Are We Reaching Consensus About FISH OIL?

PLUS: Why Omega-3 Studies Have Different Outcomes
CAUTION: Individuals consuming more than 50 mcg (2000 IU) per day of vitamin D (from diet and supplements) should periodically obtain a serum 25-hydroxy vitamin D measurement. Do not exceed 10000 IU per day unless recommended by your doctor. Vitamin D supplementation is not recommended for individuals with high blood calcium levels.

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We Have a New Look

Our new bottles and labels include important product details (dosages, cautions, all ingredients).

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Optimized NAD⁺ Cell Regenerator™ combines 300 mg of nicotinamide riboside with resveratrol and other plant extracts.

For those already taking resveratrol, we also offer NAD⁺ Cell Regenerator™ that provides 300 mg of nicotinamide riboside.

The only online source of these NAD⁺ formulas is LifeExtension.com (or by calling 1-800-544-4440).

* For pricing available to readers of this magazine, call 1-800-544-4440 or visit LifeExtension.com/NAD
What troubles us, however, is that patients taking the EPA-only fish oil drug (Vascepa®) are unlikely to take other fish oil supplements. This ignores the critical role of the DHA component of the omega-3 family on life-sustaining processes, especially brain and eye health.

The estimated out-of-pocket cost, assuming no insurance coverage, is over $300 a month for this EPA-only fish oil drug. This is about seven times higher than what a comparable amount of EPA+DHA can be obtained for when using dietary supplements.

This editorial describes legal battles that took place over decades regarding fish oil, and introduces new data that corroborate the benefits of consuming higher omega-3 potencies.

In 2019, the FDA sought the advice of an expert panel to review new data about a fish oil drug.

By a vote of 16-0, the panel recommended that the FDA allow broader claims about its ability to reduce cardiovascular risks.

In December 2019, the FDA acted on this recommendation by expanding the “approved use” of this fish oil drug to reducing risk of heart attack, stroke, and death in high-risk patients.

This decision was largely based on a study published in the New England Journal of Medicine showing remarkable benefits in people taking high doses of a fish oil drug that consisted of the EPA omega-3 fraction.

Compared with placebo, there was a 25% reduction in a composite of cardiovascular death, nonfatal myocardial infarction, nonfatal stroke, coronary stents/bypass surgeries, or unstable angina in the fish oil drug group.

The study observed several other benefits including:

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

This fish oil is marketed to doctors as a drug that lowers triglycerides without raising LDL cholesterol.

To the physician, this may sound appealing compared to a competitor fish oil drug that contains both EPA and DHA.
Many of you may take for granted your ability to purchase affordable fish oil supplements, but it was not always this way.

On February 26, 1987, the FDA conducted an armed raid against Life Extension®, marking the first time in the FDA’s 88-year history that it has been forced to give up on a criminal prosecution.

Seven years later, Congress passed legislation that allowed consumers to access a variety of affordable dietary supplements.5 This helped curb the FDA’s appetite for overly aggressive and frankly police-state-like enforcement actions. The FDA nonetheless continued to censor lifesaving data about fish oil and other healthy foods (such as walnuts and cherries).7,8

This prompted another lawsuit filed in 1994 by Durk Pearson and Sandy Shaw that sought to force the FDA to allow the following health claim on fish oil supplement labels:9

“Consumption of omega-3 fatty acids may reduce the risk of coronary heart disease.”

The FDA rejected this one-sentence claim, and multi-year litigation ensued based on scientific and constitutional grounds.

The FDA contended this health claim was not adequately backed by scientific studies and that the agency had the legal authority to ban these kinds of health claims.

After seven years of extensive litigation, the FDA capitulated and said it would permit the following claim:9

“Consumption of omega-3 fatty acids may reduce the risk of coronary heart disease. FDA evaluated the data and determined that although there is scientific evidence supporting the claim, the evidence is not conclusive.”

To substantiate this position, a document enumerating the scientific studies backing the benefits of omega-3 fatty acids was filed, along with arguments supporting the constitutional right to disseminate truthful, non-misleading information.

Everything I am describing has to do with what “words” the FDA allows to be on a fish oil label.
FDA Suffers Major Defeat in Federal Court

The FDA strictly regulates what drug makers are permitted to say about their products. Until recently, what could be said was limited to what the FDA allowed.

A major victory over FDA censorship occurred when a maker of prescription-drug fish oil sued the FDA to make a health claim about fish oil’s potential to reduce cardiovascular disease risk.\(^1\)

The FDA insisted it was illegal for the maker of this fish oil drug to state a coronary disease prevention claim until the FDA said so.

After years of costly litigation and thousands of pages of documents produced, a federal court ruled that a qualified health claim could be made for a fish oil drug called Vascepa\(^\circledast\).

The court based this 2015 ruling on the facts that:

- The claim is truthful and non-misleading.
- FDA accepted this phrasing elsewhere in its regulatory labyrinth.

Here is the revised claim the federal court ruled could be made to doctors about this fish oil drug in 2015:\(^4\)

“Supportive but not conclusive research shows that consumption of EPA and DHA omega-3 fatty acids may reduce the risk of coronary heart disease. Vascepa\(^\circledast\) should not be taken in place of a healthy diet and lifestyle or statin therapy.”

After years of protracted disagreement that led to full-blown litigation, the above statement is the primary outcome of this legal victory over FDA censorship.

In the ruling, the judge quoted from prior cases that:

“Securing First Amendment rights is in the public interest” and “the government does not have an interest in the unconstitutional enforcement of a law.”\(^14\)

• The First Amendment to the U.S. Constitution allows it.

FDA Partially Capitulates

On September 8, 2004, the FDA decided to allow an expanded health claim on products containing the omega-3 fatty acids EPA and DHA as follows:

“The FDA went on to recommend that consumers not exceed more than 3,000 mg per day of EPA and DHA omega-3 fatty acids, with no more than 2,000 mg per day derived from dietary supplements.\(^11\)

Life Extension\(^\circledast\) argued that many studies show that higher amounts of EPA and DHA are often needed to obtain benefits, such as reduction of triglycerides.\(^12,13\)

Our position continues to be vindicated in studies showing benefits when higher potencies of omega-3s are consumed.
Is A Consensus Being Reached?

Results from recent, large studies continue to validate the need for higher-dose omega-3 intake.

As mentioned in the introduction of this article, and in the November 2019 edition of Life Extension® magazine, robust benefits were found when a high dose (4,000 mg/day) of an EPA-only fish oil drug (Vascepa®) was used. The study found a 25% reduction across a broad spectrum of cardiovascular disorders.1

In this same issue, we described why 1,000 mg a day of an EPA/DHA supplement (and only 2,000 IU/day of vitamin D) failed in its primary endpoint, but did yield meaningful risk reduction in several subgroups including:17,21

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

At the American Heart Association annual meeting in November 2019, a presentation on a study that administered about 3,300 mg of an EPA/DHA fish oil drug called Lovaza® revealed striking improvements in cognitive functions in older individuals.22
What made this study so compelling is that blood levels of EPA/DHA were carefully measured. The cognitive benefits occurred in those with an omega-3 index over 4%. Here is the conclusion from this presentation made at the American Heart Association meeting:\textsuperscript{22}

"High dose EPA and DHA prevented cognitive decline in cognitively healthy coronary artery disease subjects, with younger subjects, nondiabetic subjects, and those achieving an omega-3 fatty acid index $\geq 4\%$ having greatest benefit. These findings are especially important for coronary artery disease patients as coronary artery disease is a risk factor for dementia."

What I continue to observe in the published data is consensus that higher-dose omega-3 intake is what induces meaningful risk-reduction benefits.

**Overlooked Role of Dietary Omega-3s**

No one argues with the idea that eating two to three cold-water fish meals a week reduces cardiovascular and other disease risks. This is nearly universally agreed upon and accepted, including in the medical profession and among researchers.

Yet missing from virtually all research on fish oil supplements is each study subject’s dietary intake of EPA/DHA-rich foods.

To put this into perspective, a 4-ounce can of wild salmon contains about 2,000 mg of total omega-3s providing about 1,800 mg of EPA/DHA.

So, a clinical trial using only 1,000 mg of supplemental EPA/DHA in people who regularly consume canned wild salmon might yield benefits because the total daily consumption of EPA+DHA is around 2,800 mg.

On the flip side, individuals consuming typical Western dietary patterns that are nearly devoid of omega-3s may require far higher amounts of supplemental EPA/DHA (3,300 mg to 4,000 mg) to achieve the same results.

The significance of these differences cannot be overstated, both from a public health standpoint and on huge savings on fish oil drugs and supplements.

People whose diets already provide ample quantities of EPA/DHA will likely require lower potencies of fish oil drugs or supplements. Yet a one-size-fits-all approach is the current protocol. The FDA now allows certain high-risk patients to be prescribed a 4,000 mg/day potency of an expensive EPA-only drug—but advises against the same potencies of lower-cost fish oil supplements!

**How This Impacts You**

The importance of achieving optimal EPA/DHA status cannot be overstated. It impacts a person’s risk of multitudes of disorders, many that are life threatening.
target a triglyceride blood level below 100 mg/dL.

Based on published studies showing benefits with higher intake of EPA/DHA, more doctors are prescribing expensive fish oil drugs, often without considering an individual patient’s dietary intake of the omega-3s.

Common-Sense Approaches

Supplementation with quality fish oil can cost about $300 a year whereas fish oil drugs can cost over $3,600 a year.

The Omega-3 Index Complete blood test includes the following measures:

- Omega-3 Index Percent (it should ideally be over 8%)
- Trans Fat Index
- Omega-6:Omega-3 ratio
- Arachidonic acid:EPA ratio
- Full fatty acid profile

Results from this blood test provide a guideline for dietary changes and fish oil supplementation for each person’s individual biochemistry.

Those who obtain few dietary omega-3s in their diet may want to boost their supplemental fish oil intake over 3,000 mg a day, whereas those who eat lots of cold-water fish may reduce their supplemental dose below 2,400 mg a day.

While these common-sense approaches are obvious to me and Life Extension’s scientific staff, many hurried physicians are likely to stick with the labeled high doses of FDA-approved fish oil drugs, i.e. the one-size-fits-all approach.

Life Extension’s Position on Fish Oil Dosing

For many decades, we’ve suggested most of our readers supplement with about 2,400 mg of EPA + DHA each day from highly purified fish oil.

We know most of you consume omega-3s in your diet by eating cold-water fish meals and/or via plant sources like walnuts, flax, and other foods.

So, our typical reader may, on average, obtain over 3,000 mg-4,000 mg each day of EPA/DHA from their fish oil supplement plus omega-3-rich dietary components.

We caution, however, that not all people, and perhaps very few, convert plant-based omega-3s to EPA/DHA. This is what makes fish oil so important but presents a dilemma for vegans.

People with stubbornly high triglyceride levels are advised to increase their fish oil intake to

Your blood ratio of omega-3 fats to omega-6 fats—which can be measured with the omega-3 index blood test—is an important determinant of overall health status.

The good news is that pricing keeps dropping for the omega-3 index comprehensive fatty acid blood panel.

Results from this test can enable you to precisely determine how many fish oil capsules you need a day to achieve an optimal omega-3 index, which by most standards is over 8%.

The recent study presented at the American Heart Association conference found meaningful cognitive benefits when omega-3-index scores were over 4%.

I’ll describe soon how you can obtain low-cost omega-3/omega-6 blood tests that might enable you to reduce the number of fish oil capsules you take a day, saving you money over the long term.

The recent study presented at the American Heart Association conference found meaningful cognitive benefits when omega-3-index scores were over 4%.

