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NUTRIENT OF THE YEAR: LITHIUM
Get The Maximum Potency From Your Multi-Vitamin!

Life Extension®’s Two-Per-Day formulas are the highest potency multivitamins. Compared to Centrum® Silver® Adults 50+, Two-Per-Day provides:

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- 25 times the vitamin B6
- 12 times the vitamin B12
- 10 times the biotin
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- 2 times the vitamin D
- 2 times the vitamin E
- 2 times the zinc

Life Extension®’s Two-Per-Day contains superior forms of nutrients such as 5-MTHF that is almost 7 times more bioavailable than folic acid. These bio-active nutrients provide the body with greater biological activity, which is especially important as people age.

Two-Per-Day Capsules
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- 4 bottles $15.50 each

For full product description and to order Two-Per-Day Capsules or Tablets, call 1-800-544-4440 or visit LifeExtension.com

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A broad-spectrum of probiotics combined with bacteria-killing phages reduce harmful gut microbes. This allows beneficial bacteria to flourish for healthier digestion and immunity.

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7 AS WE SEE IT: RESURGENCE OF DIABETIC COMPLICATIONS
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High in anthocyanins and fiber, black beans attenuate blood sugar spikes and provide anticancer effects.
VITAMIN D3
Systemic support for youthful cell function, bone health, and normal insulin and blood-sugar levels.

Item #01713 • 5,000 IU • 60 softgels
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For full product description and to order Vitamin D3, call 1-800-544-4440 or visit www.LifeExtension.com

CAUTION: Individuals consuming more than 50 mcg (2000 IU) 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.

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.
Gustavo Tovar Baez, MD, operates the Life Extension Clinic in Caracas, Venezuela. He is the first physician in Caracas to specialize in anti-aging medicine.

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Thomas F. Crais, MD, FACS, a board-certified plastic surgeon, was medical director of the microsurgical research and training lab at Southern Baptist Hospital in New Orleans, LA, and currently practices in Sun Valley, ID.

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Sergey A. Dzugan, MD, PhD, was formerly chief of cardiovascular surgery at the Donetsk Regional Medical Center in Donetsk, Ukraine. Dr. Dzugan’s current primary interests are anti-aging and biological therapy for cancer, cholesterol, and hormonal disorders.

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Örn Adalsteinsson, PhD, is chairman of the Life Extension® Scientific Advisory board. He holds a master’s and doctorate from the Massachusetts Institute of Technology (MIT). He has specialized in human therapeutics including vaccines, monoclonal antibodies, product development, nutraceuticals, formulations, artificial intelligence, hormones, and nutritional supplementation. He has also authored articles and contributed to peer-reviewed publications and served as an editor for the Journal of Medicinal Food.

Richard Black, DO, is a dedicated nuclear medicine physician practicing as an independent contractor out of Cleveland, Ohio. Dr. Black is board certified in internal medicine and nuclear medicine, and is licensed to practice medicine in multiple states throughout the United States.

John Boik, PhD, is the author of two books on cancer therapy, Cancer and Natural Medicine (1996) and Natural Compounds in Cancer Therapy (2001). He earned his doctorate at the University of Texas Graduate School of Biomedical Sciences with research at the MD Anderson Cancer Center, focusing on screening models to identify promising new anti-cancer drugs. He conducted his postdoctoral training at Stanford University’s Department of Statistics.

Aubrey de Grey, PhD, is a biomedical gerontologist and Editor-in-Chief of Rejuvenation Research, the world’s highest-impact, peer-reviewed journal focused on intervention in aging. He received his BA and PhD from the University of Cambridge in 1985 and 2000 respectively. Dr. de Grey is a Fellow of both the Gerontological Society of America and the American Aging Association and sits on the editorial and scientific advisory boards of numerous journals and organizations.

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Steven B. Harris, MD, is president and director of research at Critical Care Research, a company that grew out of 21st Century Medicine in Rancho Cucamonga, CA. Dr. Harris participates in groundbreaking hyperthermia, cryothermia, and ischemia research. His research interests include antioxidant and dietary-restriction effects in animals and humans.

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Dipnparee Maharaj MD, MB, ChB, FRCP (Glasgow), FRCP (Edinburgh), FRCPath., FACP is the Medical Director of the South Florida Bone Marrow Stem Cell Transplant Institute and is regarded as one of the world’s foremost experts on adult stem cells. He received his medical degree in 1978 from the University of Glasgow Medical School, Scotland. He completed his internship and residency in Internal Medicine and Hematology at the University’s Royal Infirmary.

L. Ray Matthews, MD, FACS, is a professor of surgery and director of Surgical Critical Care at Morehouse School of Medicine in Atlanta, GA, and a trauma and critical care surgeon at Grady Memorial Hospital. He has published widely and is known as one of the top vitamin D experts. Dr. Matthews has spoken before the U.S. Food and Drug Administration several times, presenting a recent update about clinical research on vitamin D.

Ralph W. Moss, PhD, is the author of books such as Antioxidants Against Cancer, Cancer Therapy, Questioning Chemotherapy, and The Cancer Industry, as well as the award-winning PBS documentary The Cancer War. Dr. Moss has independently evaluated the claims of various cancer treatments and currently directs The Moss Reports, an updated library of detailed reports on more than 200 varieties of cancer diagnoses.

Michael D. Ozner, MD, FACC, FAHA, is a board-certified cardiologist who specializes in cardiovascular disease prevention. He serves as medical director for the Cardiovascular Prevention Institute of South Florida and is a noted national speaker on heart disease prevention. Dr. Ozner is also author of The Great American Heart Hoax, The Complete Mediterranean Diet and Heart Attack Proof. For more information visit www.drozner.com.

Jonathan V. Wright, MD, is medical director of the Tahoma Clinic in Tukwila, WA. He received his MD from the University of Michigan and has taught natural biochemical medical treatments since 1983. Dr. Wright pioneered the use of bioidentical estrogens and DHEA in daily medical practice. He has authored or co-authored 14 books, selling more than 1.5 million copies.

Xiaoxi Wei, PhD, is a chemist, expert in supramolecular assembly and development of synthetic transmembrane nanopores with distinguished selectivity via biomimetic nanoscience. She has expertise in ion channel function and characterization. She founded X-Therma Inc., a company developing a radical new highway towards non-toxic, hyper-effective antifreeze agents to fight unwanted ice formation in regenerative medicine and reduce mechanical icing.
In addition to purified fish oil, Super Omega-3 provides olive oil polyphenols and sesame lignans to extend the stability of DHA in the blood.

CAUTION: If you are taking anti-coagulant or anti-platelet medications, or have a bleeding disorder, consult your healthcare provider before taking this product.

For full product description and to order Super Omega-3, Enteric Coated Super Omega-3, or Super Omega-3 Plus, call 1-800-544-4440 or visit www.LifeExtension.com

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
This uptick in diabetic disorders has begun to reverse decades of hard-won improvements as follows:

1. **Lower-extremity amputations** are soaring;

2. **Emergency room visits** caused by hyperglycemic (high blood sugar) crisis have almost doubled;

3. **Hospitalizations** due to hyperglycemic crisis increased by 73%;

4. **Deaths** due to hyperglycemic crisis increased by 55%.

Long-term improvements in Americans aged 18-64 for end-stage kidney failure, heart attack, and hospitalization for stroke, stalled after 2010. None of this should surprise readers of *Life Extension*® magazine. We long ago predicted an epidemic of sugar-related diseases caused by factors that are finally being recognized by the medical establishment.

This editorial describes what’s behind the upsurge in diabetic complications and how to protect yourself.
Those afflicted with type II diabetes are frequently overweight or obese, and typically do not obtain adequate levels of physical activity. This results in insulin resistance, a hallmark characteristic of type II diabetes.

Insulin resistance occurs when cells in muscle, the liver, and other parts of the body do not respond appropriately to insulin.

As a compensatory mechanism, the body increases the secretion of insulin from the pancreas, resulting in higher insulin blood levels.

But resistance to insulin means too much blood sugar remains in circulation. This leads to damage inflicted by high blood glucose levels, by after-meal glucose spikes, and by high insulin levels.

Microvascular diabetic complications develop as a result of years of poor glycemic control. This means that even before type II diabetes is clinically diagnosed, silent damage can result in loss of vision, kidney damage, and painful nerve disease (neuropathy).

There is little mystery behind the spiraling epidemic of diabetic complications.

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**Sky-High Obesity Prevalence**

A staggering 42% of Americans are obese and nearly 32% are overweight.6,7

Less than 30% of Americans are at a healthy weight. The new “normal” for Americans is overweight or obese.

Excess body weight and inadequate physical activity are associated with higher blood pressure, elevated lipids, and increased levels of chronic inflammation.

As the maps on page 9 depict, there is direct correlation between excess body mass and type II diabetes prevalence.

There is typically a lag between deteriorating glycemic control linked with excess body weight (and inadequate physical activity) and full-blown type II diabetes.

Yet during this prediabetic period, damage to the eyes, kidneys, and nerves begins.

What makes this regrettable is that poor glucose control, increasing blood lipids, and inflammation can be detected early with simple blood tests.

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**Stagnation in Preventive Care**

A viewpoint article published in the *Journal of the American Medical Association* (JAMA) identified several factors contributing to surging increases in diabetes-related complications.2

In addition to high body mass and failure to control blood lipids and blood pressure, the JAMA authors believe there may be stagnation in overall preventive care, most prominently in young adults.

This eye-opening JAMA viewpoint states:

“After encouraging reductions in hemoglobin A1c levels among patients with diabetes through most of the 2000s, the proportion meeting individualized HbA1c targets declined...”2

This translates into fewer Americans achieving targeted glycemic control blood levels.

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**High “Normal” Glucose**

Hemoglobin A1c is a blood test that measures long-term glucose control. To reduce risk of diabetic complications, optimal glycemic control is critical.

For younger patients with type II diabetes, more stringent glucose control can help reduce diabetes-related microvascular damage.

In addition, some observational data suggest that blood markers (glucose and hemoglobin A1c) in high “normal” ranges are associated with an increased risk for heart attack8-17 and some types of cancer.18-24
Age-Adjusted Prevalence of Obesity and Diagnosed Diabetes Among U.S. Adults

These maps reveal striking increases in obesity (BMI ≥30 kg/m²) and diabetes that occurred between 1994 and 2015. This is not mere correlation but reflective of the causative impact of excess body weight on one’s ability to maintain optimal (lower reference range) fasting insulin and glucose blood levels.

The material is available on the agency website at no charge.

Reference to specific commercial products, manufacturers, companies, or trademarks does not constitute its endorsement or recommendation by the U.S. Government, Department of Health and Human Services, or Centers for Disease Control and Prevention.

Content source:
Centers for Disease Control and Prevention.

For older patients, frail patients, and those with type 1 diabetes, lower blood sugar targets must be balanced with the risk of hypoglycemia (low blood sugar).

**Unpredictable Health Care Coverage**

The *JAMA* Viewpoint authors describe how uncertainties related to health insurance coverage are causing diabetic complications to increase, especially in younger and lower-income groups.² Even those with employer-paid insurance plans face higher deductibles that translate into potentially lethal delays in treating and pursuing preventive care in diabetic patients.

The *JAMA* authors express concern about the continually increasing price of insulin and other anti-diabetic drugs. These high drug prices lead some people to cut back on treatment.

The authors mentioned that perhaps most concerning are the social and economic factors behind the increase in middle-age mortality that may have preventable causes—including the complications of diabetes.

**What’s Behind the Resurgence?**

Most of you remember a time when deciding whether to visit a doctor was not a major financial issue.

You may also recall being able to afford the prescribed diagnostic and medication.

As this nation suffocates under greater regulatory burdens, the cost of medical care is increasingly being borne by consumers who cannot afford it.

The tragic result is that gains made decades ago in protecting against diabetic complications have been thrown into reverse.

As more Americans develop diabetic disorders, the burden on today’s healthcare system worsens, and costs continue spiraling out of control.

I warned decades ago that this medical fiasco was imminent, in

books, articles, and national media appearances. What I predicted is now recognized by mainstream publications like the *Journal of the American Medical Association*.

What’s particularly scary is that *JAMA* is only identifying a resurgence in complications among diagnosed diabetics.

It fails to mention that anyone with less-than-optimal glucose control is also at higher risk for blood-sugar-related disorders.

**Free-Market Solutions**

The cornerstone of a diabetes prevention or management program is frequent blood testing.

You need to know your glucose, fasting insulin and hemoglobin A1c levels.

With appointment delays, crowded waiting rooms, and high costs, it is challenging even for financially well-off individuals to get real-time updates on their underlying state of glucose control.
We at Life Extension® resolved part of the problem 24 years ago by offering comprehensive blood tests direct to consumers at low cost with convenient walk-in blood-draw stations in most regions.

