HORRIFIC CONDITIONS INSIDE DRUG FACTORIES

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Magnesium and Brain Health

Profound loss of connections between nerve cells in the brain is one of the major hallmarks associated with neurodegeneration and memory impairment. Previous research has shown that magnesium is a critical factor in controlling synaptic density.¹

To combat this, an innovative form of magnesium called Neuro-Mag™ has been developed. The magnesium-L-threonate contained in Neuro-Mag™ has been shown to specifically target multiple areas of the aging brain. In fact, pre-clinical models show that the magnesium-L-threonate contained in Neuro-Mag™ boosted levels of magnesium in spinal fluid by 15% versus no increase from conventional magnesium.²

New Cognitive Benefits Revealed!

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The suggested daily dose of three Neuro-Mag™ Magnesium-L-Threonate Capsules provides 2,000 mg of Magnesium-L-Threonate. While supplying a modest 144 mg of elemental magnesium, its superior absorption into the bloodstream and nervous system make it a preferred choice for maturing individuals to supplement with.

This same brain-health supporting magnesium is also available in a natural lemon flavor called Neuro-Mag™ Magnesium-L-Threonate with Calcium and Vitamin D3 Powder. In addition to its fresh lemon flavor, the one-scoop per day serving supplies the same amount of magnesium as the capsules plus 500 mg of highly soluble calcium and 1,000 IU of vitamin D3.

A bottle containing 90 vegetarian capsules of Neuro-Mag™ Magnesium-L-Threonate or a jar containing 30 scoops of Neuro-Mag™ Magnesium-L-Threonate with Calcium and Vitamin D3 Powder retails for $40. If a member buys 4 units, the price is reduced to $27 per unit.

References

Capsules or Powder... Value Priced

To order Neuro-Mag™ Magnesium L-Threonate Capsules or Powder call 1-800-544-4440 or visit www.LifeExtension.com

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
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Numerous garlic products can be found in health food stores. Each garlic manufacturer claims that its products are of the best quality and provide optimal health benefits. Garlic supplements, however, are not that simple.

When garlic is aged, its harsh and highly odorous compounds are converted into more beneficial and much less odorous compounds. Numerous studies have suggested that supplementing one's diet with aged garlic extract may be beneficial. Published data about aged garlic extract shows that it:

1. Helps maintain healthy endothelial function and structure.*¹,²
2. Helps maintain healthy immune function.*³,⁴
3. Helps maintain healthy cellular DNA structure.*⁵,⁶

Why Life Extension Recommends Kyolic® Aged Garlic Extract™

The Life Extension Foundation recommends dietary supplements based on the published, peer-reviewed scientific literature. There are more published studies substantiating the multiple benefits of Kyolic® Aged Garlic Extract™ than any other brand.

While some other garlic preparations may work as well as Kyolic®, we do not want our members risking their precious health on a supplement that has not been specifically documented to work. We therefore recommend Kyolic® over all other brands.

Easy-To-Swallow Kyolic® Garlic Capsules

Each easy-to-swallow capsule of Kyolic® Reserve provides 600-mg of standardized aged garlic extract. The suggested dose for healthy people is two capsules per day with meals.

The retail price for a bottle containing 120 600-mg capsules of Kyolic® Reserve is $27.95. If a member buys four bottles, the price is reduced to only $18.75 per bottle.

To order Kyolic® Reserve 600-mg capsules, call 1-800-544-4440 or visit www.LifeExtension.com
I’ve never understood why people traffic heroin or cocaine when higher profit margins are available manufacturing prescription drugs.

In my early days I assumed that with their enormous price markups, at least minimum quality-control standards would exist at drug makers. How uninformed I was!

As history has taught us, pharmaceutical companies don’t care about their customer’s health. It’s not a part of their business model whether their drugs heal or harm. Their overriding concern is to make money.

Dietary supplement companies do not enjoy the gargantuan profit margins of regulated drug makers. Yet never have I seen such reckless disregard for consumer protection as has been exposed in the field of prescription drug manufacturing.

The FDA pretends to protect the public against contaminated drugs. The sordid facts reveal an agency incapable of acting in a rational manner, and when the FDA does something “after the fact,” they often create worse problems.

Such is the case of a company that made contaminated injectable drugs that sickened 745 Americans with 58 associated deaths at the time of this writing. The FDA identified problems with this manufacturer as early as 2002, but dropped the ball into a state pharmacy board’s lap that failed to act. FDA again identified dangerous problems in 2006, but once more failed to take actions other than send a “warning letter.” The FDA now says it needs more power and money to do its job.

What the FDA does not want the public to know is that the reason this shady manufacturer was able to take over such a significant part of the market is that FDA actions caused other companies to stop making certain injectable drugs.

The media was initially confused by this tragedy and blamed it on lack of regulatory authority.

In this article, you’ll see past this charade as you’ll read how a drug factory pretended to be a compounding pharmacy. Particularly appalling is the FDA’s inability to recognize that making as many as 17,000 vials of a drug all at once under filthy conditions was a far cry from custom making one drug at a time per individual prescription in a sterile environment.

The contamination problem, however, is not isolated to one bad drug maker. It turns out that these kinds of safety violations were routine at drug factories that the FDA had certified as being safe.
US Drug Factories in ‘Terrible Shape’

Here’s how the New York Times described conditions inside FDA-registered drug factories:

“Weevils floating in vials of heparin. Morphine cartridges containing up to twice the labeled dose. Manufacturing plants with rusty tools, mold in production areas and—in one memorable case—a barrel of urine.”

The New York Times emphasized that these were not reports about the injectable drug maker that was linked to 745 cases of infection and 58 American deaths. These quality lapses were found at large drug companies whose names are familiar to many Americans.

When these problems were discovered, the FDA sent out “warnings” to these companies. Instead of fixing the problems, many of these drug makers decided it was cheaper to simply discontinue making the drug(s). The result was severe shortages of the drugs cited by the FDA. This opened up the market for disreputable companies to make these same drugs, who did so under the same kind of abysmal conditions the FDA found at large drug factories.

The FDA would like to take credit for stopping these problems, but in certain cases, it was people working at the drug factories that came forward to complain about unsanitary manufacturing conditions, or people dying from contaminated drugs, that prompted FDA action.

The sad fact is that some drug companies are so greedy they will not stop their highly profitable assembly lines to perform even the most rudimentary sterilizing procedures.

Contaminated Injectable Drugs

Fungal meningitis causes inflammation of the lining of the brain and spinal cord that results in dreadful sickness and sometimes death.

A drug factory made large quantities of a steroid (methylprednisone) that was injected into the joints and spines of aging humans in chronic pain. It provided temporary relief.

The problem was this drug was contaminated with a black fungus that infected those who were injected with it. Since injectable drugs bypass the natural barriers afforded by an intact digestive/immune system, they have to be manufactured and maintained in a sterile environment to avoid killing patients.

FDA inspections in 2002 and 2006 revealed injectable drugs being made under substandard (non-sterile) conditions at a drug factory. It was not until hundreds fell ill and scores died that the FDA took meaningful action.

How the FDA Bungled the Investigation

The name of the company that made the fungus-laced injectable drug is New England Compounding Center (NECC). It pretended to be a compounding pharmacy, but instead functioned as a drug factory.

The FDA claims that it lacks adequate regulatory authority over compounding pharmacies, but FDA’s inspection of NECC in the year 2002 revealed problems with sterility and other issues. That same year, the FDA informed the Massachusetts State Board of Pharmacy of an adverse reaction to methylprednisone, which is the same drug that in 2012 caused the fungal-meningitis outbreak.

Had the FDA done their job back in 2002, they would have forced NECC to register as a drug manufacturer and subjected NECC to stricter regulatory oversight, although that may still not have prevented the problems since FDA-registered drug makers were later...
In addition, NECC did not test the manufacturing equipment used to sterilize injectable drugs on a timely basis according to regulators.\textsuperscript{13}

The result of these multitudes of quality lapses were injectable vials that contained black matter inside, which turned out to be the fungus that has been linked to 58 deaths so far.\textsuperscript{1,10}

**FDA Inspects After Catastrophe**

After hundreds had fallen ill from fungal meningitis, the FDA conducted a thorough inspection of NECC’s drug factory.\textsuperscript{14}

The FDA’s report cited greenish-yellowish discoloration on sterilization equipment and non-sterile raw ingredients. The FDA found that 25\% of supposedly sterile vials were contaminated with greenish-black foreign matter and that 100\% of these vials sent for analysis contained fungus.\textsuperscript{14}

The FDA noted that NECC was unable to provide documentation that its steam autoclave devices were capable of achieving product sterility, a critical factor when making injectable drugs.\textsuperscript{10,13} In fact, FDA inspectors found greenish-yellow discoloration inside the one cleaning autoclave and a tarnished discoloration inside another.\textsuperscript{13,15}

NECC turned off its air conditioning in “clean rooms” from 8:00 pm to 5:30 am, which is improper because failing to keep clean rooms at low temperature and low humidity provides a fertile environment for fungal growth.\textsuperscript{14,15}

Particularly troubling in the FDA report was documentation that NECC had found microbial contamination, but did not enact cleanliness procedures to neutralize this lethal threat.\textsuperscript{14}

Furthermore, “clean rooms” used to make injectable drugs had been identified by NECC’s own staff as detecting bacteria and molds, but the FDA could find no evidence that the company acted to fix these lethal problems.\textsuperscript{14}

The FDA’s belated inspection of NECC did nothing to prevent the suffering and death of hundreds of victims who contracted fungal infections from contaminated vials of methylprednisolone injected into their spines and joints.\textsuperscript{10}

**Good Manufacturing Practices Overlooked**

According to Massachusetts state regulators, the NECC drug factory failed to sterilize injectable drugs, something that is mandatory for a substance that is going to be injected into the body.\textsuperscript{11}

The regulators said that NECC didn’t keep manufacturing equipment clean, operated a leaky boiler near the “clean room” where injectable drugs were packaged, and shipped products before receiving test results showing the products were sterile, which violates good manufacturing guidelines.\textsuperscript{12,13}

The FDA and Massachusetts state pharmacy board’s most blatant failure, however, was to uncover horrific conditions inside NECC and take no practical steps to enforce safety compliance or shut down NECC before tragedy struck.\textsuperscript{10}

**FDA: Failure, Deception and Abuse**

My book titled *FDA: Failure, Deception and Abuse* was published in early 2010, but no one in Congress listened, and scores of Americans are dead because of the FDA’s egregious ineptitude in the NECC fiasco.
“We’re just not buying it, doctor… You lack the authority to do anything, yet you send a letter like this?”

(In reference to FDA 2006 Warning Letter).

This warning letter documented numerous violations of existing rules the FDA found in 2006, yet the FDA failed to take action until citizens started dying.

House members repeatedly berated regulators who failed to prevent the fungal meningitis outbreak, stating the FDA and Massachusetts state regulators both knew as far back as 2002 that there were problems at the pharmacy, which distributed more than 17,000 doses from contaminated lots of steroids.

Dr. Hamburg was lambasted by House Committee members who stated:18

“…a complete and utter failure on the part of your agency.”

“This is one of the worst public health disasters ever caused by a contaminated drug in this country.”

“After a tragedy like this the first question we all ask is ‘Could this have been prevented?’ After an examination of documents produced by the Massachusetts Board of Pharmacy and the US Food and Drug Administration, the answer here appears to be, ‘Yes.’”

Other House members came to Dr. Hamburg’s defense, arguing that a solution needed to be found instead of seeking to “prosecute the Food and Drug Administration.”

The day after the November 2012 House hearing, where the FDA asked for more authority, a bipartisan staff of the Senate Health, Education, Labor, and Pensions Committee issued a report detailing how federal and state regulators knew nearly a decade before of serious safety concerns with the pharmacy (NECC) tied to hundreds of meningitis cases, but failed to act decisively. The report concluded that “bureaucratic inertia appears to be what allowed a bad actor to repeatedly risk public health.”19,20

While acknowledging the lack of clarity in what the FDA’s role should be in regulating compounding pharmacies, the Senate cited plenty of evidence that the FDA should have taken action against NECC, which clearly was functioning as a drug factory.

The Senate investigators wrote, “Both federal and state regulators were well aware that NECC and its owners posed a risk to the public health” and “repeatedly failed to demonstrate that the company could safely compound sterile products.”19
The Senate report uncovered an internal FDA memo in 2003 that concluded there was “potential for serious public health consequences if NECC’s compounding practices, in particular those relating to specific sterile products, are not improved.”19

The Senate confirmed that methylprednisolone produced by NECC “had previously been a suspected cause of at least two cases with bacterial meningitis-like symptoms” in 2002, leading to an FDA inspection…with no meaningful action taken.19

Most Senators expressed skepticism the FDA could effectively use widened authority under any new law, one stating “the FDA has failed to use its existing authority…” with another stating, “This has been going on since 2002…It took all this time, and nobody did anything.”20

Regrettably, some Senators still believe that giving the FDA more tax dollars will solve these issues of bureaucratic incompetence and mismanagement.

At the Senate hearing, FDA Commissioner Margaret A. Hamburg conceded: “Perhaps we should have been more aggressive,” referring to the FDAs failure to inspect NECC and follow up on the 2006 warning letter. “There was a lot of debate within the agency about whether to proceed.”20

Senators repeatedly questioned the FDAs sending NECC a warning letter in 2006 and a letter in 2008 saying that it planned to inspect, but not following through until after the fungal meningitis outbreak occurred in late 2012.19,21

CBS News Enables FDA to Temporarily Deceive Public

On March 10, 2013, CBS News’ 60 Minutes aired an emotional broadcast about the NECC tragedy that included interviewing victims who suffered horrific illnesses, along with family members of those who died.22

60 Minutes accurately told this story about NECC-contaminated drugs that caused 58 deaths and over 700 serious illnesses.1

What 60 Minutes omitted was the fact that the FDA knew about this disaster-waiting-to-happen, but failed to stop it until Americans started dying in 2012.

FDA officials were given free rein on 60 Minutes to blame this catastrophe on a lack of regulatory authority. As you’re learning here, the fault instead lies with bureaucratic ineptitude at the hands of the FDA and the state pharmacy board that permitted these lethal deviations in good manufacturing practices to occur.

Instead of blaming the FDA for ignoring this lethal problem, CBS News let FDA officials blame Congress for not giving the FDA more regulatory power.

What the FDA does not want the public to know is that the reason this shady manufacturer was able to take over such a significant part of the market is that FDA actions caused other companies to stop making certain injectable drugs.
CBS News overlooked the House and Senate investigations that documented FDA’s egregious failings in the NECC matter.

**Congress Strikes Back at the FDA**

On April 16, 2013, the FDA was subpoenaed to appear before Congress to account for why more wasn’t done to protect the public against contaminated drugs made at NECC.13,23

Congress wanted the FDA Commissioner to explain why she was not more forthcoming about the FDA failures during the House and Senate hearings held in November 2012.

According to the House Committee report on the NECC debacle:

- “The investigation revealed what FDA Commissioner Margaret Hamburg did not disclose during the November 2012 hearing: FDA received a litany of complaints about NECC and its sister company, Ameridose, right up until the 2012 outbreak.”13

- “These complaints were related to the safety and potency of NECC and Ameridose products, issues that the FDA failed to routinely, if ever, inform the state about.”13

- “After reviewing more than 27,000 documents, we found a dramatically different picture than the one painted by the FDA during our initial hearing in November. We now know that doctors, patients, providers, and whistleblowers tried to warn FDA for years that NECC and Ameridose were operating as manufacturers and marketing their products nationwide without patient prescriptions.”13

The box on the bottom of this page contains highlights from the House Committee report showing that FDA failures contributed to the NECC disaster and how the FDA tried to cover up their own ineptitudes.

**What Congress Overlooked**

What was not discussed in Congressional hearings was the

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**Highlights from House Committee Report On FDA’s Cover Up and Failings**

On April 16, 2013, the House Committee on Energy and Oversight issued a report titled:23

**FDA’S OVERSIGHT OF NECC AND AMERIDOSE: A HISTORY OF MISSED OPPORTUNITIES?”**

Here are some highlights from the Committee’s report:

“Since the (November 2012) hearing, the Committee has pressed FDA to produce all of its documents relating to NECC and Ameridose in order to obtain a full picture of FDA’s inspectional history, oversight, and decision-making with respect to these firms. Only after being threatened with the possibility of a subpoena in a February 1, 2013, letter to Commissioner Hamburg, did FDA finally complete its production on March 21, 2013.

After reviewing these documents, Majority Committee staff believes there is a strong basis for Members to pursue answers from FDA on whether this tragedy was preventable had the agency taken action under its existing authorities to address the steady stream of complaints it had received about NECC and its sister company, Ameridose, since issuing a Warning Letter to NECC in December 2006.

One of FDA’s fundamental reasons for existence is to protect the public health by assuring the safety of our nation’s drug supply. With respect to NECC and Ameridose, documents produced to the Committee raise serious questions about whether FDA repeatedly failed in its core mission.

The agency’s inaction in the face of years of complaints and red flags associated with the safety of both companies’ products and underlying practices had a tragic ending.”

This entire document can be accessed at: www.lef.org/necc
FDA’s history of abusing and misusing whatever authority Congress gave it.

For example, when the FDA first discovered problems at NECC (in 2002), it chose to direct its resources to prosecuting a man named Jay Kimball, who sold a drug (liquid deprenyl) that harmed no one. Jay Kimball remains in prison.24

In 2006, while the FDA did not think it needed to stop NECC’s lethal manufacturing practices, it somehow found the time to censor claims by cherry growers that cited scientific studies on their website showing cherries conferred health benefits.25

What few understand is how the FDA has historically abused its authority in a discriminatory manner. The new “authority” the FDA is seeking would enable the agency to pick out small, well-run pharmaceutical firms and regulate them out of business using minor technical arguments that have no bearing on safety.

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**GLAXO Pays $750 Million Fine for Quality Lapses**

GlaxoSmithKline is the world’s 4th largest drug maker, with annual sales of nearly $46 billion and profits of almost $9 billion.26

In July 2002, the FDA sent a warning letter about quality problems uncovered at one of GLAXO’s subsidiary manufacturers. The egregious problems, however, were not corrected despite additional FDA inspections that continued to turn up severe problems, including failure to safeguard against microbial contamination.27

The FDA initiated a seizure action in 2005 to remove adulterated and improperly made drugs.28 Horrendous problems persisted, however, until the Justice Department filed a criminal complaint against GlaxoSmithKline and stopped what could have been a human catastrophe.29

In October 2010, GlaxoSmithKline agreed to plead guilty and pay a $750 million fine to resolve criminal and civil liability regarding the manufacturing deficiencies.29

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**Glaxo’s Defective Drugs**

The defective drugs, manufactured between 2001 and 2005, were Kytril, Bactroban, Paxil CR, and Avandamet.29

Kytril is a sterile injectable anti-nausea medication used by cancer patients receiving chemotherapy or radiation. Bactroban is a topica1 anti-infection ointment used to treat skin infections. Paxil CR is the controlled-release formulation of the popular anti-depressant drug Paxil, and Avandamet is a combination of Avandia and metformin.

Avandia has since essentially disappeared from the market because of increased heart attack risks, though an FDA advisory panel recently recommended it be allowed to be prescribed to certain diabetic patients.30

Years after FDA approval, Glaxo sent out a black box warning about increased suicide risks in users of Paxil.31
With the realization that cardiovascular disease is the leading cause of death amongst diabetics, and suicide a huge risk in depressed patients, the notion that the FDA approved drugs with these kinds of side effects borders on absurdity.12,33 These lethal side effect issues, however, are irrelevant to the manufacturing lapses that occurred.

According to an employee who filed a lawsuit against Glaxo over these uncorrected defects, the water system was contaminated, the air system allowed for cross-contamination between products, the warehouse was so overcrowded that rented vans were used for storage, the plant could not ensure the sterility of intravenous drugs, and pills of differing strengths were sometimes mixed in the same bottles.34 Although FDA inspectors had spotted some problems, most were missed.

Glaxo paid the $750 million fine and admitted that its subsidiary failed to ensure that Kytril and Bactroban finished products were free of contamination from micro-organisms. It also admitted that its manufacturing process caused Paxil CR two-layer tablets to split, which the company itself called a “critical defect,” because potential distribution of tablets would not have any therapeutic effect and no controlled release mechanism.35

Glaxo admitted that Avandamet tablets did not always have the proper mix of active ingredients and, as a result, potentially contained too much or too little of the ingredient with the therapeutic effect.29

Potential Lethal Impact of Glaxo’s Abhorrent Lack of Quality Control

One can only imagine the problems that would occur if a depressed individual took a powerful anti-diabetic drug like Avandia, which could inflict acute hypoglycemia. A former employee identified nine instances where the wrong pills were sold, including Avandia30 mixed in packages of over-the-counter antacids like Tagamet31.

For chemotherapy patients who are immune compromised, they could have easily succumbed to an infection without their oncologists ever suspecting it was linked to the anti-nausea drug Kytril, which was not tested to ensure it was free of microbial contamination.

No Jail Time for Glaxo Executives

Glaxo denies that any patients were ever harmed by the adulterated drugs they distributed in the United States and also denied that these kinds of problems occurred at its other drug factories.

No one from Glaxo faced criminal charges. I again remind readers that Jay Kimball, who sold a clean product that harmed no one, remains in federal prison. One difference is that Jay Kimball had no money for an attorney and had to represent himself in court (or render himself insolvent defending against FDA’s prejudicial accusations). Pharmaceutical behemoths like Glaxo, on the other hand, spend virtually unlimited money on lobbyists and lawyers and have not faced personal criminal liability for the misdeeds they allowed.

Reputation in Lieu of Regulation

One reason why horrific quality issues occur at pharmaceutical companies is that few consumers know who makes their prescription drugs.

When your doctor writes a prescription, you take it to your pharmacy and usually get a brown-colored bottle with pills inside. Seldom is the manufacturer’s name stated on the bottle. Drug companies can thus run their manufacturing facilities with reckless abandon with little reputational risk.
Dietary supplement companies, on the other hand, prominently state their name on the labels of their products.

In a more sensibly-regulated environment, better-operated pharmaceutical companies would prosper as their reputation for quality control became known. Unfortunately, today’s Orwellian regulatory structure has created utter chaos, with retail pharmacies not knowing which generic manufacturer is going to make which generic drug at any given time.

Since we established the Life Extension Pharmacy™ six years ago, we have learned how dangerous the prescription drug marketplace has become, with counterfeiting, shortages, and quality problems more rampant than reported by the media.

We would prefer that pharmaceutical companies place a higher value on their reputation and instill better quality standards.

Instead, regulatory burdens are so cumbersome that quality control takes a back seat to pleasing bureaucrats who wield unbridled power, but lack the competency to recognize catastrophic problems as occurred with the contaminated steroids made by NECC.

**How Much More FDA Failure Will Americans Tolerate?**

In 1906, a book called The Jungle was published that described appalling conditions inside America’s meat packing industry. The revelations in this book resulted in the establishment of federal laws that mandated standards of strength, purity, and quality of foods and drugs.

Conditions inside some of America’s drug factories are eerily similar to those described in The Jungle, yet the FDA has been around for more than 100 years! How much longer is the public expected to wait before the FDA effectively spends its $4 billion annual budget on real consumer protection, as opposed to threatening walnut and cherry growers for claiming health benefits of their foods?

No matter how many times the FDA fails to protect consumers against contaminated drugs, there are no calls for meaningful reform. Instead of recognizing FDA ineptitude, cries ring out to give the FDA more money and power… as Americans perish from contaminated drugs the FDA had the authority to stop!

**No Free Market!**

What the public doesn’t yet understand is that contaminated drugs are the result of draconian regulations that limit free market competition. By restricting drug making to only those controlled by incompetent bureaucrats, the inevitable result will be shortages, poor quality, and high prices.

As I write this article, one of the challenges in dealing with the
NECC catastrophe is that there may be new shortages of injectable drugs because there are not enough drug factories in the US to meet patient demand. Shortages create opportunities for unsavory companies to dump even greater amounts of overpriced and contaminated drugs into the bodies of unsuspecting victims.

This kind of problem would not continue in a free market, but ever-increasing regulations are exacerbating the problems of drug shortages, deadly manufacturing practices, and obscenely high prices.

You’ll read in this month’s issue about the quality-control standards we at Life Extension insist on. Unlike those involved in pharmaceutical manufacturing, I and most everyone else at Life Extension consume these nutrients ourselves and would never tolerate the deplorable conditions that exist in certain American drug factories today.

For longer life,

William Faloon

References

A battle is raging in the US Senate over whether you will be able to continue to obtain medications that are often more effective and less expensive than what large pharmaceutical companies offer.

On April 16, 2013, the FDA was subpoenaed to appear before Congress to account for the contaminated drugs made at New England Compounding Pharmacy (NECC).

According to the Congressional investigative reports, this unscrupulous manufacturer was allowed to inflict this carnage because the FDA failed to do its job.

Instead of punishing the FDA for its appalling dereliction of duty, the Senate has introduced a bill giving the FDA more power to take away bioidentical hormones and other drugs that are safely being made at compounding pharmacies.

Large pharmaceutical companies are using the NECC fiasco as a ruse to give the FDA more power to stamp out lower-cost competition.

You can easily contact your Senators by logging on to Life Extension’s legislative action website lef.org/lac and sending them a prepared email instructing them to oppose S.959. The provisions contained in S.959 give the FDA the authority to restrict and eliminate the bioidentical hormones upon which millions of women and men depend.

FDA failures have resulted in unprecedented numbers of contaminated drugs poisoning Americans. The absolute worst response to these catastrophes is to give the FDA more power when it utterly botched its job with the draconian authority it already has.

Please send an email alerting your members of Congress to vote NO on Senate bill 959 (S.959).

You can also phone your Senators at 1-877-762-8762 to let your voice be heard.
**SUPPORT FOR THE IMMUNE SYSTEM**

*Reishi mushroom* has been traditionally used to boost immune system vitality. Its broad-spectrum benefits have been demonstrated in thousands of studies.¹

An advanced extraction technology has resulted in a new *Reishi extract* that make its active compounds even more bio-available.

**REISHI SUPPORTS A HEALTHY IMMUNE SYSTEM**

An abundance of evidence demonstrates that *Reishi* constituents enhance the protective activity of the body’s *hematopoietic stem cells, T-cells, and other crucial immune factors.*²⁻⁹

*Reishi*’s immune-supporting compounds include an array of unique *polysaccharides, triterpenes,* and other constituents,¹⁰⁻¹¹ many of which assist activation of the cell surface receptors that modulate normal immunity.¹²

The *Reishi* mushroom also supports the body’s production of endogenous antioxidant enzymes—such as *superoxide dismutase (SOD), catalase,* and *glutathione*—which, in turn, support the body’s natural immune defenses against free radical damage.¹³⁻¹⁴

**ADVANCED EXTRACTION TECHNOLOGY**

*Reishi Extract Mushroom Complex* delivers powerful compounds and represents the *next generation* of natural immune support. *Reishi* extracts standardized to polysaccharides have been available for years, but most do not standardize for triterpenes and include the spores. This full-spectrum extract has multiple components that have shown to support healthy immune function and enhanced longevity in a natural experimental aging model.¹⁵

The suggested 2 capsules a day of *Reishi Extract Mushroom Complex* provide:

- **Reishi mushroom (Ganoderma lucidium) extract** (Fruit body) 980 mg [standardized to 13.5% polysaccharides (132.3mg) and 6% triterpenes (58.8mg)]
- **Shell-broken Reishi mushroom (Ganoderma lucidium) spore** 150 mg

A bottle containing 60 vegetarian capsules of *Reishi Extract Mushroom Complex* retails for $30. If a member buys four bottles, the price reduced to $20.25.