I’ll describe soon how you can obtain low-cost omega-3/omega-6 blood tests that might enable you to reduce the number of fish oil capsules you take a day, saving you money over the long term.
The buildup of senescent cells continues to be recognized as a causative factor in degenerative aging. As you’ll read on page 26 a plant flavonoid (apigenin) can reduce the toxic secretions that emanate from senescent cells. Sulforaphane from broccoli has demonstrated powerful anti-cancer properties. Page 54 describes the best ways of transporting sulforaphane from the digestive tract into the blood.

Too Many Needless Heart Attacks

Growing consensus about fish oil, along with the new claims allowed by the FDA, will help enable more Americans to benefit from higher consumption of omega-3 fatty acids. The tragedy is that it took so long for the benefits of omega-3s to be widely recognized. Cardiovascular disease remains the leading cause of disability and death in the United States, especially in elderly population groups. Armed raids by the FDA against those who recognized fish oil’s benefits in the 1980s resulted in countless numbers of cardiovascular events and astronomical medical costs for bypass procedures, stents and prescription drugs.

We look forward to science prevailing over the kinds of actions one might expect in an authoritarian, police state.

This happened when doctors in Wuhan, China warned of a pneumonia epidemic in December 2019, but were silenced with threats of arrests for “spreading false rumors.” This governmental censorship led to the deaths of hundreds of thousands of people worldwide from COVID-19 disease.

FDA censorship of fish oil dating back to the 1980s may have led to similar tragedies.

Turn the page for information on popular Male and Female Blood Test Panels and how you can obtain an omega-3 index at the lowest price ever.

For longer life,

William Faloon, Co-Founder
Life Extension Buyers Club
References


Comprehensive Blood Tests at Low Lab Sale Prices

New supporters often ask Life Extension® what the most important nutrients are. Our typical reply is we have no idea if you don’t have recent blood test results. Commercial labs charge over $2,000 for blood tests needed to evaluate vascular, inflammatory, immune, and other degenerative risk factors.

Once a year, Life Extension® offers these same tests in comprehensive Male and Female Panels for $224... a savings of about 90%. (This year magnesium is added to 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

**OMEGA-3 INDEX COMPLETE**

Knowing one's fatty acid status can enable better dietary and supplement choices. One of the parameters in this panel can enable you to target an omega-3 blood level in the ideal range of 8%-12%. This is the lowest price we have ever offered on the OMEGA-3 INDEX COMPLETE. Price effective until October 5, 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.
Enzymatically Active Vitamins

BioActive Complete B-Complex provides enzymatically active forms of meaningful potencies of each B vitamin.

This includes the pyridoxal 5’-phosphate form of vitamin B6 shown to protect lipids and proteins against glycation and the most biologically active form of folate called 5-methyltetrahydrofolate (5-MTHF), which is up to 7 times more bioavailable than folic acid.*

Item #01945 • 60 vegetarian capsules
1 bottle $9
4 bottles $8 each

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

Reference
HIGHLY PURIFIED FISH OIL

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.

HIGHLY CONCENTRATED EPA/DHA + SESAME LIGNANS + OLIVE POLYPHENOLS:

SUPER OMEGA-3 Fish oil
EPA/DHA fish oil, sesame lignans and olive extract
(Small, Easy-to-Swallow softgels)

Item # 01986 • 240 Easy-to-Swallow softgels*
1 bottle $24
4 bottles $21 each

SUPER OMEGA-3 Fish oil
EPA/DHA fish oil, krill, astaxanthin, sesame lignans, and olive extract

Item # 01988 • 120 softgels
1 bottle $33.75
4 bottles $31.50 each

SUPER OMEGA-3 Fish oil
EPA/DHA fish oil, sesame lignans and olive extract

Item # 01982 • 120 softgels*
1 bottle $24
4 bottles $21 each

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

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

* Highest Independent 5-star rating, International Fish Oil Society For Over Nine Years.

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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.
FLORASSIST® Liver Restore™ contains 7 strains of beneficial probiotic bacteria—plus a supporting prebiotic—to provide targeted liver support.

When clinically studied, the probiotic-prebiotic blend in FLORASSIST® Liver Restore™ was found to:

- Support healthy levels of liver enzymes
- Inhibit inflammatory factors to support liver health

Take 2 capsules daily, with or without food, or as recommended by a healthcare practitioner.

Item #02402 • 60 capsules
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In the News

Vitamin C Could Lower Ventilation Duration

Results of an analysis published in the *Journal of Intensive Care* revealed an association between the administration of vitamin C to critically ill patients and a reduction in the length of time that the use of a ventilator was required.*

Researchers pooled the results of eight controlled trials that compared the length of ventilation among patients who received intravenous or orally administered vitamin C, to the ventilation duration of control groups who did not receive the vitamin.

Upon having determined a 14% reduction in time spent using a ventilator among subjects who received vitamin C infusions, they subsequently limited the analysis to five trials that involved longer ventilation times of 10 hours or more, which suggests more severe disease.

The results in these critically ill patients found an average reduction in ventilator time of 25% among patients who received 1-6 grams of intravenous or oral vitamin C per day.

*Editor’s Note:* The authors concluded that, “Given the strong evidence of benefit for more severely ill critical care patients along with the evidence of very low vitamin C levels in such patients, ICU patients may benefit from the administration of vitamin C. Further studies are needed to determine optimal protocols for its administration.”

*J Intensive Care. 2020 Feb 7;8:15.*
Supplementing with Glucosamine Linked with Reduced Risk of Type II Diabetes

A report published in the American Diabetes Association journal *Diabetes Care* revealed a significant association between the use of glucosamine and a lower risk of developing type II diabetes.*

The study included 404,508 men and women enrolled in UK Biobank, a population-based prospective study that was established to facilitate investigations of genetic and nongenetic determinants of diseases of middle and older age.

Questionnaires completed upon enrollment in UK Biobank reported the regular use of various supplements, while blood samples collected at the time provided information concerning levels of C-reactive protein.

Participants were free of cancer, cardiovascular disease and diabetes at the beginning of the study. Type II diabetes was diagnosed among 7,228 subjects during a median follow-up of 8.1 years. Glucosamine supplementation in men and women was associated with a 17% lower risk of developing diabetes during follow-up.

**Editor’s Note:** C-reactive protein levels at the beginning of the study were significantly lower in glucosamine users than nonusers. Among participants whose blood levels of CRP placed them among the top 25% of subjects, the use of glucosamine was associated with an 18.8% lower risk of diabetes compared to nonusers. Glucosamine has long been used by people with cartilage degenerative disorders in their joints.

* *Diabetes Care.* 2020 Jan 27.
Iron Interferes with the Benefits of Lycopene

Lycopene is a carotenoid found in tomatoes and other red fruits that gives them their bright color. It also provides numerous health benefits and has been associated with a lower risk of prostate\(^1\) and lung\(^2\) cancers.

Unfortunately, those benefits could be reduced if tomatoes are consumed with iron-rich foods, like meat.

According to a recent study published in *Molecular Nutrition & Food Research*, iron interferes with the body’s ability to absorb lycopene.\(^3\)

For this study, researchers had a small group of people consume a tomato-extract-based shake, either with or without iron.

Numerous blood draws and digestive samples revealed that lycopene levels in the blood and in the stomach were significantly lower when lycopene was consumed with iron.

“When people had iron with their meal, we saw almost a two-fold drop in lycopene uptake over time,” said the study’s lead author, Dr. Rachel Kopec.

This means that less lycopene is available for the body to utilize.

**Editor’s Note:** This study highlights why iron is **not** included in Life Extension\(^\circ\) supplements. Those with low iron levels should supplement with iron at a different time of the day from when they take lycopene. Note that calcium and green tea block iron absorption. It is best to take iron with vitamin C, which enhances iron absorption.

**References**
Specific Nutrients May Improve the Body’s Immune Response to RNA Viruses

An article published in *Progress in Cardiovascular Diseases* proposes the use of nutritional supplements to enhance the body’s **type 1 interferon immune response** to influenza and coronaviruses. These viruses have **RNA**, rather than **DNA**, as their genetic material.*

“Activation of toll-like receptor 7 (TLR7) by single-stranded viral RNA trapped within endosomes provides a key stimulus to type 1 interferon induction by RNA viruses,” authors Mark F. McCarty and James J. DiNicolantonio wrote.

Based on this and other research findings, the researchers identified the antioxidant compounds **lipoic acid**, **ferulic acid** and **sulforaphane** as nutrients that may enhance TLR7-mediated induction of type 1 interferon.

**Spirulina** or a protein in spirulina extracts known as phycocyanobilin may also improve this response to RNA viruses.

**N-acetylcysteine** (NAC) increases the production of glutathione and could help protect TLR7 from damage due to oxidation.

The provisional daily dosage suggestions for nutraceuticals that might aid control of RNA viruses including influenza and coronavirus were as follows:

<table>
<thead>
<tr>
<th>Nutraceutical</th>
<th>Dosage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ferulic acid</td>
<td>500 mg–1,000 mg</td>
</tr>
<tr>
<td>Lipoic acid</td>
<td>1,200 mg–1,800 mg (in place of ferulic acid)</td>
</tr>
<tr>
<td>Spirulina</td>
<td>15 grams (or 100 mg of phycocyanobilin or PCB)</td>
</tr>
<tr>
<td>N-Acetylcysteine</td>
<td>1,200 mg–1,800 mg</td>
</tr>
<tr>
<td>Selenium</td>
<td>50 mcg–100 mcg</td>
</tr>
<tr>
<td>Glucosamine</td>
<td>3,000 mg or more</td>
</tr>
<tr>
<td>Zinc</td>
<td>30 mg–50 mg</td>
</tr>
<tr>
<td>Yeast Beta-Glucan</td>
<td>250 mg–500 mg</td>
</tr>
<tr>
<td>Elderberry</td>
<td>600 mg–1,500 mg</td>
</tr>
</tbody>
</table>

In an interview, Dr. DiNicolantonio told *Thailand Medical News*, “Therefore, it is clear that certain **nutraceuticals** have antiviral effects in both human and animal studies. Considering that there is no treatment for the new **coronavirus**...we welcome further studies to test these **nutraceuticals** as a strategy to help provide relief in those infected with encapsulated RNA viruses.”

**Editor’s Note:** Another mechanism of type 1 interferon response, activation of mitochondrial antiviral-signaling protein (MAVS), can be upregulated by a high dose of **glucosamine**.

* *Prog Cardiovasc Dis*. 2020 Feb 12.
Highly Absorbable

CURCUMIN

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.

45 Times Greater Bioavailability
At a Lower Price

---

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500 mg, 60 vegetarian capsules
1 bottle $24
4 bottles $22 each

Item #02324
500 mg curcumin + gingerol, 30 softgels
1 bottle $20
4 bottles $18 each

For full product description and to order Curcumin Elite™ or Advanced Curcumin Elite™,
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visit www.LifeExtension.com

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Human studies demonstrate robust neurological benefits in response to low-dose lithium and colostrum-derived, proline-rich polypeptides.

**Memory Protect** has been formulated with these two nutrients to support healthy structure of brain cells, normal memory, and recall function.

The upgraded **Memory Protect** now has > 3 times more lithium at the same low price.

For full product description and to order **Memory Protect**, 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.
Research shows zinc deficiency is common in aging populations—and may contribute to the decline of immune function.\(^1\)

Zinc supports and activates:

- Natural killer cell function\(^2\)
- A healthy inflammatory response\(^3\)
- Thymic function needed to make immune T-cells.

Life Extension® combines the superior bioavailability of zinc monomethionine\(^4\) with zinc citrate to provide 50 mg of these absorbable zinccs in a single capsule.

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

OptiZinc® is a registered trademark of InterHealth Nutritional, Inc.

CAUTION: Supplemental zinc can inhibit the absorption and availability of copper. If more than 50 mg of supplemental zinc is to be taken daily for more than four weeks, 2 mg of supplemental copper should also be taken to reduce the risk of copper deficiency.