If a blood test reveals higher-than-optimal ranges for a diabetic or metabolic marker (like C-reactive protein or dangerous lipids), retests for these specific markers can be done at affordable prices soon after corrective interventions (such as diet, nutrient, drug, behavior, and lifestyle modifications) are initiated.

Annual Lab Test Sale

The most popular blood tests utilized by our readers are the Male and Female Panels.

These comprehensive panels provide insight into one’s underlying state of health and provide a road map to better disease prevention.

Just once a year we discount the Male or Female Panel down to $224.

Commercial labs charge over $2,000 for these tests and do not provide follow-up answers to questions one might have about the results.

This year we add a magnesium test to the Male and Female Blood Panels to enable better individualized dosing of this vital nutrient.

To order the comprehensive panels described on the next page, call 1-800-208-3444 (24 hours) or log on to: www.LifeExtension.com/blood

For longer life,

William Faloon, Co-Founder
Life Extension Buyers Club

References

Comprehensive Blood Tests at **Low Lab Sale Prices**

The Male and Female Panels provide more individual tests compared to their launch over 20 years ago. Yet the price is far below what commercial labs charge.

Last year we added fasting insulin to help detect glucose control issues before outward disease manifests. Excess fasting insulin can temporarily suppress blood glucose and obscure a smoldering problem that can silently damage tissues.

In 2018, we added apolipoprotein B to better assess the artery-clogging risk of circulating blood lipids like LDL. This year we’ve added a magnesium serum test to help optimize dosing of this vital mineral.

Commercial labs charge over $2,000 for the tests included in the Male and Female Panels.

### MALE PANEL

**METABOLIC PROFILE**

- Glucose
- Insulin
- Hemoglobin A1c
- Serum Magnesium

**Kidney function tests:** creatinine, BUN, uric acid, BUN/creatinine ratio

**Liver function tests:** AST, ALT, LDH, GGT, bilirubin, alkaline phosphatase

**Blood minerals:** calcium, potassium, phosphorus, sodium, chloride, iron

**Blood proteins:** albumin, globulin, total protein, albumin/globulin ratio

**CARDIAC MARKERS**

- Apolipoprotein B (ApoB)
- Homocysteine
- C-Reactive Protein (high sensitivity)

**LIPID PROFILE**

- Total Cholesterol
- LDL (low-density lipoprotein)
- HDL (high-density lipoprotein)
- Triglycerides

**COMPLETE BLOOD COUNT (CBC)**

- Red Blood Cell count including: hemoglobin, hematocrit, MCV, MCH, MCHC, RDW
- White Blood Cell count including: lymphocytes, monocytes, eosinophils, neutrophils, basophils
- Platelet count

**CANCER MARKER**

- PSA (Prostate Specific Antigen)

**HORMONES**

- Free and Total Testosterone
- DHEA-S
- Estradiol (an estrogen)
- TSH (thyroid function)
- Vitamin D

### FEMALE PANEL

**METABOLIC PROFILE**

- Glucose
- Insulin
- Hemoglobin A1c
- Serum Magnesium

**Kidney function tests:** creatinine, BUN, uric acid, BUN/creatinine ratio

**Liver function tests:** AST, ALT, LDH, GGT, bilirubin, alkaline phosphatase

**Blood minerals:** calcium, potassium, phosphorus, sodium, chloride, iron

**Blood proteins:** albumin, globulin, total protein, albumin/globulin ratio

**CARDIAC MARKERS**

- Apolipoprotein B (ApoB)
- Homocysteine
- C-Reactive Protein (high sensitivity)

**LIPID PROFILE**

- Total Cholesterol
- LDL (low-density lipoprotein)
- HDL (high-density lipoprotein)
- Triglycerides

**COMPLETE BLOOD COUNT (CBC)**

- Red Blood Cell count including: hemoglobin, hematocrit, MCV, MCH, MCHC, RDW
- White Blood Cell count including: lymphocytes, monocytes, eosinophils, neutrophils, basophils
- Platelet count

**HORMONES**

- Progesterone
- Estradiol (an estrogen)
- Free and Total Testosterone
- DHEA-S
- TSH (thyroid function)
- Vitamin D

**LAB TEST SALE • MARCH 23 - JULY 3, 2020.**

Regular price: **$299**  
Sale Price: **$224**

To obtain these comprehensive Male or Female Panels at these low prices, call **1-800-208-3444** or log on to **www.LifeExtension.com/blood** to order your requisition forms.

After you order and receive our form, you can visit a blood-draw facility we suggest at your convenience in your area or the **Life Extension Nutrition Center** in Ft. Lauderdale.

Lab tests are available in the continental United States and Anchorage, AK, only. Not available in Maryland. Restrictions apply in MA, NY, NJ, and RI. Kits not available in PA.
Arterial Protect can help stabilize endothelial plaque and promote healthy blood flow throughout the body.*

Just one capsule a day provides the patented French Maritime pine bark extract used in clinical studies along with Gotu Kola.

Item #02004 • 30 vegetarian capsules
1 bottle $33
4 bottles $29 each

Reference

Pycnogenol® and Centelicum® are registered trademarks of Horphag Research and the use of this product is protected by international patents.
Ashwagandha Improves Sleep Quality

A double-blind, randomized, placebo-controlled study found that individuals with insomnia who received an extract of the herb ashwagandha had better sleep and less anxiety (which can affect sleep) in comparison with a placebo group, reported the journal Cureus.*

Participants included 60 people with insomnia who received either 300 mg of ashwagandha root extract or a placebo twice daily for 10 weeks. Sleep actigraphy devices worn during the trial monitored periods of rest and activity, and provided data concerning sleep onset latency, total sleep time, waking after sleep onset and sleep efficiency. Subjects were evaluated for other aspects of sleep as well as anxiety, at the beginning of the study and at five and 10 weeks.

At the end of the study, sleep onset latency was less among participants who received ashwagandha in comparison with the placebo group. Sleep efficiency, sleep quality and other aspects of sleep also improved more in the ashwagandha group.

Editor’s Note: “Available conventional therapies of insomnia are known to develop drug dependency and exert side effects. Ashwagandha extract, a natural compound with sleep-inducing potential, is well tolerated and improves sleep quality and sleep onset latency in patients with insomnia,” the authors concluded.

* Cureus. 2019 Sep; 11(9): e5797.
Breast Cancer Risk Reduced in Women Over 50 who Lose Weight and Keep it Off

A study published in *JNCI: Journal of the National Cancer Institute*, found that overweight and obese women over the age of 50, who had a sustained weight loss, had a lower risk of breast cancer, compared to those whose weight remained stable.* It has been known for some time that excess body weight raises the risk of breast cancer.

The large study included over 180,000 subjects from the Pooling Project of Prospective Studies of Diet and Cancer, whose weight was assessed three times in about 10 years. Researchers from the American Cancer Society, the Harvard T.H. Chan School of Public Health, and others, found that women who lost about 4.4 lbs. to 10 lbs. had a 13% lower risk, women who lost 10 lbs. to 20 lbs. had a 16% lower risk, and those who lost 20 lbs. or more had a 26% lower risk.

Additionally, women who lost weight, and then gained some of it back, also had a reduced risk of breast cancer compared to women whose weight remained stable. “Our results suggest that even a modest amount of sustained weight loss is associated with lower breast cancer risk for women over 50,” said the lead author of the study, Dr. Lauren Teras.

**Editor’s Note:** “These findings may be a strong motivator for the two-thirds of American women who are overweight to lose some of that weight,” Dr. Teras said.

Three-Day Treatment Decreases Senolytic Cells in Humans

*EBioMedicine* published a preliminary report from an ongoing clinical trial involving individuals with diabetic kidney disease who experienced a decrease in senescent cell burden following brief treatment with quercetin and the drug dasatinib. *

Senescent cells are aged, damaged cells that, rather than self-destructing, survive to increase inflammation and death in nonsenescent cells.

While dasatinib plus quercetin have been the subject of experimental research that demonstrated their anti-senolytic effect, little clinical research has been conducted.

In young mice and in humans, increased senescent cell abundance has been found in fat tissue in obesity-related conditions such as metabolic dysfunction and chronic kidney disease. For the current trial, nine participants with diabetic kidney disease received 100 mg of dasatinib and 1,000 mg of quercetin daily for three days. Eleven days later, participants exhibited a reduction in senescent cell markers and adipose tissue macrophages (white blood cells that are attracted to and activated by senescent cells) in fat tissue.

*Editor’s Note:* Skin markers of senescent cells and circulating senescent-associated secretory phenotype factors were also reduced, the authors reported.

Zinc Can Help Fight Bacterial Infections, Animal Study Shows

Research reported in PLoS Pathogens explored zinc’s ability to fight bacterial infections. *

A group of mice were provided with diets that resulted in a 70% lower level of serum zinc than that of another group given standard lab chow. The animals were then exposed to Streptococcus pneumoniae, that causes pneumonia.

Thirty-six hours after exposure, animals that received zinc-restricted diets had a greater bacterial burden in various areas of the body than those given adequate zinc. Elemental bioimaging of the lungs showed lower zinc concentrations in and migration of zinc to specific regions of the lungs of both groups upon infection. “These data show that zinc co-localizes with the invading pathogen in murine [rodent] lungs,” the authors stated.

It was determined that phagocytes, immune cells that ingest harmful foreign particles (including bacteria), accumulate zinc and utilize the mineral as a direct antimicrobial agent.

Editor’s Note: “This study reveals the link between dietary zinc intake and host resistance to bacterial pneumonia, demonstrating the antimicrobial activity of zinc in host niches against invading S. pneumoniae and in potentiating the efficacy of phagocytic cell killing of the pathogen,” the researchers concluded.

An article in Clinical Cancer Research describes an experiment designed to validate a hypothesis concerning the genesis of ovarian cancer.*

Acting on initial findings of age-associated ovarian fibrosis in mice, the researchers determined that fibrosis also occurred in the ovaries of postmenopausal women. In the course of their research, an ovary from a 69-year-old woman was found to have no fibrosis. The woman had been using the drug metformin.

The researchers hypothesized that ovarian fibrosis is caused by damage resulting from inflammation associated with ovulation. Giving mice a drug that prevents ovulation resulted in failure of the animals’ ovaries to become fibrotic during aging.

Subsequent examination of 27 ovaries removed from young and old women revealed no fibrosis among five that had been removed from postmenopausal women who used metformin. The findings suggest that metformin could help prevent ovarian cancer among those at risk.

Editor’s Note: “These data support a novel hypothesis that unifies the primary non-hereditary ovarian risk factors through the development of ovarian fibrosis and the formation of a pre-metastatic niche and suggests a potential use for metformin in ovarian cancer prophylaxis,” the authors concluded.

* Clin Cancer Res. 2020 Feb 1;26(3):632-642.
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Curcumin Elite™ utilizes a new patented turmeric extract that results in 45 times greater bioavailability of active or free curcuminoids and 270 times better total curcuminoid absorption compared to standard curcumin.

Curcumin Elite™ contributes to higher blood levels of bio-active curcuminoids that stay in the body longer to provide more health benefits.

Advanced Curcumin Elite™ contains the same optimal 500 mg potency of curcumin with the added benefits of ginger and additional turmeric actives.

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N-Acetyl-L-Cysteine supports healthy levels of glutathione, a molecule utilized by all cells for protection against free-radical damage and attacks from foreign compounds.

CAUTION: Those who supplement with NAC should drink 6 to 8 glasses of water daily in order to prevent cysteine renal stones. Cysteine renal stones are rare but do occur.

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Senescent cells are old cells that no longer function optimally. Senescent cells emit factors that accelerate aging.

Senolytic compounds selectively help target senescent cells in the body. Laboratory studies show evidence of systemic rejuvenation when the senescent cell burden is reduced.

Once-Weekly Senolytic Formula

Senolytic Activator provides a highly absorbable form of quercetin phytosome and black tea theaflavins designed to enhance the body’s ability to manage senescent cells.

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Ashwagandha supports the regeneration of axons and dendrites, nerve cell components that support brain and nervous system function.

Item #00888 • 60 vegetarian capsules

1 bottle $7.50

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Sensoril® is protected under US Patent Nos 6,153,198 and 6,713,092 and is a registered trademark of Natreon, Inc.

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Dietary Supplement of Year 2020

Lithium

Melting point (°C): 180.54
Boiling point (°C): 1347
Most years do not uncover a nutrient with so much longevity potential that it deserves a special award.

My enthusiasm about a nutrient that deserves a trophy extends beyond the scientific data. I also consider the consumer affordability factor.