**References**

15. FASEB. 2012, 26:373.2.
Hundreds of studies document the importance of protecting against blood glucose surges.1

What the public doesn’t realize is that a huge source of blood sugar emanates from dietary starch.2,3 This includes bread, pasta, potatoes, and rice. But even so-called healthy carbohydrates such as whole-grain bread and brown rice can induce undesirable glucose spikes.4

In a breakthrough development, scientists have shown that an enzyme called transglucosidase converts starches into prebiotic fiber—within your own digestive tract!5,6 Taking this enzyme with starchy meals helps avoid the flood of glucose into the bloodstream that results from eating carbohydrates.

COMPELLING HUMAN RESEARCH DATA

Published studies show that transglucosidase limits the amount of sugar released from starch, especially in the critical after-meal period. It does this by converting dietary starch into a beneficial indigestible prebiotic fiber.5,6

Transglucosidase has been demonstrated in humans to reduce the level of rapidly digested starch in a carbohydrate food item by 31%.7 This helps maintain healthy blood glucose, cholesterol, and insulin levels for those whose levels are already in the normal range.8-11

SHIELD AGAINST AFTER-MEAL GLUCOSE SURGES

Each vegetarian capsule of the new GlycemicPro™ Transglucosidase contains a full 450,000 TG (transglucosidase activity units) of trans-glucosidase.

Just one capsule taken with starch-containing meals helps limit the release of sugar from starch. Those who consume a low-starch diet may need to take only one GlycemicPro™ Transglucosidase capsule daily with their starch-containing meal.

A bottle of 60 vegetarian capsules of GlycemicPro™ Transglucosidase retails for $54. If a member buys four bottles, the price is reduced to $37.50 per bottle.

References

Contains soybeans. Contains tree nuts (coconut).

CAUTION: If you are taking blood glucose lowering medication, consult your healthcare provider before taking this product. GlycemicPro™ Transglucosidase, 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.*
Backed by controlled human trials, FAST-C® COMBINES FASTER-ABSORBING ASCORBIC ACID-MINERAL BLEND with vitamin C “recycling” power.

Vitamin C efficacy can be limited because it is quickly utilized and excreted by the body.¹

A novel formula sets a new standard for rapid absorption, enhancing the time that vitamin C is delivered to the cells. In two human trials at a distinguished research center, FAST-C® was compared head-to-head with a leading premium brand of “enhanced absorption” vitamin C.²,³

Their findings validate that FAST-C® has faster absorption—and without greater excretion!

Rapid Vitamin C Delivery

Vitamin C neutralizes free radicals,⁴-⁷ supports biosynthesis of certain neurotransmitters,⁸,⁹ and promotes production of vital tissue (collagen) that supports arterial walls, skin, and bones.⁷,⁹ Vitamin C promotes immunity,¹⁰ boosts lymphocyte glutathione levels,¹¹ and helps regenerate other antioxidants, including vitamin E.¹²

But because it leaves the body quickly,¹ capturing vitamin C’s optimal benefits has required taking supplements several times daily, hoping they’ll be effective without posing a risk for acid-sensitive stomachs.

The scientific community has long sought faster-absorbing vitamin C formulas.
REMARKABLE WEIGHT REDUCTION WITH CoffeeGenic® Green Coffee Bean Extract (GCA™)

In a placebo-controlled human study, subjects took 350 mg of green coffee extract three times daily (before meals).

Study subjects were not asked to change their calorie intake or exercise level, but people participating in weight loss trials often do make lifestyle changes in order to increase their odds of shedding body fat.

The impressive findings, published in January 2012, noted that men and women lost an average of 17.6 pounds—over 10% of body weight—after 12 weeks of green coffee extract supplementation! There was also an average 4.44% reduction in body fat percentage!

The conclusion is that green coffee extract supports the ability to lose weight. The form of green coffee bean extract used in this successful weight loss study is CoffeeGenic® Green Coffee Extract (GCA™).

How CoffeeGenic® Works

The active ingredient in green coffee bean extract is chlorogenic acid.

Published studies on chlorogenic acid demonstrate a wide range of supportive properties related to insulin sensitivity and glucose formation and absorption.

Clinical research has shown that chlorogenic acid helps limit after-meal glucose surges, supporting healthy blood sugar levels for those already within the normal range.

CoffeeGenic® Green Coffee Extract (GCA™) provides a standardized dose of chlorogenic acid extracted from green coffee beans.

Based on the latest research, CoffeeGenic® Weight Management™ with Green Coffee Extract (GCA™) has been formulated to provide in each capsule:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Dosage</th>
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<tbody>
<tr>
<td>CoffeeGenic® Green Coffee Bean Extract</td>
<td>350 mg</td>
</tr>
<tr>
<td>[Standardized to 50% chlorogenic acid]</td>
<td></td>
</tr>
<tr>
<td>Integra-Lean® African Mango</td>
<td>100 mg</td>
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<tr>
<td>(Irvingia gabonensis) proprietary extract (seed)</td>
<td></td>
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<tr>
<td>Chromium</td>
<td>150 mcg</td>
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<tr>
<td>[as Crominex® 3+ chromium stabilized with Capros® (Phyllanthus emblica) extract (fruit) and PrimaVie® Shilajit]</td>
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<tr>
<td>Iodine (as potassium iodide)</td>
<td>100 mcg</td>
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<tr>
<td>Green Tea decaffeinated extract</td>
<td>50 mg</td>
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<tr>
<td>[98% polyphenols, 45% EGCG]</td>
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The suggested dose is just one capsule before each meal. A bottle of 90 vegetarian capsules of CoffeeGenic® Weight Management™ with Green Coffee Extract (GCA™) retails for $48. If a member buys four bottles, the price is reduced to $31.50 per bottle.

References

To order CoffeeGenic® Weight Management™ with Green Coffee Extract (GCA™), 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.
Bone Restore combines critical bone boosting nutrients into one superior formula.

Bone Restore includes highly absorbable forms of calcium and boron, along with vitamin D3, magnesium, zinc, manganese, and silicon. Bone Restore is now available with or without vitamin K2 (MK-7).

Bone Restore contains magnesium citrate, which is one of the most absorbable forms of magnesium.

The retail price for 150 capsules of Bone Restore is $26. If a member buys four bottles, the price is reduced to $17.25 per bottle. (Item# 01711)

The same Bone Restore formula without vitamin K2 (MK-7) is available as well. The retail price for 150 capsules is $22.50. If a member buys four bottles, the price is reduced to $14.63 per bottle. (Item# 01611)

Note: Those who take Super Booster or Super K usually do not need additional vitamin K2. They should order Bone Restore without vitamin K2. Those taking the anti-coagulant drug Coumadin® (warfarin) should use BONE RESTORE without vitamin K2.

Just five capsules of Bone Restore provide:

- Highly Absorbable Calcium 1,200 mg (as DimaCal® dicalcium malate, TRAACS® calcium glycinate chelate, calcium fructoborate)
- Vitamin D3 1,000 IU
- Vitamin K2 (as menaquione-7) 200 mcg
- Magnesium (as magnesium citrate) 100 mg
- Boron 3 mg (calcium fructoborate as patented FruiteX B® OsteoBoron®)
- Zinc (as TRAACS® zinc glycinate chelate) 2 mg
- Manganese 1 mg
- Silicon 5 mg

Bone Restore is now available with or without vitamin K2 (MK-7). Bone Restore contains magnesium citrate, which is one of the most absorbable forms of magnesium.

To order Bone Restore, call 1-800-544-4440 or visit www.LifeExtension.com

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
Dietary Supplements and Exercise Associated with Lower Heart Disease Risk in Women

In the *Journal of Clinical Nursing*, researchers from Taiwan report a reduction in the incidence of coronary artery disease (CAD) in middle-aged women who engaged in exercise or used dietary supplements.*

The study included 65 women whose age averaged 56.2 years. Cardiac catheterization revealed the presence of coronary artery disease in 31 subjects. Questionnaire responses provided data concerning activity levels and the intake of dietary supplements over the preceding year and others. Blood samples were analyzed for fasting glucose, lipids, and additional factors.

Adjusted analysis of the data uncovered a 72% lower risk of coronary artery disease in supplement users compared to nonusers, and an 84% lower risk of CAD among those who engaged in physical activity in comparison with inactive women.

**Editor’s Note:** Authors C. C. Tsai and colleagues remark that by reducing lipid peroxidation and free radical damage, vitamins C and E, and other antioxidants help protect the heart’s blood vessels. In addition, studies have found a reduction in low-density lipoprotein cholesterol and triglycerides in association with increased vitamin C intake. Furthermore, B vitamins can help prevent increases in serum homocysteine, which damages the lining of the vessels, lowers nitric oxide levels, and alters platelet activity.

—D. Dye


Increased Breast Cancer Risk Associated with Deficient Vitamin D Levels in Saudi Women

The *American Journal of Clinical Nutrition* recently published the findings of researchers from Saudi Arabia and the University of Arizona of a greater risk of breast cancer among women with deficient levels of serum vitamin D.*

Fatimah M. Yousef and her associates compared 120 Saudi women with invasive breast cancer with 120 age-matched controls. Dietary questionnaires completed by the participants provided information concerning vitamin D intake. Blood samples were analyzed for serum 25-hydroxyvitamin D levels.

Dietary intake of vitamin D among the participants was low. Average serum 25-hydroxyvitamin D levels were 9.4 ng/mL among subjects with breast cancer in comparison with 15.4 ng/mL in the control group. While 38.3% of the control group had deficient vitamin D levels of less than 10 ng/mL, this percentage rose to 60.8% of the breast cancer group.

Optimal 25-hydroxyvitamin D blood levels are between 50–80 ng/mL. Religious laws in Saudi Arabia prohibit women from exposing their skin in public. Lack of sunlight and lack of supplements results in very low vitamin D levels and subsequent increases in breast cancer rates.

**Editor’s Note:** When women whose vitamin D levels were less than 10 ng/mL were compared with those whose levels were greater than 20 ng/mL, the risk of breast cancer was more than six times higher in the lower vitamin D level group.

—D. Dye

Increased Vegetable Fat Intake Linked with Lower Risk of Premature Death in Prostate Cancer Patients

In *JAMA Internal Medicine*, researchers from the University of California and Harvard report an association between greater consumption of vegetable fat intake and a lower risk of dying over an 8.4 year median among men with prostate cancer.*

The investigation included 4,577 men who were diagnosed with nonmetastatic prostate cancer between 1986 and 2010. Questionnaires completed at the beginning of the study and every four years thereafter provided data on fat intake.

Events of lethal prostate cancer, defined as the occurrence of distant metastases or death from the disease, occurred in 315 subjects. The adjusted risk of events of lethal prostate cancer was 16% higher among those whose animal fat intake was among the top 20% in comparison with those whose intake was among the lowest 20%. In contrast, an intake of vegetable fat that was among the top 20% was associated with a 36% lower risk.

**Editor's Note:** When death from any cause was examined, those whose animal fat intake was highest had a 19% greater risk of dying over follow-up in comparison with the lowest group, and those whose vegetable fat intake was highest had a 35% lower risk.

—D. Dye

Decreased DHEA Sulfate Levels Linked to Greater Stroke Risk in Women

In an article published in the American Heart Association journal *Stroke*, researchers from Brigham Women's Hospital and Harvard School of Public Health report an association between lower levels of the hormone dehydroepiandrosterone sulfate (DHEAS) and a greater risk of stroke in older women.*

The study included women who had no history of stroke upon enrollment in the Nurses’ Health Study in 1976. Stored blood samples obtained between 1989 and 1990 were analyzed for DHEA sulfate levels. Four hundred sixty-one participants in whom stroke had occurred over follow-up were matched for age, race, menopausal status, and other factors with 461 control subjects.

Among women whose DHEAS levels were among the lowest 25% of participants in the current study, the adjusted risk of experiencing an ischemic stroke was 33% higher than that of women whose levels were among the top 25%.

**Editor's Note:** Authors Kathryn M. Rexrode MD, MPH, and colleagues note that DHEA could influence the development of cardiovascular disease and stroke through mechanisms that include inhibition of the migration and proliferation of vascular wall cells, and stimulation of vascular smooth muscle cell apoptosis, which reduces vascular remodeling subsequent to injury.

—D. Dye

Higher Dose Metformin Associated with Improved Survival Among Colorectal Cancer Patients

*Cancer Epidemiology, Biomarkers & Prevention* published an article that reports a positive effect for the antidiabetic drug metformin in colorectal cancer survival among men and women with stage I-III colorectal cancer diagnosed between 2001 and 2006. Participants included 207 diabetics who had been prescribed metformin, 108 diabetics who did not use the drug, and 3,501 nondiabetics.* The subjects were followed through 2010, during which 196 deaths occurred among those with diabetes and 1,897 occurred among the nondiabetics.

When subjects treated with metformin were compared to diabetics who were not treated with the drug, a reduction in the risk of death due to colorectal cancer that “approached significance” was observed. However, those whose use of metformin was categorized as high intensity had a 56% lower risk of dying of the disease than diabetics not treated with metformin.

Intensity of metformin use was calculated as high or low based on the number of days that metformin was presumably taken in the year prior to a cancer diagnosis. The average dose of metformin used by study participants was 1,148 mg daily.

**Editor's Note:** Metformin use was additionally associated with a 31% lower adjusted risk of dying from any cause among diabetic subjects over follow-up.

—D. Dye

* *JAMA Int Med.* 2013 Jun 10.

* Stroke. 2013 May 23.

Cinnamon Compounds May Protect Against Tau Protein Aggregation in Alzheimer’s Disease

The Journal of Alzheimer's Disease published an article by Donald J. Graves and his associates at the University of California, Santa Barbara which describes how compounds in cinnamon reduce the aggregation of tau protein that occurs, along with amyloid-beta aggregation, in the brains of men and women with Alzheimer’s disease.*

Previous research conducted by Dr. Graves’ team uncovered an ability of cinnamon extract to inhibit tau aggregation and dissociate tangles in brain tissue derived from Alzheimer's disease patients. The current study revealed that the compounds cinnamaldehyde and the oxidized form of epicatechin derived from cinnamon extract inhibited tau aggregation in vitro by protecting the protein from oxidative stress.

Editor’s Note: Lead author Roshni C. George noted that, “Cell membranes that are oxidized also produce reactive derivatives, such as Acrolein, that can damage the cysteines. Epicatechin also sequesters those byproducts.”

—D. Dye


Higher Plasma Vitamin D Levels Associated with Lower Biomarkers of Cardiometabolic Disease

The United States Centers for Disease Control and Prevention (CDC) reports a reduction in risk factors for cardiometabolic disease among men and women with higher plasma vitamin D levels.*

Canadian researchers evaluated data from 1,928 men and women between the ages of 6 and 79 years who participated in the Canadian Health Measures Survey. Blood samples obtained during physical examinations were analyzed for glucose, fasting insulin, C-reactive protein, fibrinogen, homocysteine, triglycerides, total cholesterol, high-density lipoprotein cholesterol (HDL-C), low-density lipoprotein cholesterol (LDL-C), apolipoprotein A1, apolipoprotein B, and 25-hydroxyvitamin D [25(OH)D]. Vitamin D levels varied according to the month during which plasma levels were sampled. Subjects who had higher levels of vitamin D had reductions in insulin, insulin resistance, triglycerides, total cholesterol, LDL cholesterol, and ratio of total to HDL cholesterol.

Editor’s Note: Cardiometabolic disease, also known as metabolic syndrome, is characterized by dyslipidemia, dysglycemia, abdominal obesity, and hypertension, which greatly increase the risk of cardiovascular disease and diabetes.

—D. Dye


Research Supports Causative Role for Reduced Vitamin D Levels in High Blood Pressure

At the annual conference of the European Society of Human Genetics, Dr. Karani S. Vimaleswaran presented the finding of a causative role for vitamin D in the development of hypertension.*

Dr. Vimaleswaran reported the findings of the D-CarDia collaboration that included over 35 studies involving up to 108,173 participants, which associated higher serum 25-hydroxyvitamin D levels with lower blood pressure. To validate causation, a team of researchers examined the association of four vitamin D-related genetic variants known as single nucleotide polymorphisms (SNPs) with 25-hydroxyvitamin D levels and with hypertension.

An association with serum 25-hydroxyvitamin D levels was confirmed for all SNPs. The researchers also uncovered an association between one SNP (CYP2R1) and diastolic blood pressure and hypertension. Following further analysis, it was concluded that reduced vitamin D levels have a modest causal association with hypertension.

Editor’s Note: A decrease in diastolic blood pressure of 0.24 mmHg and a 7% decrease in the risk of hypertension were associated with each 10% increase in serum 25-hydroxyvitamin D.

—D. Dye

* Annual Conference of the European Society of Human Genetics. 2013 June 11.
**Life-Extending Mechanism of Rhodiola Explored**

The journal *PLOS ONE* published an article that reports a benefit for *Rhodiola rosea* in extending the life span of fruit flies.* The herb does not appear to promote longevity via mechanisms involved in calorie restriction, which is a well-known method of extending life span in experimental models.

Previous studies revealed that Rhodiola can extend the lives of flies, yeast, and worms. In order to determine whether Rhodiola utilized the same mechanisms as calorie restriction, Mahtab Jafari and colleagues at the University of California, Irvine gave Rhodiola to fruit flies provided with diets containing reduced amounts of yeast. If Rhodiola extended life span in a manner similar to that of dietary restriction, it was not expected to be associated with longer life in animals in which the molecular pathways associated with dietary restriction were already affected, but Dr. Jafari’s team observed an increase in life span in male and female flies that received Rhodiola.

Editor’s Note: In fruit flies in which the known molecular pathways associated with calorie restriction (including silent information regulator 2 (SIR2) proteins, insulin, and insulin-like growth factor signaling and target of rapamycin pathways) were perturbed, Rhodiola still elicited an extension of life span.

—D. Dye

* *PLOS ONE*. 2013 May 21.

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**Diabetes Risk Linked to Red Meat Consumption**

Red meat consumption has been consistently associated with an increased risk of type II diabetes mellitus. However, whether changes in red meat intake are related to subsequent type II diabetes risk remains unknown.* A study published in the *Journal of the American Medical Association* set out to examine this association.

The study followed up with 26,357 men in the Health Professionals Follow-up Study (1986-2006), 48,709 women in the Nurses’ Health Study (1986-2006), and 74,077 women in the Nurses’ Health Study II (1991-2007). Diet was assessed by validated food frequency questionnaires and updated every four years. Time-dependent models were used to calculate the effects of age, family history, race, marital status, initial red meat consumption, smoking status, and changes in other lifestyle factors (physical activity, alcohol intake, total energy intake, and diet quality).

The study concluded that increasing red meat consumption over time is associated with an elevated subsequent risk of type II diabetes, and the association is partly mediated by body weight. Their results add further evidence that limiting red meat consumption over time confers benefits for type II diabetes prevention.

—M. Richmond

**ASTAXANTHIN**

_Astaxanthin_ is a fat-soluble carotenoid compound. The challenge to deriving maximum benefits is its normally limited absorption—as low as about 50%.[1,2] Assimilation of astaxanthin is impeded by limited uptake and intestinal degradation.

A **new Astaxanthin 4 mg with Phospholipids** combines 4 milligrams of natural astaxanthin with a _proprietary blend_ of _phospholipids_.

By incorporating phospholipids, scientific study shows that carotenoid _absorption_ may be enhanced _several-fold_.[3]

The new **Astaxanthin 4 mg with Phospholipids** uses four different phospholipids to facilitate maximum _absorption_ of _astaxanthin_ into the bloodstream, where it is transported to cells throughout the body.

**ASTAXANTHIN**

Each softgel of the new **Astaxanthin with Phospholipids** provides 4 mg of natural astaxanthin along with 80 mg of proprietary phospholipid blend. Just one softgel a day provides tremendous systemic cellular support!

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A bottle of 30 softgels of **Astaxanthin 4 mg with Phospholipids** retails for $16. If a member buys four bottles, the price is reduced to **$10.50** per bottle. **Contains soybeans.**

**References**


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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.
ubiquinone form. In middle-aged mice, ubiquinol was shown to be 50% more effective in slowing measurements of aging, compared to ubiquinone. Life Extension® offers this highly bioavailable ubiquinol form of patented CoQ10 in an advanced delivery system, providing an unparalleled absorption level.

2. ENHANCED SUPPORT WITH SHILAJIT

PrimaVie® shilajit has been shown to double levels of CoQ10 in mitochondria. Combining CoQ10 and shilajit produced a 56% increase in energy production in the brain—40% better than CoQ10 alone. And in muscle, there was a 144% increase in energy production—27% better than CoQ10 alone.

Shilajit boosts CoQ10’s beneficial effects by stabilizing CoQ10 in the superior ubiquinol form. Additionally, shilajit facilitates more efficient delivery of CoQ10 into the mitochondria, which results in greater cellular energy production. Shilajit itself is rich in essential compounds that help the mitochondria convert fats and sugars into ATP (adenosine triphosphate), the body’s main source of energy.

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.
PQQ activates

• Promotes mitochondrial biogenesis.

It also beneficially interacts with genes directly involved in mitochondrial health. These same genes support healthy body weight, normal fat and sugar metabolism, and youthful cellular proliferation.20

• Mitochondrial defense. Mitochondria possess their own DNA, distinct from those contained in the cell nucleus. Unfortunately, compared to nuclear DNA, mitochondrial DNA are relatively unprotected—and yet situated at the source of both energy and free-radical production! PQQ’s antioxidant potency and favorable gene-expression profile powerfully boost mitochondrial defense.

• Antioxidant power. PQQ is a potent antioxidant. Its extraordinary molecular stability enables it to facilitate thousands of antioxidant reactions in the mitochondria—without breaking down—for maximum antioxidant and bioenergetic support.21

PQQ is an essential nutrient, meaning that your body cannot make it on its own. A wealth of research demonstrates that—alone and especially in combination with CoQ10—its unique nutritional profile supports heart health and brain function.22-24 This should be no surprise, given how much energy these vital organs need.

Life Extension has identified a purified, highly potent form of PQQ from Japan that is produced through a unique fermentation process. The result is some of the highest quality PQQ available today.

**BREAKTHROUGH WEAPON IN THE BATTLE AGAINST AGING!**

Super Ubiquinol CoQ10 With BioPQQ® combines:

• CoQ10 in a super-absorbable ubiquinol form.

• Shilajit to synergistically boost mitochondrial CoQ10 levels and youthful cellular energy.

• PQQ to support spontaneous generation of new mitochondria in aging people.

The suggested dosage of one (1) softgel daily of Super Ubiquinol CoQ10 With BioPQQ® provides:

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A bottle of 30 softgels of Super Ubiquinol CoQ10 With BioPQQ® retails for $54. If a member buys four bottles, the price is reduced to $37.50 per bottle.

The optimal dose of PQQ is 20 mg each day. Members taking Mitochondrial Energy Optimizer, Mitochondrial Basics, or PQQ 10 mg caps obtain this optimal PQQ dose when taking the new Super Ubiquinol CoQ10 with PQQ.

References


To order Super Ubiquinol CoQ10 With BioPQQ®, call 1-800-544-4440 or visit www.LifeExtension.com

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
John Snow, MD, is the genius who created the modern science of epidemiology.¹

Dr. Snow demonstrated that feces-laden water consumed by the people of London in the mid-1800s was causing cholera and other epidemic diseases.¹

Dr. Snow had no idea that microscopic bacteria were behind cholera. Doctors at that time had not yet recognized the “germ theory” of disease. He nonetheless concluded that contaminated water was the source of a self-replicating poison that was killing thousands of London residents.

Few people of the day followed Dr. Snow’s admonition to boil drinking water and avoid fluids that emanated from the bowels of cholera patients.

It might not surprise you that the medical establishment did not agree with Dr. Snow. Physicians in 1854 attributed cholera and other enteric diseases to the foul smelling gasses produced by piles of rotting garbage and raw sewage that characterized London at that time.¹

Rational decision making by the medical establishment has not improved much on a relative basis since Dr. Snow’s time.

Mainstream medicine continues to overlook proven methods to prevent, mitigate, or eradicate chronic disorders. The result is that too many Americans needlessly suffer and die.
A fundamental purpose of Life Extension is to investigate and identify the underlying culprits behind today’s epidemics and devise practical protocols to circumvent them.

Over the past 10 years, Life Extension has accumulated a wealth of new lifesaving knowledge. This article describes the modern world’s leading cause of death. It then reviews the completely revised 2014 edition of Disease Prevention and Treatment, a textbook designed for professionals and the lay public alike.
One of today’s great misconceptions is how people die. Most believe **disease** is the leading **cause** of death. Nothing could be further from the truth.

While data is regularly published showing what diseases people die with, missing is what **caused** the disease to manifest in the first place.

The number one **cause of death** throughout the world is **medical ignorance**. Not just the Western world, but the entire world. This fact can be demonstrated by looking at the degree of **ignorance** in developing countries today.

In parts of Africa, for example, AIDS is not considered to be a viral disease. Instead, the belief is that one contracts AIDS by “thinking” they may contract AIDS. Therefore, according to this backward logic, to even “think” that practicing safe sex will prevent AIDS causes one to contract the disease. The result of this fallacy is that HIV infection has spread at epidemic proportions in Africa, as people freely engage in dangerous sex practices and intentionally pretend that there is no such thing as HIV-AIDS.

One reason that new viral diseases keep emanating from China is that sanitary conditions are very bad in many parts of the country. Some rural Chinese farmers live under the same roof as their livestock, increasing the likelihood of transmitting animal viruses to humans. Apartment buildings constructed during the communist regime have such improperly installed plumbing that it is not unusual for the toilet contents of those living upstairs to wind up in their downstairs neighbor’s sinks. Rampant infectious disease involving the same organism has been known to strike virtually everyone living in these decrepit apartment buildings.

More than **1.8 million** humans die annually from water-borne bacterial diarrhea including **cholera**. While many Third World populations have little choice, it’s not the cholera bacterium that is their enemy. The preventable culprit is their **ignorance** about the dangers of **drinking** contaminated water.

**It’s Nearly as Bad in the Western World**

Arrogant doctors in the Western world pretend that they have somehow lifted themselves out of the sea of oblivion that caused so many needless deaths in the past.

The unfortunate fact is that **medical ignorance** in the Western world is also the leading cause of death; it just consumes its victims in other ways. Doctors who would ridicule the stupidity of disease causation in developing nations don’t understand that their own oversight is also easy to criticize.

For example, hospitalized patients continue to die needlessly due to **malnutrition** even in industrialized countries. Despite numerous studies documenting the negative effects of hospitalization on nutritional status, very little is being done to correct this problem. The result is that hospitalized Americans continue to perish from **malnutrition**, just as those in the Third World continue contracting **water-borne infections** at epidemic proportions—two diseases with the same underlying cause... **medical ignorance**!

If doctors can’t get it right in hospitals when it comes to something as easy as measuring the calorie intake of patients, then can we really expect them to optimally treat complex disease states? The answer is a resounding no!

In the brand **new** 2014 edition of the book **Disease Prevention and Treatment**, you will find out how **medical ignorance** in the so-called modern world deprives patients of life-saving treatments and contributes to unnecessary suffering and death.