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Suppress Toxic Secretions from SENESCENT CELLS

By Jason Fitzgerald

When aged cells lose healthy functionality they’re supposed to die off and their remnants expunged from the body.

**Senescent cells** do not follow this rule.

They instead **linger** in a highly activated (toxic) state that **damages** healthy cells.

**Cellular senescence** is a major contributor to degenerative disorders and systemic **aging**.¹-⁸

**Senescent cells** can be partially **removed** from the body using compounds known as **senolytics**.

Researchers have made another advance in **senolytic** strategy. They’ve identified that **apigenin** (a plant extract) reduces harmful compounds that **senescent cells** emit.
Senolytics Remove Senescent Cells

A few years ago, researchers at the Mayo Clinic showed that it was possible to selectively remove senescent cells using drugs and other compounds known as senolytics.9

Initial studies relied on synthetic anti-cancer drugs as part of the senolytic regimen. Navitoclax and dasatinib are two cancer drugs that have been successfully used to eliminate senescent cells.10,11

One of the most studied senolytic treatments combines dasatinib with a nutrient found in many fruits and vegetables called quercetin. Each compound targets senescent cells in different ways.

In cell culture and animal studies, senolytics remove senescent cells and reduce disease, leading to longer lives for the animals.8,9,12-14

Last year a study confirmed that senolytics can eliminate senescent cells in human subjects.15

In this trial, a daily dose of 100 mg of dasatinib and 1,000 mg of quercetin for three days resulted in a significant reduction in senescent cells.

The results were seen in fat tissue, opening the door to potential senolytic treatments for those suffering from obesity, metabolic disease, and more.

Plant-Based Senolytics

Using cancer drugs even in very low doses concerns many natural-health enthusiasts.

Scientists have been searching for senolytic agents that do not rely on these drugs. They’ve recently made discoveries showing functional efficacy of plant-based senolytics.

In late 2019, a study was published indicating that the nutrient quercetin is successful as a senolytic agent on its own, without combining it with the cancer drug dasatinib.16

In this study, quercetin removed senescent cells in the kidneys of mice. This led to improved function and a decrease in the fibrosis (scarring) that causes deterioration and kidney failure.

Quercetin has also been shown to inhibit the proteins that block apoptosis, or programmed cell death, in senescent cells. This makes it easier for other senolytic compounds to eliminate damaged cells from tissues.17

The data still show that combining quercetin with dasatinib works better than quercetin alone. This led to a search for a plant-based compound that acts like dasatinib, without the side effects.

Scientists have discovered that theaflavins from black tea may act as a senolytic agent by inhibiting cellular receptors Eph, BRC-ABL, and BLC-218-21 to clear senescent cells from the body.

Increased activity by a signaling protein called ephrin has been linked to senescence, and dasatinib works in part by stopping ephrin (Eph) receptors from activating.9

Theaflavins block ephrin receptor activation and can prevent cell senescence.18,22

Research shows that theaflavins also inhibit BCL-2 proteins that make it easier to induce death in senescent cells.21
Toxic Secretions Emitted by Senescent Cells

Researchers realized that it’s not enough just to remove senescent cells from the body.

When cells become senescent, they don’t just sit there, as if inert. They undergo a series of transformations that result in their secreting high levels of toxic compounds collectively referred to as SASP or senescence-associated secretory phenotype.

SASP consists of protein-degrading enzymes that damage and destroy surrounding healthy cells and initiate chronic inflammation.23

This low-level inflammation silently damages tissues and organs, leading to disease, dysfunction, and accelerated aging.24

Persistent inflammation also contributes to weight gain and obesity, which increases risk for type II diabetes and metabolic syndrome, along with cardiovascular disease, cancer, and dementia.1-4,8,23-28

Why Senescent Cell Removal is not Enough

It is not yet possible to remove all senescent cells that accumulate in our aging bodies. The best we can do is reduce what’s known as the “senescent cell burden.”

A New Senolytic Triple Therapy

- As cells age, some of them become senescent. This means they are dysfunctional, but don’t die off like most damaged cells.
- Senescent cells rob their tissues of function. They also secrete compounds that incite chronic inflammation, causing damage and dysfunction to surrounding tissues.
- Cellular senescence is linked to rapid aging and increased risk for chronic disease.
- Senolytics are compounds capable of removing senescent cells. The most common senolytic therapy studied so far is a combination of the plant nutrient quercetin and a cancer drug, dasatinib.
- Recent research has found that theaflavins from black tea provide similar senolytic effects as dasatinib.
- A third nutrient, called apigenin, provides further protection. It suppresses the secretion of pro-inflammatory compounds by existing senescent cells.
- Together, these three plant-based nutrients provide powerful protection against the damage done by cellular senescence.
Remaining senescent cells continue secreting SASP that slowly destroys healthy surrounding tissues by degrading proteins and igniting inflammatory fires. To put this into perspective, Mayo Clinic scientists calculated that if only one in 7,000 to 15,000 cells is senescent, then age-related problems in physical function started to appear in mice. To protect against the senescent cell burden, more needs to be done to reduce the emission of toxic SASP.

A Triple-Action Senolytic Approach

Apigenin is a flavonoid found in certain herbs, fruits, and vegetables. In two recent studies, apigenin was found to inhibit the SASP. This resulted in a reduction in pro-inflammatory compounds produced by senescent cells.29,30 Reducing inflammation caused by SASP while diminishing the senescent cell burden is crucial for healthy longevity. Quercetin and theaflavins (from black tea) function via separate and complementary mechanisms to purge the body of senescent cells.

A strawberry flavonoid called fisetin may become one of the most effective senolytics, but it is not yet bioavailable enough to induce a systemic benefit. A triple approach utilizing highly absorbable quercetin, theaflavins, and apigenin can attack cellular senescence from multiple angles, helping to rid the body of the damage it causes.

Summary

Cellular senescence is a major contributor to rapid aging and risk for degenerative illnesses. Senolytic therapies remove senescent cells from the body, rejuvenating tissues and preventing the chronic damage that senescent cells do. Major advances have been made in senolytic treatments in the last few years, including demonstrating that these interventions can remove senescent cells in human subjects. Some of the earliest senolytic compounds used were chemotherapy drugs. Recent research has shown that plant-derived nutrients function via similar senolytic mechanisms.

Los Angeles Times Reports on Senolytics

“This drug cocktail reduced signs of age-related diseases and extended life in mice and human cells”

“…A group led by Mayo Clinic anti-aging researcher James Kirkland not only offers a clear look at the power of senescent cells to drive the aging process, but also a pharmaceutical cocktail that, in mice at least, can slow and even reverse it…”

“Compared with mice that aged normally, those that started the dasatinib-quercetin cocktail at an age equivalent to 75 to 90 years in humans ended up living roughly 36% longer, and with better physical function…”

“Aging...is beginning to look more and more like a disease—and a treatable one at that.” — L.A. Times, July 10, 2018.
Enhancing Quercetin’s Effects

A challenge to fully benefiting from quercetin is that it can have low oral bioavailability. To improve quercetin’s absorbability so that the body can obtain higher benefits at lower doses, researchers integrated quercetin into a phytosome.

Phytosomes combine a natural compound (like quercetin) with a plant-based phospholipid carrier. This enables much more quercetin to enter the bloodstream to exert its beneficial effects throughout the body.

Quercetin + theaflavins mimic senescent-cell-removing actions of quercetin and dasatinib (the cancer drug).

Apigenin provides added protection by reducing the emissions (SASPs) from residual senescent cells that ignite inflammatory reactions in our aging bodies.

As we await the development of bioavailable fisetin (a plant flavonoid), combinations of theaflavins, quercetin and apigenin are options for people over age 35-45 to consider.

Healthy younger individuals are unlikely to need senolytics as they have not yet acquired a toxic “senescent cell burden”.

References
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.²³

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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Restore Connections Between Your Neurons

Neuro-Mag® Magnesium L-Threonate was specifically formulated by MIT scientists to be uniquely absorbable by brain and nerve cells.

The numbers of synapses that connect brain cells decline with aging.

Magnesium L-Threonate has been shown to improve synaptic density and other structural components of the brain.*


For full product description and to order Neuro-Mag® Magnesium L-Threonate or Neuro-Mag® Magnesium L-Threonate Powder, call 1-800-544-4440 or visit www.LifeExtension.com

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Senescent cells no longer function optimally and secrete harmful compounds that damage healthy cells.

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.

Apigenin has been added to inhibit proinflammatory compounds produced by senescent cells.

The suggested dose is to take two capsules of Senolytic Activator just once weekly.


For full product description and to order Senolytic Activator, 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.
VITAMIN C’s Critical Role in Immune Health
We’ve heard it all our lives:

**Vitamin C fights colds.**

That’s partially true.

Some human studies show that taking vitamin C can lessen the severity and duration of the common cold.¹

What’s irrefutable is the role that vitamin C plays in maintaining immune function.²-⁴

**The ABCs of Vitamin C**

Vitamin C is an essential nutrient in humans.²

Without it we die.

Humans don’t internally produce vitamin C like most animals. It must be obtained from diet or other external sources.

Severe vitamin C deficiency—medically known as scurvy²—causes major health problems, including increased susceptibility to infections.⁵

Low vitamin C levels are relatively common in the United States.²,⁶,⁷

Diets lacking in fruits and vegetables fail to provide enough vitamin C.

Vitamin C is further depleted by smoking, illness, exposure to pollutants, and stress.²

As a water-soluble nutrient, vitamin C can’t be readily stored in the body.
VITAMIN C’S CRITICAL ROLE IN IMMUNE HEALTH

Impact on Infections

In the process of fighting infection, immune cells rapidly use up vitamin C. Some studies show that in common infectious illnesses, such as colds, supplemental vitamin C lessens the severity and duration of symptoms.1

In people with acute respiratory infections, like bronchitis or pneumonia, increasing oral dosages of vitamin C can reduce the severity of respiratory symptoms.8

The results can be dramatic. Some studies report rapid clearance on chest x-rays of patients with lung infections, following intravenous vitamin C treatment.8,10

In pneumonia and other serious infections, vitamin C has been shown to reduce symptoms, shorten hospital stay, and lead to more rapid normalization of markers of disease.8,11

Barrier Against Disease

Before viruses, bacteria, and other infectious agents can make us ill, they must invade the body, breaching biological barriers meant to prevent their entry.

Our skin and the linings of our respiratory and digestive tracts are protective barriers.

Vitamin C is important for the creation and maintenance of these protective-barrier tissues. It’s required for the synthesis of collagen, a structural protein that provides strength and durability to barrier and connective tissues.2

Vitamin C also affects the linings of the airways in lungs, which are prone to infection. In animals with acute lung infection, treatment with vitamin C has been shown to restore barrier function, repairing junctions between cells in the lining of the respiratory tract.12

Helping Immune Cells

Vitamin C supports cells of the immune system, including those most directly involved in response to infections.

Neutrophils are the “first responder” immune cells against infections. They are called to infected tissues early in the course of disease. Research has shown that they play important roles in response to viral as well as bacterial infections.13,14

Vitamin C supports neutrophil function by:

• Helping neutrophils reach an infection. Early in an infection, neutrophils migrate to the infected tissues. Insufficient vitamin C impedes this process, making it difficult for neutrophils to find the infection.15-17 In a study of participants with inadequate vitamin C status, daily supplementation with vitamin C resulted in a 20% increase in neutrophil migration.18

• Helping neutrophils destroy microbes. Once neutrophils encounter an infection, they consume and kill infectious organisms. With vitamin C deficiency, that ability is severely impaired.2 One study showed that increased vitamin C intake, in combination with vitamin E, enhances the ability of neutrophils to devour and kill infectious agents.19

After neutrophils destroy pathogens, they die off and are removed by other cells. This helps resolve inflammation and start the healing process. But a lack of vitamin C can cause neutrophils to die in a way that releases potentially toxic compounds, causing new inflammation and tissue damage that make disease even worse.20,21 Preclinical studies show that adequate vitamin C inhibits this harmful process.22
Lymphocytes are the second most common form of immune cells. They include B cells, T cells, and natural killer cells (NK cells).