Melatonin was my previous favorite. We introduced melatonin in 1992 and had a monopoly for a while. Yet we charged only $8 for a two-month supply.

This garnered us nationwide media coverage after the New York Academy of Sciences validated melatonin’s ability to improve immunity and its affordability was recognized.

Accumulated data have uncovered a nutrient that costs less than melatonin and may provide greater overall benefits.
**Prevent Cognitive Decline and Extend Longevity**

In the July 2020 issue of *Life Extension®* magazine, you’ll read how modest-dose lithium may protect against age-related disorders and extend healthy lifespan.

This information is too important to delay. I therefore summarize here what lithium has been shown to do:1-13

1. **Humans** in areas with higher lithium in drinking water live longer;

2. Long term, lithium may help maintain longer telomeres;

3. **Lithium** has been shown to regulate genes related to healthy DNA structure;

4. Lithium appears to slow the rate of brain aging;

5. People with higher lithium intake show improved mood;

6. **GSK-3** is an enzyme that plays a powerful role in regulating metabolism. Dysfunctional GSK-3 activity raises the risk of many chronic diseases of older age including Alzheimer’s, type II diabetes, mood disorders, cancer, and others. Lithium has been shown to inhibit overactivity of GSK-3;

7. By itself, lithium extended fruit fly lifespan by an average of 11%; and

8. Combined with two other compounds, lithium extended fruit fly lifespan by an average of 48%.

---

**Rapamycin**¹ + **Senolytic**² + **Lithium**³

= Fruit Fly Lifespan Extension by **48%**

1. Rapamycin benefits can partially occur when AMPK is activated.
2. Health-conscious people today are utilizing senolytics.
3. Scientists are seeking optimal dose for human lifespan extension.

A triple drug combination targeting components of the nutrient-sensing network maximizes longevity.10
What I Discovered During Live Presentations

In my live presentations, I urge audiences to initiate supplementation with about 1,000 mcg of lithium a day. The response from those in the audience who try, on the spot, to order it using their cell phones is that no one offers this lithium dose.

This motivated me to investigate. I was pleased to find that lithium’s low-cost make it consumer friendly analogous to melatonin in 1992.

Its game-changing longevity potential, along with it’s affordability causes me to nominate LITHIUM as the 2020 nutrient of the year.

Those seeking the benefits discovered about lithium may want to add about 1,000 mcg each day to their supplement program.

The three slides in this article are from Power Point presentations I give to live audiences, suggesting that they supplement with lithium, which up until now, no one seemed to offer in what may be an ideal potency.

If you have any questions on the scientific content of this article, please call a Life Extension® Wellness Specialist at 1-866-864-3027.
“Previous studies in fruit flies have achieved lifespan extensions of about 5-20%...so we found it was quite remarkable that this drug combination enabled them to live 48% longer.”

Combined Interventions Are More Effective than Single Agent Therapy

References

• With age, our bifidobacteria levels decline to as little as 5%, creating gut imbalance.¹

• Increasing bifidobacteria levels enhances digestion and carbohydrate metabolism.

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

• 1,000 mg of XOS (xylooligosaccharides) per prebiotic chewable.

References

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

PreticX™ is a trademark of AIDP, Inc.
Natural killer cell activity declines with normal aging, which can affect immune function.

**NK Cell Activator™** supports healthy natural killer cell activity to promote a robust immune response.¹³

Functional NK cells also recognize and eliminate senescent cells that accumulate in aged tissues.

The standardized plant extract in **NK Cell Activator™** supports the activity of natural killer (NK) cells.

**Clinical Studies**

In one clinical study, scientists documented a 3-fold increase of natural killer cell activity in healthy individuals within three to four weeks of receiving 500 mg daily of the rice bran compound found in **NK Cell Activator™**.

In another double-blind, randomized, placebo-controlled study, researchers noted that subjects taking the rice-bran compound found in **NK Cell Activator™** experienced a boost in myeloid dendritic cells—cells that act as key messengers between the innate and the adaptive immune systems.⁴

The suggested single serving of one vegetarian tablet of **NK Cell Activator™** provides:

<table>
<thead>
<tr>
<th>Proprietary Enzymatically Modified Rice Bran</th>
<th>500 mg</th>
</tr>
</thead>
</table>

Contains wheat.

**References**


For full product description and to order **NK Cell Activator™**, call 1-800-544-4440 or visit www.LifeExtension.com
In areas where lithium is naturally abundant in the drinking water, people tend to live longer, healthier lives.1-3

Lithium is a low-cost mineral that supports cognition, cell DNA, and healthy aging.3-5

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References

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Probiotic-Phage Blend Fights Digestive Problems and Boosts Immune Defenses

Gas. Bloating. Stomach pain. Diarrhea. As many as 74% of Americans suffer from these and similar digestive problems.¹

Up to 15% of U.S. adults live with chronic irritable bowel syndrome.²

An underlying cause of many of these conditions is an imbalance of good to bad bacteria in our gut.³-⁵

Health-conscious people know the value of taking a quality probiotic. These health-promoting bacteria help rebalance the gut microbiota.

Now there is a way to make probiotics even more powerful and more effective.

Research shows that when 7 specific probiotics and 4 types of bacteriophages are used in combination, harmful bacteria are reduced, allowing beneficial bacteria to grow to as many as thousands of times their baseline rate.⁶,⁷

Bacteriophages are tiny packages of DNA or RNA wrapped in protein that seek out and selectively eliminate only harmful bacteria.⁸ This encourages healthy bacteria to rapidly multiply and thrive.

Combining probiotics and bacteriophages in a protective dual-encapsulation format provides an innovative solution for digestive and overall systemic health.
The Importance of a Healthy Microbiome

The gut microbiota—the trillions of microorganisms in the gastrointestinal tract—play a critical role in health and disease.

The balance of good to bad bacteria can be disrupted by age, medication, stress, or a diet heavy in processed carbohydrates, meats, fats, preservatives, and other additives.

Antibiotic overuse also wreaks havoc on the gut microbiota, killing both bad and healthy bacteria.

An imbalance in the ratio of good to bad bacteria can trigger the development of digestive problems like gas, diarrhea, bloating, and stomach pain.

It can also lead to irritable bowel syndrome, a chronic condition causing these and other symptoms, including cramping and constipation.

The solution is to shift your gut microbiota toward a healthy balance, which can resolve digestive issues and improve overall health.

Giving Probiotics a Boost

Oral probiotics have proven an effective way to increase levels of beneficial bacteria.

But they can have difficulty competing with the more aggressive, harmful microbes in the gut.

Scientists have found a way to give probiotics a huge advantage: combining the probiotics with a technique known as phage therapy.

This approach uses bacteriophages, or phages for short, to selectively reduce only harmful bacteria. That clears the way for beneficial probiotic organisms to flourish and more fully restore the microbiome to a healthy, balanced state. What exactly are bacteriophages? They’re submicroscopic packages of DNA or RNA enclosed in a protein envelope. Each one is chosen for its targeted ability to attach to a particular strain of unwanted bacteria (like E. Coli) in the intestines.

The Origins of Phage Therapy

Phage therapy has a long history. Scientists pioneered the use of bacteriophages in Eastern Europe before World War I.

By the 1940s, corporations such as Eli Lilly and L’Oréal had developed bacteriophage “cocktails” as a highly effective treatment for infections.

The development of powerful antibiotics soon pushed this approach into the background.

But antibiotics eliminate both harmful and healthy bacteria, leaving us vulnerable to attack by other organisms. Bacteriophages eliminate only detrimental bacteria.

Recognizing bacteriophages’ targeted activity, the food industry now uses them to reduce dangerous bacteria, from Listeria to E. coli to Salmonella.

Taken orally, phages provide protection both in the large intestine, where bacterial imbalance occurs, and in the small intestine, where bacterial overgrowth can occur. They are effective in small doses and work within hours.

By combining probiotics and phage therapy, scientists have documented an exponential increase in beneficial bacteria and a similar decrease in harmful bacteria.

Cell-Based Studies

Researchers demonstrated the effectiveness of a specific mix of four bacteriophages in studies using E. coli bacteria.

E. coli (Escherichia coli) can cause diarrhea, urinary tract infections, pneumonia, and other illnesses, and crowd out beneficial organisms.
The researchers cultured healthy *Bifidobacterium longum* in two Petri dishes along with *E. coli*. A bacteriophage mixture was added to just one dish.6

Five hours later, there was little growth of *B. longum* in the dish without bacteriophages. This health-promoting strain (*B. longum*) could not compete with *E. coli*.6 But in the dish also containing bacteriophages, *B. longum* colonies rocketed to more than 7,000 times the numbers compared to those in the untreated (without phages) dish.6

The bacteriophages had selectively targeted and eliminated *E. coli*, making room for the beneficial *B. longum* bacteria to multiply.

Scientists conducted the same experiment using beneficial *Lactobacillus acidophilus* instead of *B. longum*.

Again, the *E. coli* suppressed growth of *L. acidophilus* in the untreated culture. But in the Petri dish containing bacteriophages, *L. acidophilus* colony counts were 20-fold higher than in the other culture.6

The beneficial *Bifidobacterium bifidum* bacteria combined with bacteriophages also showed impressive results.6

To further validate these findings, scientists moved on to laboratory animals.

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**WHAT YOU NEED TO KNOW**

**Upgrade Probiotics with Bacteriophages**

- An imbalance in our gut bacteria is a cause of digestive problems like bloating, gas, and diarrhea.
- Taking probiotics, beneficial bacteria, can fix that imbalance and dramatically ease gastrointestinal distress.
- Scientists have developed a way to make probiotics far more effective: combining them with bacteriophages, packages of DNA or RNA wrapped in protein.
- These “phages” selectively target and eliminate only undesirable bacteria while encouraging beneficial probiotic organisms to flourish.
- Researchers have now identified seven specific probiotic strains that improve digestive health and increase their populations by an average of 30 times when taken with a unique four-bacteriophage blend.
- Scientists have combined these seven strains and the phage blend in a dual-encapsulation form that ensures they survive the harsh stomach environment and populate the gut.
Animal Studies

The probiotic *B. longum* was given to a group of mice, along with a disease-causing *E. coli* strain. A second group received the same mixture plus the phage blend specifically designed to target *E. coli*.7

Just 24 hours later, the phage-treated mice had:7

- About a 10-fold decrease in *E. coli* in the small intestine,
- About a 100-fold decrease in *E. coli* in the large intestine, and
- About a 100-fold decrease in *E. coli* in fecal matter.

The phage-treated group also had:7

- About a 100-fold increase in *B. longum* in the small intestine,
- About a 100-fold increase in *B. longum* in the large intestine, and
- About a 40-fold increase in *B. longum* in fecal matter.

This translated into clear benefits: Phage-treated mice had improved digestive function with no detrimental side effects.

By contrast, mice treated only with *E. coli* and *B. longum*, without the added phages, became constipated. Intestinal segments showed swelling, redness, and leaks.7

As a result of these and other studies, scientists have begun adding **bacteriophages** to **probiotics** to make a more effective, enhanced probiotic formula.

Probiotic Strains Boosted by Phages

Recent research has identified **seven** specific **probiotic strains** that have two important benefits for digestive health:

1. Each probiotic is documented to improve an array of digestive symptoms.4,5,27-35
2. Each probiotic’s colony numbers are greatly increased when taken with a carefully developed bacteriophage mix.7

The seven strains in this probiotic blend are **enhanced by an average of 30 times** when combined with the mix of **four bacteriophages**.36

Every single one of these probiotics has been shown in studies to improve **irritable bowel syndrome**.5,27-31

Safety Profile

**Bacteriophages** are found almost everywhere—from soil, hot springs, and the ocean depths, to the animal and human body.37

They have been successfully and safely used in numerous human clinical and therapeutic settings.38-40

In fact, **phage therapy** has been used to treat infections of the gastrointestinal tract, skin, head and neck, bone, chest, and abdomen.16,38,41

And they have successfully targeted disease-causing bacteria such as *Staphylococcus*, *Streptococcus*, *E. coli*, *Salmonella*, and *Pseudomonas*.16,38,41

Evidence suggests that success rates for phage therapy may range up to 80% to 95% with either no side effects, or only mild and reversible ones.16,38,41

Together with **probiotics**, which also have a long history of safe use, they’re a powerful way to promote digestive health.
They’ve also demonstrated the ability to benefit an array of other gastrointestinal issues:

- **B. longum SP54, L. paracasei IMC502, and L. rhamnosus IMC501** provide antimicrobial effects against Candida (an infection-causing fungus), *H. pylori* (bacteria that can cause ulcers), and *E. coli*.27,32,34

- **B. lactis BLC1 and L. acidophilus LA1** relieve symptoms of ulcerative colitis (a disease that causes inflammation and ulcers in the colon)33 and ease lactose intolerance.35

- **B. breve Bbr8 and L. plantarum 14D** reduce symptoms of celiac disease, which can include diarrhea, bloating, and gas.4,5

Researchers have combined these seven specific probiotic strains with the bacteriophage blend for comprehensive gut health.