**Needless Cancer Deaths**

Despite proclamations of progress, cancer continues to inflict an epidemic of disability and death on the aging American population.

When a primary tumor is surgically removed, the body produces **growth factors** to heal the surgical wound. The problem is that these same growth factors also promote the proliferation of cancer cells that may have already spread (metastasized) to other parts of the body. If drugs that suppressed these growth factors were administered **prior** to cancer surgery, many lives could be spared. The sad fact is that most oncologists do not even consider prescribing...
drugs and nutrients before surgery that not only suppress growth factors, but also markedly reduce the metastatic potential of the primary tumor. In the 2014 edition of Disease Prevention and Treatment, we discuss new approaches to treating cancer both before and after surgery that could result in many more successful long-term outcomes.

Cancer cells are uniquely able to adapt to toxic environments, which is why chemotherapy drugs have such a high failure rate. Researchers have identified survival mechanisms that cancer cells employ to avoid obliteration by chemotherapy drugs and other conventional therapies, yet few practicing oncologists incorporate these synergistic strategies into clinical practice. The 2014 edition of Disease Prevention and Treatment identifies therapies that may complement cancer treatments to improve patient outcomes.

Radiation has been used to kill cancer cells for over 100 years, but doctors continue to overlook novel methods to enable this therapy to better treat the disease. The 2014 edition of Disease Prevention and Treatment contains voluminous data on how cancer patients may achieve better results when having to undergo radiation therapy.

Don’t Let Viruses Get You

Each year, tens of millions of Americans suffer acute viral outbreaks that result in debilitating cold-flu sicknesses, herpes, and shingles recurrences, and lethal episodes of influenza. While effective therapies exist to combat these diseases, the delay in initiating treatment too often results in failure to contain the virus. The 2014 edition of Disease Prevention and Treatment identifies novel drug-nutrient-hormone cocktails that can quickly suppress or destroy a broad array of common viruses.

The most important recommendation, however, is to encourage patients to initiate these comprehensive therapies at the very first symptom of a viral infection. Few doctors understand that treatment delay past 48 hours renders even the most advanced anti-viral approaches virtually useless.

Victims of HIV and hepatitis know how difficult it is to kill a virus once it gains a foothold inside the cells of the body. For those afflicted with chronic viral infections, the 2014 edition of Disease Prevention and Treatment provides a plethora of immune-boosting strategies designed to contain difficult-to-manage viruses.

Control High Blood Pressure

High blood pressure is a silent epidemic that threatens the lives of one in every three American adults. Of those taking blood pressure medications, optimal control rates are typically less than half. This means that the majority of those diagnosed with hypertension spend most of their day with blood pressure levels that are dangerously elevated.

Since increased blood pressure is a major risk factor for heart disease, stroke, congestive heart failure, and kidney disease, it acts as an accomplice in millions of deaths each year. Mainstream medicine has fallen fatally short of relieving high blood pressure. A major problem is that conventional medicine’s definition of what constitutes acceptable blood pressure levels is far too high. In the 2014 edition of Disease Prevention & Treatment, readers will learn about a dangerous assumption made by doctors regarding anti-hypertensive drugs, optimal blood pressure targets, and ways to better manage blood pressure.

Avoid the Dangers of Chronic Stress

Chronic and unremitting stress can increase our risk of suffering from a barrage of anxiety- and pressure-related diseases ranging from high blood pressure to dementia to depression. Regrettably, while chronic stress produces significant adverse health effects, conventional medicine often relies upon psychoactive drugs to mask stressed patients’ symptoms. At the same time, mainstream stress management strategies often fail to address
biochemical abnormalities, such as imbalanced *adrenal hormone levels*, that contribute to the detrimental health effects of chronic stress.\textsuperscript{17-19}

At the core of chronic stress is deregulation of the hypothalamic-pituitary-adrenal (HPA) axis, an interconnected network of physiologic command terminals that governs the production of stress hormones like cortisol, epinephrine, and norepinephrine. Chronic stress leads to desynchronization of the HPA axis and subsequent imbalances in stress hormone levels, a critical feature of stress-related illness.

The 2014 edition of *Disease Prevention and Treatment* describes the dangers of chronic stress, how it contributes to various diseases, and how one can optimize their stress response by combining healthy lifestyle habits with scientifically studied natural therapies.

**Overlooked Multiple Sclerosis Therapy**

More than three decades ago a *natural intervention* was hypothesized to be an environmental determinant of multiple sclerosis incidence.\textsuperscript{20,21}

Since then, numerous scientific studies have shown that this common natural compound can dramatically modulate the cascade of autoimmunity and inflammation that claims the lives of so many multiple sclerosis patients.\textsuperscript{22,23} Moreover, evidence shows many multiple sclerosis patients have very low levels of the natural substance in their blood.\textsuperscript{24}

Despite robust findings suggesting this inexpensive natural therapy should be an integral part of every multiple sclerosis patient’s treatment plan, conventional medicine still fails to recommend it. In the 2014 edition of *Disease Prevention and Treatment*, you will learn about this underappreciated multiple sclerosis therapy as well as a multitude of other innovative disease treatments that conventional medicine continues to overlook.

**Keeping the Blood Flowing**

Atherosclerosis is the most deadly disease in the United States, yet most doctors still do not understand how it develops. While most people think of their arteries becoming clogged like a pipe, the fact is that the aging process damages the inner linings of blood vessels, even when conventional risk factors such as cholesterol and blood pressure are within normal ranges.\textsuperscript{25}

While high cholesterol levels contribute to atherosclerosis, the mechanism by which it most damages the arterial wall is quite different than what drug companies promote. When levels of cholesterol (and other atherogenic risk factors) are too high, there is a corresponding reduction in the amount of *nitric oxide* available to the endothelial lining of the arteries.\textsuperscript{26}

*Nitric oxide* is a critically needed substance that enables the arteries to expand and relax with youthful elasticity.\textsuperscript{27} The encouraging news is that novel approaches are available that have been shown to safely increase nitric oxide and reverse atherosclerosis markers in humans and animals.\textsuperscript{28-33}

In the 2014 edition of *Disease Prevention and Treatment*, readers will learn how to circumvent the many overlooked factors that make aging humans so vulnerable to artery disease and subsequent stroke and heart attack.

**Protect Healthy Tissues Against Lethal Radiation Damage**

Even if cancer is completely cured by radiation therapy, there is sometimes severe peripheral damage to healthy tissues known as *radiation fibrosis*.\textsuperscript{34} Life Extension long ago advised those undergoing radiation to use a drug-nutrient combination that was shown to promote healing time and reduce pain following radiation damage.

A more dangerous form of radiation damage, however, occurs when treating cancers involving the brain. The high levels of radiation used to treat tumors in the brain can result in a lethal side effect called *radiation necrosis* that manifests long after the therapy is discontinued.\textsuperscript{35,37}
The swelling of the brain caused by radiation necrosis can lead to dementia or death.38,39 Doctors treat the brain swelling by administering anti-inflammatory steroid drugs. At some point, steroid drug therapy fails. Years ago, one expert complained that no matter how many brain tumors are cured with radiation therapy, the patients eventually died from radiation necrosis.

What conventional doctors overlook is that even when brain swelling is temporarily controlled, the radiation necrosis process itself continues to stimulate inflammatory cytokines. The result is a vicious cycle where damaged brain tissues keep provoking inflammatory cytokines that cause even more necrotic damage, which then promotes even more inflammatory cytokine production (and more necrotic damage).

In the 2014 edition of *Disease Prevention and Treatment*, a breakthrough drug-nutrient cocktail is introduced to suppress the chronic inflammatory-cytokine cascade and gain long-term control over radiation necrosis.

**Why You’ll Want This Book in Your Library or on Your Coffee Table**

For the past 33 years, Life Extension has published life-saving information a decade or more ahead of conventional medicine. A case-in-point is Life Extension’s advice to take low-dose aspirin to prevent heart attacks. While mainstream hospitals like Johns Hopkins now advocate aspirin to prevent heart attacks, the Life Extension Foundation® published evidence about aspirin’s benefits back in 1983. The Life Extension Foundation® then spent 15 years battling the FDA to force the agency to recognize the cardio-protective effects of low-dose aspirin.

When a serious medical disorder develops, most people have no one to turn to other than their doctor. The problem is that physicians are often too busy to keep up with the latest research findings. As a result, many patients suffer and die even though advanced therapies already exist that could cure them.

For example, in 2005 “Tamiflu®” became a household word as fears of an avian flu epidemic caused a shortage of this anti-viral drug. Those who purchased the year 2003 edition of *Disease Prevention and Treatment*, however, learned about Tamiflu before the public and were advised about the benefits of having it available to prevent a flu virus infection.

A stark illustration of the failure of doctors to recognize the value of life-saving medical breakthroughs was a study showing that the drug *cimetidine* improved survival odds in a group of colon cancer patients.40 In this landmark study, patients with an aggressive form of colon cancer took 800 mg of *cimetidine* for one year after surgery. After ten years, there was nearly a 60% improvement in survival in the group that took *cimetidine*.

As early as 1985, the Life Extension Foundation recommended *cimetidine* as an adjuvant cancer therapy. If you had been a Life Extension member and contracted colon cancer, your odds of dying could have been reduced dramatically.

Many colon cancer patients learned about the enormous value of cimetidine in the year 2003 edition of *Disease Prevention and Treatment*. The brand new 2014 edition of *Disease Prevention and Treatment* provides even more novel therapies for colon cancer patients to consider.

For those afflicted with chronic illnesses, the new information contained in the 2014 edition of *Disease Prevention and Treatment* could result in a liberating experience. When a medical concern arises, you don’t want to be left in the darkness of scientific ignorance. By keeping the latest edition of *Disease Prevention and Treatment* close by, you will quickly be able to use the expanded index to educate yourself about novel therapies that have shown efficacy in peer-reviewed studies, but have not yet made it into conventional medical practice.

**Save Over 60% on Disease Prevention and Treatment**

Life Extension has spent millions of dollars in researching, writing, and editing the 130 chapters that comprise the 2014 edition of *Disease Prevention and Treatment*. We expect to recoup some of this expenditure when we release it to book stores in January 2014.
We want every one of our members to have this updated reference book in their homes today. To encourage this, we are offering the book to members at a **64% discount** off the cover price of *Disease Prevention and Treatment* until January 31, 2014. This beautiful hardbound book retails for $69.95—a far lower price than what medical textbooks like this normally cost. Until January 31, 2014, you can obtain the **2014 edition** of *Disease Prevention and Treatment* for only $24.95.

To order your personal copy of the **new Disease Prevention and Treatment** reference book, call 1-800-544-4440 today.

*References*

The most expensively-produced book you will ever read!

The 2014 edition of Disease Prevention and Treatment could help you or someone you know overcome a chronic medical condition, or better yet, prevent it from developing in the first place.

The 2014 edition of Disease Prevention and Treatment provides over 1,400 pages of concise data about therapies that are documented in scientific literature, but not routinely incorporated into clinical medical practice. Gaining access to this knowledge enables one with a medical disorder to take advantage of these advanced modalities immediately, rather than waiting years for conventional medicine to catch on.

It is a well-known fact that people suffer and die even though effective treatments may already exist for their diseases. Don’t let this happen. Disease Prevention and Treatment helps break down barriers of ignorance that censor life-saving knowledge.

If you know someone who is concerned about staying healthy, or in need of better treatment for cancer, heart disease, hepatitis, etc., the 2014 edition of Disease Prevention and Treatment is a must for their library.

Disease Prevention and Treatment is fully indexed so that a person can easily learn more about their medical problems. Each chapter provides specific recommendations for the novel use of diet, nutrients, hormones, and drugs to address 130 different health concerns.

Life Extension has spent millions of dollars over the past 10 years updating Disease Prevention and Treatment. This one-of-a-kind beautiful hardbound book serves as a handy household reference that may be used for years to come.

Disease Prevention and Treatment is the only book that makes specific recommendations about combining mainstream therapies with natural approaches and novel medications to provide the best chance of preventing or gaining control over serious medical disorders. This is not a nutrition book. Rather, Disease Prevention and Treatment provides guidelines about how to safely use FDA-approved drugs, along with innovative therapies, in order to implement logical treatment regimens to address the multiple pathological processes involved in degenerative disease.

The protocols discussed in this book are documented by thousands of published studies from internationally recognized scientific journals. Despite this bountiful evidence, the medical establishment largely ignores many of the therapies recommended in this book.

The leading cause of death and disability today is ignorance about scientific approaches to prevent and treat degenerative disease. The novel information contained in Disease Prevention and Treatment could literally save the life of someone you care for.

The cover price of the 2014 edition of Disease Prevention and Treatment is $69.95. Until January 31, 2014, members can obtain this book for only $24.95.

To order the 2014 edition of Disease Prevention and Treatment for only $24.95, call 1-800-544-4440 or log on to www.LifeExtension.com
Scientists have discovered that an extract of the fern *Polypodium leucotomos* helps inhibit cellular changes in the skin that can lead to premature aging due to sun exposure.¹

Taken *orally*, **Enhanced FernBlock® with Red Orange Complex** provides an additional layer of support for the body's ultraviolet-light defenses.

*Best of all, Polypodium leucotomos* offers this protection from the inside out. The result is an oral photoprotective agent that provides uniform, systemic, total-body surface protection (including the eyes, lips, and scalp), without the problems associated with sunscreen.²,³

**Oral Sun Defense**

**FernBlock®** has shown remarkable effectiveness in promoting skin defenses against harmful solar radiation.¹⁴-⁷

**FernBlock®** in this oral formulation works by promoting the body's ability to inhibit absorption of ultraviolet rays and to quench the free radicals that this type of radiation can generate.⁴,⁵ In one clinical study, *Polypodium leucotomos* offered significant protection against the sun's rays, even for those taking medication that causes increased sun sensitivity.⁶ The study subjects experienced an almost three-fold increase in the amount of time they spent in the sun.

**Enhanced FernBlock® Formula**

This product has been upgraded to contain **Red Orange Complex**, a standardized extract that is obtained from three red orange varieties—*Citrus sinensis* var. Moro, Tarocco, and Sanguinello.

The main active phenolic compounds include anthocyanins, flavanones, and hydroxycinnamic acids. It also includes vitamin C,⁷ which works together to support the body's natural photoprotection against ultraviolet radiation,¹⁰,¹¹ by helping to balance the body's normal inflammation response,²⁶ free-radical defense mechanism, and healthy apoptotic (cell death) activity.¹²

In a controlled human trial, 15 days of oral supplementation with **Red Orange Complex** was demonstrated to measurably support natural skin defenses against ultraviolet radiation.¹¹

---

**More Comprehensive Sun Protection**

**Enhanced FernBlock® with Red Orange Complex** is designed to complement topical sunscreens for sun exposure. Taken orally, **FernBlock®** supplements the effectiveness of topical sunscreens by protecting the entire skin surface and has an obvious advantage in that it cannot be removed by perspiring or bathing.

If taken daily, just one capsule should provide everyday protection. Each vegetarian capsule of **Enhanced FernBlock® with Red Orange Complex** provides:

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A bottle of 30 vegetarian capsules of **Enhanced FernBlock® with Red Orange Complex** retails for $42. If a member buys four bottles, the price is reduced to $28.50 per bottle.

To order **Enhanced FernBlock® with Red Orange Complex**, call 1-800-544-4440 or visit www.LifeExtension.com

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FernBlock® is a registered trademark of Industrial Farmaceutica Cantabria, S.A.

Note: This product is not a sunscreen.

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References

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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.
Comprehensive Brain Support!

COGNITEX®

Brain decline affects all aging humans. Scientific studies demonstrate more youthful cognition and memory in response to the proper nutrients. Cognitex® provides the following brain boosting ingredients in one advanced formula:

- **Alpha-glyceryl phosphoryl choline** boosts levels of acetylcholine, a neurotransmitter that enables brain cells to communicate and is intimately involved in memory and learning. Acetylcholine levels markedly decline as humans age past 30.
- **Vinpocetine** enhances circulation, oxygenation, and electrical conductivity of brain cells.
- **Uridine-5’-monophosphate** is a compound naturally found in the milk of nursing mothers and is essential to humans when brains are the youngest. UMP also supports superior cognitive function in aging adults.
- **Wild blueberry extract** has been shown to inhibit oxidative and inflammatory changes in brain cells believed to be involved in memory decline.
- **Hops** and **rosemary** have all been shown to help suppress inflammatory cytokines.
- **Ashwagandha** inhibits an enzyme (acetylcholinesterase) that breaks down acetylcholine in the brain.
- **Phospholipid grape seed extract** improves blood vessel tone and elasticity, thus boosting cerebral oxygen flow.
- **Pregnenolone** is a hormone involved in synchronization of brain cells that declines in normal aging brains.

**JUST THREE SOFTGELS PROVIDE THE FOLLOWING:**

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**MOST ADVANCED NEUROLOGICAL FORMULA AT NEW LOWER PRICES**

The ingredients in Cognitex® sell for a small fortune in Europe, where they are commonly prescribed. You can obtain them all at a fraction of this cost in the comprehensive Cognitex® nutrient formula for the brain.

The retail price for 90 softgels of Cognitex® with NeuroProtection Complex (with or without pregnenolone) is $74 (Item # 01697) and $72 (Item # 01696), respectively. If a member buys eight bottles of either version, the price per bottle is $44.17 and $42.72, respectively.

References for most can be found at:


Sharp-PS® GOLD is a trademark of Enzymotec Ltd. US Patent No. 7,935,365. Sensoril® is protected under US Patents Nos. 6,153,198 and 6,713,092 and is a registered trademark of Natreon, Inc. Perluxan® is used with permission.

To order Cognitex® with NeuroProtection Complex, call 1-800-544-4440 or visit www.LifeExtension.com

Contains fish (wild herring, blue whiting) and soybeans.

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.
Melatonin was introduced to the United States in 1992 as a “sleep hormone.”

While some find melatonin helps restore restful sleep, scientists are finding far more consistent applications for melatonin in the area of brain protection.

New discoveries are validating melatonin’s ability to guard the brain from oxidative stress and the neurodegeneration that occurs as a result of aging and environmental factors.1 With this research, melatonin deserves the title of “brain hormone.”

Scientists are increasingly finding that the age-related decline in melatonin levels may be one factor for the age-related increase in neurodegenerative diseases.2-4 In fact, some symptoms of melatonin deficiency are seen in patients with Alzheimer’s, such as disruption of day/night patterns, mood changes, and delirium.5

Fortunately, supplementing with melatonin in middle age and beyond has been shown to protect against Alzheimer’s as well as reduce the risk of Parkinson’s disease, shrink the size of the infarct area involved in a stroke, and minimize the brain swelling and dysfunction following a head injury.2,6-13

As if this were not enough, research is also finding that in lab studies melatonin can play a role in longevity by increasing the “longevity protein” SIRT1.14,15 Clearly, melatonin’s beneficial properties extend far beyond sleep.
Some scientists think the increase in neurodegenerative diseases as we age may be directly related to the age-related decline in melatonin levels. Fortunately, oral melatonin supplements are available, which may combat this decline by increasing blood and brain levels of melatonin.

Supplementation with low-cost melatonin thus offers an opportunity to restore the brain’s natural antioxidant protection and potentially prevent age-related changes to the brain. In fact, melatonin’s effects are so powerful that it’s been designated a drug by the European Medicines Agency (EMA).

With the onset of menopause, animals (like humans) experience a marked increase in oxidative damage, leading to brain cell dysfunction. Studies show that in such animals, melatonin supplementation reverses those harmful effects in a similar manner to hormone replacement—but without the associated risks.
Melatonin Fights Brain Changes in Alzheimer’s Disease

In animals given the drug haloperidol (Haldol®), which impairs melatonin synthesis, memory deficits and brain protein changes resembling Alzheimer’s disease arise.²⁶,²⁷ However, when the animals are then supplemented with melatonin, the changes disappear, indicating a critical role for melatonin in protecting neurons.

In addition, melatonin has been found to help combat Alzheimer’s disease by reducing the damage caused by two harmful proteins: amyloid beta proteins and tau proteins.⁶,²⁰,²⁶,²⁸,²⁹ High levels of these two proteins contribute to the death of brain cells and have been linked to Alzheimer’s disease.

Melatonin also helps fight Alzheimer’s disease by guarding against the harmful effects of aluminum, which is known to produce Alzheimer’s-like oxidative changes in brain cells.²⁸ Together, these biochemical effects help to explain why melatonin supplementation has been found to reduce learning and memory deficits in animal models of Alzheimer’s disease.⁷,³⁰

Why It’s Important to Start Melatonin Early

Researchers agree that it’s best to start taking melatonin before symptoms arise and before physical changes in brain cells have occurred.

One particular animal study demonstrated just how dramatic melatonin’s preventive properties really are. For the study, scientists used mice that had human genes predisposed to Alzheimer’s disease (these are called transgenic mice).⁷

Melatonin Deficiency Linked to Alzheimer’s Disease

Melatonin deficiency and Alzheimer’s disease are closely linked; profound reductions in melatonin levels have been found in Alzheimer’s disease patients. Melatonin, which is maintained at high levels in the brain and spinal fluid throughout youth and middle age, begins to decline sharply with advancing age—in a fashion that closely parallels the rise of Alzheimer’s incidence.²,¹⁹,²⁰

One impressive study found that melatonin levels in the spinal fluid of adults older than 80 were just half those of younger, healthy individuals.²¹ But older adults who had Alzheimer’s had dramatically lower levels yet—roughly one-fifth of those in healthy young people.

This connection is often overlooked, but vitally important—especially because some of the symptoms that arise as a result of melatonin deficiency are detected long before other more obvious cognitive Alzheimer’s symptoms present themselves.²² This makes melatonin deficiency one of the earliest indicators of Alzheimer’s disease.

Most notably, these include symptoms such as insomnia and sundowning. Sundowning is a “circadian” (daily rhythm) disturbance in which agitation and activity increase, rather than slow down, as the day wanes.²³,²⁴ Sleep disorders (such as insomnia, restlessness, and poor sleep quality) generally increase with age and are a sign of declining melatonin production. Such disorders occur in about 45% of those with Alzheimer’s.

Fortunately, clinical research has demonstrated the value of melatonin supplementation in reversing these and other changes associated with Alzheimer’s, particularly when implemented early in the course of the disease.²⁴,²⁵

Why It’s Important to Start Melatonin Early

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By late-middle age, the unsupplemented mice proceeded to develop the behavioral and cognitive deficits typical of the disease. In fact, even before signs of disease were visible, the animals’ brains already manifested the typical increased oxidation and decreased intracellular antioxidant defenses seen in Alzheimer’s. Soon their brain cells began to die off.

However, mice that were supplemented with melatonin before any disease was evident showed none of those pathological changes—and they performed normally on cognitive and behavioral tests.

This shows just how powerfully melatonin works as a preventive agent. Unfortunately, it’s been difficult to prove these preventive benefits in people because human trials of interventions for Alzheimer’s tend to start only after the disease has become apparent—and well after the window of opportunity for intervention has closed. Nonetheless, very encouraging findings come from studies showing that Alzheimer’s patients taking melatonin experience improved sleep patterns, less sundowning, and slower progression of cognitive impairment.23,24

Still more evidence that it’s best to start melatonin supplements as early as possible comes from several recent studies of mild cognitive impairment, a condition defined as impairment that precedes actual dementia. About 12% of people with mild cognitive impairment proceed to develop dementia each year. In a series of studies, researchers have now shown that people taking between 3 and 24 mg of a fast-acting formulation of melatonin daily for 15 to 60 months performed significantly better on a host of cognitive assessment scales and tests of memory.23,31,32

Melatonin Fights Parkinson’s at the Earliest Stages

Animal studies demonstrate that melatonin supplementation can prevent—and to some extent, even reverse—the changes in behavior and motor function induced by Parkinson’s disease. Parkinson’s disease robs its victims of normal movement, slowing them down, making their walk erratic, and blocking normal facial expressions. All of this occurs through the loss of neurons that produce the neurotransmitter dopamine.

Parkinson’s has a number of similarities to Alzheimer’s. Both can lead to dementia. Both are the result of out-of-control oxidation (in the case of Parkinson’s focused on brain regions that control movement and balance). And in both diseases, brain cell death and dysfunction is brought on by an abnormal, oxidizing, and inflammatory protein accumulation. In Parkinson’s, that protein is called alpha-synuclein.36,37

What You Need to Know

Melatonin: The Brain Hormone

- Melatonin, a hormone produced in the pineal gland of the brain, is well known as a sleep aid; it is registered as a drug for that purpose in Europe.
- Melatonin also has incredible neuroprotective effects.
- Studies now reveal that melatonin levels begin to decline at just the time when neurodegenerative diseases begin to rise, and there’s good scientific evidence for a strong connection between these phenomena.
- Supplemental melatonin restores normal, youthful levels of the hormone, and provides powerful antioxidant protection for the brain.
- Laboratory and early clinical studies show that melatonin supplementation can protect against the age-induced brain changes leading to Alzheimer’s and Parkinson’s diseases, to increased stroke risk, and to susceptibility to brain trauma.
- To achieve the most benefit from melatonin, begin supplementation as early as possible.
Working with various laboratory models of Parkinson’s disease, scientists have demonstrated that melatonin can attack Parkinson’s disease at each of its critical junctures:

- It prevents the production of alpha-synuclein in brain cells, at the same time attacking existing molecules of the toxic protein and making them available for cellular cleanup.36,37
- It reverses the inflammatory changes seen in the brains of people with Parkinson’s disease.38
- It restores normal activity of a key enzyme involved in dopamine production.8,24

Melatonin Cuts Stroke Risk

As you age, waning melatonin levels place your brain at risk for both immediate and long-term neurological damage. In particular, decreased melatonin levels have been associated with a greater presence of stroke, with the odds appearing to rise more than 2% for each 1 pg/mL decline in melatonin.39 In people whose pineal gland (the source of melatonin) has become calcified and non-functional, the risk of stroke is increased by 35%.40

Plenty of biochemical evidence is available to explain this increased risk. Much of the damage done in either type of stroke—ischemic (insufficient blood flow) or hemorrhagic (bleeding into the brain)—is the result of free radical production. In an animal model of ischemic stroke, melatonin improved cognition by scavenging and neutralizing free radicals.41

It also reduces indirect risk factors for stroke, such as elevated cholesterol and blood pressure. It has been shown to suppress cholesterol formation by 38%, reduce LDL-cholesterol accumulation by 42%, and reduce blood pressure into the normal range.42

Melatonin Limits Stroke Damage

Once a stroke has begun to develop, melatonin can prevent the death of neurons in the stroke area—limiting the damage done by the stroke.11 Researchers conducted an experiment in which they removed the pineal glands of rats to make them deficient in
melatonin. They found that these rats experienced significantly greater brain damage after a stroke or seizure than the rats that still had sufficient melatonin levels.43

Repeated animal studies have demonstrated that animals supplemented with melatonin prior to a stroke experienced a decrease in the volume of brain tissue affected by an ischemic stroke (the most common kind).11,44,47 This results in improved neurological and behavioral outcomes, and faster recovery from the stroke.11,47,48

One of the most important determinants of a good recovery from a stroke is the degree of “plasticity” in the surviving neurons.49 Plasticity involves how well the surviving neurons are able to shift their function and take on some of the activities of damaged or destroyed brain cells.49 Melatonin has been found to increase the plasticity of the neurons on both sides of the brain (the affected side and the opposite side)—an effect that hastens recovery.50

Another way melatonin helps reduce the damage caused by a stroke is by reducing the activation of destructive “protein-melting” enzymes.47,51 An ischemic stroke triggers an increase in “protein-melting” enzymes, which impair the integrity of the normal blood-brain barrier, leading to brain swelling, increased pressure, and occasionally transformation into a hemorrhagic (bleeding) stroke.52 However, in experimental models of ischemic stroke, when melatonin is administered during or after ischemia, it reduces the activation of those destructive enzymes, tightens the blood-brain barrier, reduces tissue swelling, and prevents hemorrhagic transformation.11,47,51,53

**Melatonin Shields Your Brain from Traumatic Injuries**

Melatonin has also been found to help protect your brain in the event of a traumatic brain injury (such as head trauma experienced in an automobile accident). Traumatic brain injury is a leading cause of death and disability in younger Americans (but not unheard of in older adults).54,55

Just as in a stroke, oxidative damage to brain cells is the leading culprit in traumatic brain injuries. Also as in a stroke, promoting brain cell plasticity (the ability of surviving neurons to take on some of the activities of damaged brain cells and to promote re-growth of damaged tissue) is a mainstay of treatment.56

Animal studies show that administration of melatonin after such an injury maintains integrity of the blood-brain barrier, prevents dangerous brain swelling in the hours and days following the injury, and shrinks the size of the bruised and injured tissue.55 It has also been found to reduce the mortality rate after a burst aneurysm.12,13

Most of these effects are related to melatonin’s direct antioxidant effects, along with its ability to induce otherwise dormant cellular antioxidant systems.13

**A Safer Alternative to Prescription Sleep Drugs**

Supplementing with melatonin may reduce the use of prescription sleep medications in the benzodiazepine family (Xanax®, Valium®, and others). In one study, 62.8% of control subjects received such drugs, while only 9.8% of melatonin supplemented patients were prescribed them.51 As a result, in Europe (where melatonin is a drug), a concerted effort is being made to increase awareness and use of melatonin as a way to get people off of these side effect-laden, abuse-prone medications.69
What Is Melatonin?

