs.²¹

I suspect this happens more often than the price-fixing violations that are ever uncovered.

My solution is a parallel **free market** whereby companies would stake their reputations on making quality generic drugs without excess regulatory oversight. Physicians and patients would in many cases quickly identify ineffective generics, such as an anti-hypertension drug that no longer controls blood pressure the same way. Independent groups like Underwriter Labs could also spot bad actors.

FDA Charges Generic Drug “User Fees”

The **FDA** began charging **user fees** for new drug applications in 1992 with the enactment of the **Prescription Drug User Fee Act**. The goal of this legislation was to accelerate the review of new drug applications by providing the FDA with additional funding.²³

Pharmaceutical companies would pay fees when submitting New Drug Applications, enabling the FDA to hire more reviewers and support staff, thereby reducing review times, and speeding up the introduction of new drugs to the market.

In **2012**, Congress authorized the **Generic Drug User Fee Amendments** that extended the user fee system to generic drug manufacturers.²⁴

Under this 2012 amended Act, generic drug companies must **pay** an **application fee** when submitting an **Abbreviated New Drug Application**, an annual **facility fee**, and comply with other regulatory requirements. The application fee for a generic drug was **\$252,453** in 2024,²⁵ and will increase to **\$321,920** in 2025.²⁶

In 2025, manufacturing facilities in the U.S. must pay an annual fee of **\$41,000**. Facilities outside the U.S. pay a higher fee of **\$56,000** which is **\$15,000** higher than for domestic ones.²⁶

Failure to pay the FDA’s annual facility fee means the company’s generic drugs are no longer considered FDA-approved and cannot be marketed.

While these fees are intended to fund the FDA’s ability to efficiently review generic drugs and ensure safety and quality, the costs of compliance—along with other factors such as market size, competition, and legal expenses—can lead some companies to discontinue products or not file applications.

This, in turn, contributes to **drug shortages**, despite the FDA’s stated goal of increasing competition through initiatives like the Drug Competition Action Plan.

Persistent Drug Unavailability

In the first quarter of **2024**, a pharmacists’ association (American Society of Health-System Pharmacists) in conjunction with the University of Utah Drug Information Service, reported a record **323** active **drug shortages**. This surpasses the previous high of 320 shortages recorded in **2014**.^{27,28}

The shortages affect a wide range of medications, including generic sterile injectables and emergency meds. Some of the critically short drugs are essential chemotherapy drugs for treating various cancers.

And with successes in combining **immune checkpoint inhibitor** drugs with chemo and radiation for certain **cancers**, significant numbers of lives may be prematurely ending.

Causes behind these shortages are multifaceted, including manufacturing and quality control issues, supply chain disruptions, and increased demand for certain medications.^{28,29}

Government agencies blame pharma companies and pharma blames incompetent regulatory oversight and vice versa.³⁰



Potential solutions by a panel of experts from Johns Hopkins University have been discussed, including increasing domestic drug manufacturing capacity, creating stockpiles of critical medications, and/or fostering public-private partnerships to ensure a more resilient supply chain.³⁰ Much of this requires more **governmental intervention, which I argue is an underlying cause of the shortages.**

I contend these shortages would not occur in a free-market environment. It is excess regulation that creates barriers that limit competition, whereby some generic drugs remain **overpriced** and in **short supply**.

Real World Solutions

The pharmaceutical industry is highly regulated by state and federal governments, creating challenges for drug approval and production.

Streamlining the FDA's approval process for generics and incentivizing domestic production could help reduce shortages and lower drug prices.

Such reforms would make it easier for manufacturers to bring affordable medications to market, especially when current regulatory hurdles contribute to delays.

How the Government is Addressing this Problem

The U.S. faces ongoing challenges with **prescription drug** shortages, affecting a wide range of critical medications.

The government's solutions are summarized below:³¹

Efforts are being made at various levels to address these issues, but resolving them will require comprehensive and coordinated actions involving policy changes, improved manufacturing practices, and enhanced supply chain management.

The U.S. Department of Health and Human Services and other agencies have proposed several policy solutions to address these shortages.