Because not all commercial probiotics reach their intended target, a dual-encapsulation format was developed.

By protecting the beneficial bacteria from stomach acids that would otherwise destroy them, this more effectively promotes healthy intestinal colonization.

**Summary**

Many digestive problems, like diarrhea, gas, and stomach pain, are caused by an imbalance in the gut microbiome.

Probiotics can correct this imbalance, improving gastrointestinal comfort and overall health.

Taking probiotics with bacteriophages, which target and eliminate only unhealthy microbes, allows beneficial bacteria to multiply at a vastly greater rate.

Scientists have identified seven specific probiotic strains that improve digestive symptoms and boost their intestinal colonies by an average of 30 times when taken with a specific blend of four bacteriophages.

A unique dual-encapsulation process protects these probiotics from stomach acids that would otherwise destroy them, enabling them to make it to the gut and thrive.

As you’ll see on the next page, probiotics have also demonstrated anti-viral properties by enhancing immune defenses.

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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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How Bacteriophages Differ from Antibiotics

**Antibiotics** are one of the 20th century’s greatest scientific discoveries.

But decades of widespread antibiotic use have created “superbugs” that are largely resistant to current antibiotics.

In severe cases, physicians desperately search for alternatives to save patients’ lives.

This has prompted excitement about bacteriophages.

Eastern European doctors were successfully neutralizing bacterial infections with phage therapy, a treatment aimed at selectively targeting and destroying harmful bacteria.

With the rise in antibiotic-resistant bacteria, phage therapy is experiencing a revival in the scientific community because of its effectiveness and safety.

Phage cocktails have been shown to effectively treat common bacterial invaders, including staph, strep, and *E. coli*.23-25

Phage therapy also encourages growth of healthy bacteria in the gut microbiome, which can further reduce harmful bacteria.
It may come as a surprise that consuming beneficial probiotic bacteria could have a beneficial effect on the respiratory tract and viral illnesses. There is a strong connection between gut flora and protection of the respiratory tract from viruses. The connection exists because both the intestinal and respiratory mucosa have similar characteristics and structures.

The mucosa is the primary site where most common viruses—including those that cause the common cold, flu, and new coronavirus—gain entry into the body. For this reason, they can be considered the “front lines” of the battle against many viral illnesses.

Ideally, the mucosa of the digestive and respiratory tracts is protected from infection by a number of reinforcements. Collectively known as the mucosal defense system, these help to keep potentially harmful viruses and bacteria at bay while allowing healthy probiotics to thrive.

Unfortunately, these defense systems are not always in top form and cannot prevent all infectious illnesses. This is particularly true with advancing age, when mucosal immunosenescence leads to waning mucosal defenses, making viral illnesses more likely and potentially more dangerous. Other chronic diseases that weaken immune defenses can further compound the problem. Fortunately, we can do something about it.

Research has revealed that probiotics stimulate and boost mucosal defenses, both for the gastrointestinal and respiratory systems. While many of the probiotic organisms consumed may end up in the gut, some colonize parts of the respiratory tract as well. The mucosal defense systems get activated by these healthy organisms, guarding against real threats, including viruses.

In addition, healthy bacteria in probiotic foods and supplements help amplify general systemic immune functions as well, getting the body ready to fight off infection more effectively should one occur.
These two effects of probiotics—shielding the mucosa and boosting immune function—work together to both decrease the incidence of viral infections and to reduce their severity if they do occur. This effect has been demonstrated in human clinical trials.

Several small studies have found that probiotics have beneficial effects against respiratory tract infections. A recent review of the existing literature concluded that probiotics had a positive influence on several outcome measures. In addition to reducing the total number of respiratory tract infections, they also reduced the average length of illness, use of antibiotics, and school absences, in cases where viral outbreaks occur.

One study evaluated a blend of probiotics that includes some of the very same bacterial species discussed in this article, *B. lactis*, *L. plantarum*, and *L. rhamnosus*. The study scientists randomized 250 healthy adults to receive this probiotic blend or a placebo daily for 90 days during peak flu season.

The impact this probiotic treatment had on respiratory infections was not subtle! The number of flu and flu-like viral illnesses were reduced by an impressive 75%. The rate of colds—also a viral illness—was also reduced, by 39%.

In the small number of subjects on the probiotic supplement who did get sick, probiotics still had a beneficial impact, reducing both the severity and duration of viral illness. Symptom severity in flu was reduced by 37%.

The length of illness was also reduced, by about one day on average for colds, three days for cough, and close to one-and-a-half days for all acute upper respiratory tract infections overall.

With respiratory tract viral illness—from common cold and flu to new threats on the rise, probiotic supplementation may provide an added layer of protection from infection.

In addition to standard precautions such as hand washing and avoiding contact with sick individuals, probiotic supplements may help to reduce viral illness risk and severity by bolstering mucosal defenses and general immune function.
REFERENCES


Glycemic Guard™ contains 250 mg of polyphenol-rich clove extract and 200 mg of maqui berry extract. These plant extracts help maintain healthy after-meal blood glucose and A1c levels.

Suggested dose is one capsule a day with or without food, or as recommended by a healthcare practitioner.

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References
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DUAL ENCAPSULATION DELIVERY

FORIFY YOUR INTESTINAL FLORA

FLORASSIST® GI with Phage Technology now provides seven strains of probiotics plus four types of phages in one daily dual encapsulated vegetarian capsule.

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Item #02125 • 30 liquid vegetarian capsules

1 bottle $24.75
4 bottles $22.50 each

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The Rising Rate of Obesity and Its Consequences
In February 2020, the Centers for Disease Control and Prevention presented data on obesity rates in the United States. The results showed a startling 42.4% of adults are obese.\(^1\)

An additional 31.8% were overweight, according to a prior study.\(^2\)

The situation is projected to worsen.

A study published in the New England Journal of Medicine estimates that by 2030 the percentage of obese American adults will rise to 48.9%.\(^3\)

The increase in medical costs due to obesity are around $3,429 per obese person per year.\(^4\) This totals over $446 billion annually.

Unless the rise in obesity rates is prevented, the financial burden for obesity-related medical costs will skyrocket in the next decade.

Women, African Americans, and those with a low socioeconomic status are affected at a significantly higher rate.\(^3\)

Excess body weight increases the risk of developing and dying from a broad spectrum of cardiovascular diseases, cognitive disorders such as Alzheimer's, and at least 13 different types of cancers.\(^5\)-\(^7\)

Obesity has been determined to be the underlying cause of approximately 20% of deaths in the United States.\(^8\)

A collaborative analysis (900,000 individuals from 57 studies) published in 2009 found that every 5-point increment in BMI (a weight-to-height ratio) was associated with a 30% increased mortality risk.\(^9\)

We are in the middle of a surging obesity epidemic. Much as public warnings against tobacco use, which debuted in 1964, have had to be repeated over and over to induce meaningful reductions in cigarette smoking.

The public needs continual reminders about the danger posed by obesity and what can be done to reduce excess body weight.
Foods that Kill

There are many factors that are contributing to the rise in obesity rates.

Lifestyles and occupations are more sedentary, while more unhealthy, ultra-processed foods are being consumed.11,12

A processed food tends to be high in added sugar, salt, oil, and unhealthy fats.

Ultra-processed foods are so altered that they hardly resemble their original whole-food state.

An ultra-processed food can be thought of as an industrial product.

In addition to having the bad qualities of a processed food, an ultra-processed food contains ingredients that are rarely added to homecooked meals, such as modified starches or hydrogenated oils. An ultra-processed food also commonly uses additives that mimic the sensorial qualities of raw food or disguises undesirable qualities of the finished product such as emulsifiers, humectants, and sequestrants.

Living 10 Years Longer

Ultra-processed foods are often “ready-to-eat” or require minimal preparation, and are highly marketed and branded.12

Some examples of these types of foods are carbonated and artificially flavored drinks, ice cream, breakfast cereals, chips, and heat-and-serve dishes.

Ultra-processed foods account for more than 60% of dietary energy in the U.S.13

Populations that have the lowest intake of ultra-processed foods—in Sardinia, Italy; Ikaria, Greece; Okinawa, Japan; Loma Linda, California, and Nicoya, Costa Rica—live an average of 10 years longer than those with a standard diet in the U.S.11

An observational study of Spanish university graduates followed participants for a median of 10.4 years.

Consumption of an average of 5.3 servings of ultra-processed food per day, compared to an average of less than 1.5 servings per day, was associated with a 62% increased risk for all-cause mortality. For each additional serving, this risk increased by 18%.14

Medical Definition of Obesity

The Obesity Medicine Association defines obesity as a:

“… chronic, relapsing, multi-factorial, neurobehavioral disease, wherein an increase in body fat promotes adipose tissue dysfunction and abnormal fat mass physical forces, resulting in adverse metabolic, biomechanical, and psychosocial health consequences.”10

The Effects of Diet Soda vs. Regular Soda

A meta-analysis published in 2017 found that regular consumption of sugar-sweetened soda was associated with an 18% increased risk of obesity.15

More surprisingly, regular consumption of artificially-sweetened diet soda was associated with a 59% increased risk of obesity.15

One might assume that diet soda is healthier than regular soda, due to the minimal calorie content. However, artificial sweeteners can lead to significant changes in the gut microbiota, an effect that is believed to at least partially explain the obesogenic effect of diet soda.15,16

Human and animal research show that non-caloric artificial sweeteners cause alterations in gut microbiota composition that impair glucose tolerance, resulting in poor metabolic responses.15,16

In a large-scale observational study in postmenopausal women, with an average of 8.4 years of follow-
up, drinking two or more diet sodas per day increased the risk of type II diabetes by 21% compared to women who drank less than one diet soda per week. But the risk was more than doubled to 43% in women drinking the same amount of sugar-sweetened soda.¹⁷

More research is needed to fully understand this association. But the key is that research has shown both types of sodas to be harmful to our health.

**Being Overweight or Underweight is Not Healthy**

It is a commonly held belief that as long you’re not obese you can be overweight and still be healthy. This is not always true. Studies have shown significant dangers associated with being overweight compared to a normal weight.

An observational study published in the *New England Journal of Medicine* in 2010 followed 1.46 million white adults for a median of 10 years. Those who had preexisting illnesses or were cigarette smokers were excluded from this study analysis.¹⁸

The results showed that those who were overweight (BMI 25-29.9) had a 13% increased risk of death compared to those who were normal weight. Additionally, out of the patients who participated in the study longest (followed for 15 years or more), there was a 12% to 19% increased risk of mortality in the overweight group compared to the normal weight group. Among this group, higher weight was associated with a higher risk of dying.

**The Dangers of Obesity**

- **Obesity rates in the U.S. are skyrocketing.** By 2030, it’s projected that nearly 50% of American adults will be obese.
- **Genetics play a role, but sedentary lifestyle and diets heavy in ultra-processed foods** (carbonated and artificially flavored drinks, ice cream, breakfast cereals, chips, and heat-and-serve dishes) are largely responsible for the increase in rates of obesity.
- **The diet with the most research supporting its use for weight loss and overall health is the Mediterranean diet**, which is high in vegetables, fruits, whole grains, beans, nuts and seeds, extra virgin olive oil, fish and seafood, and includes moderate amounts of poultry, eggs, and dairy, with only very occasional meats and sweets.
- **The AMPK-activating drug metformin** can also aid in weight loss. An extract of the plant species *Gynostemma pentaphyllum* works in the same way, and has been shown to reduce belly fat, BMI, and other indicators of obesity.
A noteworthy study published in 2015 showed a significant relationship between a BMI over 25 and postmenopausal invasive breast cancer incidence.21

The researchers pooled data from 67,142 postmenopausal women from a previous clinical trial and followed them for a median of 13 years. The results showed a positive relationship between BMI and the incidence of invasive breast cancer. Those who were overweight had a 17% increased risk and those who were obese had as much as a 58% increased risk.21

In a more recent study, researchers compared the heart rate variability of underweight, normal weight, and overweight adult women.19

Heart rate variability measures the differences in the time interval between each heartbeat. It is conventionally measured with an electrocardiogram, though there are now smartwatches and small devices that can test it as well.