Melatonin is a hormone that is primarily secreted in the pineal gland, a minute, pea-sized organ located in the center of the brain between the two hemispheres. Shaped like a tiny pine cone (hence the name), the pineal gland is filled with nerve cells that respond to light or darkness (some biologists refer to the pineal as the “third eye” for this reason).

Through its secretion of melatonin, the pineal gland acts as the body’s central clock, telling the brain and other organs when it’s time to be active and when it’s time to rest. That’s why melatonin is typically thought of as the “sleep hormone.”

But in addition to its hormonal actions, melatonin is one of the body’s most powerful intrinsic antioxidants. Melatonin has several antioxidant mechanisms: it directly scavenges free radicals of both oxygen and nitrogen, neutralizes a host of other radicals, and stimulates gene expression of powerful intracellular antioxidant systems. But melatonin has an additional action that sets it apart from other antioxidants: It readily crosses the blood-brain barrier and enters brain cells and their organelles.

Unfortunately, the pineal gland’s production of melatonin declines rapidly after middle age. Since the brain lacks other oxidative defense mechanisms, the decline in melatonin production leaves brain cells increasingly vulnerable to oxidative damage, resulting in dysfunction at the level of molecules and cells.

We see the effects of that dysfunction in the various diseases of the aging brain, such as Alzheimer’s, Parkinson’s, Huntington’s, and others. Oxidative damage also produces the disastrous effects of a stroke or a traumatic brain injury, effects which may be attenuated by melatonin.

Can Melatonin Extend Your Life?

There’s no question that melatonin exerts powerful protective effects on brain tissue. We’ve seen how it can mitigate oxidative damage that contributes to neurodegenerative diseases, stroke, and head trauma.

But melatonin is a potent antioxidant that’s also found in the blood, making it accessible to other tissues throughout the body. Could melatonin, then, offer true life extension by preventing damage not just to the brain, but to the entire body?

It’s too early to say definitively, of course. Humans live so long that it’s challenging to conduct an ethical, randomized, placebo-controlled study of most interventions. But studies in other animals yield considerable reason for hope.

In the single-celled organism *Paramecium tetraurelia*, melatonin treatment increased both the mean and the maximal life span by up to 24% over control animals. In fruit flies (*Drosophila melanogaster*), melatonin-fed flies had a 33% increase in maximum life span and a nearly 14% increase in median life span.

In higher organisms such as mice and rats, data are promising but incomplete. Melatonin increases expression of the “longevity protein” SIRT1, which triggers the expression of a host of self-healing genes (SIRT1 is activated by calorie restriction). One study in mice found no increase in mean life span, but an increase in the life span of the last surviving 10% of the population. Another study did show increases in longevity in mice engineered to age rapidly.

Research also shows that animals undergoing calorie restriction—a documented means of extending life span—substantially increase their production of melatonin. And melatonin activates (and synergizes with) some of the same brain-protective mechanisms activated by resveratrol, another life-extending supplement.
Summary

Melatonin has been ignored or trivialized as simply a “sleep aid” ever since Life Extension introduced it to the world in 1992. But a burst of new studies now reveals that melatonin can protect your brain from many of the ravages of aging.

When we’re young, melatonin protects our brains from free radical attack. But after middle age, melatonin levels drop precipitously, leaving our brains increasingly susceptible to the growing impact of oxidative damage. Such damage leads to increased risk of neurodegenerative diseases and stroke, and increased vulnerability to the effects of head trauma.

Studies now show that melatonin supplementation can normalize oxidative damage in brain tissue. It can protect against the pathological changes seen in Alzheimer’s and Parkinson’s diseases, can shrink the size of the brain area involved in a stroke and can minimize brain swelling and dysfunction following a head injury.

But, like all preventive measures, brain protection with melatonin requires early action. You likely won’t get much benefit from melatonin if you wait until after onset of symptoms of neurodegeneration or until after a stroke or head injury claims some of your brain cells.

In order to keep your brain functioning in top condition, you need to support your dwindling supplies of brain-protective melatonin now.

References


**ULTIMATE PROSTATE PROTECTION**

Ultra Natural Prostate combines cutting-edge ingredients that have been scientifically substantiated to protect the prostate gland and maintain its healthy function.*

AprèsFlex® is an extract of Boswellia serrata that has two times the bioavailability of the leading boswellia extract. AprèsFlex® inhibits the enzyme 5-lipoxygenase. Boron is included because of studies showing it may help slow elevation of prostate-specific antigen (PSA).

The formula provides saw palmetto extract and Graminex® Flower Pollen Extract™ to interfere with DHT activity and help regulate inflammatory reactions in the prostate.* Lycopene is a carotenoid that is included in the formula to help maintain healthy DNA gene function in prostate cells.

In order to boost its anti-estrogen capabilities, Ultra Natural Prostate incorporates HMRLignan™, derived from Norway spruce, flax lignans, and nettle root extract.

Since normal aging can lead to potentially unsafe levels of prostaglandins in the prostate, Pygeum africanum extract is included to help suppress prostaglandins and thereby promote prostate comfort.* Beta-sitosterol has been added because it is the most biologically active component of Pygeum and enhances its protective effects.

The retail price for one bottle of Ultra Natural Prostate with AprèsFlex® and Standardized Lignans is $38. If a member buys four bottles, the price is reduced to $26.25 per bottle. If a member buys 12 bottles, the price is reduced to $24 per bottle.

The daily dose of two softgels of Ultra Natural Prostate with AprèsFlex® and Standardized Lignans Formula provides:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Quantity</th>
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<tbody>
<tr>
<td>USPlus® Saw Palmetto (C02 DeepExtract™) (std to 85%-95% total fatty acids and sterols)</td>
<td>320 mg</td>
</tr>
<tr>
<td>Graminex® Flower Pollen Extract™</td>
<td>252 mg</td>
</tr>
<tr>
<td>AprèsFlex® (Boswellia serrata) extract</td>
<td>70 mg</td>
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<tr>
<td>Pumpkin seed oil (Cucurbita pepo) extract</td>
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<tr>
<td>Stinging and Dwarf nettle root extracts</td>
<td>240 mg</td>
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<tr>
<td>Pygeum extract</td>
<td>100 mg</td>
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<tr>
<td>Lycopene</td>
<td>10 mg</td>
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<tr>
<td>Phytosterol complex (standardized to 26.6% free beta-sitosterol)</td>
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<tr>
<td>Proprietary blend of HMRLignan™</td>
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<td>Norway Spruce and ActiFlax™ Flax lignan extracts</td>
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Contains soybeans.

To order Ultra Natural Prostate with AprèsFlex® and Standardized Lignans, 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.
The retail price for 1 bottle of Fast Acting Liquid Melatonin is $12. If a member buys 4 bottles, the price is reduced to $8.25 a bottle. Seven drops provide about 1 mg of melatonin and there are approximately 1,180 drops in each bottle. Most people place one to two full eyedroppers under their tongues at night which provides 3 to 6 mg of melatonin.

The consequences of sleep deprivation go far beyond fatigue and diminished performance. Sleep deprivation can impact the immune system, the nervous system, memory and cognitive impairment, mood, and more.1 Ultimately, lack of sleep leads to an overall poor quality of life.

If you’re one of the more than 20 million Americans who suffer from occasional sleep problems,2 you don’t have to settle for frustrating nights of tossing and turning. A new, fast-acting LIQUID melatonin may enable you to…

TAKE BACK CONTROL OF YOUR SLEEP!

Melatonin is well known for its ability to regulate your body’s internal clock. However, as you grow older, the secretion of melatonin declines significantly as the pineal gland becomes calcified.3,4 Fortunately, melatonin has been studied and shown to be effective for managing disturbances in circadian rhythms.5,6

A meta-analysis of 17 studies concluded that melatonin supplementation decreases the time it takes to fall asleep while increasing sleep efficiency and total sleep duration.7 In fact, melatonin has been shown to increase the speed of falling asleep—and the quality of sleep—in about 60% of people who use it.8,9

NEW MELATONIN LIQUID DROPS!

Not all people benefit from melatonin when it’s in the form of a capsule or tablet. However, some report that by applying melatonin liquid drops under their tongue at bedtime for immediate absorption, they are able to sleep better. While any kind of liquid melatonin has been reported to work, Life Extension has developed melatonin liquid drops that are completely free of sugars.

This new soothing Fast-Acting Liquid Melatonin has a great tasting natural citrus vanilla flavor and is quickly absorbed for a restful night’s sleep.

An increase in age doesn’t have to mean an increase in sleep problems. Consider making Liquid Melatonin a part of your healthy sleep program.

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.
Many people think of whey protein as a supplement only used by athletes wanting to increase their muscle mass. But evolving research suggests the branched-chain amino acids (BCAAs) leucine, isoleucine, and valine and other fractions found in whey can mimic the longevity benefits of calorie restriction (CR)!

Searching for CR-mimetics, scientists recently investigated the life span effects of a balanced amino acid mixture high in the branched chain amino acids found in whey.\textsuperscript{1,2} In keeping with earlier studies on other organisms,\textsuperscript{3,4} they found branched chain amino acids significantly increased life span in mice.\textsuperscript{2} This “superfood” provides all 18 amino acids, naturally occurring bioactive components such as immunoglobulins and lactoferrin, and a cysteine concentration over 4-fold higher than other proteins—all in a highly absorbable form.\textsuperscript{5-8} And whey is one of the greatest foods for maximizing glutathione,\textsuperscript{9,10} the endogenous antioxidant that quenches oxidative stress\textsuperscript{11,12} to inhibit diseases of aging.\textsuperscript{10,13-15}
In addition to expanding life span, whey has been found to reduce muscle wasting in the elderly, reduce the risk of diabetes, inhibit cancer development, and defend against cognitive decline.16-19

Given all these benefits, whey has now been substantiated by significant science as a powerful super food in the quest for healthy longevity. >
**Whey is a potential solution. First, whey represents a high-quality protein supplement for aging persons—with a rich source of BCAAs to stimulate protein synthesis and inhibit protein breakdown.**

Second, whey delivers CR benefits—playing pivotal roles in hormone secretion and action, intracellular signaling, and regulation of gene transcription and translation. Let’s review some of these longevity studies.

**CR Mimetic: Whey Can Add the Equivalent of Nearly 10 Human Years**

Scientists investigating calorie restriction mimetic compounds discovered that increasing the availability of the branched chain amino acids abundantly found in whey—leucine, isoleucine, and valine—increased life span in yeast (Saccharomyces cerevisiae).1,3 Similarly, it was found that the most striking distinction common only to long-lived mutant varieties of Caenorhabditis elegans worms was their increased up-regulation of these same branched chain amino acids.1 Then in a breakthrough study, scientists supplemented the diet of mice with a branched chain amino acids-enriched mixture of amino acids, similar to the composition of whey. The test mice received the mixture daily beginning at nine months of age, which is middle-aged for mice. There was no significant change in maximum life span for any of the mice in the study. However, the median life span was 774 days for the untreated controls, and 869 days for the whey supplemented mice—an increase of more than 12% after starting the protocol only in middle age!2

In human terms, based on today’s life expectancy of 78.7 years,30 this median increase—even beginning supplementation only at midlife—translates to an additional 9.4 years of life!

**Whey Can Prevent Type II Diabetes—A Major Aging Disease!**

Scientists demonstrated that whey can reduce the risk of developing type II diabetes.16 Normally, a high-fat diet produces excessive weight gain, adiposity, and metabolic complications associated with higher risk for type II diabetes and fatty liver disease. Scientists placed mice on a high-fat diet for eleven weeks and gave one group 100 grams of whey protein per liter of drinking water (equivalent to approximately 12 grams for an average 165 pound human).

With no other intervention, the whey-protein mice improved both their glucose tolerance and insulin sensitivity. They also maintained lower weight and greater percentage of lean body mass, compared to control mice consuming the same daily calories but
without the added whey. The team concluded that whey protein boosted metabolic rate in the test group and may be beneficial in preventing the development of type II diabetes.16

Another team found that whey remarkably decreases blood sugar without increasing insulin secretion. For non-diabetic individuals, taking protein along with oral glucose would normally decrease the usual rise in blood sugar. Researchers wondered whether whey protein could still lower blood glucose in humans diagnosed with insulin-resistant prediabetes—or whether, instead, their insulin resistance would blunt the hypoglycemic effect.31

They divided the human subjects into three groups according to level of insulin resistance. For eleven mornings, they gave 0, 5, or 30 grams of protein (from whey protein concentrate) and canola oil to all participants along with doses of 50 grams of oral glucose.31

Whey significantly reduced blood glucose levels in all three categories of insulin resistance—yet the rate of insulin secretion was not affected. They concluded that, despite very high levels of insulin resistance in some of the individuals, whey was still able to decrease blood sugar levels.31

**Whey Maintains Youthful Weight and Lean Body Mass**

In 2013, scientists reviewed many previous studies and concluded that the evidence supports the use of whey as a therapeutic treatment for obesity.32 Specifically, the study team concluded that:

> "Whey protein, via bioactive peptides and amino acids generated during gastrointestinal digestion, enhances the release of several hormones...that lead to reduced food intake and increased satiety."32

In a host of studies—all with similar conclusions—scientists have investigated pathways through which the proteins, peptides, and minerals in whey boost satiety, influence glucose homeostasis, and optimize lean body mass.33-37

The branched chain amino acids play an essential role in supporting lean muscle mass, especially among older adults.13,38 One trial compared diets high in leucine—abundant in whey—to calorie-equivalent diets high in carbohydrate. After 16 weeks, the leucine group lost 6.8 pounds more in total body weight, 7 pounds more in body fat—but lost 1.5 pounds less in lean body mass!39

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**Whey: The New CR Powerhouse**

- Although whey is often viewed simply as a protein source, emerging evidence indicates that the branched-chain amino acids (BCAAs) and other fractions found in whey act as a calorie restriction-mimetic.

- Studies on middle-aged animals demonstrate that supplementing with the branched chain amino acids and other components in whey increase median life span by up to the equivalent of 9.6 years in human terms!

- This effect is modulated along typical CR pathways—boosting mitochondrial biogenesis, reactive oxygen species (ROS) defense, cell signaling, and expression of sirtuin 1 (SIRT1)—the mammalian longevity gene CR.

- Whey constituents increase median, but not maximum, life span—indicating disease prevention at work. And whey’s protection against age-related diseases has been separately confirmed.

- Whey offers an ideal supplement to secure calorie restriction’s life extension benefits—without the rigors of a low calorie regime.
Block Age-Related Muscle Loss and Muscle Wasting

Approximately 30% of people aged 60 or over have sarcopenia, age-related muscle-wasting that increases the risk of falls and disability. By sparing and synthesizing muscle, whey blocks this process. (This mimics the proven sarcopenia-delaying effects of calorie restriction.)

The most metabolically active branched chain amino acid in whey is leucine, which promotes muscle synthesis by activating a signaling pathway in muscle that modulates the body’s anabolic drive. Aging muscle becomes resistant to leucine stimulation, but taking leucine with meals (or in leucine-rich whey) can overcome this aging deficit, stimulating muscle synthesis.

Cachexia is a clinical wasting syndrome characterized by progressive loss of weight, muscle, and strength. Increased calorie intake doesn’t help. Cachexia can occur with cancer, AIDS, rheumatoid arthritis, and various chronic or malignant diseases—and is a major cause of death.

What is a Calorie Restriction Mimetic?

A wealth of scientific data spanning more than seven decades shows that calorie restriction (CR), the reduction of caloric intake without malnutrition, has power to boost longevity in nearly all forms of life—as much as 100% in some species.

However, most people cannot submit to a sufficiently restrictive dietary regimen to obtain the benefits. And the effects and risks for elderly individuals have not been well investigated.

The good news is that pioneering researchers have brought to light a novel class of nutrients called calorie restriction mimetics (CR-mimetics). The administration of a CR-mimetic results in some of the same physiological changes seen in CR itself. One way these substances work is by influencing specific genes that ultimately affect either cell repair or cell death.

A handful of natural compounds have been shown to safely simulate some of the beneficial effects of calorie restriction—without the need for stringent dietary measures.

Each of the following CR-mimetics operates in a multi-targeted and complementary fashion—allowing you the opportunity to activate your longevity genes without hunger:

Resveratrol, the most widely known of the CR mimetics, is a polyphenol found most abundantly in red wine grape skins, as well as in many other darkly colored fruits.

Fisetin is a relatively rare flavonoid found only in minute quantities in the plant kingdom that augments the effects of resveratrol.

Pterostilbene is a polyphenol closely related to resveratrol, but with unique attributes.

Grape Seed Extract is a derivative of whole grape seeds; resveratrol is a polyphenol contained in grape seeds.

Quercetin is a plant-derived flavonoid found in fruits, vegetables, leaves, and grains.

Black Tea, a type of tea that is more oxidized than oolong, green, and white teas, contains polyphenols and other constituents.

Whey has newly emerged as a CR mimic and is gaining acceptance as the first whole food CR-mimetic.
Because whey has among the highest biological values—meaning absorption, use, and retention—of any other protein source, it attenuates catabolic wasting by boosting muscle mass.5-7,52,53

One study involving HIV-positive men given whey found dramatic increases in glutathione, with most subjects reaching ideal body weight.54

Aging individuals may also benefit from whey’s ability to promote bone formation and suppress bone resorption.55

**Whey Protein Inhibits Development of Cancer Cells**

Animal studies have demonstrated that whey is superior to other dietary proteins for suppression of cancer development.56-58

This benefit is attributed to whey’s high content of cystine/cysteine and gamma-glutamylcysteine dipeptides—used for synthesis of glutathione—giving whey its rare ability to raise levels of glutathione.9,10 Glutathione is well-known to destroy reactive oxygen species—but it also detoxifies carcinogens and ensures a competent immune system!56

Studies show that whey’s tumor prevention is accompanied by enhanced glutathione levels, spleen lymphocyte proliferation, phagocytosis, and activity of natural killer, T helper, and cytotoxic T cells.56

And the whey component lactoferrin powerfully inhibits tumors by various pathways, including inducing apoptosis, blocking angiogenesis, modulating carcinogen-metabolizing enzymes, and possibly by scavenging iron.56

**Whey’s Multiple Anti-Aging Benefits**

This highest-quality of all protein sources delivers the wide spectrum of anti-aging effects provided by a calorie restriction (CR) diet, without the need for the willpower of long-term starvation. (See figure 2 on page 60.)

Among the many anti-aging benefits of whey are:

- Mitochondrial biogenesis
- Bone growth
- Muscle support
- Hypoglycemic effect
- Anticancer defense
- Antioxidant enhancement
- Anti-inflammatory protection
- Anti-hypertensive effect
- Anti-microbial activity
- Cholesterol reduction
- Mood balance
- Cognitive function
- Reduced sarcopenia
Whey Component Uniquely Modulates Iron for Broad Health Benefits

**Lactoferrin** is a minor fraction of whey (see figure 1 on page 59). Its unique ability to modulate iron—up or down as needed—in different tissues provides a remarkably broad range of health benefits that contribute to whey’s life extension effects.

Extensive scientific research demonstrates that, through its wide network of modulatory effects, lactoferrin:

- Kills dangerous microbes
- Nurtures beneficial bacteria
- Binds iron to prevent free radicals
- Optimizes blood-iron levels
- Inhibits cancer cells
- Enhances intestinal absorptive cells and maturation of dendritic cells
- Boosts immunity
- Enhances gene transcription
- Reduces inflammation
- Combats obesity

It’s no wonder scientists have described the whey protein lactoferrin as “multifunctional!”

**Unique Protein Subfractions Modulate the Origins of Cardiovascular Disease**

Cardiovascular disease is the leading cause of mortality in Western society, and the two main contributing factors are hypertension (high blood pressure) and dyslipidemia (elevated LDL/reduced HDL).

Recent research demonstrates that whey-based peptides reduce both of these risk factors through various pathways. And food-derived peptides are considered far safer than anti-hypertension drugs.

Several whey peptides—including alpha-lactalbumin and beta-lactoglobulin—exhibit opioid-like activity. Endogenous opioid peptides have shown promise as blood-pressure modulators.

And limited evidence suggests whey’s lactoferrin helps modulate platelet binding.

Casein protein raises cholesterol—but whey protein shows the opposite effect! Two-generation feeding of rats with sphingolipids—a type of phospholipid found in whey—decreased blood cholesterol levels by about 30%! How? Scientists speculate whey inhibits synthesis of cholesterol in the liver.

Research also demonstrated a marked lowering of LDL cholesterol in rats given whey, which may be mediated through a decrease in VLDL (very low-density lipoprotein) fractions.
serotonin. In a double-blind, placebo-controlled study, whey significantly improved memory-test performance in stress-vulnerable subjects.67

Also, because it boosts glutathione levels,9,10 whey may protect against various age-related diseases—including neurocognitive disorders.13-19, 66-68

A 2012 review suggested that the peptides and alpha-lactalbumin found in whey may help protect against age-related cognitive decline and dementia during aging.68

**Whey Components Protect Gastrointestinal Tissue and Boost Beneficial Bacteria**

Because whey raises glutathione levels, it protects tissue against damage caused by inflammation.69,70

Lower levels of antioxidants—including glutathione—are associated with inflammatory bowel disease (IBD).71

Also, glutamine is a preferred fuel source for support of epithelial cells lining the small intestine. It is rapidly utilized by tissues during catabolic states, such as gastrointestinal dysfunction among children.72

Dietary components that act as prebiotics can improve balance and persistence of beneficial colonic bacteria by providing substrates (growth surfaces). Whey lactose can be converted to galactooligosaccharides—indigestible ingredients that create a substrate that specifically enhances growth of bifidobacteria.73 These and other bacteria protect the intestine by secreting antimicrobial substances, modulating immune response, and influencing metabolic activities.74,75

In rats, the whey component alpha-lactalbumin showed dose-dependent protection against gastric injury caused by alcohol or stress.76 Researchers concluded that whey may help prevent gastric mucosal injury, ulcers, and other gastrointestinal pathologies—avoiding the need for antulcer drugs, and their risks.76

**Whey Defends Against Neurocognitive Decline During Aging**

Serotonin levels in the body can decline with age.62,63 The rate of the brain's serotonin synthesis normally depends on its concentration of tryptophan, serotonin's essential amino acid precursor.64,65 Reinforcing this, dietary intake of tryptophan has been found to relieve depression and stress.86

A double-blind, placebo-controlled study indicated that whey's alpha-lactalbumin increases the plasma ratio of tryptophan. And in subjects assessed as highly vulnerable to stress, this whey fraction raised brain serotonin activity and coping ability and improved mood under stress.66

Memory performance can decline under chronic stress, believed to result partially from reduced brain serotonin. In a double-blind, placebo-controlled study, whey significantly improved memory-test performance in stress-vulnerable subjects.67

Also, because it boosts glutathione levels,9,10 whey may protect against various age-related diseases—including neurocognitive disorders.13-19, 66-68

A 2012 review suggested that the peptides and alpha-lactalbumin found in whey may help protect against age-related cognitive decline and dementia during aging.68

**Whey Proteins Rejuvenate and Optimize Immune Function!**

Whey uniquely fortifies the overall immune system—so broadly that it’s remarkable!8

Major and minor whey fractions are established immune-enhancing constituents that modulate a full range of immune functions, including destruction of pathogens and elimination of toxins.87,78

Whey supplementation significantly improves primary and secondary antibody responses to a variety of vaccines.79

A key immunity pillar is the cell-mediated, adaptive immune system, which—through clonal expansion
NEW LONGEVITY BENEFITS OF WHEY PROTEIN

Summary

Whey is often viewed simply as a high-quality protein source for athletes. However, emerging evidence indicates that the branched-chain amino acids (BCAAs) and other fractions found in whey mimic many of the longevity benefits of calorie restriction (CR).

Studies on various organisms, including middle-aged mice, demonstrate that supplementing with the BCAAs and other components in whey can increase median life span by up to the equivalent of 9.6 years in human terms!

This effect was modulated along typical CR pathways, including increases in mitochondrial biogenesis, reactive oxygen species (ROS) defense, cell signaling, and expression of sirtuin 1 (SIRT1)—the mammalian longevity gene induced by CR!

Whey offers a method to secure some of the anti-aging effects of calorie restriction without extreme food deprivation.

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

References


Whey proteins provide a diverse array of functional properties that produce beneficial effects on many different biological processes and organ systems.

Figure 2: Functional Properties of Whey

WHEY PROTEINS

- Promote bone growth
- Muscle strength
- Protease inhibitors
- Anticancer
- Anti-oxidative
- Aging
- Immunoregulatory
- Anti-inflammatory
- Wound healing
- Improved cognitive function
- Mood
- Hypolipidemic
- Cholesterol lowering
- Anti-microbial
- Anti-hypersensitive

(proliferation)—builds up a pool of antigen-reactive bodies. Whey was found in an array of studies to be superior to other commercially available protein sources in improving adaptive immune reactivity.

Mice supplemented with whey produced higher levels of white blood cells, lymphocytes, and cytokines—resulting in greater immune responsiveness and reduced infection severity.

The antibody-mediated, humoral immune system needs to quickly produce antibodies in response to foreign microorganisms. Several studies found that, compared to other protein sources—soy, casein, wheat, corn, egg white, fish, beef, or spirulina maxima—whey proteins much more substantially boost production of both humoral immune response and antibodies. In fact, in some instances, the response was nearly five times greater than with other protein sources!