These cells are an integral part of the immune system’s ability to recognize foreign invaders and mount an attack on them.

Vitamin C promotes growth, maturation, antibody production, and survival of lymphocytes.23-26

Reducing Inflammation

Excessive inflammation initiated by infection causes damage to tissues. Preclinical studies show that vitamin C reduces excessive amounts of pro-inflammatory compounds.22,27,28

Studies in animal models and in humans have demonstrated that oral intake of vitamin C leads to lower levels of histamine, a pro-inflammatory compound which causes symptoms of both infection and allergy.17,29-31

Fighting excessive inflammation is important in wound healing and recovery of tissues following injury. By decreasing pro-inflammatory compounds, vitamin C helps initiate tissue-healing processes.32

Vitamin C Helps Fight Infections

- **Vitamin C** strengthens immunity by promoting healthy barrier function to keep out pathogens and supporting optimal function of immune-system cells.

- Inadequate levels of **vitamin C** are not uncommon and can impair immune response. Requirements for vitamin C are increased when the body is fighting infection.

- **Daily oral intake** of vitamin C restores bodily levels and has been shown to improve the function of immune cells, supporting a healthy response to viral and other infections.

- Health-conscious people supplement with **500 mg** and sometimes much higher doses of vitamin C each day.
**Summary**

**Vitamin C** is an essential nutrient that supports healthy immune function. Inadequate levels of vitamin C in the body impair the ability to ward off infectious disease and respond to an infection. Increasing intake of vitamin C corrects some of these impairments. This helps strengthen barrier functions that repel infectious agents and support optimal immune-cell function.

The need for vitamin C increases with acute illness. In animal models and human clinical studies, vitamin C has been shown to reduce incidence and severity of various forms of infectious disease.

In 1970, two-time Nobel Prize Laureate Linus Pauling claimed that vitamin C prevents and alleviates the episodes of the common cold. Ever since, most health-conscious Americans have supplemented with 500 mg a day (and far higher) of low-cost vitamin C.

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**

BROAD-SPECTRUM IMMUNE SUPPORT

Lactoferrin is a component of whey protein best known for its immune benefits.

An array of published studies describes how lactoferrin up-regulates innate and adaptive immune responses to a variety of antigens.

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

Contains milk.
Bioferrin® is a registered trademark of Glanbia.

Item #01681 • 300 mg, 60 capsules
1 bottle $45 • 2 bottles $40 each
(Two-Month Supply)

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Once-Daily HEALTH BOOSTER

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WHEY’S
Longevity Benefits

BY MICHAEL DOWNEY

For years, whey protein has been taken by athletes seeking to increase muscle mass and performance.

Evolving research shows that whey does much more.

Whey helps protect against muscle-wasting and weight gain, while lowering certain cardiovascular risk factors.1-11

Glutathione levels drop with age, and this could play a role in neurodegeneration, reduced immunity, and other age-related conditions.16-20

Whey protein enhances glutathione production.12,13

The ability of whey to increase glutathione levels comes from its unique combinations of small peptides.

Whey protein is increasingly seen as a superfood for healthy longevity.
Dangers of Low Protein

About 45% of older people in the U.S., and more than 84% in residential care facilities, are not adequately nourished.\(^{21,22}\) This results from reduced appetite and food intake, impaired nutrient absorption, and other age-related changes.\(^{22-24}\)

Insufficient intake of quality protein can lead to loss of muscle mass,\(^{25}\) especially in older individuals. After age 70, muscle mass decreases by about 15% per decade. However, this process begins as early as age 40, with an estimated 8% loss of muscle mass per decade.\(^{24}\)

Approximately 5%-13% of people aged 60 or over experience age-related muscle-wasting so severe, it increases the risk of falls and disability.\(^{26-28}\)

Inadequate protein consumption is associated with increased risk of age-related conditions like loss of bone strength and poor immunity.\(^{29}\)

In fact, low protein intake is associated with frailty,\(^{30}\) when the body is so weak it becomes unable to cope with stress or injury. Frailty is a strong predictor of mortality in aging people.\(^{21,31}\)

Whey is a potential solution.

Whey Inhibits Muscle-Wasting

Made from the liquid part of milk that separates during cheese production, whey is a high-quality protein source for aging people. It is also a great source of branched-chain amino acids, essential nutrients that reduce muscle breakdown and stimulate the creation of new protein in muscle.\(^{32}\)

The most metabolically active branched-chain amino acid in whey is leucine. It activates signals in muscle that boost the body’s anabolic (growth-promoting) drive, spurring muscle synthesis.\(^{2,33-36}\)

In one study, hospitalized, frail, elderly men and women were given whey daily during their hospital stay. Compared to patients who didn’t take whey, those who did had significant improvements in grip strength and knee extensor force, and improved rehabilitation outcomes.\(^6\)

Boosting Muscle Mass

Whey doesn’t just help prevent muscle loss. Two studies show that it also significantly increases lean muscle mass, perhaps especially when combined with exercise.

In a randomized, controlled trial, researchers divided 81 healthy, older women, aged 65-80, into three groups. Over 24 weeks, one group exercised twice weekly, another took whey protein but didn’t exercise, and the third took the same amount of whey protein after exercising.\(^4\)
The increase in muscle mass was significantly higher for the whey + exercise group than the other two groups. There was also a significant increase in grip strength and gait speed.4

Researchers also conducted a study to assess whey's effects on muscle loss following periods of inactivity.

In a controlled trial, men and women in their late 60s consumed a diet in which 45% of their protein came from either whey or animal peptides. After two weeks of habitual activity, participants spent two weeks being inactive, then returned to normal activity for one more week (recovery).1

During the inactive periods, lean leg mass was reduced in both groups. During the recovery week, lean leg mass increased only in the whey protein group.1

Preventing Weight Gain

Our metabolism naturally slows as we age, causing many to gain weight.

Whey has been shown to help prevent weight gain. Scientists have even considered it as a potential application for the treatment of obesity.37

In a host of studies, researchers discovered that the proteins, amino acids, and minerals in whey boost satiety (the feeling of fullness), benefit glucose homeostasis (the regulation of blood sugar levels), and optimize lean body mass.38-42

Scientists conducted one recent study on 100 men aged 70 or older with sarcopenic obesity, characterized by low lean mass and high fat mass.10

They divided the subjects into three groups. One received no treatment, another received whey protein only, and the third received whey protein and underwent whole-body electrical muscle stimulation (which “exercises” the muscles). In addition, all subjects received 800 IU/day of vitamin D.10

Total body fat, trunk body fat, and waist circumference were significantly reduced in both intervention groups (whey protein alone or combined with electrical muscle stimulation) after 16 weeks, but not in the untreated group.10

Another analysis of randomized, controlled trials on overweight and obese people concluded that there was a significant decrease in body weight and total fat mass in those who took whey protein.11
Fighting Cardiovascular Disease

Cardiovascular disease is the leading cause of death in the U.S.

Hypertension is one of the main factors contributing to cardiovascular disease.\textsuperscript{43} Research shows that whey-based peptides may help reduce this risk factor.\textsuperscript{44,45} (Peptides are chains of amino acids that are smaller than proteins.) And food-derived peptides like the kind found in whey are far safer than anti-hypertension drugs.

In a study, researchers asked 27 adults with mild hypertension (high blood pressure) to eat a high-fat breakfast and lunch along with 28 grams of whey protein. This was later repeated with 28 grams of calcium caseinate, a protein derived from casein (non-whey protein) in milk, and 27 grams of the carbohydrate maltodextrin.\textsuperscript{5}

Whey was found to reduce systolic blood pressure (the pressure on vessels when the heart contracts), by an average of 15.2 mmHg compared to calcium caseinate, and 23.4 mmHg compared to maltodextrin, for up to five hours after ingestion.

Whey also reduced arterial stiffness compared to maltodextrin. All these actions show whey’s potential to improve cardiovascular risk factors.\textsuperscript{5} Scientists examining previous trials on overweight and obese patients also found that whey protein reduced body weight and significantly lowered blood pressure, glucose levels, and cholesterol, reducing the risk of cardiovascular disease.\textsuperscript{11}

Summary

Whey protein is often viewed as just a protein source for bodybuilders.

Whey has also been shown to stop muscle-wasting in the elderly, boost lean muscle mass, prevent weight gain, and lower risks of cardiovascular disease and other illnesses.

It’s increasingly recognized as a food to protect against degenerative aging and prevent muscle loss.

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

References


16. McCarty MF, DiNicolaontonio JJ. An increased need for dietary cysteine in support of glutathione synthesis may underlie the increased risk for mortality associated with low protein intake in the elderly. *Age (Dordr).* 2015 Oct;37(5):96.


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**What Type of Whey is Right for You?**

Whey protein is commonly available in three forms:

- **Concentrate,**
- **Isolate,** and
- **Isolate with added creatine and glutamine.**

**Whey concentrate** is simply whey with the water removed. That leaves a powder that mixes easily for a protein shake. Most whey concentrates contain about 80% protein, and may be the most economical form of protein for the human body to digest and use.

**Whey isolate** is put through a filtration process that reduces the amount of carbohydrate, lactose, and fat, providing a purer protein in the end. Whey isolate contains about 98% protein. Those who are lactose intolerant should note that, like whey concentrate, whey isolate contains lactose.

**Whey isolate with added creatine and glutamine** is a premium isolate option for those seeking greater strength and exercise performance.

**Creatine** is found naturally in muscle cells. It supports energy production by increasing levels of cells’ energy currency, ATP, and helps maintain healthy muscle mass. Studies show that creatine helps build muscle and strength in explosive, short-duration activities like resistance-exercise training.

**Glutamine** is abundant in muscles, but levels are reduced after prolonged and high-intensity exercise. Glutamine encourages recovery after intense exercise, increases synthesis of energy-storing glycogen, and helps inhibit protein breakdown in muscle tissue. It can also inhibit blood ammonia accumulation during exercise, preventing physical fatigue.


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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

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Support Healthy Immune Function with WHEY Protein

Whey protein, packed with vital amino acids promotes glutathione synthesis. Glutathione plays an important role in supporting immune balance in the body.1-3

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Advanced Whey Isolate with Glutamine and Creatine
A premium isolate for greater strength and exercise performance. Item #02246 Vanilla**
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Contains milk. Use these products as a food supplement only. Do not use for weight reduction.

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** Creapure® is a registered trademark of AbChem Trostberg, GmbH, Germany, US Reg. No 2715915.
Roughly 1.8 million Americans are diagnosed with cancer each year.

More than 600,000 people in the United States die from it annually.\(^1\)\(^2\)

It doesn’t have to be this way.

Many cancers are preventable.

Improving diet, increasing exercise, and changing unhealthy behaviors can significantly reduce risk.\(^3\)

Studies show that higher intake of cruciferous vegetables is associated with a reduced risk for cancers.\(^4\)\(^5\)

Ongoing research points to anti-cancer effects of compounds found in broccoli and other cruciferous vegetables.

One clinical trial showed that a specific cruciferous vegetable nutrient triggered a complete resolution of pre-cancerous cervical lesions in 100% of women, removing the risk that the lesions could develop into cancer.\(^6\)

Until recently, it was difficult to deliver these cruciferous nutrients into the bloodstream at high enough levels to be effective.

Scientists have found a way to maximize the activity of cruciferous compounds so that they can reach tissues throughout the body.
Cruciferous Vegetable Compounds

Cruciferous vegetables are a group of edible plants that include broccoli, kale, green and red cabbage, cauliflower, and Brussels sprouts. They are loaded with nutrients shown to help prevent a wide variety of common disorders.