A heart rate that is more variable at rest is most beneficial, as this allows you to respond better to stress. Those who have a more variable resting heart rate also have better exercise performance and decreased risk of cardiac disease.20

The results of this study revealed that those who were underweight (BMI < 18.5) and those who were overweight had reduced heart rate variability compared to normal weight individuals. A special analysis revealed a U-shaped curve, where too little or too much fat mass was associated with worse heart rate variability.19 In other words, individuals with a healthy BMI of 18.5 to 24.9 and healthy extent of fat mass have a higher resting heart rate variability.

Additional Negative Effects of Excess Weight

- Excess weight increases the risk for an array of serious conditions: fatty liver disease, kidney disease, gallbladder disease, and sleep apnea.22,23

- Being overweight or obese is associated with an increased risk of chronic pain and pain syndromes, including low-back pain, headaches, irritable bowel syndrome and abdominal pain, fibromyalgia, jaw pain, and body-wide chronic pain. A study in twins found that compared to their normal weight twin, obese or overweight twins had significantly higher odds of low-back pain or generalized body pain, respectively.24,25

- Excess weight promotes osteoarthritis as a result of both increased wear and tear, and because of increased chronic inflammation.26

- Obesity is strongly associated with depression. A meta-analysis that included data on over 58,000 individuals found that obesity significantly increased the odds of developing depression, while depression significantly increased the odds of becoming obese.27

- A host of negative pregnancy outcomes, such as gestational diabetes, pre-eclampsia, caesarean birth, fetal defects, and preterm birth are all more common in overweight or obese mothers.28

- Excess weight makes it more difficult to absorb vitamin D and other fat-soluble vitamins.29

A noteworthy study published in 2015 showed a significant relationship between a BMI over 25 and postmenopausal invasive breast cancer incidence.21
An Optimal Diet

_Life Extension®_ has written extensively about the benefits of certain diets and compounds to maintain healthy weight and support longevity.

Although there are numerous data regarding the health benefits of vegetarian or vegan diets, we believe that the Mediterranean diet has garnered the greatest research support.30-32

A meta-analysis of randomized, controlled trials concluded that following a Mediterranean diet may be useful to reduce body weight, especially when it is energy-restricted, combined with physical activity, and sustained for more than six months.33

A Mediterranean diet is high in vegetables, fruits, whole grains, beans, nuts and seeds, extra-virgin olive oil, fish and seafood, moderate amounts of poultry, eggs, and dairy products. Red meat and sweets are limited.34,35

Whatever the dietary pattern, one that emphasizes whole, mostly unprocessed foods will yield significant health benefits over the typical Western diet, which is high in ultra-processed foods.

A recent meta-analysis evaluated the mortality benefit of weight loss diets. The analysis included studies that lasted for a median duration of only two years, yet still found that these diets resulted in an 18% relative reduction in all-cause mortality.36

Compounds that Aid in Weight Loss

_Life Extension®_ has long been one of the most vocal proponents of the incredible and multi-targeted benefits of metformin. It is an FDA-approved drug to treat type II diabetes. In addition to a remarkable list of benefits, studies show that it can also aid in weight loss.37

An extract of the plant species _Gynostemma pentaphyllum_ has been shown to work on one of the same mechanisms that metformin does, by activating the enzyme AMPK (adenosine-monophosphate protein kinase).38

Activated AMPK mimics some of the most important benefits of calorie restriction and exercise by increasing insulin sensitivity and glucose utilization.

Daily intake of _Gynostemma_ extract for 12 weeks was shown in a study to result in significant reductions in body weight, total abdominal fat area, body fat mass, percent body fat, and BMI, compared to a placebo group of comparably obese patients.39

Summary

If Americans continue to opt for more sedentary lifestyles and consume more ultra-processed foods, obesity will continue to rise at an exponential and alarming rate.

If current trends continue, almost 50% of the American population will be obese by 2030, resulting in catastrophic health consequences.

Being overweight or obese increases the risk of the most prevalent diseases afflicting humankind. The financial costs to our healthcare system are unsustainable.

While the media have been sounding the alarm on this issue for decades, not nearly enough is being done to help Americans attain and maintain healthy weight, to avoid terrible and deadly diseases, and to enjoy their lives to the fullest.

We need to be better informed and motivated about maintaining a healthy body weight.

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

**Pomegranate Complete**

combines extracts from the **whole fruit, flower, and seed oil** to support system-wide health.

It *augments* these **polyphenols** with other pomegranate plant compounds to help inhibit inflammation and combat age-related metabolic changes.

For full product description and to order **Pomegranate Complete**, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

POMELLA® extract is covered under U.S. Patent 7,638,640 and POMELLA® is a registered trademark of Verdure Science, Inc.

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Increase AMPK to Better Manage Body Weight

Most people today consume too many excess calories.

This results in mTOR constantly running at high gear, which is a factor in unwanted fat storage.

Studies show that increasing AMPK activity turns down excess mTOR.¹

Reduce Cell Fat Storage

Scientific studies show that increasing AMPK activity can encourage cells to store less fat and burn it as energy.²,³

AMPK Metabolic Activator was formulated based on data showing reduced belly fat in response to just one of its ingredients (Gynostemma pentaphyllum).³

AMPK Metabolic Activator is a dual-nutrient formula designed to support healthy AMPK cellular activation.

References

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

Actiponin® is a trademark of TG Biotech Co., Ltd.
This supplement should be taken in conjunction with a healthy diet and regular exercise program. Individual results may vary and are not guaranteed.

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At Life Extension® we have long advocated annual blood testing as one of the most important ways to optimize and maintain health.

Some doctors don’t order yearly blood tests or only focus on a few basics unless a patient shows symptoms of disease. This is a losing strategy. If a disease is already symptomatic, it may be too late to stop it.

But many illnesses and risk factors for disease can be detected with a blood test long before symptoms begin to show. Identifying problem areas early allows you to work with your doctor to treat and correct them—ideally, before they manifest in disease.

Back in 1996, Life Extension® founded the first mail-order, blood-screening service offering the public state-of-the-art blood testing that helps identify many of the age-related diseases plaguing our society today.

Dr. Scott Fogle reviews what Life Extension® considers the top, critical, yearly blood tests and the importance of annual testing.
Blood chemistry abnormalities may indicate a kidney problem, thyroid disorder, or even possible cancer. The chemistry panel also includes other tests that are excellent in screening for kidney and liver disease.

The complete blood count (CBC) identifies types and numbers of blood components, including platelets, red blood cells, and various types of white blood cells. These can help identify infection, anemia, and other blood and bone marrow conditions.

The lipid panel evaluates healthy and unhealthy fats in the body, which are primary drivers of your risk for cardiovascular disease, including heart attack and stroke.

For example, high levels of LDL (“bad”) cholesterol strongly contribute to the dangerous buildup of plaque in blood vessels, and to cardiovascular risk.

By identifying any abnormalities, you and your doctor can decide on an effective strategy to address them and prevent future disease.

2. Fasting Insulin

Elevated fasting insulin is a hidden danger. It’s a major risk factor for hidden diabetes and other metabolic disease, but most people never get tested for it, so they don’t know if they have it.

Insulin is a hormone that helps the body process glucose absorbed after a meal. Levels rise after a meal
but should then drop to a level just low enough to main-
tain optimal glucose. As your body ages and tries to
compensate for poor diet, insulin can remain high even
in a fasting state. High fasting insulin can be a sign of
developing **insulin resistance**, a hallmark of **type II
diabetes**.

Identifying high insulin levels early is critical.

Scientists have discovered that high insulin has
harmful effects on health even before metabolic disease
develops.\(^1\)\(^2\) On its own, elevated insulin can contribute
to high blood pressure, atherosclerosis, obesity, cancer, abnormal blood lipids, gout, migraine, and
cognitive decline.\(^2\)\(^4\)

Stimulating the enzyme **AMPK** can help boost
healthy metabolism, lower insulin levels, and ward off
metabolic disease.\(^5\)\(^6\)

In addition to exercise and improved diet, some
nutrients have been shown to activate AMPK, includ-
ing **hesperidin**, a compound found in citrus fruits, and
the herb **Gynostemma pentaphyllum**. Medications
are also available to activate AMPK if needed, such as
metformin.

### 3. Hemoglobin A1c

Abnormally high blood levels of **glucose** are a major
cause of long-term health issues, from cancer to heart
disease—and of course, the hallmark sign of diabe-
etes. Practically all tissues in the body are negatively
impacted by high blood sugar.

A blood glucose test, however, is only a snap-
shot of a moment in time. Glucose levels rise and fall
throughout the day, so this test may miss a problem.

A **hemoglobin A1c** test is a superior way to screen
for glucose problems because it shows what levels
have looked like over the past **two to three months**.
The higher the level, the more severe the problem with
blood glucose control.

In addition, studies have shown that high levels of
hemoglobin A1c are an important predictor of risk for
**heart disease**, even in individuals who do not have
metabolic syndrome or diabetes.\(^7\)

In those with existing metabolic syndrome or diabe-
etes, hemoglobin A1c can be used to track response to
treatment, confirming that blood glucose control is
improving.

Dietary changes, exercise, nutrients (including
**magnesium** and **vitamin D**),\(^8\)\(^9\) and medications can
help bring elevated hemoglobin A1c and blood sugar
under control.
4. DHEA

DHEA (dehydroepiandrosterone) is a hormone produced naturally in the adrenal glands. The body uses it to make other hormones, including the male and female sex hormones, testosterone and estrogen.

Levels of DHEA peak in the 20s, then steadily decline. This slow slide can compromise vitality and quality of life in older age to such a degree that DHEA is sometimes referred to as an "anti-aging" hormone.10

If a blood test shows low levels, DHEA can be taken orally to support healthy levels. It can also help support testosterone and estrogen levels to varying degrees.

DHEA itself also supports immune function, bone density, mood, libido, and healthy body composition.10

A 2017 study published in the *Journal of the American Heart Association* found that lower DHEA levels indicated a significant increased risk for all-cause mortality, fatal cardiovascular event, and nonfatal cardiovascular event in patients with cardiovascular disease.11

A 2019 study concluded that higher levels of DHEA are associated with a lower risk of falls and recurrent falls in older people, especially women.12 In addition, a 2018 meta-analysis on DHEA for depression pointed to a significant effect in favor of treatment with DHEA compared to placebo.13

5. Prostate-Specific Antigen (PSA) for Men

Prostate-specific antigen (PSA) is a protein made in the prostate gland of the male reproductive system. Normally, PSA largely remains in the prostate. But several conditions cause it to be released into the bloodstream, where it is detectable on a simple blood test. These include age-related enlargement of the prostate, inflammation, infection, and prostate cancer.

Prostate cancer is extremely common in men and often causes no outward symptoms early in its development. Regular PSA screenings can identify it early, when it is still confined to the prostate gland and easiest to treat.

The *American Cancer Society* recommends annual testing for men beginning at 50, and at 40-45 in those deemed high risk, including men with a strong family history of prostate cancer.14

If an elevated PSA level is detected, further testing should be done under the direction of your physician.

6. Homocysteine

Studies have linked high levels of the amino acid homocysteine with increased risk for several health problems, including heart attack, bone fractures, macular degeneration, gallstones, and declining cognitive function.15-19

In fact, even in people with no history of cardiovascular disease, those with the highest homocysteine levels had more than a 3-fold increased risk of heart attack over a five-year period, compared to those with the lowest levels.20

High levels of homocysteine can be lowered by increasing intake of the B vitamins folate, B2, B6, and B12. Supplementation with active forms pyridoxal-5-phosphate (B6), methylcobalamin (B12), and 5-MTHF (folic acid) provides the exact form of these vitamins that your body can use best.

7. C-Reactive Protein

Chronic inflammation is a major contributor to nearly all forms of age-related disease and dysfunction, including diabetes, cardiovascular disease, Alzheimer’s, cancer, and more.21

We now know that chronic inflammation accelerates the aging process itself, leading scientists to coin the term inflamaging to describe the connection.22
**C-reactive protein (CRP)** level in the blood is one of the most used clinical indicators of inflammation throughout the body.

The most recent technology in C-reactive protein testing is a test called **Cardiac CRP** (or High Sensitivity CRP). This is a highly sensitive test, able to detect even small changes in C-reactive protein levels. Despite its name, it indicates levels of inflammation throughout the entire body.

Elevated levels of C-reactive protein are predictive of cardiovascular disease, type II diabetes, age-related macular degeneration, cognitive decline, and more.23-26

Many nutrients can reduce inflammation, including **omega-3 fatty acids** from fish oil, **curcumin** (a compound found in turmeric), **magnesium** and **zinc**, **vitamin D**, and various **polyphenols** including **flavonoids**.27

---

**8. Thyroid Stimulating Hormone**

The **thyroid** gland in the neck secretes thyroid hormone. It can be thought of as a master regulator that sets the base level of metabolism in the body.