Glutathione is the centerpiece of immune protection against endogenously created oxidative stress as well as that from exogenous sources such as pollution, toxins, exercise, and ultraviolet light exposure. And as mentioned, whey can greatly increase glutathione levels.

An example of a condition characterized by glutathione deficiency—and greater oxidative stress—is HIV infection. Fortunately, whey supplements have been shown to dramatically increase glutathione levels in those with HIV!


The suggested daily dose of 3 vegetarian capsules of Optimized Tryptophan Plus provides:

- L-Tryptophan 1,000 mg
- L-Lysine (as L-Lysine HCl) 250 mg
- Proprietary Tryptophan Plus Blend 285 mg
  - Perluxan® Hops Standardized Extract (Humulus lupulus) (cones), and
  - Ursole™ Rosemary Standardized Extract (Rosmarinus officinalis) (leaves)
- Niacin (as Niacinamide) 66 mg

A bottle of 90 vegetarian capsules of Optimized Tryptophan Plus retails for $32. If a member buys four bottles, the price is reduced to $21.75 per bottle.

References

Perluxan® is used by permission. Ursole™ is a trademark of Vitiva d. d., Slovenia.

Multi-Pathway Tryptophan Support

The Optimized Tryptophan Plus formula also provides a unique, balanced supply of other nutrients found to help maintain tryptophan activity in the body.6,8

Purity and Safety

Life Extension® Optimized Tryptophan Plus contains premium L-tryptophan which has undergone significantly more rigorous manufacturing processes than regular tryptophan material to assure the highest purity and safety.
As people age, they become more susceptible to muscle deterioration and a declining immune system. Fortunately, whey protein can have a positive impact on muscle construction and immunity due to its branched-chain amino acid profile (BCAAs) and naturally occurring lactoferrin and immunoglobins.¹³¹⁴

Unlike many commercial brands on the market, New Zealand Whey Protein Concentrate is uniquely derived from grass-fed, free range cows living healthy lives in New Zealand and not treated with Growth Hormone (rBST).

Life Extension’s New Zealand Whey Protein Concentrate offers the following:

- Non-GMO Whey Protein Concentrate!
- Naturally high levels of essential branched-chain amino acids!
- High-quality muscle building protein!
- Easily mixes into water or milk!
- Great Taste! – Available in both natural chocolate and natural vanilla flavors.

The retail price for an 18.34 ounce container of New Zealand Vanilla Flavored Whey Protein Concentrate (Item # 01770) or for a 23.28 ounce container of New Zealand Chocolate Flavored Whey Protein Concentrate (Item # 01771) is $30. If a member purchases four bottles, the price is reduced to $19.95 per bottle. Contains milk.

To order New Zealand Whey Protein Concentrate, call 1-800-544-4440 or visit www.LifeExtension.com

References
3. Available at: http://www.innovatewithdairy.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.
Scientists have identified multiple mechanisms by which green tea extract helps protect against LDL oxidation, neuronal oxidation, and a host of other structural and functional age-related changes. LIFE EXTENSION MIX™ provides more green tea extract than found in commercial formulations.

Broccoli is one of the vegetables best documented to protect healthy DNA. The broccoli concentrate in LIFE EXTENSION MIX™ is standardized to provide sulforaphane and other glucosinolates, compounds responsible for broccoli’s protective benefits.

Olive polyphenols help protect against LDL oxidation, quench free radicals, and stabilize cell membranes. LIFE EXTENSION MIX™ contains an olive extract standardized to provide the best-documented Olive polyphenols DNA.

Luteolin is a flavonoid found in parsley, artichoke, basil, celery, and other foods. It has shown the ability to help protect against DNA oxidative damage. When measured against 27 other citrus flavonoids, luteolin proved one of the most beneficial at maintaining healthy DNA. Luteolin also suppresses excess levels of interleukin-6 and interleukin-1b. LIFE EXTENSION MIX™ contains a standardized dose of 8 mg of luteolin.

Lycopene is the red carotenoid in tomatoes that supports a healthy prostate and helps promote healthy lipid profiles for those already within a normal range.

Lutein is found in spinach and collard greens and has been shown to help maintain normal eye macula pigment structure.

D-glucarate is found in grapefruit, apples, oranges, broccoli, and Brussels sprouts. D-glucarate supports a detoxification process that helps to remove DNA toxins.

Pomegranate may be the most effective plant to help maintain optimal endothelial function. This pomegranate extract is standardized to provide the punicalagins and other polyphenols found in up to 2.6 ounces of pomegranate juice.

Sesame lignans increase tissue levels of vitamin E, including gamma tocopherol, and inhibit the formation of an inflammatory precursor called arachidonic acid.

Wild blueberry extract, standardized to help maintain optimal neuronal function.

Pterostilbene is a compound naturally found in blueberries and grapes that has been shown to have beneficial, anti-aging effects on gene expression and to promote healthy cognitive function.

Cyanidin-3-Glucoside is a berry compound that promotes healthy function of the retina to help support night vision.

Pyridoxal 5'-phosphate helps protect against glycation reactions, a toxic process in which sugars bind to lipids and proteins to form non-functional structures in the body.

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.
The Most Complete Multivitamin Available Today

Published scientific studies document that people who eat the most fruits and vegetables have much lower incidences of health problems. Few people, however, consistently eat enough plant foods to protect against common age-related decline.1-3 and commercial multivitamins do not provide all of the vital plant components needed to maintain good health. Life Extension Mix provides a broad array of vegetable/fruit extracts.

Life Extension Mix™ now contains the sodium selenite form of selenium in addition to L-selenomethionine and Se-methyl-L-selenocysteine.

Fat-Soluble Vitamins

Vitamin A (90% Betatene® beta-carotene + 10% acetate) 5,000 IU
Vitamin D3 (cholecalciferol) 2,000 IU
Vitamin C (as calcium ascorbate, ascorbic acid, ascorbyl palmitate, magnesium ascorbate, niacinamide ascorbate, acerola extract) 2,000 mg
Ascorbyl palmitate (fat-soluble vitamin C) 250 mg
Vitamin E (natural d-tocopheryl succinate and d-tocopherol) 100 IU
Natural mixed tocopherols (providing gamma, delta, alpha, and beta tocopherol) 60 mg

Amino Acid Complex

N-acetyl-L-cysteine 600 mg
Taurine 200 mg

Mineral Complex

Selenium (from Se-methyl L-selenocysteine) 100 mcg
Selenium (from L-selenomethionine—SelenoPure™) 50 mcg
Selenium (from sodium selenite) 50 mcg
Zinc (monomethionine) (OptiZinc®) 20 mg
Zinc (succinate) 15 mg
Boron (as boron citrate/aspartate/glycinate) 3 mg
Calcium 218 mg
Copper (as copper glycinate chelate TRAACS®) 1 mg
Chromium (as Crominex® 3+ chromium stabilized with Capros® and PrimaVie® Shilajit) 500 mcg
Potassium chloride (37.4 mg elemental) 71.3 mg
Molybdenum (sodium molybdate) 125 mcg
Manganese (gluconate) 1 mg
Iodine (potassium iodide) 150 mcg
Magnesium oxide (335.96 mg elemental) 560 mg
Magnesium citrate (35.28 mg elemental) 261.3 mg
Magnesium glycinate (117.4 mg elemental) 100 mg
Magnesium taurinate (7.83 mg elemental) 100 mg
Magnesium arginate (5.87 mg elemental) 100 mg
Magnesium ascorbate (3.40 mg elemental) 58.1 mg

Cholinergic Complex

Choline (from bitartrate) 120 mg
Phosphatidylcholine (from soy) 150 mg
Inositol 250 mg

Each one of these selenium compounds provides unique biological benefits. The new Life Extension Mix™ also provides a small amount of gamma tocopherol (40 mg) as a part of natural mixed tocopherols which includes natural vitamin E. Most members take an additional 200 mg of gamma tocopherol in other supplements. The full daily dose of Life Extension Mix™ can be obtained for as little as $1.49 per day.

Vitamin D3 helps maintain healthy bone density and DNA. There is five times more vitamin D in LIFE EXTENSION MIX™ compared to conventional multivitamins. The new Life Extension Mix™ utilizes natural mixed tocopherols that provide natural vitamin E from alpha tocopherol and a small amount of gamma tocopherol (40 mg). Compared to synthetic vitamin E, the natural form is far more bioavailable to the body.

N-acetyl-L-cysteine suppresses free radicals inside the cell and maintains healthy glutathione levels. Taurine may protect against free radicals between cells and supports eye health.

Life Extension Mix™ contains the sodium selenite, selenomethionine, and Se-methyl L-selenocysteine forms of selenium. Some scientific evidence suggests that consumption of selenium may reduce the risk of certain forms of cancer; however, the FDA has determined that this evidence is limited and not conclusive.

Zinc is often poorly absorbed, but LIFE EXTENSION MIX™ provides two of the most bioavailable forms of zinc.

Boron is not only needed to maintain healthy bone density but may also help promote healthy prostate cell function.

LIFE EXTENSION MIX™ provides a high amount of an optimal form of chromium to help maintain arterial wall structure and already normal glucose levels.

Magnesium helps protect arteries and heart valves, and supports heart and brain cells. LIFE EXTENSION MIX™ provides high potencies of six different forms of magnesium to fully saturate the body with this life-saving mineral.

Maintaining high levels of acetylcholine in the brain helps support cognitive function and memory.

Contains soybeans.

References


To order call toll-free 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.
If you could go back in time, you'd want to have a pint of your blood removed and frozen every few years so that it would be available to be reintroduced into your aging body.

One reason is that your young blood does not have the inflammatory proteins that are found in old blood. These inflammatory factors have been found to inhibit stem cell function. Young blood also contains more youthful immune system cells (T-lymphocytes and B-lymphocytes). Cells in the immune system become less functional with age.

Another benefit of having your youthful blood available is that it contains more youthful stem cells that can provide a systemic rejuvenating effect.

Progressive medical facilities in the United States now offer a service where they temporarily stimulate stem cells in healthy people to boost their white blood cell production (using granulocyte-colony-stimulating factor). After a week’s time, the doctors withdraw your blood and freeze it until a time in the future when you need it to save your life. There is no time limit for how long your blood can remain frozen.

The time and expense involved in this procedure precludes most people from doing it.

Over forty years ago scientists demonstrated that linking the blood circulation of old rats to young rats could extend the life span of old rats by about 20%.¹ The rat experiments worked because the rats were genetically identical, despite being different ages. Elderly humans cannot accept the blood of younger people because of immune rejection of the stem cells unless they are a full tissue match.

Only in the last ten years have scientists begun to discover the reason behind the life-extending benefits for old rats sharing blood circulation with young rats. This was one of the many topics covered in the “Aging and Diseases of Aging” conference held in Tokyo, Japan, on October 22-27, 2012.
Research in Tissue Aging

As described by Thomas Rando, PhD, (Professor of Neurology & Neurological Sciences at Stanford University) the technique of shared blood circulation between rodents of different ages was not used again for decades until 2005 when his graduate student, Irina Conboy, showed that the procedure restored the regenerative capacity of muscle stem cells in the older mice.\(^2\) It was also demonstrated that the stem cells in the liver, brain, and bone of an old animal could regain regenerative potential by being exposed to the circulating blood of a young animal.\(^2\) Later studies have confirmed that molecules in the blood of old animals depress muscle stem cell activity in both young and old animals.\(^3\)
that senescent cells resulting from DNA damage are induced to produce pro-inflammatory cytokines by increased activity of the NF-κB pathway. Senescent cells are thus in large part responsible for the chronic inflammation of old age that causes so many age-related diseases such as cancer and atherosclerosis.

Dr. Campisi noted a discovery made in 2011 of the rejuvenating effects of eliminating senescent cells in mice. Dr. Campisi has wondered whether there is any benefit that results from the secretory products of senescent cells. Her conclusion is that in the presence of senescent cells, wound-healing is less fibrous than it would be otherwise due to the presence of protein-digesting enzymes secreted by the senescent cells (along with the other inflammatory molecules).

Reducing Methylation

Juleen Zierath, PhD (Head of the Section of Integrative Physiology, Department of Molecular Medicine and Surgery, Karolinska Institute, Stockholm, Sweden), like Dr. Rando, is interested in control of DNA expression (epigenetics, as distinct from genetics, which studies the effects of DNA differences). Dr. Zierath is specifically investigating the relationship between gene expression and type II (formerly called adult-onset) diabetes.
An important mechanism of epigenetics is addition of methyl molecules (methylation) or removal of methyl molecules (demethylation) to regulatory areas of DNA. Methylation of biomolecules is an essential biochemical reaction required for maintaining the integrity of biological membranes, synthesis of neurotransmitters, visual acuity, increasing glutathione synthesis in the brain to protect against oxidative stress, and protection against depression among many other vital functions. Methylation and demethylation of DNA is a means by which control is exerted over which genes are expressed and which genes are not. If DNA were completely methylated, no genes would be expressed, whereas if there were no DNA methylation there would be chaotic overexpression of too many genes. Both excessive and inadequate DNA methylation have been associated with cancer. Dr. Zierath has been studying DNA methylation effects in type II diabetes. As background, Dr. Zierath described twin studies. Identical twins are genetically identical because they have the same DNA and continue to have the same DNA throughout their lifetimes. Identical twins are epigenetically identical at birth, but become increasingly epigenetically distinct as they become subject to different environmental influences. She cited a study which showed that epigenetic effects due to smoking and dietary behavior can be inherited.

In 2009 Dr. Zierath’s laboratory published a study showing that fatty material in the bloodstream causes methylation of DNA regulatory areas that results in a reduction of mitochondria (and resultant reduction of cellular energy). This study was an advance in providing a molecular mechanism that would explain why patients with type II diabetes have fewer mitochondria in their cells. The following year, her team published research indicating that exercise induces epigenetic changes that induce mitochondria function and fat utilization. Dr. Zierath has called exercise “the first line of defense against the development of insulin resistance in type II diabetes.” Vigorous exercise at least once per week has been shown to reduce the risk of type II diabetes by 33%. Most recently Dr. Zierath’s group published a study showing that exercise increases gene expression of sections of DNA that induce mitochondrial formation.

Dr. Zierath takes her research personally. When I crossed her path in the hotel gym she asked me, “How’s your methylation?” I did not see anyone else from the conference in the hotel gym.

Stimulating SIRT3

Eric Verdin, MD (Senior Investigator at the Gladstone Institute of Virology and Immunology at the University of California, San Francisco), discovered in 2002 that the sirtuin SIRT3 is localized in the mitochondria (energy-producing portions of cells). Sirtuins are a family of enzymes that modify protein function by removing an acetyl molecule. The seven known sirtuins in mammals are identified by number: SIRT1, SIRT2...SIRT7. SIRT1 is the most famous because (unlike the others) it has been shown to extend the life span of worms and flies. Resveratrol activates SIRT1 but not the other sirtuins.
SIRT1 acts primarily by removing acetyl molecules from the proteins surrounding DNA in the cell nucleus, thereby altering gene expression. DNA in the mitochondria is not surrounded by proteins, so Dr. Verdin has spent much of the last decade trying to determine the function of SIRT3. SIRT3 levels in the mitochondria have been shown to be increased in mice on calorie restriction, a dietary alteration that extends the life span of rodents. By removing an acetyl group of the mitochondrial antioxidant enzyme SOD2, SIRT3 reduces free radical oxidation.

A major breakthrough occurred when Dr. Verdin’s research team demonstrated that mice lacking SIRT3 show accelerated obesity, insulin resistance, and other symptoms of the metabolic syndrome when fed a high fat diet. A high fat diet normally has this effect on mice, but the effect is much greater when SIRT3 is absent. Dr. Verdin’s team also demonstrated that removing a single fat-processing enzyme that SIRT3 affects could rescue the mice from the effects of the high fat diet, even when SIRT3 was absent. Dr. Verdin’s team further demonstrated that a mutation in SIRT3 is associated with the metabolic syndrome in humans. Dr. Verdin is hopeful that a molecule can be found that stimulates SIRT3 activity, just as resveratrol stimulates SIRT1 activity.

Research on Adiponectin

Takashi Kadowaki, MD, PhD (Professor of Diabetes and Metabolic Diseases, University of Tokyo), has been doing research on adiponectin for over a decade. Adiponectin is a protein secreted exclusively by fat cells. Adiponectin sensitizes the body to insulin, thereby acting as an anti-diabetic agent. Insulin resistance (a condition in which cells show reduced insulin-mediated uptake of amino acids, fatty acids, and particularly glucose) precedes and predicts the development of type II diabetes. Although adiponectin is produced by fat cells, adiponectin levels are typically low in people who are obese. Reduced levels of adiponectin are associated with insulin resistance, lipid dysregulation, and atherosclerosis.

The first published paper by Dr. Kadowaki on adiponectin reported that adiponectin, particularly when combined with another adipokine known as leptin, could reverse the insulin resistance that a high fat diet produced in mice. Kadowaki’s research team later demonstrated the key role of adiponectin receptors in mediating the effects of adiponectin suggesting that agents stimulating those receptors could be used to treat insulin resistance and type II diabetes linked to obesity. His team has studied the molecular mechanisms behind the reduced mitochondria seen in type II diabetics, linking adiponectin effects to increased activity of the sirtuin SIRT1. Mouse experiments suggest that a calorie restricted diet or a EPA/DHA rich omega-3 diet can increase blood levels of adiponectin.

Screening Heart Drugs

Rolf Bodmer, PhD (Professor in the Development and Aging Program of the Sandford-Burnham Medical Institute in La Jolla, California), has been studying genetic and environmental influences on heart function. He has been doing this research primarily on fruit flies.

The heart of a fruit fly is basically a tube with an aorta at the upper end. But the muscular effects of fly heart aging are surprisingly similar to humans. As with humans, exercise-training in fruit flies reduces the age-related decline in heart function. Dr. Bodmer’s research team has demonstrated that, as with humans, fruit flies show a decrease in heart rate and an increase in heart arrhythmias (irregular heartbeats) as they age. Dr. Bodmer illustrated these effects at the conference by showing a video of a heart operation in young and old fruit flies. Studying fruit flies has the advantages of short life span, ability to genetically manipulate, and ability to precisely quantify the effects.

Fruit flies fed a high fat diet become obese and display features of metabolic syndrome. Dr. Bodmer’s research team demonstrated that the high fat diet affects the heart independently of atherosclerotic effects by directly impairing heart function. Dr. Bodmer suggests that fruit flies could be used for primary screening of drugs to be used against cardiac arrhythmias.
Reducing Amyloid Formation

Edward Lakatta, MD (Chief of the Laboratory of Cardiovascular Science at the National Institute on Aging in Baltimore, Maryland), has been studying stiffening of arteries close to the heart with aging, a process that leads to an increase in blood pressure. He said that 8 out of 10 older adults develop high blood pressure. He noted that artery stiffness is strongly influenced by collagen, elastin, and other proteins in the artery walls. Lakatta has been particularly interested in stiffening of the aorta and upper body by an amyloid fibril protein. Insofar as this form of amyloid is found in the aorta of virtually every Caucasian over the age of 50, this amyloid represents a potential overlooked cause of cardiovascular disease. Dr. Lakatta would like to find ways to reduce amyloid formation in the central arteries as a way of reducing cardiovascular aging.

The Role of Autophagy

Ana Maria Cuervo, MD, PhD (Co-Director of the Einstein Institute of Aging Research at the Albert Einstein College of Medicine in Bronx, New York), was introduced as “the Queen of Autophagy.” Her name appears on sixteen peer-reviewed journal articles about autophagy in 2012 alone. Autophagy is the most important garbage-collection system used by cells to dispose of cellular waste. Autophagy is the process by which waste is taken to (or taken into) a cell’s lysosome (“incinerator”). From the point of view that the lysosome digests cellular material and recycles (reuses) the breakdown products, the lysosome could also be called the “stomach” of a cell.

More than a decade ago, Dr. Cuervo established that autophagy declines with aging. In 2007 she established that age-related autophagy decline is primarily due to changes in the lysosome membrane. In her presentation Dr. Cuervo focused on the role that autophagy decline or malfunction plays in neurodegenerative disease. Her team has established that protein malformation in Parkinson’s disease blocks autophagy, and that a similar problem occurs in Huntington’s disease as well as Alzheimer’s disease. They also showed that one of the enzymes that is defective in inherited cases of Alzheimer’s disease is required for effective lysosome function. And most recently they showed that a high fat diet or a high cholesterol diet reduces autophagy due to incorporation of those fats into the lysosome membrane. Decline in autophagy function could explain the increased risk of Alzheimer’s disease associated with obesity.

Summary

Overall, this conference seemed more concerned with diseases of aging than aging itself, except for the discussion of stem cell rejuvenation and senescent cell action. Nonetheless, chronic inflammation and the effects of fat in aging were recurrent themes. A deep inquiry into the particular conditions revealed the significant roles played by fat and inflammation. Fortunately, Life Extension members have been taking supplements that help suppress chronic inflammation like vitamin D, curcumin, luteolin, DHEA, and omega-3s.

Collecting and Storing Your Healthy Adult Stem Cells

Commercial companies and research institutes around the country are offering to harvest your healthy adult stem cells and freeze them for future use. You can find locations near you by entering “storage of adult stem cells” into Google.

In South Florida, we use:

South Florida Bone Marrow/ Stem Cell Transplant Institute
10301 Hagen Ranch Road, Ste.600
Boynton Beach, FL 33437
1-866-235-5736
Email: info@bmscti.org
If you have any questions on the scientific content of this article, please call a Life Extension® Health Advisor at 1-866-864-3027.

References


Each pack contains the following supplements:

- Two-Per-Day Multi-Nutrient Tablets (2 tablets)
- Super Omega-3 EPA/DHA with Sesame Lignans and Olive Fruit Extract (2 softgels, yielding 700 mg EPA and 500 mg DHA)
- Super Bio-Curcumin® (1 capsule provides 400 mg of Bio-Curcumin® that can provide blood levels equal to 2,500-2,800 mg of commercial curcumin supplements)
- Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support (1-100 mg softgel)
- Super Booster Softgels with Advanced K2 Complex (1 softgel)

The Best Way to Manage Your Daily Supplement Regimen

These vital nutrients, bundled at no extra cost into a single packet, combine convenience with superior value when compared to buying each product separately.

A box containing a 30-day supply of Comprehensive Nutrient Packs Advanced retails for $90. If a member buys four boxes, the cost is just $61.50 per box. Item# 01796

Kaneka QH® is a registered trademark of Kaneka Corporation. Tomat-O-Red® is a registered trademark of LycoRed LTD. SelenoPure™ is a registered trademark of InterHealth Nutrionals, Inc. Bioliq® is a trademark of Bioliq SA de CV. Eriminex® 3+, Capros® and PrimaVie® are registered trademarks of Naturon, Inc., Albion® is a registered trademark of Albion Laboratories, Inc. Bio-Curcumin® and BCM-95® are registered trademarks of Dolcas-Biotech, LLC. U.S. Patent Nos. 7,883,728, 7,736,679 and 7,879,373.

Contains soybeans. Due to the source of kelp, this product may contain fish and shellfish.

To order Life Extension® Comprehensive Nutrient Packs Advanced, 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.
TARGET AND REJUVENATE THE AGING SKIN AROUND YOUR EYES!

The thin, delicate skin area around your eyes is extremely susceptible to the visible impacts of aging, such as wrinkles, crow’s feet, fine lines, and bags. Oxidative and environmental stress gradually breaks down the elastin and collagen, resulting in more fragile skin around the eye area.

Researchers have combined three natural ingredients into a formula to promote skin renewal and rejuvenation for the tender skin surrounding the eye.

UNIQUE SCIENTIFIC FORMULATION

Specifically designed for the eye’s delicate skin, Renewing Eye Cream combines several complementary compounds that have been generating interest among dermatologists for their beautifying effects. Renewing Eye Cream contains:

- **Jujube seed extract**—a skin tonic rich in jujubosides, flavonoids, phenolics, and vitamin C.¹,²
- **Olive leaf extract**—packed with potent compounds, notably oleuropein, to help with inflammation.³
- **Levan**—a polymer that attracts water molecules into the skin with powerful moisturizing effects.⁴

Renewing Eye Cream promotes firmer skin and helps maintain natural hydration. It also smooths and minimizes the appearance of fine lines and wrinkles.

In a controlled clinical study, twice-daily application of the active compounds contained in Renewing Eye Cream to the area around the eye was demonstrated to have softened the appearance of wrinkles by an average of 17%.² This result was translated by the scientists to have provided the overall appearance of being 6 years younger—in just 28 days!²

One 1/2-ounce jar of Cosmesis Renewing Eye Cream retails for $65. If a member buys two jars, the price is reduced to $42.75.

References

Can you imagine having a business where you charge customers $200 each month for something that cost you only $2.10! That’s a markup of about 100 times and it’s not for a patented product.

In 2010, drug companies were charging around $7 for each 500 mg tablet of a generic medicine called valacyclovir. The brand name Valtrex® was priced slightly higher. People with frequent oral or genital herpes outbreaks needed to take one valacyclovir tablet each day to reduce the number of outbreaks they’d suffer.

The annual cost to these consumers was $2,400, yet drug companies paid only $25.20 to produce it. (Valacyclovir is also used in higher doses to treat shingles.)

You would think that with these obscene profits, drug factories would bend over backward to ensure the strictest quality-control standards so as not to jeopardize this lucrative cash cow, much of it guaranteed by your tax dollars.

Instead, with quasi-monopoly status provided by federal regulators who stomp out competition, some pharmaceutical companies ran 24-hour-a-day assembly lines to make as many of these outrageously priced drugs as possible, knowing they had little downside risk by ignoring even rudimentary safety standards.

Over the past 33 years, Life Extension® has inspected hundreds of supplement makers. While some do not meet our exacting standards, we have never seen anything close to the deplorable conditions that have been uncovered inside some of America’s largest drug factories.

One difference between supplement makers and drug factories is that owners of supplement companies often take their own products daily, whereas some pharmaceutical owners apparently live in a state of denial that they will ever need the polluted drugs they sell to others.

The FDA pretends to protect the public against contaminated drugs. The sordid facts reveal an agency incapable of acting in a consistent and logical manner.

Such is the case of a company that made contaminated injectable drugs that have killed and sickened many Americans. The FDA identified problems with this manufacturer as early as 2002, but dropped the ball into a state pharmacy board’s lap that failed to act. The FDA again identified dangerous problems in 2006, but once more failed to take actions other than sending a “warning letter.” The FDA now says it needs more power and money to do its job.

An increasing number of supplement companies are being bought out by pharmaceutical companies. These corporate behemoths have historically shown little regard for their customer’s health and longevity, as demonstrated by the cover-ups of deadly side effects of drugs like Vioxx® that killed tens of thousands of Americans.

This article describes the quality-control mandates for products that carry the Life Extension® brand name.>
Since June 2007, there have been strict federal rules in outlining requirements for manufacturing, packaging, labeling and holding dietary supplement products in the United States.

Long before this, however, Life Extension insisted that its manufacturing and packaging partners follow these types of stringent quality control practices to ensure product purity and potency.

Life Extension stays ahead of government mandates by proactively defining and managing quality systems internally with an emphasis on qualification of materials and suppliers, mandating meticulous facility cleanliness, and insisting on rigorous finished goods specification/testing programs.

**FDA Inspections of Life Extension**

In the year 2000, an FDA inspector showed up at Life Extension and demanded samples of products for the FDA to assay.