These include diversifying manufacturing sites, increasing inventories of critical medications, developing a rating system for quality management in drug production, and enhancing transparency in the drug supply chain.

There have been calls for legislative action to address the root causes of drug shortages. Recommendations include enacting laws to support domestic manufacturing of essential drugs, improving the inspection processes for drug manufacturing facilities, and creating stockpiles of critical medications.

What if instead of the above **multi-governmental** actions that may **worsen** the problem, they allow a parallel **free market** and watch **drug shortages** disappear while consumer **prices plummet**.



One proposed solution is creating a parallel system where consumers, doctors, and hospitals can access essential medications through alternative sources. For example, pharmacy chains like Walgreens and CVS could manufacture their own private-label generics, bypassing certain regulatory barriers.

Independent groups like Underwriters Laboratories (UL) could verify bioequivalence, while the FDA would still oversee quality control and safety inspections. This would give consumers the choice between expensive FDA-approved drugs and more affordable generics, especially during shortages.

Sterile injectable drugs, often in short supply, could be produced by domestic compounding pharmacies with stricter quality control but fewer regulatory burdens. These pharmacies already supply hospitals, and expanding their role could help address shortages without excessive user fees. Reducing regulatory inefficiencies and costs would improve drug availability and affordability.

For more insights into how the current regulatory system impacts healthcare and the economy, readers can access at no charge, a book I authored years ago called *Pharmocracy II* at: LifeExtension.com/pharm ■

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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Brazil Nuts

BY LAURIE MATHENA



Brazil nuts are best known for their large size, with most nuts averaging up to two inches long.

These nuts provide a variety of minerals, amino acids, dietary fiber, protein, and tocopherols. They also contain **19 grams** of fat per ounce (about six nuts), **37%** of which is from heart-healthy polyunsaturated fatty acids.¹

With a nutrient profile like this, it's hardly surprising that consuming more than **three servings** of Brazil nuts *per week* has been associated with a reduced risk of cardiovascular, cancer, and overall mortality.²

Human studies have shown that consuming **15-50 grams** of Brazil nuts per day may favorably modify lipid profiles. This is likely due to their higher levels of unsaturated fatty acids.^{3,4} However, further clinical trials are needed to confirm these benefits.

A pilot trial found that daily consumption of one Brazil nut for six months improved selenium levels, antioxidant activity, and certain cognitive functions in older adults with mild cognitive impairment. Compared to those in the control group, the people consuming Brazil nuts experienced improvements in **verbal fluency** (the ability to quickly produce words) and in **constructional praxis** (the ability to manipulate spatial patterns, as in drawing or handwriting).⁵

Eating Brazil nuts could also help combat two factors associated with obesity: inflammation and intestinal permeability.

A study found that incorporating **8 grams** of Brazil nuts (about 1-2 nuts) per day into an energy-restricted diet for eight weeks significantly reduced inflammatory markers and improved intestinal permeability in women with overweight or obesity, compared to a nut-free control group. These benefits were linked to increased selenium content of the nut.⁶

Brazil nuts are nutrient powerhouses, but it is important to eat them in moderation because of the potential for nutrient imbalances.

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- 01513 Optimized Fucoidan with Maritech® 926
- 02230 Optimized Resveratrol Elite™
- 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

- 02538 Hair Growth for Men
- 02209 Male Vascular Sexual Support
- 00455 Mega Lycopene Extract
- 02306 Men's Bladder Support
- 02515 Men's Vitality Packs
- 01789 PalmettoGuard® Saw Palmetto and Beta-Sitosterol
- 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 Lithium
- 01459 Magnesium Caps
- 01682 Magnesium (Citrate)
- 02535 Magnesium Glycinate
- 01328 Only Trace Minerals
- 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
- 02542 GABA
- 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™
- 02354 Life Extension Mix™ Capsules
- 02364 Life Extension Mix™ Capsules without Copper
- 02356 Life Extension Mix™ Powder
- 02355 Life Extension Mix™ Tablets
- 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

PET CARE

- 01932 Cat Mix
- 01931 Dog Mix

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
- 02539 FLORASSIST® Probiotic Youthful Gut