Several disorders can lead to either **hyperthyroidism** (excess levels of thyroid hormone) or **hypothyroidism** (low levels).

**Hyperthyroidism** can cause rapid or irregular heartbeat, anxiety, irritability, tremors, and difficulty sleeping.28

**Hypothyroidism**, which is more common in women, can cause unexplained fatigue, depression or anxiety, constipation, dry skin, low libido, and weight gain.29

**Thyroid stimulating hormone** is produced in the pituitary gland and exerts control over the secretion of thyroid hormone. If there is something wrong with thyroid function, levels of thyroid stimulating hormone are usually disturbed. This shows up on a blood test, helping to identify various thyroid problems.

Both hyperthyroidism and hypothyroidism can be treated with medications and several nutrients can support healthy thyroid function like selenium, vitamins A and B12, iodine, magnesium, ashwagandha root extract, L-tyrosine, and fermented Korean ginseng root extract.30,31

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**9. Testosterone (Free and Total)**

**Testosterone** is the primary sex hormone in men, while healthy women produce smaller amounts. It is mostly made by the testes, but the ovaries in women and the adrenal glands in both genders also make small amounts of testosterone.

Levels fall with advancing age, which has a significant impact on health.

In **men**, testosterone drops to about 60% of their youthful levels by age 75.32 These lower levels contribute to diminished libido, erectile dysfunction, loss of muscle mass and strength, increased body fat, lower bone density, depressed mood, and trouble concentrating.33-35

Low testosterone is also linked to an increased risk of life-threatening conditions such as cardiovascular disease, type II diabetes, and metabolic syndrome.36-38
Levels of testosterone in **women** also drop with age and significantly impact quality of life. As in men, maintaining adequate levels helps to prevent loss of libido, depressed mood, loss of muscle, and more.

Testing can reveal levels of **free testosterone** (testosterone that is not bound to any other proteins) and **total testosterone** (all testosterone, free and bound, in the blood). The most comprehensive test measures both.

Your physician can discuss various treatments for low testosterone levels.

**10. Estradiol and Progesterone**

In women, the ovaries produce two primary sex hormones, **estrogen** (which mainly circulates in a form called **estradiol**) and **progesterone**. Men also produce small amounts of these hormones.

Both hormones are involved in fertility and reproductive function. But like testosterone, they have diverse effects on other aspects of health in men and women.

Testing estradiol and progesterone in women during reproductive years can help evaluate **fertility** and identify possible reasons for difficulty conceiving or maintaining a healthy pregnancy.

In women **after** menopause and in older men, these hormones support healthy bone mineral density. In fact, lower levels of estradiol are directly associated with increased risk of **osteoporosis** and **bone fractures**.39-42

Some health conditions can also cause unnaturally **high** levels of these hormones, such as ovarian cysts and rare forms of **ovarian cancer**. Screening for these hormones can both help maximize bone health and catch signs of disease that would have otherwise gone undetected.

As a woman ages and starts moving toward menopause, the first hormone that typically drops is **progesterone**.

During a typical 28-day menstrual cycle progesterone peaks around day 21. This is the best day to test progesterone for a woman still having cycles but feeling that her hormones may be off or diminishing. Blood testing can help identify the ideal dose of bioidenti-cal progesterone for sleep, libido, depression, mood changes, anxiety, a racing mind, and hot flashes.

**11. Apolipoprotein B100**

**Apolipoprotein B100 (Apo B)** is a component of low-density lipoprotein (LDL) cholesterol and very low-density lipoprotein (VLDL) cholesterol. It is present in all the lipoprotein particles that are not HDL.

Non-HDL particles are known as “bad” cholesterol because higher levels contribute to the development of **atherosclerosis**, the buildup of plaque on artery walls. Atherosclerosis leads to **cardiovascular disease** and raises risk of heart attack and stroke.
Although cholesterol levels by themselves are an indicator of risk for cardiovascular disease, research shows that apolipoprotein B100 is an even better predictor of heart disease and other cardiovascular conditions.43-46 The higher the number of the Apo B blood test, the greater the risk for future cardiovascular disease.

12. Vitamin D

For decades, science has recognized the importance of vitamin D for the health of bones. Lower levels put people at risk for osteoporosis and bone fractures.

In recent years, research has found that vitamin D is far more important to many different aspects of health than was previously understood. Low levels have now been found to be associated with increased risk for cardiovascular disease, autoimmune diseases, neurological disorders, diabetes, depression, and cancer.47,48 Vitamin D is also tied to overall longevity: Those with the highest levels generally lead longer, healthier lives.49

Most people do not get enough vitamin D. More than 40% of Americans have insufficient blood levels of vitamin D (defined as less than 30 mg/dL) in this study,50 however Life Extension advocates an optimal level of 50 to 80 ng/mL.

Low levels of vitamin D do not cause any symptoms until diseases begin to arise, so testing is critical. Correcting a deficiency is as simple as taking regular doses of vitamin D to raise levels into the optimal range.

13. Magnesium

Most Americans aren’t getting nearly enough magnesium.

By recent estimates, roughly 64% of all men and 67% of all women in the U.S. have inadequate intake of magnesium.51 For those over 71, who have diminished ability to absorb the mineral, that number rises to more than 80%.

Suboptimal intake of magnesium can lead to magnesium deficiency. Severe magnesium deficiency leads to nausea, vomiting, fatigue, and weakness.

But even mild deficiency is thought to eventually contribute to life-threatening disease.

Magnesium deficiency is linked to high blood pressure, arterial stiffening, dysfunction of the blood vessels, and atherosclerosis, all of which lead to cardiovascular disease.52

Indeed, human studies have found that lower levels of magnesium are significantly associated with higher rates of heart attack and stroke.51-53 Low magnesium is also a major contributor to other chronic illnesses, including type II diabetes, osteoporosis, and cognitive decline and dementia.54-59

Fortunately, simple blood tests can identify low magnesium levels. Experts in magnesium research concluded that the regular lab reference range for serum magnesium is not adequate for maintaining health. They determined a person should be in approximately the upper half of the reference range for good health. At the lower end of the reference range their research indicated magnesium was being pulled from the bones and other tissues.60

Annual testing of magnesium can indicate the need for magnesium supplementation and determines whether increased intake is bringing levels into an optimal range.
Summary

Many disorders and risk factors for disease are hidden. They don’t present any outward symptoms in their early stages.

Annual blood testing can reveal these problems, years or even decades before disease would occur.

Once identified, problem areas can be discussed with a doctor and addressed through various interventions, including dietary changes, exercise, nutrients, and, when necessary, medication.

The Most Important Yearly Tests Are:

- Chemistry panel/complete blood count/lipid panel,
- Fasting insulin,
- Hemoglobin A1c,
- DHEA,
- Prostate-specific antigen (for men),
- Homocysteine,
- C-reactive protein,
- Thyroid stimulating hormone,
- Testosterone (free and total),
- Estradiol/progesterone,
- Magnesium,
- Apolipoprotein B100, and
- Vitamin D.

Having these blood tests done annually lets you make informed decisions to optimize current health and reduce risk for future 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.

References


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**CBC/Chemistry Profile**

These CBC/Chemistry tests are included in the popular Male and Female Panels, and other panels on this page so you don’t have to order them separately.

**CARDIOVASCULAR RISK**

- Total Cholesterol
- HDL Cholesterol
- LDL Cholesterol
- Triglycerides
- Cholesterol/HDL Ratio
- Estimated CHD Risk
- Glucose

**LIVER FUNCTION**

- AST (SGOT)
- ALT (SGPT)
- LDH
- Total Bilirubin
- Alkaline phosphatase

**KIDNEY FUNCTION**

- BUN
- Creatinine
- BUN/Creatinine Ratio
- Uric Acid

**BLOOD PROTEINS**

- Total Protein
- Albumin
- Globulin
- Albumin/Globulin Ratio

**BLOOD COUNTS**

- Red Blood Cell Count
- White Blood Cell Count
- Eosinophils
- Neutrophils (Absolute)
- Lymphs (Absolute)
- Monocytes (Absolute)
- Baso (Absolute)
- RDW
- Monocytes
- Lymphocytes
- Platelet Count
- Hemoglobin
- Hematocrit
- MCV
- MCH
- MCHC
- Neutrophils

**BLOOD MINERALS**

- Calcium
- Potassium
- Sodium
- Chloride
- Iron

The regular price for the CBC/Chemistry Profile alone is $35, but drops to $26.25 during the Lab Test Super Sale. (LC381822)

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This is NOT a complete listing of LE lab test services. Call 1-800-208-3444 for additional information.

* This test requires samples to be shipped to the lab on dry ice for customers using a Blood Draw Kit. Customer is responsible for obtaining dry ice.

** This test is packaged as a kit.

Lab tests available in the continental United States and Anchorage, AK only. Restrictions apply in NY, NJ, RI, and MA. Not available in MD. Kits not available in PA.
People who struggle with weight loss often point to several “Achilles’ heels” that sabotage their efforts to keep the pounds off: eating between meals, grazing at night, and a constant desire to snack are among the most common.

The fantastic news is that a proprietary extract of saffron, called Satiereal®, is clinically proven to deal with nearly all these issues. In fact, women involved in Satiereal® studies experienced the following amazing results: 1, 2

- 100% reduction in the desire to snack
- 55% fewer instances of eating between meals
- Less hunger
- Moderate weight loss
- More energy
- Better mood

Say goodbye to “kitchen raids” and say hello to Optimized Saffron with Satiereal®.

For full product description and to order Optimized Saffron with Satiereal®, call 1-800-544-4440 or visit www.LifeExtension.com

References

This supplement should be taken in conjunction with a healthy diet and regular exercise program. Results may vary and individual results are not guaranteed.
Maintain Youthful

HOMOCYSTEINE LEVELS

FOR BRAIN, HEART, AND HEARING HEALTH

Homocysteine Resist supports healthy levels of homocysteine, an unfavorable amino acid that can increase with normal aging.

Just one daily capsule of Homocysteine Resist provides:

- 5-MTHF (activated folate) 5,000 mcg
- Methylcobalamin (activated vitamin B12) 1,000 mcg
- Pyridoxal 5'-phosphate (activated vitamin B6) 100 mg
- Riboflavin (vitamin B2) 25 mg

Suggested dose: If your daily multi-vitamin contains activated B-vitamins, then take one capsule daily of Homocysteine Resist at a different time of the day.

Item #02121 • 60 vegetarian capsules

1 bottle $19.50
4 bottles $17.50 each

For full product description and to order Homocysteine Resist, 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.
A nutrient called PQQ (pyrroloquinoline quinone) restores youthful cellular function and extends the lifespan of worms.¹,²

PQQ helps mitochondria—the “powerhouses” of the cell—work more efficiently.

It also promotes formation of new mitochondria in aging cells. Dysfunctional mitochondria contribute to body-wide degeneration.²-⁹

But it turns out PQQ does much more.

A team of researchers from China and Italy found that when PQQ was applied to human cells in culture, it delayed cellular senescence.¹⁰

A growing body of research suggests that reducing cellular senescence may lead to increased health-span and lifespan.

This one-two punch—promoting mitochondrial health and slowing cellular senescence—explains why PQQ has powerful potential to slow aging processes.

In fact, in those recent worm studies, PQQ increased lifespan by roughly 30%.¹,²
HOW PQQ SLOWS AGING

Stopping Cellular Senescence

Low-level chronic inflammation is a key contributor to aging of the human body.

As we age, levels of inflammation-stoking messenger molecules called cytokines increase, contributing to greater risk of cardiovascular disease, neurodegenerative diseases, diabetes, cancer, and more.

This phenomenon, known as inflammaging, is a major factor in the aging process itself.\textsuperscript{11,12}

In a preclinical cell study, the nutrient PQQ (pyrroloquinoline quinone) showed the ability to block the effects of these harmful molecules by interfering with the signaling pathways they provoke to induce cellular senescence and inflammaging.\textsuperscript{10}

Testing PQQ in Human Cells

A team of scientists recently set out to determine whether PQQ could slow cell aging caused by inflammatory signaling, and reduce the number of senescent cells.\textsuperscript{10}

Researchers first grew human lung cells in a nutrient broth, and added inflammaging-associated proteins, including TNF-alpha, to some of the cell samples.\textsuperscript{10}

TNF-alpha promoted senescence and inflammaging in the treated cells. But when cells were pre-treated with PQQ before the TNF-alpha, the numbers of senescent cells in the culture dropped to significantly less than those in the untreated group.

Other signs of inflammaging were also reduced in PQQ-treated cells.

This study shows that PQQ can inhibit cellular aging by reducing TNF-alpha’s ability to stimulate senescence. This is a promising finding for PQQ’s ability to slow aging throughout the body and help prevent age-related disease.