In particular, cruciferous vegetables have demonstrated the ability to protect cells from several processes that result in malignant transformations.4,5

Two cruciferous nutrients are especially well validated for their cancer-fighting properties:

1) Sulforaphane
2) DIM (3,3’-diindolylmethane).6–8

Findings from Johns Hopkins

In a seminal 1994 study from Johns Hopkins, rats were split into two groups. One was treated with sulforaphane, and one was not.9

All the animals were then exposed to a powerful cancer-inducing chemical.

The sulforaphane-treated rats developed 39% fewer tumors than the untreated group. And the tumors that did develop progressed at a slower rate.

Other studies have produced similar findings, showing that sulforaphane kills cancer stem cells, slows the growth of tumors, and promotes the death of cancer cells.10–12

In lab and animal studies, sulforaphane has been associated with diminished growth of cancer cells and a reduced risk of many types of cancer including:

- Breast,10–12
- Bladder,13
- Lung,14
- Prostate,15,16
- Cervix,17–19
- Blood (leukemia),20–22
- Mouth,23 and
- Brain.24,25

The other active compound in broccoli, DIM, also shows the ability to slow or even stop cancer cells from growing.

In one remarkable study, women with cervical intraepithelial neoplasia, a cervical cancer precursor, were treated with DIM.

After three to six months, 100% of women receiving 200 mg of DIM daily had their neoplasia completely resolved, compared to 61% of women in a placebo group.6

What’s most striking about these cruciferous compounds is that they have shown these effects on cancer in virtually every tissue studied.
Taken orally, these two components meet and mix only in the small intestine. That means higher levels of cancer-fighting sulforaphane can be achieved.

The results are striking. Scientists at Johns Hopkins found that sulforaphane levels from this glucoraphanin-myrosinase mix are three to four times more bioavailable (absorbable) than those created by glucoraphanin alone.27
How Sulforaphane and DIM Work

Sulforaphane and DIM have shown the ability to reduce cancer risk and malignant changes in four important ways:

- Stop deleterious epigenetic gene expression changes from occurring,
- Reduce or minimize cancer-promoting chronic inflammation,
- Fight estrogen-driven stimuli that encourage cancer cell replication and spread and
- Impede pre-cancerous cells from developing into tumors.

Stopping Epigenetic Changes

Cancer can be caused by epigenetic changes, the ability to “turn genes on and off.”

Epigenetic changes can be described as changing gene expression via one’s behavior or inadvertent exposure to outside toxins like air pollution.

By way of example, smoking cigarettes causes deleterious epigenetic changes that make the smoker more vulnerable to certain cancers.

Fish oil and vitamin D, on the other hand, have been shown to induce beneficial epigenetic changes.

These changes don’t alter the DNA, but they change expression patterns of genes.

Research has shown that sulforaphane and DIM can reverse some of these cancer-associated changes.16

One example of this is that sulforaphane reverses alterations in histone proteins involved in the regulation of genes, an epigenetic change that can help prevent cancer formation.28,29 This mechanism is so important, it’s a target of many new cancer drugs under development.30-32

Suppressing Inflammation

Chronic inflammation contributes to practically every age-related disease—including cancer.

Our bodies have a “master switch” that regulates the signaling molecules that drive inflammation. It’s called nuclear factor-kappa B (NF-kB).

Studies show that sulforaphane blocks NF-kB, reducing inflammation throughout the body. Along the way, sulforaphane kills cancer stem cells that can trigger tumor recurrence.11,33
By separating these precursor plant compounds, much more sulforaphane becomes bioavailable in the small intestine. There, it can be rapidly absorbed, delivering higher blood levels of this beneficial (sulforaphane) compound.

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


Stop Developing Tumors in their Tracks

Sulforaphane has demonstrated the ability to suppress signals and enzymes that spur growth of tumors, and to reduce formation of blood vessels that feed them.44-49

DIM has also been shown to reduce new blood vessel formation in tumors and to inhibit the spread of cancer.50

And both compounds spur cancer cells to die off, while leaving normal, healthy cells unharmed.51,52

These actions prevent pre-cancerous cells from developing into cancer and slow the growth of existing cancer.

Summary

Cruciferous vegetables like broccoli have proven capable of slowing and even reversing the development of many types of cancer.

Research shows that many of the anti-cancer effects are due to two compounds derived from these vegetables: sulforaphane and DIM.

While DIM is stable and easily absorbed when taken orally, sulforaphane is rapidly converted to inactive compounds.

To solve this problem, scientists developed a delivery system (glucoraphanin plus myrosinase) that maximizes the amount of sulforaphane available for absorption into the bloodstream.


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- **DIM** (di-indolyl-methane) to provide further cell health benefits.

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Retinol Blend Repairs Aging Skin

BY ROBERT GOLDFADEN AND GARY GOLDFADEN, MD

Many skin creams and serums have temporary effects.

But retinol can initiate changes in the skin that turn back the clock on skin aging.

Once applied to the skin, retinol converts into retinoic acid, a compound that sends signals to skin cells that stop and even repair skin aging.

Researchers have found that retinoic acid:

• Stimulates collagen and elastin synthesis,
• Boosts moisture,
• Promotes tissue repair, and
• Combats solar radiation.

Many topical creams contain retinol. But retinol is just one of a group of compounds called retinoids, which have slightly different effects.

These retinol compounds have been shown to:

• Reduce crow’s feet by 44%,
• Decrease mottled pigmentation by 84%,
• Prevent and even repair sun damage, and
• Reduce fine lines and wrinkles in just 14 days.

A lipid-soluble delivery system allows retinol to be gradually released in the skin to restore a smoother, more youthful appearance, with fewer side effects.
Retinol Enhances Skin Renewal

When retinol is topically applied to normal, aged skin, it increases the number of epidermal keratinocytes by 12-fold (Keratinocytes produce the key structural protein keratin). This boosts the thickness of the epidermis, strengthening the skin-barrier function crucial for keeping skin hydrated, soft, and youthful.

Topical retinol regenerates the dermis by increasing the number of protein-synthesizing fibroblasts and reducing secretion of protein-degrading enzymes.

It also stimulates the synthesis of collagen, elastin, and fibronectin, proteins that make up the dermal matrix, which can be thought of as the skin’s scaffolding. These retinol-induced effects can be seen in people after as little as seven days. All these changes lead to a visible impact.

One randomized, double-blind clinical trial showed that topical retinol significantly reduces fine wrinkles, roughness, and severity of changes in naturally aged skin after 24 weeks, compared to a placebo.

These benefits were later confirmed in another controlled, clinical trial that found significant increases in collagen and water-binding hyaluronic acid in response to topical retinol, leaving participants with rehydrated, smooth, and rejuvenated skin.

Numerous human studies have confirmed that topical retinol also breathes new life into photodamaged skin. In one study, 62 participants applied either retinol or a placebo to their face for one year. Compared to the untreated group, retinol decreased crow’s feet by 44% and reduced mottled pigmentation by 84%.

Retinyl Palmitate Protects Against Sun Damage

Retinyl palmitate is the main retinoid in the epidermis. There, it absorbs harmful ultraviolet rays and blocks inflammation, lipid peroxidation, and DNA damage associated with premature aging and skin cancer.

In people, topical application of retinyl palmitate before UV exposure was as effective as sunscreen in preventing erythema (skin reddening and inflammation) and thymine dimers, a marker of DNA damage.

Another study confirmed its photoprotective effects on DNA.

Additional research indicates that retinyl palmitate not only prevents but repairs the sun’s damaging effects on the skin.

How Skin Ages

Skin naturally ages over time, but there are ways to partially rebel.

The epidermis, the outer layer of the skin, becomes thinner, which weakens the barrier function. That leads to increased moisture loss and vulnerability to environmental threats.

In the second layer of skin, the dermis, there is reduced function and number of the specialized cells known as fibroblasts. This diminishes the output of the structural proteins collagen and elastin, which give skin its firmness and elasticity, and of hyaluronic acid, responsible for keeping skin hydrated.

All these changes make skin appear dry, pale, and blemished, and lead to fine wrinkles.

Skin aging is accelerated by environmental factors, especially prolonged sun exposure.

Ultraviolet radiation activates enzymes that break down dermal structural proteins and cause DNA damage that slows the production of new skin cells.

Sun-damaged skin is characterized by rough texture, deep wrinkles, age spots, and dark patches.

There’s a way to repair skin damage.

Retinol, retinyl palmitate, and hydroxypinacolone retinoate are vitamin A derivatives that belong to a group known as retinoids.

These retinoids enhance the ability of aged, damaged skin to restore itself.
Retinoids Rejuvenate Aging Skin

- Over time, and with exposure to sun, our skin ages. This causes wrinkles, dryness, age spots, rough texture, and other visible signs of damage.
- Applied topically, three related compounds called retinoids exert anti-aging effects.
- Retinol renews the outer layers of the skin, reversing damage caused by time and UV radiation. It reduces wrinkles and crow's feet, roughness, and mottled pigmentation.
- Retinyl palmitate protects against photoaging by absorbing ultraviolet rays and inhibiting DNA damage. Applied before UV exposure, it’s shown to be as effective as sunscreen in preventing skin reddening and inflammation.
- Hydroxypinacolone retinoate repairs damage and reduces fine lines and wrinkles similarly to prescription retinoic acid, but without its side effects (like peeling, redness, and hypersensitivity to the sun).

In one randomized, clinical trial, people applied topical retinyl palmitate (combined with vitamin E and moisturizers) to their face, neck, décolletage, arms, and lower body for 12 weeks. At the study’s end, the face and neck areas of the treatment group had significant improvements in roughness, mottled pigmentation, coarse wrinkles, fine lines, and uneven skin tone compared to baseline and non-treatment groups.

The décolletage, arms, and lower legs also showed improvements in dryness, scaling, and crepey skin texture.

Hydroxypinacolone Retinoate Repairs Skin

Retinol and retinyl palmitate each undergo several steps to be converted into retinoic acid.

A related compound, hydroxypinacolone retinoate, binds directly to retinoid receptors on skin cells, without needing to go through a conversion process.

This allows hydroxypinacolone retinoate to provide similar benefits to prescription-only retinoic acid, but without its side effects (like peeling, redness, and hypersensitivity to the sun).

A topical formulation containing hydroxypinacolone retinoate was shown in humans to boost epidermal thickness by 26.3%, while significantly increasing the production of collagen, elastin, and fibronectin in the dermis to repair sun-damaged skin.

In a separate human study, topical hydroxypinacolone retinoate reduced fine lines and wrinkles after 14 days—without skin irritation.

WHAT YOU NEED TO KNOW
Advanced Delivery System

Most topical products use a conventional delivery system that releases retinol all at once in the skin. This leads to the side effects people associate with retinol, such as redness and irritation.

A new delivery system **encapsulates** retinol in a solid matrix lipid structure. This enables it to be easily absorbed into the skin, then released in a **controlled** manner that minimizes side effects.31

Gradually releasing retinol into the skin maximizes its benefits and keeps skin smooth, hydrated, and youthful.

Summary

Three topical vitamin A derivatives—retinol, retinyl palmitate, and hydroxypinacolone retinoate—have been shown in human studies to protect and repair naturally aged and photodamaged skin.

A unique delivery system has been developed that ensures a gradual release of retinol in the skin to safely restore smooth, youthful, hydrated skin, without irritation. •

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

Gary Goldfaden, MD, is a clinical dermatologist and lifetime member of the American Academy of Dermatology. He is the founder of Academy Dermatology in Hollywood, FL, and Cosmesis Skin Care. Dr. Goldfaden is a member of the Life Extension® Medical Advisory Board. All Cosmesis products are available online.