The FDA agent was initially belligerent, perhaps expecting a legal challenge to his demand for product samples. Instead, Life Extension's quality control supervisor provided the FDA with all the requested samples, but let him know that the identical lot numbers would be sent out to two independent assay laboratories to verify any findings the FDA came back with.

During this initial inspection, the FDA agent repeatedly threatened to imprison Life Extension personnel if any problems were found. Life Extension responded that the products had already been assayed and, therefore, we had no concern about what the FDA would find.

Within ten days, the assays from the two independent labs came back on all the products. Upon submitting these assays to the FDA inspector, along with file cabinets full of quantitative analysis results, the FDA agent stated he was calling off the inspection because the quality control procedures employed, as he stated, are "analogous to those of drug companies." At the time, we took that as a compliment, until recent reports showed how poorly certain drug factories operate.

The FDA inspector indicated that he did not expect that a supplement maker would operate under high quality standards. When the FDA agent was asked if the samples taken ten days earlier met the FDA’s standards, he indicated that they were not yet submitted for assay and would not be because the two independent testing labs had already documented that they met label potency.

The FDA inspected again in 2012. The inspection resulted in zero findings of non-compliance.

**NSF® International Registration**

Life Extension's fulfillment facility recently earned cGMP (current Good Manufacturing Practices) registration from NSF International, an organization that provides third party certification programs using state-of-the-art analytical laboratories and a highly skilled staff of chemists and microbiologists.

NSF International registration was based on a demanding two-day audit conducted by NSF International which included an evaluation of Life Extension’s Warehouse & Distribution center, including facility cleanliness and sanitation, as well as various quality systems such as complaint handling/investigations, product returns, training, deviation management and product recall handling. The NSF International registration is widely recognized as an objective “seal of approval” signifying the meeting or exceeding of cGMP requirements and industry standards/best practices for quality.

**ConsumerLab and International Fish Oil Standards**

Life Extension continues to participate in the voluntary ConsumerLab testing program. The program includes an annual evaluation of various product families for potency and label claim verification. For example, over the past year products were submitted in a variety of categories including Multivitamins, Bone Health, Cancer, B-Vitamins, CoQ10/Ubiquinol and Memory. In 2012, all submitted products met all testing requirements.

ConsumerLab in late 2012 evaluated a wide range of green coffee bean extract supplements and found that 50% failed to meet their label claims. As usual, Life Extension green coffee bean extract, which contains the identical ingredient used in successful clinical studies, came out flawlessly.

Life Extension also continues to participate in the International Fish Oil Standards (IFOS™) testing program for fish oil products. In 2012, over 10 batches were submitted which met or exceeded the industry standards requirements for purity and potency. This is especially important for delicate fish oils that can oxidize and lose their EPA/DHA potency, and/or contain toxic levels of mercury and other heavy metals.

**Supplier Management/External Audit Program**

Life Extension places high emphasis on the management and evaluation of outside providers ... including contract manufacturers and packagers, contract laboratories and raw material suppliers. The evaluation process consists of an assessment of completed regulatory questionnaires as well as an aggressive on-site audit program based on our stringent criteria for manufacturing, packaging, labeling and holding dietary supplement products in the United States. Items of special interest include: cleaning and sanitation procedures,
pest control, manufacturing and packaging controls, testing, training and documentation practices.

In 2011, we conducted 13 audits including on-site evaluations of Life Extension’s top contract manufacturers, packagers and laboratories. Audit findings were documented and reported to the suppliers and corrective and preventive actions were requested from each supplier. In several instances, follow-up audits were performed to evaluate the effectiveness of corrective actions. In some cases, suppliers were disqualified for not meeting Life Extension’s exacting quality standards.

In 2012, 26 audits were conducted. These audits include evaluations of new suppliers and/or existing supplier follow-up. This aggressive audit schedule will continue to ensure cGMP compliance and drive continuous improvement initiatives with our manufacturing partners.

Roughly 90% of Life Extension branded products are manufactured in NSF International cGMP registered facilities and the combination of NSF International registration along with Life Extension on-site inspections helps ensure that the products manufactured on our behalf have been produced in accordance with the highest standards.

Internal Audit Program

To ensure compliance with applicable regulations, policies and procedures, the Life Extension Quality Unit maintains a documented system for self-inspections which includes internal audits conducted at the corporate location as well as the distribution center in Coram, NY. Although these internal audits are required annually, they are actually conducted more frequently by choice. Since late 2011, a total of four internal audits have been conducted at corporate and four have been conducted at the distribution center. The findings of these audits are captured under a documented quality-control program which ensures that processes and procedures are constantly being reviewed and evaluated as part of the company’s continuous improvement initiatives.

Raw Material Qualification Program

Before new Life Extension-purchased raw materials can be considered for use in branded products they must undergo an extensive, documented review process to ensure that they meet requirements for identity, potency and purity. These materials are tested at contract analytical laboratories which have been qualified by the Life Extension Quality Unit. Materials are typically assayed for potency via advanced analytical chemistry techniques like high performance liquid chromatography (HPLC) or gas chromatography (GC) and are screened for contaminants such as heavy metals via inductively coupled plasma-mass spectrometry (ICP-MS) and microbes utilizing advanced United States Pharmacopeia (USP) methodology.

Botanical ingredients undergo a higher level of scrutiny, with identity (genus/species) verified through comparison to reference standards utilizing high performance thin layer chromatography (HPTLC) and microscopy methods.

Botanical ingredients are also screened for pesticides as defined in USP 561, Articles of Botanical Origin. In some cases residual solvents will also be evaluated to ensure that raw materials purchased by Life Extension meet appropriate requirements for safety, purity and efficacy. Based on these qualification activities, raw material specifications are developed for each ingredient which are reviewed and approved by the Quality Unit. Life Extension partners with contract manufacturers to ensure that all incoming test results on these materials meet Life Extension specifications and have been reviewed and approved by the Life Extension Quality Unit before use.

**Finished Product Specifications/Testing Requirements**

Requirements for the formulation, manufacturing, packaging and testing of all Life Extension branded finished goods are defined in each product’s Finished Product Specification Packet (FPSP). This comprehensive document is developed, reviewed and approved by Life Extension’s Product Development, Purchasing and Quality experts to ensure that Life Extension finished goods are manufactured, packaged and tested the same way every time. The process begins with the development of formulation and testing requirements by Product Development and Quality Control. These requirements are communicated to the contract manufacturer of choice and become the basis for what eventually becomes the Finished Product Specification Package. Contract manufacturers are required to acknowledge the approved specifications in writing and must notify Life Extension of any changes before implementation. Life Extension’s specifications are reflected in the manufacturers’ Master Manufacturing Records (MMRs) ensuring that the manufacturing, packaging and testing processes can be replicated on each run.

The finished product testing requirements are rigorous, including specifications for the testing of active ingredients (label claim) as well as potential contaminants including heavy metals and microbes. These tests are conducted using state of the art equipment such as HPLC, GC and ICP-MS at Life Extension’s approved contract manufacturers and laboratories. Each lot of finished product received by Life Extension is held in quarantine pending a physical inspection of the goods along with a review of the product’s Certificate of Analysis, which must accompany each shipment. The result of this incoming inspection is documented by Life Extension’s Quality Control group. Any finished products not meeting these exacting
Pharmaceutical cGMP Standards Not Always Adhered to by Drug Makers

The FDA’s current Good Manufacturing Practices (cGMP) requirements are, in general, stricter for pharmaceuticals than either food cGMP or dietary supplement cGMP standards. Dietary supplement cGMP can be accurately characterized as a combination of food cGMP and pharmaceutical cGMP.

In 2003, the FDA implied that food cGMP should be followed for dietary supplements. In fact, food cGMP focuses upon product safety and sanitation, not quality. In contrast, pharmaceutical cGMP focuses upon safety, sanitation, and quality.

In 2007, the FDA passed 21 Code of Federal Regulations (CFR) Part 111 to ensure the identity, purity, quality, strength, and composition of dietary supplements. The FDA proceeded with enforcement under a “rolling” approach tiered for company employee number.

Tragedy that could have been prevented

The public learned in late 2012 that not all pharmaceutical makers are following sanitary procedures and other mandated cGMP practices to make injectable prescription drugs. Fungal meningitis causes inflammation of the lining of the brain and spinal cord that results in dreadful sickness and sometimes death.

A drug factory made large quantities of a steroid (methylprednisone) that was injected into the joints and spines of aging humans in chronic pain. It provided immediate but temporary relief.

The problem was that almost 800 Americans contracted fungal infections that caused severe meningitis. Use of the contaminated drug has been linked to 58 deaths.1 The underlying culprit was a black mold that was allowed to grow in the supposedly sterile vials of injectable steroid (methylprednisone).2 Since injectable drugs bypass the natural barriers afforded by an intact digestive/immune system, they have to be manufactured and maintained in a sterile environment to avoid killing patients.

FDA inspections in 2002 and 2006 revealed injectable drugs being made under substandard (non-sterile) conditions. It was not until hundreds fell ill and scores died that the FDA took meaningful action.

How the FDA bungled the investigation

The name of the company that made the fungus-laced injectable drug is New England Compounding Center (NECC). It pretended to be a compounding pharmacy, but instead functioned as a large drug factory.

The FDA claims that it lacks adequate regulatory authority over compounding pharmacies, but the FDA’s inspection of NECC in year 2002 revealed problems with record keeping, sterility, and other issues. That same year the FDA informed the Massachusetts State Board of Pharmacy of an adverse reaction to methylprednisone, which is the same drug that in 2012 caused the fungal meningitis outbreak.

Had the FDA done their job back in 2002, they would have forced NECC to register as a drug manufacturer and subjected them to stricter regulatory oversight … which may not have prevented the problems since FDA-registered drug-makers were later found to have similar unsanitary facilities.

The FDA and Massachusetts State Board of Pharmacy’s most blatant failure, however, were to uncover horrific conditions inside NECC and then take no practical steps to enforce safety compliance or shut down its facilities before tragedy struck.

Independent Assays

All of Life Extension’s raw material qualification samples are sent out to independent labs for assay, heavy metals, micro and other contaminants during the qualification process. Likewise, a large percentage of finished product assay work and most finished product heavy metals testing is performed by qualified independent labs which are mandated and approved by Life Extension.

This independent testing, along with our participation in the ConsumerLab and International Fish Oil Standards programs, provides a very high level of confidence that Life Extension products meet all requirements for potency and purity.

Deviation/Change Control Management

An important part of a robust Quality System is developing and managing a process for identifying, documenting, justifying and approving changes which could affect an approved process or system impacting a product’s safety, purity and efficacy.
Life Extension has developed internal processes and procedures for documenting one-time occurrences (deviations) and permanent changes (change control). These systems cover changes to formulations, procedures, specifications, labels and any other cGMP-related system which could impact the quality of a finished product.

Life Extension's suppliers are required to notify Life Extension in writing of any proposed changes to formulations or processes and these changes cannot be implemented without the written approval of the Life Extension Quality Unit.

**Current Good Manufacturing Practices/Standard Operating Procedures Training**

Life Extension maintains a documented internal cGMP (current Good Manufacturing Practices) training program for colleagues involved in the formulation, purchasing or holding of dietary supplements. This program includes a summary review of safety mandates and is presented to new hires in Quality Assurance and Quality Control, Product Development, Purchasing and Distribution Operations. Annual refresher training is provided to existing employees.

Life Extension’s Quality Unit has also developed a training matrix per position defining Standard Operating Procedure (SOP) training requirements for these colleagues based on their job function and description. Relevant training is performed for new hires or when SOPs are issued or revised. These training efforts ensure that Life Extension colleagues are well-versed on cGMP requirements and have the training to effectively execute their specific job functions.

**Complaint Handling/Continuous Improvement**

All dietary supplement companies in the United States are obligated to document and investigate customer complaints.

Life Extension's complaint management system far exceeds these requirements in that all complaints are tracked and trended to drive Continuous Improvement initiatives internally and at our contract manufacturers. These complaints are vigorously documented and investigated to ensure that products in the field meet or exceed high quality standards for our supplement customers.

As part of the complaint management system, quarterly reports are compiled and reviewed to spot trends in problematic products or suppliers. The reports are shared with Life Extension’s contract manufacturers as a means to identify areas for improvement in products and processes. These “continuous improvement” efforts have been fruitful, with a robust 50% decrease in quality customer complaints in 2012 compared to those received in 2011.

**Member-Ready Certificates of Analysis (COA)**

Life Extension makes member-ready Certificates of Analysis (COAs) available to our customers upon request. These COAs are representations of the analytical reports received from the contract manufacturers and laboratories and contain all of the required tests as defined in the Finished Product Specification Packets (FPSP), including potency, heavy metals and micro. This transparency provides additional confidence that Life Extension's products meet high quality standards for purity and potency.

**Summary**

This report describes the step-by-step processes Life Extension has in place to ensure cleanliness, purity, active ingredient status and overall integrity of finished products. These quality control standards exceed FDA mandates in order to ensure consumers the highest quality finished products.

Life Extension has taken steps to produce nutritional supplements made under far safer conditions from a potency and purity standpoint than many expensive prescription drugs.

**References**


IFOS™ certification mark is a registered trademark of Nutrasource Diagnostics, Inc. These products have been tested to the quality and purity standards of the IFOS™ program conducted at Nutrasource Diagnostics, Inc.
The daily serving of 2 softgels of Endothelial Defense™ with Full-Spectrum Pomegranate™ contains:

- Superoxide Dismutase/Gliadin Complex (GliSODin°) [SOD (Superoxide Dismutase) Enzyme Activity = 500 IU] 500 mg
- POMELLA® Pomegranate (Punica granatum) Extract (fruit) [std. to 30% punicalagins (120 mg)] 400 mg
- Pomegranate (Punica granatum) 5:1 Extract (fruit) 100 mg
- Proprietary Pomegranate Blend (Punica granatum) [flower extract and seed oil (standardized to 22% (30 mg) punicic acid)] 137.5 mg

The reason for many circulatory problems is the breakdown of endothelial function and structure.

Today, there are nutrients that have been clinically shown to help maintain healthy endothelial function and arterial circulation. Endothelial Defense™ with GliSODin° provides potent nutrients to support endothelial health: standardized pomegranate and an orally active form of superoxide dismutase.

While both of these components have been clinically shown to help with blood flow and age-related changes in endothelial function, Life Extension® has made the best endothelial product even more powerful by adding Full-Spectrum Pomegranate™, which includes active constituents from the seed and flower in addition to the pomegranate fruit.1-7

References

POMELLA® Extract is covered under U.S. Patent 7,638,640. POMELLA® Extract is a registered trademark of Verdure Sciences, Inc. Isocell SA, France is the owner of US Patents Nos. 6,045,809 and 6,426,068B1 and the registered trademark of GliSODin°.

Contains soybeans and wheat.

Next-Generation Pomegranate Power

The unique blend of pomegranate flower extract and seed oil in Endothelial Defense™ with Full-Spectrum Pomegranate™ contains potent polyphenols that provide support for youthful lipid and glucose metabolism, and help with inflammatory factors.9 A bottle containing 60 softgels of Endothelial Defense™ with Full-Spectrum Pomegranate™ retails for $56. If a member buys four bottles, the price is reduced to just $39 per bottle.

To Order Endothelial Defense™ with Full-Spectrum Pomegranate™, call 1-800-544-4440 or visit www.LifeExtension.com

Item # 01498

HEART HEALTH

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.
Lentils (Lens culinaris) are indigenous to central Asia and one of the oldest cultivated legumes or pulses. Historians have found archeological evidence of lentil seeds in the Middle East dating back 8,000 years. Lentil seeds spread throughout Europe and Africa before being introduced to India, where they are frequently used in traditional cuisine. Lentils are available in a variety of colors including black, red, green, and brown, with the latter two the most common.¹
Cancer Protection

With their abundance of phytochemicals, vitamins, minerals, and dietary fiber, it’s hardly surprising that numerous studies have reported a strong connection between greater intakes of lentils and a lowered risk of various cancers. In a study published in the *International Journal of Cancer*, researchers assessed the relationship between dietary flavonol intake and breast cancer risk in more than 90,000 premenopausal women, between the ages of 26 and 46, over an 8-year period. Consuming at least two servings of lentils per week was associated with a 24% reduced risk of breast cancer compared with those who ate lentils less than once a month.

In a separate study, Norwegian scientists analyzed legume intake in 3,539 cancer cases and 2,032 controls. They uncovered an association between lentil consumption and cancers of the upper digestive tract. Higher intakes of lentils decreased the risk of mouth/throat, esophagus, and larynx cancers by 51, 48, and 37%, respectively.

Other research shows that people who consumed more than two servings of lentils per week cut their risk of colon cancer by 47%. In the laboratory, scientists fed rats different types of lentils for five weeks before inducing them with the carcinogen azoxymethane, which leads to the formation of lesions known as aberrant crypt foci that precede colon cancer. Compared with the control group, the supplementation of raw split lentils and cooked whole lentils reduced the number of aberrant crypt foci by 36 and 42% respectively. Although the mechanisms are not yet clear, it may be related to lentils’ high content of resistant starch.

Combating Metabolic Syndrome

Up to 34% of Americans have metabolic syndrome, a collection of metabolic abnormalities that increase the risk for heart disease and type II diabetes. Metabolic syndrome is defined as having at least three of the following components: central obesity (increased waist circumference); raised blood pressure; insulin resistance; elevated triglycerides; and lowered HDL cholesterol levels. Epidemiological evidence published in the *Archives of Iranian Medicine* indicates an association between the consumption of legumes like lentils and metabolic syndrome, as people with the highest intakes were 75% less likely to develop the condition.

This positive observational finding is supported by several compelling clinical studies showing that a diet rich in lentils can effectively combat the individual components that contribute to metabolic syndrome. For instance, English researchers found that overweight and obese people consuming two servings of pulses, such as lentils, per day for 18 months reduced their waistlines by 1.5 inches, compared to 0.78 inches in the control group. In another study reported in the *European Journal of Nutrition*, four servings of lentils or other legumes per week as part of a reduced calorie diet for
8 weeks lowered obese subjects’ mean systolic blood pressure reading (top number) by 9 mmHg versus 4 mmHg in the controls.\textsuperscript{12}

To determine the effects of a pulse-dense diet on metabolic syndrome risk factors, scientists at the University of Toronto randomly assigned 40 overweight and obese adults to an ad libitum diet with five cups of pulses per week that included lentils, or a reduced calorie diet with dietary counseling. After 8 weeks, both groups exhibited improvements in several parameters of metabolic syndrome including insulin resistance and fasting glucose levels. However, the pulse group also increased HDL cholesterol by 4.5%, compared with a decrease of 0.8% in the control group.\textsuperscript{13}

**Diabetes Management**

In addition to decreasing the risk for metabolic syndrome, lentils show promise for improving blood glucose control in diabetics. In animal research published in the *Malaysian Journal of Nutrition*, diabetic rats fed cooked lentils daily for 6 weeks had lower blood glucose levels compared to a control group of rats.\textsuperscript{14}

This favorable effect on blood sugar levels was also noted in a recent human study.\textsuperscript{15} Researchers enrolled 121 type II diabetics and randomly selected them for a low-glycemic index diet with at least one cup of legumes daily or whole wheat products rich in insoluble fiber for 3 months. Hemoglobin A1c (HbA1c) levels, an indicator of blood glucose control over the last approximately three months, along with heart disease risk were the main outcomes studied. The findings revealed that the legume group lowered HbA1c levels by 0.5%, compared to 0.3% in the wheat group.\textsuperscript{15} Furthermore, the legume group decreased their risk of cardiovascular disease by 0.8%, which was largely attributed to a reduction in systolic blood pressure by an average 4.5 mmHg.\textsuperscript{15}

**Summary**

The ingestion of lentils in place of saturated fat, omega-6 fat, and high-glycemic carbohydrate foods can help ward off diabetes, cancer, and the deadly metabolic syndrome.

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**Easy To Make Lentil Soup\textsuperscript{17}**

**Ingredients:**
- 2 cups dry lentils
- 1 bay leaf
- 1 can crushed tomatoes (14.5 oz)
- 1 tsp dried basil
- 1 onion chopped
- 8 cups of water
- 1/4 cup olive oil
- 1/2 cup spinach, rinsed and thinly sliced
- 2 carrots diced
- 2 tbsp of vinegar
- 2 stalks of celery chopped
- salt and black pepper to taste
- 2 cloves garlic minced
- 1 tsp dried oregano

**Directions:**

Put olive oil, carrots, onions, and celery in a large soup pot and place over medium heat. Once onion is tender, add in garlic, bay leaf, basil, and dried oregano. Allow this to cook for 2 minutes, add water and then fold in lentils and tomatoes. Bring this to boil and reduce heat. Let it simmer for one hour. Before it’s ready to be served, add in spinach and cook until it wilts. Then add vinegar along with salt and pepper to taste. Makes 6 servings.

Per serving: calories 349, protein 18 g, fat 10 g, carbohydrates 48 g, cholesterol 0 mg, sodium 121 mg, fiber 22 g.


As we age, a balanced immune and inflammatory response becomes critical to guarding our health.1-5 Research has shown Black Cumin Seed Oil to be particularly effective.6,9

UNIQUE MOLECULAR COMPLEX

Scientists have determined that black cumin seeds contain a broad spectrum of active compounds.6 Combined, these compounds provide powerful and wide-ranging immune support and promote healthy inflammatory response.6,7

DUAL IMMUNE SUPPORT

A number of biological factors contribute to the body’s normal inflammatory activity, including cell-signaling chemicals and hormone-like messengers.6,9 In a series of scientific studies, Black Cumin Seed Oil has been shown to support the normal effectiveness of these inflammatory factors.6,7,9

Also, an aging, healthy immune system needs to orchestrate the activity of macrophages and helper T-cells that work together to identify and destroy dangerous microbes and abnormal cells. Black Cumin Seed Oil was also shown to support the optimal function of these vitally important defensive activities.9-11

A BALANCED INFLAMMATION RESPONSE

By acting on both immune factors and inflammatory factors, Black Cumin Seed Oil supports a healthy immune system—which is increasingly important as we age—and facilitates a healthy inflammatory response!

The suggested daily dosage of two softgels of Black Cumin Seed Oil provides:

Thymocid™ organic Black cumin seed oil (Nigella sativa) 1,000 mg

A bottle containing 60 softgels of Black Cumin Seed Oil retails for $16. If a member buys four bottles, the price is reduced to $10.50 per bottle. (Item# 01709)

Since curcumin possesses some of the properties of black cumin seed oil, some people might want to take both nutrients in the same capsule.

The suggested daily dose of two softgels of Black Cumin Seed with Bio-Curcumin® provides:

BCM-95® Bio-Curcumin® (Curcuma longa) extract 400 mg

Thymocid™ organic Black Cumin Seed Oil (Nigella sativa) 1,000 mg

A bottle containing 60 softgels of Black Cumin Seed Oil with Bio-Curcumin® retails for $32. If a member buys four bottles, the price is reduced to $22.50 per bottle. (Item# 01710)

To order Black Cumin Seed Oil or Black Cumin Seed Oil with Bio-Curcumin®, call 1-800-544-4440 or visit www.LifeExtension.com

References

Thymocid™ is a trademark of Verdure Sciences, Inc.
Bio-Curcumin® and BCM-95® are registered trademarks of Dolcas-Biotech, LLC. U.S. Patents Nos. 7,883,728, 7,736,679 and 7,879,373.

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.
Lentil Vegetable Soup

Rich Rewards™

One Smart Bowl of Soup™
A delicious vegetarian soup suitable for vegans
Only Healthy Ingredients

Processed food companies sell vegetable soups so cheaply because they load them with high-glycemic carbohydrates (rice, potatoes, pasta) that cost virtually nothing. They then add inexpensive ingredients like corn, sugar, and sometimes omega-6 fats (like cottonseed oil). So for less than $2, you get a relatively high-carb-calorie soup that provides virtually no health benefits. Life Extension® has formulated a **lentil vegetable soup** suitable for vegans that contains only garden-fresh ingredients, including lentils, mushrooms, tomatoes, carrots, extra-virgin olive oil, and a host of other beneficial plant foods.

Each serving of Rich Rewards Lentil Vegetable soup contains only 120 calories of the best-documented foods to maintain your precious health. You can consume the entire contents or use a smaller portion of the soup as part of a meal for you (or several people).

The entire container supplies about 3.5 servings of these lentils, mushrooms, and vegetables—with none of the glucose-spiking fillers found in commercial soups.

Rich Rewards Lentil Vegetable Soup is packaged in a re-closable bottle free of BPA. While the FDA says the BPA lining in most cans is safe, we at Life Extension have always used BPA-free containers.

The retail price for a 3.5 serving **bottle** of Rich Rewards Lentil Vegetable soup is $13. The member price is $9.75.

**Nutrition Facts**

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<tr>
<th>Nutrient</th>
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<tr>
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*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

- Calories: 2,000 2,500
- Total Fat Less than 65g 80g
- Saturated Fat Less than 20g 25g
- Cholesterol Less than 300mg 300mg
- Sodium Less than 2,400mg 2,400mg

**Cruciferous Vegetable Soups**

You can also order soups that contain vegetables like **broccoli**, **cauliflower**, and **asparagus** in extra-virgin olive oil with only 60-70 calories per serving at the same price as the Lentil Vegetable Soup.

**Cruciferous Vegetable**

- **Retail Price**: $11.95
- **Member Price**: $8.96
  
- **Spicy Cruciferous Vegetable**
  
- **Retail Price**: $11.95
- **Member Price**: $8.96

**Souper tasty. Souper Satisfying.**

You know you don’t eat enough veggies. So Life Extension® cooked up a convenient, tasty way to spoon-feed you these souper foods. Unlike many canned soups, Rich Rewards™ Lentil Vegetable Soup is contained in a convenient resealable package that is free of BPA.

This soup provides unique garden-fresh ingredients, such as lentils, mushrooms, tomatoes, carrots, and other beneficial plant foods plus heart-healthy extra virgin olive oil.

**One Smart Bowl of Soup**

- Contains about 3.5 servings of healthy lentils, mushrooms, and vegetables per bottle
- Only 120 calories per serving
- No added starches or sugars!
- Excellent source of lentils, mushrooms, and fiber
- Contains 4.5 grams of total fat per serving
- 0g trans fat. No saturated fat or cholesterol

To order your fresh supply of Rich Rewards Lentil Vegetable soup, call 1-800-544-4440 or visit www.lef.org/soup
**Dual-Action Support for Aging Joints!**

As you grow older, age-related stiffness and discomfort in the joints becomes a fact of life. Activities once routine become a challenge as limited mobility hampers your every move.

You now have a more potent option to provide broad-spectrum support for aging joints.

**ArthroMax™ Advanced with UC-II® and AprèsFlex®** is a multi-nutrient formula based on scientific data on natural support for joint health. The ArthroMax™ formula provides more joint support than ever before, enhanced with two innovative, clinically validated ingredients: AprèsFlex® and UC-II®.

**Better Absorption for Optimum Benefit**

AprèsFlex® represents a quantum leap forward in the delivery to aging joints of boswellia, long prized for its ability to help with inflammatory issues. It is a superior inhibitor of the enzyme 5-lipoxygenase or 5-LOX.

Excess activity of 5-LOX results in the accumulation of leukotriene B4, a pro-inflammatory compound that affects aging joints. Boswellia has been shown to bind directly to the 5-LOX enzyme in our bodies, blocking it from facilitating production of pro-inflammatory leukotrienes.\(^1,2\)

AprèsFlex® boswellia absorbs into the blood 52% better than previously available forms of boswellia, for superior effectiveness.