Protecting the Heart

In energy-consuming cells like those in the heart, PQQ functions almost like a “fuel additive”, helping to burn fuel more efficiently.

In animals suffering heart attacks, insufficient PQQ contributes to worse outcomes.\textsuperscript{13}

Animal studies show that increasing PQQ in models of heart attack can:

\begin{itemize}
  \item Shrink the size of the infarct, or damaged area, in the heart muscle,
  \item Improve cardiac function following loss of blood flow (ischemia) to the heart muscle,
  \item Boost the function of mitochondria in ailing heart cells subjected to ischemia, and
  \item Prevent heart muscle death after ischemia.
\end{itemize}

These benefits are likely attributable to PQQ’s ability to combat oxidative stress and its effects on signaling pathways.\textsuperscript{17,18}
Building Stronger Bones

In aging bone, senescent cells accumulate, pouring out damaging pro-inflammatory signaling molecules. This is yet another mechanism involved in the destructive effects of inflammaging.

Over time, inflammaging contributes to lower rates of new bone formation and higher rates of bone breakdown. The result: weaker, fracture-prone bones.

Animal studies have shown that PQQ can promote bone formation and prevent bone degradation. It accomplishes this through multiple, different pathways, including oxidative stress, hormonal, and complex signaling pathways.

Benefits for Diabetes

PQQ was shown in a cell culture study to block oxidative stress and cell death caused by high glucose, through an effect on signaling pathways.

By battling oxidative stress and modulating insulin signaling pathways, PQQ has been shown in diabetic animals and in lab studies to:

- Lower blood sugar,
- Decrease lipid abnormalities,
- Activate insulin signaling to increase glucose tolerance,
- Reduce glucose-induced oxidative stress in brain tissue, a contributor to neurodegenerative diseases, and
- Protect kidney cells against events leading to diabetic kidney disease.

PQQ also increases production of the “longevity protein” Sirt3, a longevity-associated factor that supports healthy mitochondrial function.

WHAT YOU NEED TO KNOW

Fight Aging with PQQ

- Damaged, aging cells called senescent cells give off age-promoting signaling molecules.
- These harmful molecular signals promote inflammation and are a major driver of aging and age-related disease.
- PQQ (pyrroloquinoline quinone) is a vitamin-like nutrient that is known for its ability to protect the mitochondria and promote the formation of new mitochondria.
- A new cell-based study shows that PQQ can also reduce senescent cells and block the harmful signals they give off.
- PQQ may also slow the overall aging process itself, and has been shown to extend lifespan by 30% in animal studies.
In these studies, PQQ’s effects included the ability to:

- Strengthen and thicken healthy bone,
- Rescue weakening bone from further breakdown,
- Inhibit inflammatory secretions from senescent cells,
- Prevent bone loss related to low levels of estrogen (like that seen in menopause) and testosterone,
- Stimulate new bone formation,
- Slow the development of bone-depleting osteoclasts, and
- Promote formation of bone-producing osteoblasts.

Help for the Aging Brain

The brain consumes more energy than any other organ in the body.

That makes brain tissue especially vulnerable to disruptions in its energy supply.

In fact, aging mitochondria are known to contribute to many age-related brain disorders, including Alzheimer’s and Parkinson’s disease.\textsuperscript{33,34}

By helping mitochondria perform more efficiently and by promoting the development of new mitochondria, PQQ may help prevent these diseases.\textsuperscript{23,35,36}

Studies in rats show that increasing PQQ can minimize brain injury induced by rotenone, a neurotoxin that causes Parkinson’s-like symptoms.\textsuperscript{36} Rats receiving rotenone and then being treated with PQQ suffer less loss of brain cells and perform better on lab tests afterward compared with untreated animals.

PQQ also protects brain cells against excitotoxicity, which is believed to be one cause of Alzheimer’s disease.\textsuperscript{37} Excitotoxicity occurs when nerve cells are damaged or killed by overactivity of the neurotransmitter glutamate.\textsuperscript{38}

In a cell culture study, PQQ countered glutamate’s destructive effects by stimulating growth of neural stem cells and reducing damage to brain cells.\textsuperscript{39}

Extending Lifespan

When senescent cells accumulate, it accelerates aging processes.\textsuperscript{12} By reducing the number of senescent cells, PQQ may increase lifespan.

Two different research groups evaluated PQQ’s life-extending effects on a type of roundworm, \textit{C. elegans}, which is commonly used to study longevity.

The findings were nearly identical. In one study, giving the animals PQQ increased lifespan by an average of 30\%. In the other study, the animal models lived an average of 31\% longer.\textsuperscript{1,2}
Summary

**PQQ (pyrroloquinoline quinone)** is a compound that protects mitochondria, the “powerhouses” of our cells. It promotes the formation of new, healthy mitochondria. This has anti-aging benefits throughout the body. Recent studies have shown a way that PQQ may be able to slow aging even more, by reducing the activity of certain age-accelerating signaling pathways. This can help lower chronic inflammation and aging-promoting senescent cells. By slowing cellular aging, PQQ can help lower risks of cardiovascular disease, diabetes, osteoporosis, and neurodegenerative disorders. Since PQQ has effects on so many aging pathways, it is a prime candidate for targeting the aging process itself and extending healthy lifespan.

References


Mega Green Tea Extract provides powerful antioxidant effects throughout the body.

Each 725 mg capsule of Mega Green Tea Extract is standardized to 98% polyphenols that provide 326 mg of EGCG* to:

- Protect against DNA damage and oxidative stress¹
- Support healthy blood sugar levels²
- Enhance heart health³
- Boost brain function⁴
- Support strong bones⁵
- Maintain healthy cholesterol levels already within normal range⁶

Each cost-effective bottle lasts over three months!

References

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

* EGCG is the acronym for epigallocatechin gallate, which is the polyphenol in green tea that has demonstrated the most robust health benefits.
Super R-Lipoic Acid is more bioavailable, stable, and potent, achieving 10-30 times higher peak blood levels. This unique sodium-R-lipoate can help you reach peak plasma concentrations within just 10-20 minutes of supplementation.

Suggested dose is one to two capsules daily.

CAUTION: If you are taking glucose-lowering medication, consult your healthcare provider before taking this product.

Bio-Enhanced® is a registered trademark of GeroNova Research, Inc.

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

Preserve Youthful CELLULAR ENERGY with Next-Generation LIPOIC ACID

Item #01208 • 60 vegetarian capsules
1 bottle $36.75
4 bottles $33.75 each

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Restore Youthful Cellular Energy with PQQ

PQQ (pyrroloquinoline quinone) activates genes involved in the production of cellular energy.\(^{1,5}\)

Studies show PQQ supports heart health and cognitive function, complementing CoQ10.\(^{6,7}\)

In fact, just 20 mg per day of PQQ plus CoQ10 promotes memory and attention in aging individuals.\(^{8}\)

This formulation contains 20 mg of PQQ per capsule, which is the recommended daily dose.

Item #01647 - 30 vegetarian capsules
1 bottle $24
4 bottles $18 each

For full product description and to order PQQ Caps or any other PQQ-containing formulas, call 1-800-544-4440 or visit www.LifeExtension.com

Also available are 10 mg PQQ caps (Item #01500) and 100 mg Super Ubiquinol CoQ10 with PQQ (Item #01733).

References
8. These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
Blueberries contain potent polyphenols that provide a wide array of health benefits.\(^1\)

Ingestion of blueberry polyphenols may decrease the risk for cognitive decline,\(^2,3\) cancer,\(^4,5\) and heart disease.\(^6,7\)

Researchers are discovering a stronger connection between blueberries and heart health than had previously been known.

They are finding that blueberries help protect against arterial blockage and improve peripheral arterial function.

Blueberry polyphenols including anthocyanins and anthocyanidins, may function as inhibitors of some underlying causes of heart disease.
Preventing Foam Cell Formation Protects the Artery Walls

The majority of heart disease is caused by atherosclerosis, which is the buildup of fatty deposits (plaque) that narrow the artery walls.7,8

A critical step in the development of atherosclerosis is the adhesion of monocytes (a type of white blood cell) to the endothelial cells that line the artery walls.9,10

These monocytes enter the blood vessel lining and develop into macrophages which have the job of engulfing oxidized LDL cholesterol. Accumulation of oxidized LDL particles in the macrophage leads to the formation of foam cells.9,10

The accumulation of foam cells, along with the proliferation of smooth muscle cells and excess connective tissue, are key drivers of atherosclerosis.9,10

The process by which atherosclerosis causes a heart attack is complex. Foam cells play a central role in the inflammation that drives this process.11

Several studies have demonstrated that blueberry consumption can interfere with the adhesion of monocytes to endothelial cells and reduce the formation of these foam cells. What this means is that blueberries may play a role in reducing the formation of atherosclerosis.

In one study, a group of researchers tested mice that were genetically prone to develop atherosclerosis and fed them a diet with or without the addition of blueberries. After 20 weeks, blueberry supplementation attenuated foam cell formation, compared to the control group. Researchers observed that in supplemented mice, the expression of receptors associated with the development of foam cells and vascular lesion formation was inhibited.12

Blueberries Reduce Metabolic Syndrome

In a more recent study, researchers evaluated the effects of blueberry consumption on indicators of oxidative stress and inflammation in patients with metabolic syndrome.13

Metabolic syndrome is a cluster of conditions that includes some combination of high blood pressure, abdominal obesity, high blood sugar, and abnormal lipid profiles. Metabolic syndrome is associated with a highly pro-inflammatory environment in the body, and a sharp increase of risk for heart disease, stroke, and diabetes.14,15

For the study, one group of patients received a smoothie containing 22.5 grams of freeze-dried blueberries (approximately two cups of fresh blueberries). The other group received a placebo smoothie twice daily.

After six weeks, blueberry supplementation markedly decreased superoxide and total reactive oxygen species in whole blood and monocytes compared to placebo. Supplemented patients also had a reduced expression of inflammatory markers in the monocytes. The researchers noted that to their knowledge, this was the first study to yield significant improvements in oxidative and inflammatory parameters in patients with metabolic syndrome after just six weeks of blueberry consumption.

Blueberries Enhance Statin Benefits

Recent data have shown that one of the ways statins (cholesterol-lowering drugs) benefit the cardiovascular system is by reducing oxidative stress.16-18

A group of researchers hypothesized that adding blueberry polyphenols to a low-dose statin would enhance its benefits.19

Not Everyone Can Afford Blueberries

Fresh blueberries in stores can be expensive. This is in part due to the high rate of spoilage if they are not sold and eaten quickly, as well as the price of shipping the fruit.

Studies presented in this article show that consumption of about two cups of blueberries daily is protective, an amount that is more easily and affordably achieved with just two blueberry extract capsules per day.
To test their hypothesis, they fed a group of rats a high-fat diet to induce hypercholesterolemia. A total of six groups of six rats each were assigned to receive a statin or blueberry extract alone (high and low dose), a combination of a statin with a high- and a low-dose blueberry extract, and a control.19

After 14 days, the researchers tested the rats’ weight and several biomarkers for cardiovascular disease risk: LDL and HDL cholesterol, total cholesterol, triglycerides, creatine kinase, homocysteine, and multiple markers for oxidative and DNA damage.

This study showed that blueberry extract supplementation protected against weight gain, improved lipid profiles, and reduced oxidative stress in hypercholesterolemic rats. The high-dose blueberry extract, in combination with a statin, was more effective than the blueberry extract alone.

Approximately a quarter of the U.S. adult population is taking a statin.20 Statin drugs significantly reduce LDL cholesterol levels. But taken alone, it is not the optimal approach to promote a healthy heart. A multifaceted approach should be taken to safely reduce all the risk factors of heart disease.

Beneficial Gene Expression

In a cell culture study, researchers dove deep into the molecular properties behind the mechanisms that drive the benefits of blueberries.21

To determine the physiologically relevant concentrations of blueberry-derived polyphenol compounds, the researchers recruited three healthy individuals and measured their blood for polyphenol metabolites following a single intake of blueberry juice.

This allowed researchers to identify a polyphenol mixture to be tested in endothelial cells for their ability to induce nuclear factor erythroid 2-related factor 2 (Nrf2). Nrf2 is a key factor in inducing the activity of genes that regulate the body’s defenses against oxidative stress.

What the researchers discovered is that blueberries and other polyphenol metabolites are bioactive, and significantly up-regulate the beneficial Nrf2 pathway. This finding further explains the systemic benefits blueberries have shown in previous studies.