References

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Advanced Retinol Serum features a delivery system that gradually releases retinol into the skin.

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The silymarin contained in European Milk Thistle is absorbed nearly 5 times better than silymarin alone, and its bioavailability to the liver is 10 times better.
Colchicine Dramatically Reduces Stroke Risk in Heart Attack Patients

BY EDWARD SANFORD

Most people don’t know that 30 days after a heart attack, there is a high risk of suffering a stroke.

These post-heart-attack strokes are more lethal than seen in typical stroke patients.

During the first three years after suffering a heart attack, the stroke risk remains 2-3 times higher than expected before dropping back to normal.¹

A major, placebo-controlled study published in the New England Journal of Medicine evaluated patients who had a recent heart attack and were then given 0.5 mg of colchicine daily.

The first data set showed that colchicine reduced risk of having another major cardiovascular event by 23%.²

The most significant data showed that heart attack patients receiving colchicine cut their stroke incidence by an astonishing 74%.²

People who have heart disease or who have suffered a heart attack should discuss colchicine with their doctor.
A Clear Benefit

Researchers were studying colchicine’s impact on major cardiovascular events, which they defined as any of the following:2

- Death from cardiovascular causes,
- Resuscitation after cardiac arrest,
- A new heart attack,
- Stroke, or
- Urgent hospitalization for chest pain leading to stent placement or bypass surgery.

In the placebo group, a major cardiovascular event occurred in 7.1% of patients. In the colchicine group, such an event occurred in 5.5% of subjects.2

This means that colchicine recipients were 23% less likely to have a major event compared with placebo recipients.

Most dramatically, colchicine recipients had a 74% lower risk of stroke, and a 50% reduction in the risk of chest pain leading to hospitalization.2
Levels of highly inflammatory cytokines (signaling proteins) produced in the heart during cardiac catheterization.

A 2015 analysis of five randomized, controlled trials involving 1,301 patients showed that 0.5 mg/day to 1 mg/day of colchicine reduced the risk of coronary artery disease, stroke, or acute coronary syndrome by 56% compared with a placebo.

All these studies, including the recent paper published in the New England Journal of Medicine, provide evidence that colchicine’s anti-inflammatory properties protect the heart and lower the risk of cardiovascular events.


cardiovascular events

Cumulative incidence of cardiovascular events (death from cardiovascular causes, resuscitated cardiac arrest, heart attack, stroke, or urgent hospitalization for chest pain leading to coronary artery procedure) over the course of the study. Colchicine recipients were 23% less likely to suffer a major cardiovascular event compared with placebo recipients (hazard ratio = 0.77).

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Side Effects

Colchicine is a powerful prescription drug and it isn’t for everyone.

Overall, side effects were reported in 16% of colchicine recipients and 15.8% of placebo subjects, an insignificant difference.

Diarrhea and flatulence side effects occurred in more colchicine recipients than in those receiving a placebo.

Pneumonia was a rare side effect, though the risk was slightly more than doubled with colchicine compared to a placebo.

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What Other Studies Showed

Previous studies have demonstrated similar benefits in people with pre-existing heart disease.

Among them:

- A 2007 study in patients with stable coronary artery disease showed that 0.5 mg of colchicine taken twice daily significantly decreased the inflammatory marker C-reactive protein, showing how colchicine lowers the inflammation that contributes to heart disease.

- A 2015 study on a similar group of patients revealed that 1 mg of colchicine followed by another 0.5 mg dose one hour later significantly reduced levels of highly inflammatory cytokines (signaling proteins) produced in the heart during cardiac catheterization.

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Reduction of Major Cardiovascular Events by Colchicine
Summary

Scientists have turned to colchicine as a possible treatment for people with atherosclerosis and heart disease.

A new study has confirmed that colchicine is effective in preventing cardiovascular events—including stroke, new heart attack, and angina (chest pain)—in patients who have recently suffered a heart attack.

This comes on the heels of other studies that suggest a similar benefit.

Colchicine is a potent prescription medication. Most studies suggest that low doses of 0.5 mg/day are safe and effective, though a small number of people may experience side effects.

People with heart disease or at risk for a heart attack or stroke may wish to discuss low-dose colchicine with their doctors.

References


The History of Colchicine

Colchicine is a compound originally extracted from the autumn crocus but also obtainable from the flame lily. It has been used since at least 1,500 BCE against rheumatism and swelling. It is widely prescribed to treat gout (a form of arthritis) and pericarditis (inflammation of tissue surrounding the heart).

A potent anti-inflammatory, it works by suppressing intracellular machinery involved in the inflammation processes.

The most common side effects of colchicine are gastrointestinal, including diarrhea, vomiting, and nausea. Other side effects that occur less commonly are fatigue, headache, throat pain, and possible endocrine or metabolic effects.

Studies have demonstrated that in low doses, it reduces the risk of cardiovascular events like stroke and heart attack.
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Type 2 diabetes is a devastating condition that is associated with serious complications like heart disease, blindness, kidney failure, lower-limb amputations, cancer, and more.

Generally, it has been considered an irreversible, progressive disease.

Research by Dr. Roy Taylor, an expert on diabetes, and author of more than 300 scientific papers, asserts a workable strategy for type 2 diabetes is found in something Life Extension® has been promoting for years: calorie restriction.

After treating people with type 2 diabetes for four decades, Dr. Taylor launched his own important research on the prevention and reversal of type 2 diabetes.

In his new book, Life Without Diabetes: The Definitive Guide to Understanding and Reversing Type 2 Diabetes, Dr. Taylor explains the exciting results. He also outlines a surprisingly simple and effective plan that has helped thousands of diabetics to improve their metabolic status.

In this interview with Life Extension®, Dr. Taylor discusses the key research that led him to these discoveries.

—LAURIE MATHENA
LE: A few years ago, you had an insight that showed you diabetes could be reversed in certain individuals. Can you tell us more about that?

Dr. Taylor: For centuries, doctors have regarded type 2 diabetes as a lifelong disease. It is a disease that can cause great misery—threats to eyesight, to limbs, to the heart—and one that just gets worse and worse, needing more and more tablets and eventually, insulin.

Reading scientific journals and keeping up with the latest information about diabetes is part of my job, and I had just turned over a page in one of the leading diabetes publications. The graph hit me between the eyes.

It showed what happened to blood sugar in the days immediately after bariatric surgery in people with type 2 diabetes. The graph line plunged from the usual high level on the day before surgery all the way down to absolutely normal by day seven.

LE: Normal blood sugar levels? In seven days? That had never been seen before. No other treatment could achieve this dramatic normalization. All the research of the previous few decades seemed to come together in a flash.

LE: You ended up conducting a series of studies that showed that diabetes was reversible in a certain population—but also showed how and why. It all started with what you call the Twin Cycle Hypothesis. Can you explain that?

Dr. Taylor: Ask someone what type 2 diabetes is and they are likely to tell you that the disease is something to do with too much sugar.

It is true that diabetes occurs when there is excess glucose in the bloodstream—with devastating effects on the eyes, feet, heart and brain.

In the normal functioning of the body, the pancreas produces insulin to help the liver [and cells throughout the body] control the supply of glucose to the rest of the body.

When there is excess fat in the liver, however, it responds poorly to insulin, produces too much glucose, and passes on excess fat to the pancreas. As a result of that, the insulin-producing cells of the pancreas cease to function properly.

Once established, these two vicious cycles will interact and reinforce each other. Too much fat from the liver will drive the pancreas cycle, and high glucose levels will eventually force up the insulin levels, driving the liver cycle.

LE: How did you use calorie restriction to test this hypothesis?

Dr. Taylor: The chase was on to find out whether the Twin Cycle Hypothesis was wrong—or right. We would do this by asking people with type 2 diabetes to lose a lot of weight. This meant that a sudden drop in food intake would be the only change, with no other complicating factors such as surgery.

If their blood glucose stayed high, we would have shown the hypothesis to be wrong and we could go back to the drawing board. If their blood glucose normalized, type 2 diabetes would have been shown to be reversible.

LE: Enter the Counterpoint study.

Dr. Taylor: In a working life of testing hypotheses, nothing had paved the way for the starkly clear results of the Counterpoint study.

A group of people with very ordinary type 2 diabetes switched to a low-calorie diet, a simple liquid formula diet with non-starchy vegetables that I designed merely as a tool to find out if the twin cycles
We received a huge number of emails from people asking how they could reverse their own diabetes. To cope, we set up a website containing all the practical information and explaining what they could do to try to improve their condition.

A second wave of emails then told amazing stories of individuals who had achieved normal blood sugar levels. Young and old, men and women, rich and poor, living in India, the U.S., South America, Europe, or elsewhere—there was a rich variety of personal stories.

The average weight loss achieved by people armed with the basic information was the same as in Counterpoint—33 pounds.

**LE:** In your study, you used a liquid diet to achieve rapid weight loss. Could calorie restriction be utilized instead?

**Dr. Taylor:** If you can't bear the idea of going on liquid formula drinks for several weeks with or without vegetables, you can of course use ordinary foods. You would have to make up meals containing around 200 calories, with no more than 800 calories a day.

**LE:** Why is rapid weight loss so important?

**Dr. Taylor:** In the first week of a 700-800 calorie diet, the average weight loss is eight pounds. During the whole eight weeks it is just over 33 pounds.

This might sound rather alarming: is it healthy to cut back so much on eating?

But the hard evidence is that for anyone who has increased their weight during adult life, or has always been overweight, losing the extra weight and then eating...
less long-term is of huge benefit to health. In our overfed society, fasting is not usually dangerous, but eating is.

You don’t have to lose weight fast to reverse your diabetes, but for most people it’s the easiest way of losing the requisite number of pounds.

**LE:** Does the length of time a person has had diabetes make a difference in being able to successfully reverse it?

**Dr. Taylor:** Yes. The longer the duration of type 2 diabetes, the lower the likelihood was of getting back to normal glucose control.

The important message is that it’s never too late to attempt to reverse your diabetes, although success is not guaranteed. •

**EDITOR’S NOTE:** For years Life Extension® has educated customers about the dangers of elevated blood sugar and the importance of diet. The use of supplements and/or medications is a major factor in the prevention of the damage that elevated blood sugar levels has on tissues, including blood vessels and nerves. For additional information please visit www.lifeextension.com/diabetes to read our Diabetes and Glucose Control protocol.

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

**ABOUT THE AUTHOR:**
Dr. Roy Taylor has been treating people with type 2 diabetes for four decades. He is director of the Magnetic Resonance Centre and an honorary and consultant physician at Newcastle upon Tyne Hospitals NHS Foundation Trust. He is the author of over 300 scientific papers.


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The Vegetarian Silver Spoon


Numerous offshoots have been published since then, but the recently published The Vegetarian Silver Spoon is the first collection of strictly vegetarian dishes.

With more than 200 recipes for healthy, meat-free Italian dishes, The Vegetarian Silver Spoon includes ingredients that have come to define Italian cuisine, plus contemporary additions like spelt and buckwheat.

Each recipe is conveniently labeled as being vegetarian, vegan, gluten-free, dairy-free, 30 minutes or less, and five ingredients or less.

Here, Life Extension® features four recipes from The Vegetarian Silver Spoon that showcase both the variety and simplicity of traditional Italian, home-style cooking.

—Laurie Mathena
Roasted Vegetable Salad

Preparation Time: 20 minutes plus resting time
Cooking Time: 30 minutes
Serves: 4

2 round eggplants (aubergines), sliced ¼ inch (0.5 cm) thick
2 yellow bell peppers
1 red bell pepper
4 tomatoes on the vine
¼ cup (60 ml) extra virgin olive oil, plus more as needed
Leaves from 1 sprig oregano
Salt

Preheat the broiler.