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

VITAMINS

- 01533 Ascorbyl Palmitate
- 00920 Benfotiamine with Thiamine
- 01945 BioActive Complete B-Complex
- 00102 Biotin
- 00084 Buffered Vitamin C Powder
- 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™

WEIGHT MANAGEMENT & BODY COMPOSITION

- 02479 7-Keto® DHEA Metabolite
100 mg, 60 veg capsules
- 02207 AMPK Metabolic Activator
- 02504 Body Trim and Appetite Control
- 02478 DHEA Complete
- 02506C Mediterranean Weight Management
- 01432 Optimized Saffron
- 02511 Thermo Weight Control
- 02509 Waistline Control™

WOMEN'S HEALTH

- 01942 Breast Health Formula
- 02537 Daily PMS Relief
- 02534 Estrogen Balance Elite
- 01894 Estrogen for Women
- 02541 Hair Growth for Women
- 02204 Menopause Relief
- 02319 Prenatal Advantage
- 02536 Sexual Health for Her
- 01649 Soy Isoflavones
- 02513 Women's Bladder Support

PROMOTE DIGESTIVE HEALTH

FLORASSIST® Daily Bowel REGULARITY

"Whenever I have a problem, this works to get things back on track."

Wendy

VERIFIED CUSTOMER
REVIEW

Discovered in New Zealand yogurt, this unique **probiotic** formula contains **17.2 billion CFU[†]** of ***Bifidobacterium lactis* HN019**.

This probiotic has been **clinically studied** to help maintain a healthy **colonic transit time**, **combat occasional constipation**, and **support bowel regularity**.¹

One capsule daily of **FLORASSIST® Daily Bowel Regularity** formula can help promote healthy, daily movement through the **colon**.



GLUTEN
FREE

1
DAILY

NON
GMO
LE CERTIFIED

Item #02421

30 vegetarian capsules

1 bottle **\$19.50**

4 bottles \$18 each

For full product description and to order **FLORASSIST® Probiotic Daily Bowel Regularity**, call **1-800-544-4440** or visit **www.LifeExtension.com**

Reference 1. Scand J Gastroenterol. 2011;46:1057-64.

† Colony Forming Units at time of manufacture.

RE-ENERGIZE

HEART AND BRAIN CELLS

Three Choices
of Superior
Ubiquinol CoQ10

"I have been taking it
for many years
and would not stop."

Alicia

VERIFIED CUSTOMER
REVIEW



100 mg CoQ10

Item #01426 • 100 mg, 60 softgels

1 bottle \$42

4 bottles \$37.50 each



200 mg CoQ10

Item #01431 • 200 mg, 30 softgels

1 bottle \$39

4 bottles \$35 each



100 mg CoQ10 + 10 mg PQQ

Item #01733 • 100 mg, 30 softgels

1 bottle \$33.75

4 bottles \$29 each



#1 Rated

CoQ10 Products | 6 Time Winner!

For full product description and to order **Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™**, or **Super Ubiquinol CoQ10 with PQQ**, call 1-800-544-4440 or visit www.LifeExtension.com

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* Ratings based on results of the 2024 ConsumerLab.com Survey of Supplement Users.

More information at www.consumerlab.com/survey.



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7 DELAYED CANCER RESEARCH

Life-threatening **drug shortages** are impeding cancer research.



20 REMOVE AGED CELLS

Aged, dysfunctional **cells** *accelerate* degenerative processes. Plant-based **senolytic** compounds can help the body *remove* these toxic cells.



32 FEMALE HAIR LOSS

Two **plant extracts** may help *resolve* **hair loss** and *restore* **hair growth**. In clinical trials, one extract *decreased* **hair loss** by **48%** while the second *reduced* **hair shedding** by **34%**.



44 CARDIOVASCULAR EFFECTS OF TAURINE

In clinical studies, **taurine** *improved* heart function, lowered blood pressure and reduced atherogenic lipids.



57 WHAT IS MAQUI BERRY?

Maqui berries are shown to *relieve* **dry eyes** and *reduce* **blood sugar** levels.



66 DRUG SHORTAGES

Persistent prescription drug shortages in the United States are adversely affecting patients today.

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