The Nrf2 pathway has received a lot of attention from researchers, including for development of drugs that upregulate Nrf2 signaling as a therapeutic approach against several chronic diseases.22
Blueberries Ameliorate Cardiovascular Damage from Smoking

A team of researchers investigated whether blueberry polyphenols can reduce oxidative stress and inflammation and promote healthy nitric-oxide-mediated endothelial function in smokers. Because cigarette smoking has the opposite effects—promoting oxidative stress and inflammation, and inducing endothelial dysfunction, this created a strong experimental challenge for blueberries’ cardiovascular health benefits.

Specifically, the trial measured the effect of a single serving of 300 grams (two cups) of blueberries on blood pressure, heart rate, and peripheral arterial function. 23

Sixteen male cigarette smokers were separated into three groups based on the experimental conditions (smoking one cigarette, smoking plus ingesting 300 grams of blueberry, or drinking a 300 mL sugar-containing control beverage). All patients rotated among the treatments with a one-week wash-out period in between.

Blueberry treatment significantly counteracted the temporary impairment of peripheral arterial function and the rise in systolic blood pressure caused by acute exposure to cigarette smoke.

What these results indicate is that even with the profound health consequences from smoking, blueberries can still shield against some of the cardiovascular damage. Of course, the most important thing smokers can do for their health is to quit smoking. Unfortunately, that is easier said than done. So, the ability of blueberries to partially protect against this damage is truly welcome.

Summary

Research shows that blueberry consumption and supplementation can shield against multiple risk factors for heart disease.

Noteworthy is that blueberries favorably affect a key factor in the development of atherosclerosis by impeding the formation of foam cells.

This new research suggests that those who are at an elevated risk for heart disease should seek to increase their blueberry polyphenol intake. •

References

The body’s production of digestive enzymes decreases with age, leading to diminished nutrient absorption and bloating, as well as other intestinal discomforts—especially after eating a large meal.

**Enhanced Super Digestive Enzymes and Probiotics**

provides a broad range of enzymes required to help break down proteins, fats, carbohydrates, and other food nutrients—including enzymes that specifically target the cell structures of plant-based foods.

This comprehensive digestive support formula provides the added benefits of the probiotic Lactospore® B. coagulans.

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DHEA is one of the most important hormones in your body. It supports immune function, mood, sex drive, and lean muscle mass.

DHEA levels markedly decline with age.

Because everyone’s needs are different, Life Extension® offers DHEA in different encapsulated potencies, along with a dissolve-in-the-mouth tablet.

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

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Blueberries provide health-boosting benefits shown to:

- Enhance heart health
- Maintain brain function
- Sustain healthy blood-sugar levels already within normal range
- Support smooth, firm skin
- Improve movement and coordination

Blueberry extract is more potent than the whole berry, providing greater metabolic support throughout the body and without the excess sugar of raw fruit.

Item #01214 • 60 vegetarian capsules
1 bottle $16.88
4 bottles $15 each

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There are different grades of olive oil available, with very different health properties. Unfortunately, it’s not always easy to tell which olive oil you are getting. (Hint: extra virgin olive oil is the healthy kind you want.)

In a 2019 published study, mice fed extra virgin olive oil had significantly lower total cholesterol and blood pressure, and a higher ratio of HDL (good) cholesterol to LDL (bad) cholesterol, compared to mice fed refined olive oil.¹

The two types of olive oil examined in this mouse study might be sold side-by-side in stores, but it is a mistake to view them equally.

The study showed that eating refined olive oil led to similar adverse results as ingesting butter.¹

One reason is the way different grades of olive oil are extracted, and their effects on gut microbiota. What surprised scientists was learning how extra virgin olive oil interacts with host microbiota to improve heart health.
At the end of 12 weeks, systolic blood pressure, lipids, and other factors that contribute to the risk of cardiovascular and metabolic diseases were measured. Feces were also collected for microbiome analysis, and blood samples were taken for biochemical analysis.

### Surprising Findings

The results of this study showed a significant impact on risk factors for disease—and changes in gut microbiota that suggested reasons for those changes.1

Body weight, systolic (top number) blood pressure, and plasma insulin were significantly higher in the butter-fed group. That makes sense. But here’s where it gets surprising: Mice fed the low-fat standard diet and the extra virgin olive oil diet had significantly lower total cholesterol than the mice fed butter or

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**Why Extra Virgin Olive Oil is Better**

Olive oil has widely publicized health benefits compared to other vegetable oils and animal fats.2,3 It is a staple of the highly recommended Mediterranean diet.

But not all olive oils are the same. When olives are freshly pressed to extract the oil, the first material that’s produced, without any chemical processing, is extra virgin olive oil.1,4,5

In this instance, the term “virgin” means the olive oil is unprocessed.

It’s rich in polyphenols, plant nutrients with a wide range of health benefits, and tocopherols, variations on vitamin E that provide protection against oxidative stress.1

Although these compounds are the source of much of extra virgin olive oil’s health benefits, high amounts can result in strong or biting flavors that are not to everyone’s taste.6

**Refined olive oil** (the label may simply say “olive oil”, but it cannot say “extra virgin olive oil”) has been subjected to chemical treatments to make it nearly flavorless, odorless, and colorless. Manufacturers may then add back a small amount of extra virgin olive oil to impart a little flavor.

The refining process does more than strip out the flavor, color, and aroma—it also strips out practically all of the polyphenols and tocopherols, leaving the oil devoid of the most beneficial compounds.4,5

The polyphenol content of extra virgin olive oil ranges between 150 mg/kg to 400 mg/kg, while that of refined olive oil is just 0 mg/kg to 5 mg/kg. This makes a huge difference in the health benefits of the two types of oil.1,7

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**Comparing Extra Virgin and Refined Olive Oil**

A group of Spanish scientists compared the effects of extra virgin and refined olive oil on body weight, blood pressure, plasma insulin and lipid profiles, and other factors.1

The researchers fed a different diet to each of four groups of mice:1

- Standard, grain-rich mouse food, in which 8% of calories came from fat,
- Standard mouse food with extra virgin olive oil added, for a high-fat diet with 38% more calories, 35% coming from fat,
- Standard food enriched with refined olive oil to the same level of calories and fat, and
- Standard food enriched with butter to the same fat and calorie level.

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refined olive oil, even though there is no cholesterol in refined olive oil. **Extra virgin** olive oil produced the highest ratio of HDL (good) cholesterol to LDL (bad) cholesterol, even higher than the lower-calorie standard diet. The animals who ate refined olive oil had HDL/LDL ratios similar to those of mice fed butter. Animals fed extra virgin olive oil also had lower blood pressure than any other group.

**How the Gut Microbiota are Involved**

The scientists also examined the different effects on gut microbiota composition.

The impact of the dietary fat source on gut microbiota composition was substantial—in ways that correlate with many of the common risk factors for degenerative diseases.¹

There were significant differences in the levels of different gut bacterial families among the groups ingesting extra virgin olive oil, refined olive oil or butter.

One bacterial group in particular, called **Desulfovibrionaceae**, was significantly higher in those fed refined olive oil and butter, compared with those given extra virgin olive oil and the standard diet.¹

These intestinal bacteria are associated with high levels of inflammation and impaired immune function—risk factors for metabolic syndrome, cardiovascular disease, and autoimmune disorders.⁸⁻⁻¹¹

Two other bacterial families were elevated in mice fed refined olive oil compared with the other diets.¹ Both have negative associations with human health, including cancers and inflammatory diseases.¹²⁻⁻²⁰

Large Human Trial Demonstrates Extra Virgin Olive Oil Reduces Cardiovascular and Breast Cancer Risks

Results of a large clinical trial published in two prestigious medical journals, *JAMA Internal Medicine* and the *New England Journal of Medicine*, demonstrate that a diet supplemented with extra virgin olive oil provides health benefits.²²⁻⁻²³

The PREDIMED study enrolled adults aged 55 to 80 who were considered at high risk for cardiovascular disease based on various factors. Participants were randomized to three different groups. Two of the groups were assigned to a Mediterranean diet, one with supplemental extra virgin olive oil (at least 4 tbsp) and the other supplemented with mixed nuts. The third group was assigned to a control, low-fat diet.

Over almost five years of follow-up, cardiovascular outcomes including heart attack, stroke, and death from any cardiovascular cause, were noted. The Mediterranean diet groups had a significantly lower rate of negative cardiovascular outcomes. This association was particularly strong for the supplemental extra virgin olive oil group, which had a 31% reduction in risk for cardiovascular disease outcomes compared to the control diet group.²²

The researchers also observed the rate of new breast cancer in the women enrolled. Here, too, the diet supplemented with extra virgin olive oil was most protective, reducing rates of breast cancer by nearly 70% compared to the control diet. Interestingly, the group that supplemented with mixed nuts did not show a significant benefit in terms of breast cancer risk.²³

The study’s authors report that this was the first human trial to find a beneficial effect of a dietary intervention on breast cancer risk. Together, these results suggest that a Mediterranean diet with supplemental extra virgin olive oil is protective against both cardiovascular disease and breast cancer in older adults with existing risk factors.
Two beneficial bacterial families were found in highest abundance in animals fed the extra virgin olive oil. Both of them are associated with improved metabolic functions, including lowering levels of insulin and leptin.1,2,21

Summary

This new preclinical mouse study adds support for the benefits of extra virgin olive oil.

Compared with butter and refined olive oil, extra virgin olive oil improved systolic blood pressure, insulin levels, cholesterol, and HDL/LDL cholesterol ratios. Those all lead to lower risks for cardiovascular and metabolic diseases.

The study also showed a likely reason: A diet rich in extra virgin olive oil favorably modulates bacterial families associated with multiple diseases, while boosting microbes with protective effects.1

Human findings show supplemental extra virgin olive oil can markedly reduce cardiovascular and breast cancer risks in those following a Mediterranean-type diet.

Health-conscious people should aim to use extra virgin olive oil in their diets, and not refined olive oil or butter.

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

References


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Black Beans

BY LAURIE MATHENA

Like many legumes, black beans originated in South and Central America, but their taste and versatility have made them popular the world over.

The signature black coat of the bean contains key phytonutrients and anthocyanins that are often more commonly associated with dark-colored fruits and vegetables. And with 15 grams of protein per cup, black beans have become a staple food for vegetarians and vegans.

Black beans are cost-effective, versatile, and chock full of vitamins and minerals, making this superfood a perfect addition to any healthy diet.

Diabetes

Black beans have a low glycemic index, which means they are more slowly digested and cause a slower rise in blood sugar levels.

This is because most of the starch in black beans is resistant starch, which is not easily digested. This allows it to pass through the digestive tract without being broken down, which prevents it from being converted to simple sugars.

Black beans can also help attenuate the blood sugar spikes caused by higher glycemic foods. In one study, when adults with type II diabetes consumed black beans with rice, it helped lessen the blood sugar spikes associated with eating rice alone.¹

Cancer and Heart Disease

Black beans’ shells are an excellent source of phytonutrients and anthocyanins, such as malvidin, delphinidin, and petunidin.

Anthocyanins have numerous anticancer effects—including anti-inflammation, anti-mutagenesis, inducing cell cycle arrest, stimulating apoptosis of cancer cells, preventing cancer cells from spreading, and even making cancer cells more sensitive to chemotherapy.²

Epidemiological studies suggest that consuming more anthocyanins reduces the risk of cardiovascular disease.³ This is likely due in part to their beneficial effect on endothelial function and inflammation.

Additionally, black beans are high in fiber, higher intake of which has been associated with a lower risk of colorectal cancer.⁴

References

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02261 Wellness Code® Whey Protein Concentrate Chocolate
02260 Wellness Code® Whey Protein Concentrate Vanilla
02243 Wellness Code® Whey Protein Isolate Chocolate
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00313 3 Niacin Capsules
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02218 Mega EPA/DHA
01937 Mega EPA/DHA
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01544 Forskolin
00668 Metabolic Advantage Thyroid Formula™
01869 Mitochondrial Basics with PQP
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02344 NAD+ Cell Regenerator™ Nicotinamide Riboside 300 mg, 30 veg capsules
02348 Optimized NAD+ Cell Regenerator™ and Resveratrol
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01647 PQQ Caps - 20 mg
00889 Rhodiola Extract
02003 Triple Action Thyroid

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01725 Bone Strength Collagen Formula
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01506 Dr. Strum’s Intensive Bone Formula
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01974 Acetyl-L-Carnitine Arginate
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02396 Cognitex® Elite
02397 Cognitex® Elite Pregnenolone
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02218 Mega GLA Sesame Lignans
01983 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract
01988 Super Omega-3 Plus EPA/DHA Fish Oil, Sesame Lignans, Olive Extract, Krill & Astaxanthin
01982 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract - 120 softgels
01985 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract - 60 enteric coated softgels
01984 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract - 120 enteric coated softgels
01986 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract - 240 softgels
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01640 Vegetarian DHA

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