In a very hot grill pan, cook the eggplant (aubergine) slices for 30 seconds per side. Transfer them to a cutting board, cut them into small strips, and place them in a large bowl.

Brush the bell peppers with a little oil and place them on a sheet pan. Broil, turning them to ensure they cook evenly, until charred and softened, 4 to 5 minutes. Remove from the oven (keep the broiler on), transfer to a bowl, cover with plastic wrap (cling film), and let cool. Peel and seed the peppers, then thinly slice the flesh and add it to the bowl with the eggplant.

Lightly oil the tomatoes and place them on a sheet pan. Broil for 5 minutes, turning them over from time to time, until their skin cracks and begins to peel off. Remove from the oven and let cool.

Peel the tomatoes, transfer the flesh to a bowl, and mash with a fork until puréed. Sprinkle with a pinch of salt and drizzle with the olive oil, then add the tomato to the bowl with the eggplant and peppers.

Serve the salad sprinkled with the oregano.
Broccoli, Kale, and Cauliflower Gratin

Preparation Time: 20 minutes  
Cooking Time: 45 minutes  
Serves: 4

1 medium cauliflower, cut into florets  
14 oz (400 g) broccoli, cut into florets  
1 bunch Tuscan kale (cavolo nero), leaves stemmed  
6 tablespoons (90 ml) extra virgin olive oil, plus more for greasing  
3 tablespoons rice flour  
1 2/3 cups (400 ml) unsweetened rice milk  
Pinch of freshly grated nutmeg  
1/3 cup (50 g) coarsely chopped raw almonds  
Scant 1/3 cup (30 g) breadcrumbs  
Salt and black pepper

Preheat the oven to 350°F (180°C). Lightly oil a baking dish. Bring a large pot of salted water to a boil. Add the cauliflower and cook for 5 minutes, then use a spider (skimmer) to transfer it to a colander to drain and cool. Repeat with the broccoli, transferring it to a separate colander to drain. Add the kale leaves to the boiling water and cook for 6 to 7 minutes, then drain and run under cold running water to cool. Squeeze out any excess water and chop the kale.

In a small saucepan, heat 3 tablespoons of the olive oil over medium heat. Add the rice flour and toast, stirring continuously, for a few seconds. While whisking, slowly drizzle in the rice milk and whisk until combined. Reduce the heat to low and cook the béchamel sauce for 7 to 8 minutes.

Season with the nutmeg and some salt, then pour the béchamel sauce into a bowl. Add the cauliflower to the béchamel and purée with a hand blender until smooth. Add the kale and almonds, season with salt and pepper, and stir to combine.

In a small bowl, mix the breadcrumbs with the remaining 3 tablespoons oil. Pour the cauliflower-béchamel mixture into the prepared baking dish. Arrange the broccoli on top and sprinkle with the breadcrumbs, then bake for about 30 minutes, until golden brown.
**Stuffed Cabbage with Buckwheat and Pumpkin**

**Preparation Time:** 20 minutes  
**Cooking Time:** 1 hour  
**Serves:** 4

- ½ cup (120 ml) extra virgin olive oil  
- 1½ cups (250 g) buckwheat, rinsed  
- 7 oz (200 g) peeled pumpkin, cut into small cubes  
- 1 clove garlic, finely chopped  
- Handful of parsley leaves, chopped  
- ⅗ cup (80 g) chopped walnuts  
- Scant 1 cup (200 mL) vegetable stock  
- 1 small savoy cabbage  
- 1 small red onion, very thinly sliced  
- Salt and black pepper

In a medium saucepan, heat 2 tablespoons of the olive oil over medium heat. Add the buckwheat and toast, stirring continuously, for 2 to 3 minutes. Add 2½ cups (600 mL) boiling water, reduce the heat to low, and cook for 20 minutes.

In a large frying pan, heat 2 tablespoons of the oil over medium heat. Add the pumpkin, garlic, a pinch of salt, and a scant ½ cup (100 mL) boiling water. Cook until the pumpkin is tender, then transfer it to a medium bowl. Mash the pumpkin with a fork and add the buckwheat, parsley, walnuts, a pinch of salt, and some pepper. Stir well to combine.

In a small saucepan, bring the stock to a boil.

Bring a large pot of salted water to a boil. Discard the outer leaves from the cabbage. Pull off 12 leaves, put them in the boiling water, and blanch for 2 minutes, then drain them and cut out the tough central ribs.

Spread the cabbage leaves out on your work surface (work in batches, if necessary). Divide the buckwheat mixture among the cabbage leaves, placing it in the center of the leaves and folding the leaves over the filling to make small parcels.

In a large nonstick frying pan, heat the remaining ¼ cup (60 mL) oil. Add the onion and 2 tablespoons of the hot stock. Arrange the stuffed cabbage leaves in the saucepan, then add the remaining stock. Cover and cook for 25 minutes, until the cabbage leaves are translucent and the filling is heated through, then serve.
Summer Vegetable Soup

**Preparation Time:** 30 minutes  
**Cooking Time:** 1 hour 30 minutes  
**Serves:** 4

- 4 plum tomatoes
- 1¾ cups (300 g) shelled fresh borlotti beans
- 3 spring onions, thinly sliced into rounds
- ¾ cup (150 g) brown rice
- 10½ oz (300 g) potatoes, peeled and cut into small cubes
- 10½ oz (300 g) green beans, sliced
- 1 bunch Swiss chard, coarsely chopped
- Leaves from 2 sprigs marjoram
- Leaves from 2 sprigs thyme
- Leaves from 1 bunch parsley
- Leaves from 2 sprigs mint
- 3 tablespoons wild fennel or fennel fronds
- 4 to 5 tablespoons (60 to 75 ml) extra virgin olive oil
- Salt

Bring a large pot of water to a boil. Add the tomatoes and blanch for 1 to 2 minutes, then drain them and let cool slightly. Peel and seed the tomatoes, then chop the flesh.

In a large saucepan, combine the borlotti beans and 8 cups (2 l) water. Bring to a simmer over medium-high heat, then reduce the heat to low and cook for about 40 minutes. Add a pinch of salt, the spring onions, and the rice and cook for 30 minutes. Add the potatoes, tomatoes, green beans, and chard and cook for about 20 minutes more, until the vegetables are tender.

In the meantime, in a food processor, combine the marjoram, thyme, parsley, mint, fennel, olive oil, and a pinch of salt. Process until well combined.

Let the soup cool slightly and serve warm or let cool completely and serve at room temperature. Top each serving with a spoonful of the herb pesto.

Reprinted from *The Vegetarian Silver Spoon* (Phaidon 2020).

Photo credit: Simon Bajada

To order a copy of *The Vegetarian Silver Spoon*, call 1-800-544-4440 or visit www.LifeExtension.com

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<tr>
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**IMMUNE SUPPORT**

**FOOD**

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<td>Rainforest Blend Whole Bean Coffee</td>
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**GLUCOSE MANAGEMENT**

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**HEART HEALTH**

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**HORMONE BALANCE**

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**JOINT SUPPORT**

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<td>ArthroMax® Advanced NT2 Collagen™ &amp; AprèsFlex®</td>
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<td>ArthroMax® with Theaflavins &amp; AprèsFlex®</td>
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**KIDNEY & BLADDER SUPPORT**

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**LIVER HEALTH & detoxification**

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### PRODUCTS

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#### LONGEVITY & WELLNESS

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<td>GEROPROTECT® Ageless Cell™</td>
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<tr>
<td>02133</td>
<td>GEROPROTECT® Longevity A.I.™</td>
</tr>
<tr>
<td>02401</td>
<td>GEROPROTECT® Stem Cell</td>
</tr>
<tr>
<td>02211</td>
<td>Grapeseed Extract</td>
</tr>
<tr>
<td>00954</td>
<td>Mega Green Tea Extract (decaffeinated)</td>
</tr>
<tr>
<td>00953</td>
<td>Mega Green Tea Extract (lightly caffeinated)</td>
</tr>
<tr>
<td>01513</td>
<td>Optimized Fucoidan with Maritech® 926</td>
</tr>
<tr>
<td>02230</td>
<td>Optimized Resveratrol</td>
</tr>
<tr>
<td>01637</td>
<td>Pycnogenol® French Maritime Pine Bark Extract</td>
</tr>
<tr>
<td>02210</td>
<td>Resveratrol</td>
</tr>
<tr>
<td>00070</td>
<td>RNA (Ribonucleic Acid)</td>
</tr>
<tr>
<td>02301</td>
<td>Senolytic Activator</td>
</tr>
<tr>
<td>01208</td>
<td>Super R-Lipoic Acid</td>
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<tr>
<td>01919</td>
<td>X-R Shield</td>
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#### MEN'S HEALTH

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
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<tbody>
<tr>
<td>02209</td>
<td>Male Vascular Sexual Support</td>
</tr>
<tr>
<td>00455</td>
<td>Mega Lycopene Extract</td>
</tr>
<tr>
<td>02306</td>
<td>Men's Bladder Control</td>
</tr>
<tr>
<td>01789</td>
<td>PalmettoGuard® Saw Palmetto with Beta-Sitosterol</td>
</tr>
<tr>
<td>01790</td>
<td>PalmettoGuard® Saw Palmetto/Nettle Root Formula with Beta-Sitosterol</td>
</tr>
<tr>
<td>01837</td>
<td>Pomi-T*</td>
</tr>
<tr>
<td>01373</td>
<td>Prelox® Enhanced Sex for Men</td>
</tr>
<tr>
<td>01940</td>
<td>Super MiraForte with Standardized Lignans</td>
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<tr>
<td>01909</td>
<td>Triple Strength ProstaPollen™</td>
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<tr>
<td>02029</td>
<td>Ultra Prostate Formula</td>
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#### MINERALS

<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>01661</td>
<td>Boron</td>
</tr>
<tr>
<td>02107</td>
<td>Extend-Release Magnesium</td>
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<tr>
<td>30731</td>
<td>Ionic Selenium</td>
</tr>
<tr>
<td>01677</td>
<td>Iron Protein Plus</td>
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<tr>
<td>02403</td>
<td>Lithium</td>
</tr>
<tr>
<td>01459</td>
<td>Magnesium Caps</td>
</tr>
<tr>
<td>01682</td>
<td>Magnesium (Citrate)</td>
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<tr>
<td>01328</td>
<td>Only Trace Minerals</td>
</tr>
<tr>
<td>01504</td>
<td>Optimized Chromium with Crominex® 3+</td>
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<tr>
<td>02309</td>
<td>Potassium with Extend-Release Magnesium</td>
</tr>
<tr>
<td>01740</td>
<td>Sea-Iodine™</td>
</tr>
<tr>
<td>01879</td>
<td>Se-Methyl L-Selenocysteine</td>
</tr>
<tr>
<td>01778</td>
<td>Super Selenium Complex</td>
</tr>
<tr>
<td>00213</td>
<td>Vanadyl Sulfate</td>
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<tr>
<td>01813</td>
<td>Zinc Caps</td>
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#### MISCELLANEOUS

<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>00577</td>
<td>Potassium Iodide</td>
</tr>
<tr>
<td>00657</td>
<td>Solarshield® Sunglasses</td>
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#### MOOD & STRESS MANAGEMENT

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
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<tr>
<td>02312</td>
<td>Cortisol-Stress Balance</td>
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<tr>
<td>00987</td>
<td>Enhanced Stress Relief</td>
</tr>
<tr>
<td>01074</td>
<td>S-HTP</td>
</tr>
<tr>
<td>01683</td>
<td>L-Theanine</td>
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<tr>
<td>02175</td>
<td>SAMe (S-Adenosyl-Methionine) 200 mg, 30 enteric coated tablets</td>
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<tr>
<td>02176</td>
<td>SAMe (S-Adenosyl-Methionine) 400 mg, 30 enteric coated tablets</td>
</tr>
<tr>
<td>02174</td>
<td>SAMe (S-Adenosyl-Methionine) 400 mg, 60 enteric coated tablets</td>
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### MULTIVITAMINS