**ArthroMax™ Advanced with UC-II® and AprèsFlex®**

In addition to AprèsFlex®, ArthroMax™ contains a novel form of undenatured chicken cartilage: UC-II®. Data show it helps with immune issues that can impact joint discomfort and ease of motion in aging individuals.

Two capsules of **ArthroMax™ Advanced with UC-II® and AprèsFlex®** provide the following nutrients in one convenient, joint-protecting formula:

- **UC-II® standardized chicken cartilage** 40 mg
- **Glucosamine sulfate 2KCl** (from corn) 1500 mg
- **AprèsFlex® (Boswellia serrata) extract** 100 mg
- **Boron** (calcium fructoborate as patented FruiteX B® OsteoBoron\(^\text{®}\)) 1.5 mg

The retail price of a bottle of 60 capsules of **ArthroMax™ Advanced with UC-II® and AprèsFlex®** is $36. If a member buys four bottles, the price is reduced to **$24** per bottle.

References

ArthroMax™ is a registered trademark of InterHealth N.I. UC-II® brand undenatured type II collagen. U.S. Patents 5,962,049, 5,637,321, 5,529,786, 5,750,144, 7,083,820, EPO Patent EP1435906B1, U.S. and world-wide patents pending.

**To order ArthroMax™ Advanced with UC-II® and AprèsFlex® 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.
LE: Let’s start at the beginning. How serious of a problem is gluten in food products?

AA: For some people—about 1% of the population—gluten can be a matter of life or death.¹ These people have a condition known as celiac disease. True celiacs, as they are called, are so sensitive to gluten
that even a small amount—really just a trace—can make them very sick. Until a decade ago, celiac disease was thought to be extremely rare, affecting 1 in 10,000 people in North America. But in 2003, Dr. Alessio Fasano, one of the world’s leading researchers in the field, reported a surprising finding: The rate was actually 1 in 133. That’s 100 times more common than was previously believed.

LE: Celiac disease is the strongest form of gluten intolerance, but your book focuses largely on a more prevalent issue, which is something called gluten sensitivity. Can you explain that a little?

AA: Gluten sensitivity is a condition with symptoms often similar to celiac disease but that may not require giving up gluten entirely. With the significant increase in our gluten intake over the past 50 years due to the ubiquity and overconsumption of products made with highly refined wheat flour, we are just beginning to appreciate gluten’s impact on our health. As a society, we are in a state of “gluten overload,” and millions of people of all ages and all walks of life are suffering as a result.

LE: What can people do to determine whether or not they have celiac disease?

AA: If you were to walk into my office tomorrow with abdominal pain, fatigue, foggy mind, joint pain, tingling in the extremities, or any of the other symptoms commonly associated with both celiac disease and gluten sensitivity, I would test you for celiac disease before suggesting that you try the Gluten Solution Program. This involves drawing blood to check for anti-tTG and other antibodies that are produced when intestinal cells are damaged and for the genes linked to celiac disease (HLA-DQ2 and/or HLADQ8). Depending on the results, a confirming biopsy may also be necessary. At the same time, I also test for nutritional deficiencies common in people with celiac disease, namely iron, folic acid, vitamin B12, and vitamin D.*

LE: In your experience, what are some of the symptoms that people may experience if they are sensitive to gluten?

AA: In my cardiology practice, I have been amazed at the number of patients who have gluten sensitivity and who have gone undiagnosed for many years. When they eat foods containing gluten, it triggers unpleasant symptoms—stomach pains, diarrhea, heartburn, body aches, headache, skin rashes, fatigue, brain fog, and depression—and sometimes leads to or exacerbates chronic illnesses such as rheumatoid arthritis and fibromyalgia. We now know that there is a relationship between this new epidemic of gluten sensitivity and the epidemics of obesity and diabetes, two related and reversible conditions that have been the principal focus of my earlier South Beach Diet books.

LE: Can you describe that insidious relationship?

AA: I have written a great deal about the epidemics of diabetes and obesity and their well-established relationship to heart disease and to most other chronic diseases. I have laid the blame squarely on our sedentary lifestyle and our poor diet filled with empty-calorie, low-fiber, non-nutritious foods—especially in the form of refined carbohydrates. Our addiction to highly processed starches has led us to consume more gluten than ever before. The irony here is that the more of these junk foods we eat, the more we crave them and the more we continue to eat them. It is a vicious cycle that leaves millions of people struggling with their weight, feeling exhausted and depressed, and suffering from a variety of health problems that are diminishing their quality of life.

LE: In order to combat this problem, many people need to alter their diets to remove all gluten products. But what is the difference between being “gluten free” and being “gluten aware”?

AA: The generally accepted definition of gluten free means that a food must contain less than 20 parts per million (ppm) of gluten, though labeling laws are yet to be passed. That’s the amount in about 1/48 of a slice of bread: just a tiny sliver. In addition, grain products—cereals, baked goods, and other products—are not truly
LE: An interesting section in your book describes how the overuse of pain relievers such as NSAIDs and antibiotics is exacerbating the gluten digestion problems many Americans face. How does this work?

AA: In recent decades, there has been an ever-increasing use of pain relievers, particularly non-steroidal anti-inflammatory medications (NSAIDs), both over the counter and prescribed. These include aspirin (Bayer, Bufferin®), naproxen (Aleve®), and ibuprofen (Advil®, Motrin®). While most of us have heard that NSAIDs can damage our stomachs, what you may not know is that they are just as likely to damage your small intestine. When you consider that more than 30 billion doses of over-the-counter and prescription NSAIDs are taken in the United States each year, the impact on our collective small intestines must be substantial. In the same manner that gastroenteritis allows incompletely digested gluten peptides to leak through the intestinal lining and cause symptoms, so can NSAID damage. As with NSAIDs, overuse and overprescription of antibiotics is rampant in the United States today, beginning in childhood. It is estimated that doctors prescribe antibiotics to a child at one out of every five visits, often for viral respiratory ailments like bronchitis and flu that do not require them.

LE: The science behind how your intestines take such a strong hit with this disease makes sense, but you even mention that gluten sensitivity can lead to osteoporosis. That’s surprising.

AA: About 55% of Americans over the age of 50 either have osteoporosis or are at high risk for developing it. I have always wondered why osteoporosis is so common in the industrialized world, despite our intake of calcium, magnesium, vitamin D, and other nutrients important for bone formation and strength. Interestingly, osteoporosis has traditionally been treated with calcium supplements, but their impact on stopping or reversing this disease seems to be minimal and there is a reason for that. We know that with celiac disease, nutrient deficiencies resulting from a damaged small intestine stunt the growth of children and, indeed, prevent children from getting enough of these vital nutrients during their bone-building years. It seems likely that the osteoporosis that occurs later in life could be due to decades of poor absorption of the nutrients that were available from food but never got into the bloodstream and tissues.

LE: And gluten sensitivity can even affect vitamin D absorption, right?

AA: If you have been told that you have a low vitamin D level, you should be tested for celiac disease, since damaged villi cannot adequately absorb this fat-soluble vitamin. Even if the results are negative, you should follow our Gluten Solution Program, monitor your response, and have your vitamin D rechecked after being off gluten. Conversely, if you find you are gluten sensitive after you’ve done our program, ask your doctor to test your vitamin D level and your levels of other nutrients as well. You may need supplementation under your doctor’s guidance.

LE: Even if someone adopts a gluten free or gluten aware diet, there is still a lot of damage that has been done to the GI tract. What can people do to repair this damage?

AA: There’s a promising area of microbiota research that is shedding new light on recolonizing the bacteria in our intestines with probiotics. The word literally means “beneficial to life.” You’ve likely heard of probiotics. These good bacteria, which already reside in our intestines, have populated or have been added to a vast number of products ranging from yogurt to green tea drinks and other supplements for years.
But despite some good rationale behind efficacy claims, we are still waiting for more evidence before probiotics can be established as an important component in achieving better health. That’s in part because the various foods and supplements for oral delivery of probiotics don’t necessarily spare these friendly bacteria from being destroyed by our stomach acid. One use of probiotics that has been found to be beneficial, however, is in the treatment of the bacterial overgrowth of _Clostridium difficile_, a decidedly unfriendly enemy that attacks our intestinal linings, causing inflammation, abdominal pain, and diarrhea.\(^\text{12,13}\)

**LE:** How is the _South Beach Diet_ similar to the _South Beach Diet Gluten Solution_ program?

**AA:** The _South Beach Diet Gluten Solution_ is simply an extension of our time-tested plan. The same principles of eating a varied diet consisting of nutrient- and fiber-rich vegetables, fruits, and whole grains, as well as lean protein and good fats, still hold true here. You’ll just be giving up all gluten for a few weeks to determine if you have any gluten sensitivity. Today, wheat has been targeted as the enemy, and some people have gone a little overboard avoiding it. Just as people were wrongly fat phobic back in the 1990s, they’re wrongly gluten phobic today. That’s why I have created the _South Beach Diet Gluten Solution_ to clear up the confusion about gluten, to help you figure out whether you need to be concerned about gluten at all, and then to help you make the best food choices for better health if it turns out you do have a gluten sensitivity. •

*Life Extension offers a Celiac Disease Antibody Screen as well as a Food Safe Allergy Screen which can determine gluten sensitivity. For more information on Celiac disease, gluten sensitivity, or to order a blood test, please contact a Life Extension® Health Advisor today at 1-866-864-3027.*

Arthur Agatston, MD, is a cardiologist and an associate professor of medicine at the University of Miami, Miller School of Medicine. He is the author of the best-selling book _The South Beach Diet_, which focuses on a food lifestyle including nutrient-dense, fiber-rich foods. Agatston admits that he didn’t set out to create a popular diet plan—the plan came out of the need to get his heart patient’s diets under control.

References


**Curcumin** is the health-promoting trace compound derived from the Indian spice *turmeric*. But not all turmeric is alike.

The curcumin found in the vast majority of dietary supplements is derived from turmeric that is nutritionally inferior.

Why? Almost all growers harvest turmeric at the point when the turmeric root turns its signature yellow color, but before it has fully matured.

The turmeric root requires more time in the ground for highly beneficial phytonutrients called *curcuminoids* and *sesquiterpenoids* to attain peak concentrations.

Life Extension®’s Super Bio-Curcumin® derives from turmeric that is grown with organic practices, cultivated to maturity, then specially transported and processed to preserve and deliver the root’s most complete nutritional profile.

In recent studies comparing the effects of standard curcumin against turmeric extracts comparable to Super Bio-Curcumin®, researchers observed:1,2

- Nearly twice the support for immune health.
- Approximately twice the support for inflammatory issues.
- Almost double the antioxidant support.

A separate study indicated that an antioxidant-rich curcumin extract3 provided powerful support for heart health.

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Curcumin is neither absorbed nor retained well in the blood, which is another challenge facing those who wish to maximize its benefits.

The highly popular Super Bio-Curcumin® uses BCM-95®, a patented, bioenhanced preparation of curcumin. It has been shown to reach up to 7 times higher concentration in the blood than standard curcumin.4

The graphs on this page illustrate that one 400 mg vegetarian capsule per day of Super Bio-Curcumin® supplies the equivalent of 2,500 mg of commercial curcumin supplements.

A bottle containing 60 vegetarian capsules of Super Bio-Curcumin® retails for $38. If a member buys four bottles, the price is reduced to only $26.25 per bottle.

**To order Super Bio-Curcumin®, call 1-800-544-4440 or visit www.LifeExtension.com**

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**References**


**CAUTION:** Do not take if you have gallbladder problems or gallstones. If you are taking anti-coagulant or anti-platelet medications, or have a bleeding disorder, consult your healthcare provider before taking this product.


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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.
Shielding your eyes from destructive ultraviolet sun rays is one of the most effective means of protecting against ocular disease.

Consumers often spend hundreds of dollars on just one pair of so-called “designer” sunglasses. Life Extension® members can obtain superior protection against damaging solar radiation at a fraction of the price of commercially sold sunglasses.

**SolarShield®** sunglasses are recognized as the number-one doctor-recommended sunglass in the world, with more than 50 million pairs sold to date. Patented **SolarShield®** sunglasses with durable polycarbonate lenses and 100% UV protection fit comfortably over prescription eyewear, providing convenient protection from the harmful effects of ultraviolet radiation.

For those who desire the added benefit of lenses that reduce distracting glare, **OveRxCast** sunglasses come with polarized gray lenses that provide natural color definition with 100% UV protection. Like the **SolarShield®** sunglasses, **OveRxCast polarized** sunglasses are designed to be worn over your prescription eyeglasses.

**SolarShield®** sunglasses retail for $12.99 for one pair, and the member price is $9.74. If a member buys two pairs, the price is reduced to only $8.63 a pair. One pair of **OveRxCast** sunglasses retails for $27, and the member price is $20.25. If a member orders two pairs, the price is reduced to just $15.75 per pair.

Compare these low prices to sunglasses sold in stores and see savings exceeding 90%!

**SolarShield®** is a registered trademark Dioptics, Inc.

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Maintain Macular Density

The macular pigment is composed of lutein, zeaxanthin, and meso-zeaxanthin. The density of the macula is essential to proper vision. Macular density declines naturally over time.

Eating lots of lutein- and zeaxanthin-containing vegetables can help maintain the structural integrity of the macula. However, since meso-zeaxanthin is not part of the typical diet, it cannot be easily replaced. Young people convert lutein into meso-zeaxanthin inside their macula. Some aging people, however, lose their ability to convert lutein into meso-zeaxanthin.

The Super Zeaxanthin formula provides zeaxanthin, lutein and meso-zeaxanthin to help maintain macular density.

Falling down is responsible for 70% of accidental deaths in older people. Poor lighting conditions are often the culprit.

Fortunately, C3G derived from black currant extract supports eyesight in dark conditions by promoting the healthy function of delicate structures within the retina that support night vision.

Super Zeaxanthin contains a potent dose of C3G to nourish cells throughout the body.

Comprehensive Ocular Protection in One Daily Softgel

The Super Zeaxanthin formula provides ingredients that have been shown to promote healthy eyesight. Just one softgel of Super Zeaxanthin with Lutein, Meso-Zeaxanthin and C3G provides:

- **OptiLut®, Lutein Plus® and MZ®** 38 mg (Marigold [Tagetes erecta] extract [flower] [free lutein equivalent 10 mg])
- **Zeaxanthin & Meso-zeaxanthin blend** 3.75 mg (Paprika [capsicum annum] extract [fruit], OptiLut®, Lutein Plus® and MZ® Marigold Extract [flower])
- **C3G** (Cyanidin-3-glucoside) 2.2 mg (from European black currant [Ribes nigrum] extract [fruit])

The retail price for a bottle containing 60 softgels of Super Zeaxanthin with Lutein, Meso-Zeaxanthin and C3G is $22. If a member buys four bottles, the price is reduced to $14.85 per bottle.
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September 6-8, 2013
Marriott Los Angeles Airport Hotel, California

Making a Positive Impact on Quality of Life

Join us in Los Angeles for the 2013 Prostate Cancer Conference, September 6-8, at the Marriott Los Angeles Airport Hotel. This year’s conference will focus on “Quality of Life” issues for men dealing with prostate cancer. PCRI has collected an outstanding faculty to discuss important subjects ranging from new treatments, active surveillance, nutrition and fitness, immunotherapy, hormone treatments, radiation, chemotherapy and much more!

Conference Highlights

- Presentations on:
  - Treatment-Related Side Effects
  - Advanced Disease
  - Radiation Oncology
  - Surgery vs. Observation
  - The PSA Screening Controversy
  - New Treatments
  - Women’s Issues

- Featuring a live on stage Prostate Biopsy

- Round-Table Discussions: Listen to real clinical cases and obtain answers to your questions during this multi-disciplinary panel discussion.

- Opportunities to interact with speakers after their presentations

Ask the Experts: question-and-answer sessions with participating faculty and other experts and conference attendees

Exhibits from participating supporters and other members of the prostate cancer community

Support group meetings will be held all throughout the conference – courtesy of UsToo and Women Against Prostate Cancer

Saturday Night Gala Dinner (optional) - Live Entertainment with the The Harry Pinchot and Catalyst Awards

Los Angeles Excursions (optional) - Hollywood Bowl featuring the Blue Man Group (Sept. 6) and the Grammy Museum (Sept. 8).

Conference Faculty

Duke Bahn, MD, Charles Drake, MD, PhD, Steven Finkelstein, MD, Mark Kawachi, MD, John Kurhanewicz, MD, Mark Moyad, MD, Charles Myers, MD, Mack Roach III, MD, Mark Scholz, MD, Andrea Singer, MD, Jeff Turner, MD, Nicholas Vogelzang, MD, and Timothy Wilt, MD

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www.pcri.org or 310.743.2116

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Blood testing provides the ultimate information regarding correctable risk factors that may predispose you to disorders such as cancer, diabetes, cardiovascular disease, and more. Information about general health and nutritional status can also be gained through standard blood analysis. Standing behind the belief that blood testing is an essential component of any program designed to attain optimal health and longevity, Life Extension® offers this innovative and convenient service at a very affordable price. Not only is comprehensive blood testing an important step in safeguarding your health, it is a simple process from virtually anywhere in the United States.

Five Easy Steps:
1. Call 1-800-208-3444 to discuss and place your order with one of our knowledgeable health advisors. (This order form can also be faxed to 1-866-728-1050 or mailed). Online orders can also be placed at www.lifeextension.com.
2. After your order is placed, you will be mailed either a requisition form to take to your local LabCorp Patient Service Center or a Blood Draw Kit; whichever is applicable (Please note: If a blood draw kit is used, an additional local draw fee may be incurred.)
3. Have your blood drawn.
4. Your blood test results will be sent directly to you by Life Extension.
5. Take the opportunity to discuss the results with one of our knowledgeable health advisors by calling 1-800-226-2370; or review the results with your personal physician.

It’s that simple! Don’t delay—call today!

For Our Local Members:
For those residing in the Ft. Lauderdale, Florida area, blood draws are also performed at the Life Extension Nutrition Center from 9:00 am to 2:00 pm Monday through Saturday. Simply purchase the blood draw and have it drawn with no wait! Our address is 990 North Federal Highway, Ft. Lauderdale, FL, 33308-2633.

### MOST POPULAR PANELS

#### Life Extension Member Pricing

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<th>Panel Description</th>
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<td>Chemistry Profile includes glucose, cholesterol, LDL, HDL, triglycerides, liver and kidney function tests PLUS 20 additional tests. CBC includes immune (white) cell count, red blood cell count and platelet count. Also includes: C-Reactive Protein, DHEA-S, TSH for thyroid function, Estradiol, Progesterone, Vitamin D 25-hydroxy, Hemoglobin A1c.</td>
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<td>MALE HORMONE ADD-ON PANEL (LCADDM)*</td>
<td>$155</td>
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<td>FEMALE HORMONE ADD-ON PANEL (LCADDI)*</td>
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<td>THE CBC/CHEMISTRY PROFILE (LC381822)</td>
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<td>CARDIOVASCULAR RISK PROFILE</td>
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<td>Potassium, Chloride.</td>
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<td>COMPREHENSIVE THYROID PANEL</td>
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<td>(LC100018) TSH, T4, Free T4, Free T3, Reverse T3, TPO, ATA.</td>
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<td>FOOD SAFE ALLERGY TEST** (LCM73001)</td>
<td>$198</td>
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<td>This test measures delayed (IgG) food allergies for 95 common foods.</td>
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<td>ADRENAL FUNCTION PANEL (LC100021)</td>
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<tr>
<td>DHEA-S, AM/PM Cortisol, Glucose, Insulin, Lipid Panel, RBC magnesium.</td>
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<tr>
<td>OMEGA SCORE*** (LCOMEGA)</td>
<td>$131.25</td>
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<td>Provides valuable information on your risk of developing heart disease, sudden heart attack, and cardiac death. The Omega Score™ also includes your AA:EPA ratio, allowing you to determine and track a major factor in total body inflammation.</td>
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<td>MITOCHONDRIAL FUNCTION PANEL*</td>
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<td>(LC100020) Carnitine (Free with Total), CoQ10, Glucose.</td>
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<td>VAP™ TEST* (LC804500)</td>
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<td>The VAP™ cholesterol test provides a more comprehensive coronary heart disease (CHD) risk assessment than the conventional lipid profile. Direct measurements, not estimations, are provided for total cholesterol, LDL, HDL, VLDL, and cholesterol subclasses.</td>
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* This test requires samples to be shipped to the lab on dry ice for customers using a Blood Draw Kit and will incur an additional $5.50 charge. If the customer is having blood drawn at a LabCorp facility, this extra charge does not apply.
** This test is packaged as a kit, requiring a finger stick performed at home.
**Other Popular Tests and Panels**

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<td>CBC/Chemistry Profile (see description), Ferritin, Total Iron Binding Capacity (TIBC), Vitamin B12, Folate, Reticulocyte Count.</td>
<td></td>
</tr>
<tr>
<td>INFLAMMATION PANEL (LC100007)</td>
<td>$135</td>
</tr>
<tr>
<td>CBC/Chemistry Profile (see description above), C-Reactive Protein (high sensitivity), Sedimentation Rate, Rheumatoid (RA) Factor, Antinuclear Antibodies (ANA) Screen.</td>
<td></td>
</tr>
<tr>
<td>THYROID ANTIBODY PROFILE (LC100004)</td>
<td>$99</td>
</tr>
<tr>
<td>Thyroid Antithyroglobulin Antibody (ATA) and Thyroid Peroxidase Antibody (TPO).</td>
<td></td>
</tr>
<tr>
<td>CARDIAC PLUS* (LC100008)</td>
<td>$145</td>
</tr>
<tr>
<td>CBC/Chemistry Profile (see description), Vitamin D 25-hydroxy, C-Reactive Protein (high sensitivity), Fibrinogen, Homocysteine.</td>
<td></td>
</tr>
<tr>
<td>VAP™ PLUS* (LC100009)</td>
<td>$330</td>
</tr>
<tr>
<td>VAP, C-Reactive Protein (high sensitivity), Homocysteine, Fibrinogen, PLAC™ Test (Lp-PLA2), Vitamin D 25-hydroxy.</td>
<td></td>
</tr>
<tr>
<td>CARCINIC RISK</td>
<td></td>
</tr>
<tr>
<td>COQ10* (COENZYME Q10) (LC120251)</td>
<td>$99</td>
</tr>
<tr>
<td>This test is used to check the blood level of CoQ10 and will enable more precise dosing for anyone seeking to achieve and maintain high levels of this critical antioxidant.</td>
<td></td>
</tr>
<tr>
<td>Lp-PLA2 (PLAC™ TEST) (LC123240)</td>
<td>$125</td>
</tr>
<tr>
<td>This test is used to aid in predicting risk for coronary heart disease, and ischemic stroke associated with atherosclerosis. Lp-PLA2 is a cardiovascular risk factor that provides unique information about the stability of the plaque inside your arteries.</td>
<td></td>
</tr>
<tr>
<td>C-REACTIVE PROTEIN (HIGH-SENSITIVITY) (LC120766)</td>
<td>$42</td>
</tr>
<tr>
<td>Measures inflammation factors in arteries. Recent studies indicate that C-reactive protein may be the most accurate risk factor for predicting heart attack and stroke.</td>
<td></td>
</tr>
<tr>
<td>FIBRINOGEN* (LC016160)</td>
<td>$31</td>
</tr>
<tr>
<td>High levels of this blood clotting factor increase the risk of heart attack and stroke.</td>
<td></td>
</tr>
<tr>
<td>HOMOCYSTEINE (LC708994)</td>
<td>$64</td>
</tr>
<tr>
<td>Can indicate if you are likely to have a heart attack or stroke. Even if you take folic acid, you still may have dangerously high levels of this artery-clotting metabolite that can be lowered with high doses of TMG, vitamin B6, and vitamin B12.</td>
<td></td>
</tr>
<tr>
<td>PSA (PROSTATE-SPECIFIC ANTIGEN) (LC018322)</td>
<td>$31</td>
</tr>
<tr>
<td>Can provide an early warning sign for prostate disorders and possible cancer.</td>
<td></td>
</tr>
<tr>
<td>FREE-PSA (INCLUDES TOTAL PSA)* (LC480780)</td>
<td>$81</td>
</tr>
<tr>
<td>Recommended to determine if an elevated PSA is indicative of prostate cancer.</td>
<td></td>
</tr>
</tbody>
</table>

**Blood tests available only in the continental United States. Not available in Maryland.**

**For non-member prices call 1-800-208-3444**

---

**HORMONES**

<table>
<thead>
<tr>
<th>Test Name</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>DHEA-SULFATE (LC040420)</td>
<td>$61</td>
</tr>
<tr>
<td>This test shows if you are taking the proper amount of DHEA. This test normally costs $100 or more at commercial laboratories.</td>
<td></td>
</tr>
<tr>
<td>DIABETES PANEL* (LC100019)</td>
<td>$159</td>
</tr>
<tr>
<td>Glucose, Insulin, HbA1c, VAP™, Cortisol, C-Reactive Protein</td>
<td></td>
</tr>
<tr>
<td>MALE BASIC HORMONE PANEL (LC100012)</td>
<td>$75</td>
</tr>
<tr>
<td>DHEA-S, Estradiol, Free and Total Testosterone, Progesterone</td>
<td></td>
</tr>
<tr>
<td>FEMALE BASIC HORMONE PANEL (LC100013)</td>
<td>$75</td>
</tr>
<tr>
<td>DHEA-S, Estradiol, Free and Total Testosterone, Progesterone</td>
<td></td>
</tr>
<tr>
<td>DIHYDROTESTOSTERONE (DHT)* (LC500142)</td>
<td>$99</td>
</tr>
<tr>
<td>Measures serum concentrations of DHT.</td>
<td></td>
</tr>
<tr>
<td>ESTRADIOL (LC004515)</td>
<td>$33</td>
</tr>
<tr>
<td>For men and women. Determines the proper amount in the body.</td>
<td></td>
</tr>
<tr>
<td>INSULIN FASTING (LC004333)</td>
<td>$42</td>
</tr>
<tr>
<td>Can predict those at risk of diabetes, obesity, and heart and other diseases.</td>
<td></td>
</tr>
<tr>
<td>PREGNENOLONE* (LC140707)</td>
<td>$116</td>
</tr>
<tr>
<td>Used to determine ovarian failure, hirsutism, adrenal carcinoma, and Cushing’s syndrome.</td>
<td></td>
</tr>
<tr>
<td>PROGESTERONE (LC004317)</td>
<td>$55</td>
</tr>
<tr>
<td>Primarily for women. Determines the proper amount in the body.</td>
<td></td>
</tr>
<tr>
<td>SEX HORMONE BINDING GLOBULIN (SHBG) (LC080216)</td>
<td>$33</td>
</tr>
<tr>
<td>This test is used to monitor SHBG levels which are under the positive control of estrogens and thyroid hormones, and suppressed by androgens.</td>
<td></td>
</tr>
</tbody>
</table>

**BONE HEALTH**

<table>
<thead>
<tr>
<th>Test Name</th>
<th>Price</th>
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<tbody>
<tr>
<td>VITAMIN D (250H) (LC081950)</td>
<td>$47</td>
</tr>
<tr>
<td>This test is used to rule out vitamin D deficiency as a cause of bone disease. It can also be used to identify hypercalcemia.</td>
<td></td>
</tr>
<tr>
<td>OSTEODENSITOMETRY* (LC102499)</td>
<td>$91</td>
</tr>
<tr>
<td>Osteocalcin is often used as a biochemical marker, or biomarker, for the bone formation process. It has been routinely observed that higher serum osteocalcin levels are relatively well correlated with bone diseases characterized by increased bone turnover, especially osteoporosis.</td>
<td></td>
</tr>
<tr>
<td>DPD CROSS LINK URINE TEST (LC511105)</td>
<td>$79</td>
</tr>
<tr>
<td>The deoxypyridinoline (DPD) urine test can be used to measure bone re-absorption rates in healthy individuals and in those with enhanced risk of developing metabolic bone diseases. Deoxypyridinoline can be used to monitor therapies (which may include bisphosphonate drugs) in people diagnosed with osteoporosis.</td>
<td></td>
</tr>
</tbody>
</table>

**OTHER POPULAR TESTS AND PANELS**

<table>
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**TERMS AND CONDITIONS**

This blood test service is for informational purposes only and no specific medical advice will be provided. National Diagnostics, Inc., and the Life Extension Foundation contract with a physician who will order your test(s), but will not diagnose or treat you. Both the physician and the testing laboratory are independent contractors and neither National Diagnostics, Inc., nor the Life Extension Foundation™ will be liable for their acts or omissions. Always seek the advice of a trained health professional for medical advice, diagnosis, or treatment. When you purchase a blood test from Life Extension/National Diagnostics, Inc., you are doing so with the understanding that you are privately paying for these tests. There will be absolutely no billing to Medicare, Medicaid, or private insurance. I have read the above Terms and Conditions and understand and agree to them.