<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>02199</td>
<td>Children's Formula Life Extension Mix™</td>
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<tr>
<td>02498</td>
<td>Comprehensive Nutrient Packs ADVANCED</td>
</tr>
<tr>
<td>02354</td>
<td>Life Extension Mix™ Capsules</td>
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<tr>
<td>02364</td>
<td>Life Extension Mix™ Capsules without Copper</td>
</tr>
<tr>
<td>02356</td>
<td>Life Extension Mix™ Powder</td>
</tr>
<tr>
<td>02355</td>
<td>Life Extension Mix™ Tablets</td>
</tr>
<tr>
<td>02357</td>
<td>Life Extension Mix™ Tablets with Extra Niacin</td>
</tr>
<tr>
<td>02365</td>
<td>Life Extension Mix™ Tablets without Copper</td>
</tr>
<tr>
<td>02292</td>
<td>Once-Daily Health Booster - 30 softgels</td>
</tr>
<tr>
<td>02291</td>
<td>Once-Daily Health Booster - 60 softgels</td>
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<tr>
<td>02313</td>
<td>One-Per-Day Tablets</td>
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<tr>
<td>02317</td>
<td>Two-Per-Day Capsules - 60 capsules</td>
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<tr>
<td>02314</td>
<td>Two-Per-Day Capsules - 120 capsules</td>
</tr>
<tr>
<td>02316</td>
<td>Two-Per-Day Tablets - 60 tablets</td>
</tr>
<tr>
<td>02315</td>
<td>Two-Per-Day Tablets - 120 tablets</td>
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#### NERVE & COMFORT SUPPORT

<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>02202</td>
<td>ComfortMAX™</td>
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<tr>
<td>02303</td>
<td>PEA Discomfort Relief</td>
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#### PERSONAL CARE

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
</tr>
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<tbody>
<tr>
<td>01006</td>
<td>Biosil™ - 5 mg, 30 veg capsules</td>
</tr>
<tr>
<td>01007</td>
<td>Biosil™ - 1 fl oz</td>
</tr>
<tr>
<td>00321</td>
<td>Dr. Proctor's Advanced Hair Formula</td>
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<tr>
<td>00320</td>
<td>Dr. Proctor's Shampoo</td>
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<tr>
<td>02222</td>
<td>Hair, Skin &amp; Nails Collagen Plus Formula</td>
</tr>
<tr>
<td>01278</td>
<td>Life Extension Toothpaste</td>
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<tr>
<td>00408</td>
<td>Venotone</td>
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<tr>
<td>00409</td>
<td>Xylitol Mouthwash</td>
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<tr>
<td>02304</td>
<td>Youthful Collagen</td>
</tr>
<tr>
<td>02252</td>
<td>Youthful Legs</td>
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#### PET CARE

<table>
<thead>
<tr>
<th>Code</th>
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</thead>
<tbody>
<tr>
<td>01932</td>
<td>Cat Mix</td>
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<tr>
<td>01931</td>
<td>Dog Mix</td>
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#### PROBIOTICS

<table>
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<tr>
<th>Code</th>
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<tbody>
<tr>
<td>01622</td>
<td>Bifido GI Balance</td>
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<tr>
<td>01825</td>
<td>FLORASSIST® Balance</td>
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<tr>
<td>02125</td>
<td>FLORASSIST® GI with Phage Technology</td>
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<tr>
<td>01821</td>
<td>FLORASSIST® Heart Health</td>
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<tr>
<td>02250</td>
<td>FLORASSIST® Mood Improve</td>
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<td>02208</td>
<td>FLORASSIST® Nasal</td>
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<tr>
<td>02120</td>
<td>FLORASSIST® Oral Hygiene</td>
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<tr>
<td>02203</td>
<td>FLORASSIST® Prebiotic</td>
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<tr>
<td>01920</td>
<td>FLORASSIST® Throat Health</td>
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<tr>
<td>52142</td>
<td>Jarro-Dophilus® for Women</td>
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<tr>
<td>00056</td>
<td>Jarro-Dophilus EPS®</td>
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<tr>
<td>21201</td>
<td>Jarro-Dophilus EPS® - 60 veg capsules</td>
</tr>
<tr>
<td>01038</td>
<td>Theracol® Probiotics</td>
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<tr>
<td>01389</td>
<td>TruFlora® Probiotics</td>
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#### SKIN CARE

<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>80157</td>
<td>Advanced Anti-Glycation Peptide Serum</td>
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<tr>
<td>80165</td>
<td>Advanced Growth Factor Serum</td>
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<tr>
<td>80170</td>
<td>Advanced Hyaluronic Acid Serum</td>
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<td>80154</td>
<td>Advanced Lightening Cream</td>
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<td>80155</td>
<td>Advanced Peptide Hand Therapy</td>
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<tr>
<td>80175</td>
<td>Advanced Probiotic-Fermented Eye Serum</td>
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<tr>
<td>80177</td>
<td>Advanced Retinol Serum</td>
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<tr>
<td>80152</td>
<td>Advanced Triple Peptide Serum</td>
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<tr>
<td>80140</td>
<td>Advanced Under Eye Serum with Stem Cells</td>
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<tr>
<td>80137</td>
<td>All-Purpose Soothing Relief Cream</td>
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<tr>
<td>80139</td>
<td>Amber Self MicroDermAbrasion</td>
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<tr>
<td>80118</td>
<td>Anti-Aging Mask</td>
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<tr>
<td>80151</td>
<td>Anti-Aging Rejuvenating Face Cream</td>
</tr>
<tr>
<td>80153</td>
<td>Anti-Aging Rejuvenating Scalp Serum</td>
</tr>
<tr>
<td>80176</td>
<td>Collagen Boosting Peptide Cream</td>
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</table>
PRODUCTS

80156 Collagen Boosting Peptide Serum
80169 Cucumber Hydra Peptide Eye Cream
80141 DNA Support Cream
80167 Environmental Support Serum
80163 Eye Lift Cream
80123 Face Rejuvenating Anti-Oxidant Cream
80109 Hyaluronic Facial Moisturizer
80110 Hyaluronic Oil-Free Facial Moisturizer
80138 Hydrating Anti-Oxidant Facial Mist
00661 Hyroderm
80103 Lifting & Tightening Complex
80168 Melatonin Advanced Peptide Cream
80114 Mild Facial Cleanser
80172 Multi Stem Cell Hydration Cream
80159 Multi Stem Cell Skin Tightening Complex
80122 Neck Rejuvenating Anti-Oxidant Cream
80174 Purifying Facial Mask
80150 Renewing Eye Cream
80142 Resveratrol Anti-Oxidant Serum
01938 Shade Factor™
02129 Skin Care Collection Anti-Aging Serum
02130 Skin Care Collection Day Cream
02131 Skin Care Collection Night Cream
80166 Skin Firming Complex
02096 Skin Restoring Ceramides
80130 Skin Stem Cell Serum
80164 Skin Tone Equalizer
80143 Stem Cell Cream with Alpine Rose
80148 Tightening & Firming Neck Cream
80161 Triple-Action Vitamin C Cream
80162 Ultimate MicroDermabrasion
80173 Ultimate Peptide Serum
80160 Ultra Eyelash Booster
80101 Ultra Wrinkle Relaxer
80113 Under Eye Refining Serum
80104 Under Eye Rescue Cream
80171 Vitamin C Lip Rejuvenator
80129 Vitamin C Serum
80136 Vitamin D Lotion
80102 Vitamin K Cream

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

VITAMINS
01533 Ascorbyl Palmitate
00920 Benfotiamine with Thiamine
00664 Beta-Carotene
01945 BioActive Complete B-Complex
00102 Biotin
00084 Buffered Vitamin C Powder
02229 Fast-C® and Bio-Quercetin Phytosome
02075 Gamma E Mixed Tocopherol Enhanced with Sesame Lignans
02070 Gamma E Mixed Tocopherol/Tocotrienols
01913 High Potency Optimized Folate
01674 Inositol Caps Liquid Emulsified
02244 Liquid Vitamin D3 • 2,000 IU, 1 fl oz
02232 Liquid Vitamin D3 • 2,000 IU, 1 fl oz, mint
01936 Low-Dose Vitamin K2
01536 Methylcobalamin • 1 mg, 60 veg lozenges
01537 Methylcobalamin • 5 mg, 60 veg lozenges
00065 MK-7
00373 No Flush Niacin
01939 Optimized Folate (L-Methylfolate)
01217 Pyridoxal 5'-Phosphate Caps
01400 Super Absorbable Tocotrienols
02234 Super K
02335 Super K Elite
01863 Super Vitamin E
02028 Vitamin B5 (Pantothenic Acid)
01535 Vitamin B6
00361 Vitamin B12
02228 Vitamin C and Bio-Quercetin Phytosome 1,000 mg, 60 veg tablets
02227 Vitamin C and Bio-Quercetin Phytosome 2,000 mg, 250 veg tablets
01753 Vitamin D3 • 25 mcg (1,000 IU), 90 softgels
01751 Vitamin D3 • 25 mcg (1,000 IU), 250 softgels
01713 Vitamin D3 • 125 mcg (5,000 IU), 60 softgels
01718 Vitamin D3 • 175 mcg (7,000 IU), 60 softgels
01758 Vitamin D3 with Sea-Iodine™
02040 Vitamins D and K with Sea-Iodine™

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

WOMEN'S HEALTH
01942 Breast Health Formula
01626 Enhanced Sex for Women 50+
01894 Estrogen for Women
01064 Femmenessence MacaPause®
02204 Menopause 731™
02319 Prenatal Advantage
01441 Progesta-Care®
01649 Super-Absorbable Soy Isoflavones
The Largest Conference for Patients + Caregivers

The annual PCRI Conference is a comprehensive educational experience for prostate cancer patients and caregivers. The conference moderated by Mark Moyad, MD, consists of keynote presentations from leading doctors followed by live Q&A sessions. For the first time, we will be livestreaming this online event for free! Attend the conference from the comfort of your own home. You can expect to learn information that will help you become empowered to make the best decisions. Learn more about this unique educational event at www.pcri.org/2020-conference.

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Keynote Topics:
- All Prostate Cancer Treatments
- Newly Diagnosed
- Diet & Exercise
- Sexual Dysfunction
- Active Surveillance
- Treatment Side Effects
- Prostate Imaging
- Benign Prostate Hyperplasia (BPH)

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Does your multivitamin measure up?

Get The Maximum Potency From Your Multivitamin!

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

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
Item #02314 • 120 capsules
(Two-month supply)

1 bottle $18
4 bottles $16 each

(Just 30 cents a day or less when 4 bottles are purchased)

Two-Per-Day Tablets
Item #02315 • 120 tablets
(Two-month supply)

1 bottle $17.25
4 bottles $15.50 each

Centrum® Can’t Compete

Two-Per-Day beats Centrum® in 10 ways!

50 times the vitamin B1
25 times the vitamin B6
12 times the vitamin B12
10 times the biotin
10 times the selenium
8 times the vitamin C
2.5 times the vitamin B3
2 times the vitamin D
2 times the vitamin E
2 times the zinc

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The medical profession and FDA now recognize the role of fish oil in reducing cardiovascular risks.

26 SUPPRESS TOXIC SENESCENT CELL SECRETIONS
Senescent cells secrete pro-inflammatory factors that accelerate systemic aging. Reducing these toxic emissions can slow degenerative processes.

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44 WHEY’S LONGEVITY BENEFITS
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54 REDUCING CANCER RISK WITH CRUCIFEROUS VEGETABLES
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The New England Journal of Medicine shows that the anti-inflammatory drug colchicine cut stroke incidence by 74%.

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