Signature of Life Extension Member

X

Life Extension Foundation Members only

MEMBER NO.

<table>
<thead>
<tr>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Date of Birth (required)</td>
</tr>
<tr>
<td>Address</td>
<td>/</td>
</tr>
<tr>
<td>City</td>
<td>Zip</td>
</tr>
<tr>
<td>State</td>
<td>Phone</td>
</tr>
<tr>
<td>Credit Card No.</td>
<td>Expiration Date</td>
</tr>
</tbody>
</table>

Mail your order form to:

Life Extension
NATIONAL DIAGNOSTICS, INC.

3600 West Commercial Boulevard
Fort Lauderdale, FL 33309

Phone your order to: 1-800-208-3444
Fax your order to: 1-866-728-1050

For non-member prices call 1-800-208-3444
AMINO ACIDS
Acetyl-L-Carnitine
Acetyl-L-Carnitine-Arginate
Branch Chained Amino Acids
D, L-Phenylalanine Capsules
Glycine Capsules
L-Arginine Capsules
Arginine/L-Osmithine Capsules
L-Carnitine Capsules
L-Carnitine Powder Natural Lemon Flavor
L-Glutathione, L-Cysteine & C
L-Glutamine Capsules
L-Glutamine Powder
L-Lysine Capsules
L-Tyrosine Tablets
Mega L-Glutathione Capsules
N-Acetyl-L-Cysteine Capsules
Optimized Carnitine with GlycoCarn®
PharmaGABA
Super Carnosine Capsules
Taurine Capsules

BONE & JOINT HEALTH
ArthroMax™ with Theaflavins and AprèsFlex®
ArthroMax™ Advanced with UC-II® and AprèsFlex®
Bone-Up™
Bone Restore
Bone Restore w/Vitamin K2
Bone Strength Formula w/KoAct™
Fast Acting Joint Formula
Glucosamine Chondroitin Capsules

BRAIN HEALTH
Acetyl-L-Carnitine
Acetyl-L-Carnitine-Arginate
CDP Choline Capsules
Cognitex® with NeuroProtection Complex
Cognitex® with Pregnenolone & NeuroProtection Complex
Cognitex® Basics
DAME Bitartrate
Ginkgo Biloba Certified Extract™
Huperzine A
Lecithin Granules
Methylcobalamin Lozenges
Neuro-Mag™ Magnesium L-Threonate
Optimized Ashwagandha Extract
Phosphatidylserine Capsules
Rhodiola Extract
Super Ginkgo Extract
Vinpocetine

DIGESTIVE
Bifido GL Balance
Carnosoothe w/PicroProtect
Digest RC™
Enhanced Super Digestive Enzymes
Extraordinary Enzymes
Life Flora™
Natural Esophaguard
Pancreatin
Probiotic All-Flora®
Regimint
Theralac Probiotics

DURK AND SANDY PRODUCTS
Blast™
Inner Power™

EYE CARE
Bilberry Extract
Brite Eyes III
Eye Pressure Support with Mirtogenol®
Overcast Polarized Sunglasses
Solarshield Sunglasses
Super Zeaxanthin with Lutein & Meso-Zeaxanthin Plus Astaxanthin and C3G
Super Zeaxanthin with Lutein & Meso-Zeaxanthin and C3G

FIBER
AppleWise Polyphenol
Fiber Food
TruFiber®
WellBetX PGX® plus Mulberry

FOOD
Rich Rewards™ Black Bean Vegetable Soup
Rich Rewards™ Spicy Cruciferous Vegetable Soup
Rich Rewards™ Cruciferous Vegetable Soup
Rich Rewards™ Lentil Soup
Rich Rewards® Coffee

HAIR CARE
Dr. Proctor's Advanced Hair Formula
Dr. Proctor's Shampoo
Super-Absorbable Tocotrienols

HEART HEALTH
AppleWise Polyphenol
Advanced Lipid Control
Aspirin (Enteric Coated)
Cardio Peak™ w/Standarized Hawthorn and Arjuna Cho-Less™
D-Ribose Tablets
D-Ribose Powder
Endothelial Defense™ with Full-Spectrum Pomegranate™
Fibrinogen Resist
Forskolin
Homocysteine Resist
Kril Healthy Joint Formula
Natural BP Management
Olive Leaf Vascular Support
Peak ATP® with GlycoCarn®
PhosphOmega®
Pycnogenol® French Maritime Pine Bark Extract
Red Yeast Rice
Super Absorbable CoQ10™ with d’Limonene
Super Omega-3 EPA/DHA with Sesame Lignani & Olive Fruit Extract
Super Ubiquinol CoQ10
Super Ubiquinol CoQ10 with BioPQQ®
Super Ubiquinol CoQ10 with Enhanced Mitochondrial™ Support
Theaflavin Standardized Extract
TMG Powder
TMG Tablets

HERBAL/PHYTO PRODUCTS
Artichoke Leaf Extract
Astaraxanthin w/Phospholipids
Berry Complete
Blueberry Extract
Blueberry Extract w/Pomegranate
Butterbur Extract w/Standardized Rosmarinonic Acid
Calcium D-Glucarate
Enhanced Berry Complete with Acai
Full-Spectrum Pomegranate™
GrapeSeed Extract with Resveratrol & Pterostibene
Huperzine A
Kyolic® Garlic Formula 102 + 105
Kyolic® Reserve
Mega Green Tea Extract
Mega Green Tea Extract (Decaffeinated) (also w/CoffeeGenic® Green Coffee Extract)
Mega Lycopene Extract
Optimized Ashwagandha Extract
Optimized Garlic
Pomegranate Extract
Pomegranate Juice Concentrate
Pycnogenol
Optimized Quercetin
Resveratrol with Synergistic Grape-Berry Actives
Rhodiola Extract
Silymarin
SODzyme™ with GilSODin®

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Biosil
Bone Restore
Bone Strength Formula w/KoAct™
Bone-Up™
Boron Capsules
Calcium Citrate with D3
Chromium Ultra
Copper
Iodoral

STEVIA
Stevia Extract
Super Bio-Curcumin®
Super Ginkgo Extract
Triple Action Cruciferous Vegetable Extract
Venotone
Whole Grape Extract

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DHEA
DHEA Complete
GH Pituitary Support Day Formula
GH Pituitary Support Night Formula
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Melatonin
Melatonin Timed Release
Natural Estrogen with Pomegranate Extract
Pregnenolone
ProgestaCare for Women
Super MiraForte with Standardized Lignans

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Black Cumin Seed Oil
Black Cumin Seed Oil w/Bio-Curcumin®
Buffered Vitamin C Powder
Echinacea Extract
2β Hyperimmune Egg
Immune Modulator w/Tinofend®
Immune Protect with PARACTIN®
Lactoterrin
Norwegian Shark Liver Oil
Optimized Fucoidan w/Maritech® 926
ProBoost™ Thymic Protein A
Reishi Extract Mushroom Complex
Vitamin C with Dihydromorphone
Zinc Loxenges

INFAMMATORY REACTIONS
Arthro-Immune Joint Support
ArthroMax™ with Theaflavins
Boswellia
Bromelain (Specially-coated)
DHA (Vegetarian Sourced)
Fast Acting Joint Formula
Ginger Force
Kril Oil
5-LOX Inhibitor w/AprèsFlex®
Mega EPA/DHA
Mega GLA with Sesame Lignans
MSM
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Omega-3 Whirl
Serrafflazyme
SODzyme™ with GilSODin® and Wolfberry
Super Omega-3 EPA/DHA with Sesame Lignans & Olive Fruit Extract
Tart Cherry w/Standardized CherryPURE®
Zylfin™ Whole Body

LIVER HEALTH
Branch Chain Amino Acids
N-Acetyl Cysteine
Liver Efficiency Formula
Certified European Milk Thistle
Hepatopro
SAME
Silymarin

MINERALS
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Bone Strength Formula w/KoAct™
Bone-Up™
Boron Capsules
Calcium Citrate with D3
Chromium Ultra
Copper
Iodoral
Iron Protein Plus
Magnesium
Magnesium Citrate
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Optimized Chromium w/Crominex® 3+
OptiZinc
Sea-Iodine™
Selenium
Se-Methyl L-Selenocysteine
Strontium
Vanadyl Sulfate
Zinc Lozenges

MISCELLANEOUS
Blood Pressure Monitor Arm Cuff
CR Way Edition Advanced Dietary Software

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Acetyl-L-Carnitine
Acetyl-L-Carnitine-Arginine
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Mitochondrial Energy Optimizer w/CoQ10®
Optimized Carnitine with GlycoCarn®
Optimized Chromium w/Crominex® 3+
Optimized Saffron with Satiereal®
Optimized Irvingia w/Phase 3™ Calorie Control Weight Management™ Formula
Optimized Irvingia w/Phase 3™ Calorie Control Weight Management™ Formula
Partial Size
Optimized Saffron with Satireal®
Optimized Saffron with Satireal®
Optimized Saffron with Satireal®

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Natural Estrogen w/Pomegranate
Super Absorbable Soy Isoflavones

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Anti-Alcohol Antioxidants w/HepatoProtection Complex
Bentoflavine w/Thiamine
Breast Health Formula
Butterbur Extract w/Standardized Rosmarinic Acid
Chlorcola
Chlorophyllin
Green Coffee Extract CoffeeGenic® (also w/Glucose control)
Corilose Super Strength
CR Mematic Longevity Formula
Cinsiulin® w/InSea® and Crominex® 3+
European Leg Solution Diosmin 95
Fem Dophilus

Femmenessence MacaPause®
GlycemicPro™ Transglucosidase
Migra-eze®
Natural Female Support
Organic Total Body Cleanse
Pecta-Sol®
Potassium Iodide
POQ Caps with BioPOQ®
PteroPure™
Prelox® Natural Sex for Men®
Pyridoxal 5’ - Phosphate
Ultra Natural Prostate w/AprèsFlex® and Standardized Lignans

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Creatine Capsules
DMG (N, N-dimethylglycine)
L-Glutamine Capsules
L-Glutamine Powder
Whey Protein Isolate
Whey Protein Concentrate

VITAMINS
Ascorbyl Palmitate Capsules
B12
Beta-Carotene
Biotin Capsules
Buffered Vitamin C Powder
Complete B Complex
Fast C®
Folic Acid + B12
Gamma E Tocopherol w/Sesame Lignans
Gamma E Tocopherol/Tocotrienols
Inositol Capsules
Mega Lycopene Extract
Methylcobalamin
MK-7
No-Flush Niacin
Optimized Folate
Super Ascorbate C Capsules
Super Ascorbate C Powder
Super K w/Advanced K2 Complex
Tocotrienols w/Sesame Lignans
Vitamin B3 (Niacin) Capsules
Vitamin B6
Vitamin B12 Tablets
Vitamin C
Vitamin D
Vitamin D3
Vitamin D3 w/Sea-Iodine™
Vitamins D and K w/Sea-Iodine™
Vitamin E
Vitamin K1

WEIGHT MANAGEMENT
Alli® Refill Pack
Advanced Anti-Adipocyte Formula
w/AdipoStat & IntegraLean®
Calorie Control Weight Management™ Formula
w/CoffeeGenic® Green Coffee Extract
CoffeeGenic® Weight Management™ with Green Coffee Extract
Keto DHEA®
DHEA® Complete
Fucoxanthin Slim™
HCA
Integra-Lean® Irvingia
LuraLean® Caps Special Propolmannan
Particle Size
Optimized Irvingia w/Phase 3™ Calorie Control Complex
Optimized Saffron with Satireal®
Natural Appetite Control
Natural Glucose Absorption Control
Super CLA Blend w/Guarana and Sesame Lignans
Super CLA Blend w/Sesame Lignans
WellBetX PGX® plus Mulberry
<table>
<thead>
<tr>
<th>No.</th>
<th>A</th>
<th>Retail Each</th>
<th>Member Each</th>
<th>Qty</th>
<th>Total</th>
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<tbody>
<tr>
<td>01524</td>
<td>ACETYL-L-CARNITINE - 500 mg, 100 veg. caps</td>
<td>$34.00</td>
<td>$25.50</td>
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<td>$102.00</td>
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<tr>
<td>01525</td>
<td>ACETYL-L-CARNITINE ARGINATE - 100 veg. caps</td>
<td>$59.00</td>
<td>$44.25</td>
<td>4</td>
<td>$176.00</td>
</tr>
<tr>
<td>01628</td>
<td>ADRENAL ENERGY FORMULA - 60 veg. caps</td>
<td>$24.00</td>
<td>$18.00</td>
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<td>$96.00</td>
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<td>01630</td>
<td>ADRENAL ENERGY FORMULA - 120 veg. caps</td>
<td>$46.00</td>
<td>$34.50</td>
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<td>$186.00</td>
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<tr>
<td>01308</td>
<td>ADVANCED LIPID CONTROL - 60 veg. caps</td>
<td>$30.00</td>
<td>$22.50</td>
<td>4</td>
<td>$110.00</td>
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<tr>
<td>01521</td>
<td>ADVANCED ORAL HYGIENE - 60 veg. mint lozenges</td>
<td>$20.00</td>
<td>$15.00</td>
<td>4</td>
<td>$80.00</td>
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<tr>
<td>00681</td>
<td>AMIC - 500 mg, 30 caps</td>
<td>$59.98</td>
<td>$44.99</td>
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<td>$239.92</td>
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<tr>
<td>01509</td>
<td>ANTI-ADIPOCYTE FORMULA w/ADIPONUC &amp; INTEGRA LEAN*(ADVANCED) - 60 veg. caps</td>
<td>$30.00</td>
<td>$22.50</td>
<td>4</td>
<td>$90.00</td>
</tr>
<tr>
<td>00457</td>
<td>ALPHA-LIPIDIC ACID W/BOTIN (SUPER) - 250 mg, 60 caps</td>
<td>$37.00</td>
<td>$27.75</td>
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<td>$111.00</td>
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<td>01440</td>
<td>ANTI-ALKOHOL ANTIOXIDANTS w/HEPATOPRO - 100 caps</td>
<td>$26.00</td>
<td>$19.50</td>
<td>4</td>
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<td>ASTAXANTHIN WITH PHOSPHOLIPIDS - 4 mg, 30 softgels</td>
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**SUB-TOTAL OF COLUMN 1**

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<th>No.</th>
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<th>Member Each</th>
<th>Qty</th>
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<td>BENFOTIAMINE W/THIAMINE - 100 mg, 120 veg. caps</td>
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<td>BONE RESTORE w/VITAMIN K2 - 120 caps</td>
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<td>BONE STRENGTH FORMULA w/KOACT® - 120 veg. caps</td>
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<td>BOOSTER w/ADVANCED K2 COMPLEX (Super) - 60 softgels</td>
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<td>BORON - 3 mg, 100 veg. caps</td>
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**SUB-TOTAL OF COLUMN 2**

*SEPTEMBER 2013*  
*LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS*
<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Retail Each</th>
<th>Member Each</th>
<th>Qty</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>01253</td>
<td>BRANCHED CHAIN AMINO ACIDS - 90 veg. caps</td>
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<td>$14.63</td>
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<td>$19.50</td>
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<tr>
<td>01699</td>
<td>BREAST HEALTH FORMULA - 60 veg. caps</td>
<td>17.00</td>
<td>12.75</td>
<td>1</td>
<td>17.00</td>
</tr>
<tr>
<td>00893</td>
<td>BRUTE EYES III - 2 vials, 5 ml each</td>
<td>34.00</td>
<td>25.50</td>
<td>1</td>
<td>34.00</td>
</tr>
<tr>
<td>01203</td>
<td>BROMELAIN (SPECIALIY-COATED) - 500 mg, 60 enteric coated tablets</td>
<td>32.00</td>
<td>24.00</td>
<td>1</td>
<td>32.00</td>
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<tr>
<td>00884</td>
<td>BUTTERBUR EXT. w/STANDARDIZED ROSEMARIN ACID - 60 softgels</td>
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<tr>
<td>01653</td>
<td>CALCIUM CITRATE w/VITAMIN D - 300 caps</td>
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<td>24.00</td>
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<tr>
<td>01651</td>
<td>CALCIUM D-GLUCARATE - 200 mg, 60 veg. caps</td>
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<td>CALORIE CONTROL WEIGHT MANAGEMENT FORMULA w/COFFEEGENIC® GREEN COFFEE EXTRACT</td>
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<td>CARDIOP EAK™/w/STANDARDIZED HAWTHORN &amp; ARALUNA - 120 veg. caps</td>
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<td>L-CARNITINE - 500 mg, 30 veg. caps</td>
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<tr>
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<tr>
<td>01003</td>
<td>CAT MIX - 100 grams powder</td>
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<td>11.25</td>
<td>1</td>
<td>15.00</td>
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<tr>
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<td>CHILDREN’S FORMULA LIFE EXTENSION MIX™ - 100 chewable tablets</td>
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<tr>
<td>00559</td>
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<tr>
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<td>$14.63</td>
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<td>$19.50</td>
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<tr>
<td>01699</td>
<td>BREAST HEALTH FORMULA - 60 veg. caps</td>
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<td>12.75</td>
<td>1</td>
<td>17.00</td>
</tr>
<tr>
<td>00893</td>
<td>BRUTE EYES III - 2 vials, 5 ml each</td>
<td>34.00</td>
<td>25.50</td>
<td>1</td>
<td>34.00</td>
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<tr>
<td>01203</td>
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<tr>
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<td>BUTTERBUR EXT. w/STANDARDIZED ROSEMARIN ACID - 60 softgels</td>
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<td>44.00</td>
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<td>24.00</td>
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<tr>
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<td>18.00</td>
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<tr>
<td>01719</td>
<td>L-CARNITINE POWDER NATURAL LEMON FLAVOR - 114 grams</td>
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<td>28.00</td>
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<tr>
<td>01258</td>
<td>CARNISOOthe w/PICROPROTECT™ - 60 veg. caps</td>
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<td>22.46</td>
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<td>29.95</td>
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<tr>
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<td>CARNOSINE (SUPER) - 500 mg, 90 veg. caps</td>
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<td>49.50</td>
<td>1</td>
<td>66.00</td>
</tr>
<tr>
<td>01003</td>
<td>CAT MIX - 100 grams powder</td>
<td>15.00</td>
<td>11.25</td>
<td>1</td>
<td>15.00</td>
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<tr>
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<td>36.00</td>
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<tr>
<td>01391</td>
<td>CHILDREN’S FORMULA LIFE EXTENSION MIX™ - 100 chewable tablets</td>
<td>18.00</td>
<td>13.50</td>
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<td>18.00</td>
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<tr>
<td>00559</td>
<td>CHOLESTRA - 500 mg, 200 tablets</td>
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<td>1</td>
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<tr>
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<td>18.00</td>
<td>1</td>
<td>24.00</td>
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<tr>
<td>01359</td>
<td>CHO-LEES™ - 90 capsules</td>
<td>32.50</td>
<td>24.38</td>
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<td>32.50</td>
</tr>
<tr>
<td>01477</td>
<td>CHROMIUM ULTRA - 100 veg. caps</td>
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<td>18.00</td>
<td>1</td>
<td>24.00</td>
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<tr>
<td>01504</td>
<td>CHROMIUM w/CROMINEX® 3+ (OPTIMIZED) - 500 mcg, 60 veg. caps</td>
<td>8.00</td>
<td>6.00</td>
<td>1</td>
<td>8.00</td>
</tr>
</tbody>
</table>

SUB-TOTAL OF COLUMN 3

LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS

SUB-TOTAL OF COLUMN 4

SEPTEMBER 2013

To order online visit: www.LifeExtension.com
Buysers Club Order Form

<table>
<thead>
<tr>
<th>No.</th>
<th>Retail Each</th>
<th>Member Each</th>
<th>Qty</th>
<th>Total</th>
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<td>80118</td>
<td>COSMESIS ANTI-AGING MASK - 2 oz</td>
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<td>COSMESIS ANTI-REDNESS &amp; ADULT BLEMISH LOTION - 1 oz</td>
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<td>COSMESIS BIOFLAVONOID CREAM - 1 oz jar</td>
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<td>COSMESIS BROCCOLI SPROUT CREAM - 1 oz jar</td>
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<tr>
<td>80120</td>
<td>COSMESIS CORRECTIVE CLEARING MASK - 2 oz</td>
<td>$64.50</td>
<td>$48.38</td>
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<tr>
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<td>COSMESIS DNA REPAIR CREAM - 1 oz jar</td>
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<td>COSMESIS ESSENTIAL PLANT LIPIDS REPARATIVE SERUM - 1 oz jar</td>
<td>$74.50</td>
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<td>80123</td>
<td>COSMESIS FACE REJUVENATING ANTIOXIDANT CREAM - 2 oz</td>
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<td>COSMESIS FINE LINE-LESS - 1 oz</td>
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<td>COSMESIS HAIR SUPPRESS FORMULA - 4 oz</td>
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<td>COSMESIS HEALING FORMULA ALL-IN-ONE CREAM - 1 oz</td>
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<td>COSMESIS HEALING MASK - 2 oz</td>
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<td>COSMESIS HEALING VITAMIN K CREAM - 1 oz</td>
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<td>COSMESIS HYALURONIC FACIAL MOISTURIZER - 1 oz</td>
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<td>COSMESIS HYALURONIC OIL-FREE FACIAL MOISTURIZER - 1 oz</td>
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<td>COSMESIS HYDRATING ANTIOXIDANT FACE MIST - 4 oz</td>
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<td>COSMESIS LIFTING &amp; TIGHTENING COMPLEX - 1 oz</td>
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<td>COSMESIS LYCOPENE CREAM - 1 oz jar</td>
<td>$28.00</td>
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**SUB-TOTAL OF COLUMN 5**

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<td>COSMESIS MELATONIN CREAM - 1 oz</td>
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<td>COSMESIS MILDE FACIAL CLEANSER - 8 oz</td>
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<td>COSMESIS NECK REJUVENATING ANTIOXIDANT CREAM - 2 oz</td>
<td>$64.00</td>
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<td>80111</td>
<td>COSMESIS PIGMENT CORRECTING CREAM - 1/2 oz</td>
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<td>80106</td>
<td>COSMESIS REJUVENATING SERUM - 1 oz</td>
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<td>80150</td>
<td>COSMESIS RENEWING EYE CREAM - 1/2 oz</td>
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<td>80142</td>
<td>COSMESIS REJUVENATING ANTI-OXIDANT SERUM - 1 oz</td>
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<td>COSMESIS SKIN LIGHTENING SERUM - 1 oz</td>
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<td>80130</td>
<td>COSMESIS SKIN STEM CELL SERUM - 1 oz</td>
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<td>80143</td>
<td>COSMESIS STEM CELL CREAM W/ALPINE ROSE - 1 oz jar</td>
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<td>COSMESIS TIGHTENING &amp; FIRMING NECK CREAM - 2 oz</td>
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<td>80116</td>
<td>COSMESIS ULTRA LIP PLUMPER - 1/3 oz</td>
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<td>80101</td>
<td>COSMESIS ULTRA WRINKLE RELAXER - 1 oz</td>
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<td>COSMESIS UNDER EYE REFINING SERUM - 1/2 oz</td>
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<td>80104</td>
<td>COSMESIS UNDER EYE REJUVENATING CREAM - 1/2 oz</td>
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<td>80129</td>
<td>COSMESIS VITAMIN C SERUM - 1 oz</td>
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<td>80136</td>
<td>COSMESIS VITAMIN D LOTION - 4 oz</td>
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<td>80145</td>
<td>COSMESIS VITAMIN E-ESSENTIAL CREAM - 1 oz</td>
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<td>80149</td>
<td>COSMESIS YOUTH SERUM - 1 oz</td>
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<td>00662</td>
<td>CRAN-MAX® - 500 mg, 60 veg. caps</td>
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<tr>
<td>01424</td>
<td>CRAN-MAX® with UTI/ROSE™ (OPTIMIZED) - 60 veg. caps</td>
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<tr>
<td>01529</td>
<td>CREATINE CAPSULES - 120 veg. caps</td>
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<tr>
<td>01746</td>
<td>CREATINE WHEY GLUTAMINE POWDER - 454 grams (vanilla)</td>
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<td>01429</td>
<td>CR MIMETIC LONGEVITY FORMULA - 60 veg. caps</td>
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<td>533840</td>
<td>CRWAY GREAT GLUCOSE CONTROL CD</td>
<td>$98.00</td>
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<td>00047</td>
<td>CURCUMIN® (SUPER BIO) - 400 mg, 60 veg. caps</td>
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**SUB-TOTAL OF COLUMN 6**
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<tr>
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<td>7-KETO® DHEA METABOLITE - 25 mg, 100 caps</td>
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<td>01479</td>
<td>7-KETO® DHEA METABOLITE - 100 mg, 60 veg. caps</td>
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<tr>
<td>01640</td>
<td>DHA (VEGETARIAN SOURCED) - 200 mg, 30 veg. softgels</td>
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<td>00607</td>
<td>DHEA - 25 mg, 100 tablets (dissolve in mouth)</td>
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<td>01478</td>
<td>DHEA COMPLETE - 60 veg. caps</td>
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<td>00335</td>
<td>DHEA - 25 mg, 100 caps</td>
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<td>00454</td>
<td>DHEA - 15 mg, 100 caps</td>
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<td>00882</td>
<td>DHEA - 50 mg, 60 caps</td>
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<td>01689</td>
<td>DHEA - 100 mg, 60 veg. caps</td>
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<td>01358</td>
<td>DIGEST RC - 30 tablets</td>
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<td>01272</td>
<td>DIGESTIVE ENZYMES (ENHANCED SUPER) - 100 veg. caps</td>
<td>18.95</td>
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<td>01671</td>
<td>D,L-PHENYLALANINE CAPSULES - 500 mg, 100 veg. caps</td>
<td>18.75</td>
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<td>01540</td>
<td>DMNE BITARTRATE - 150 mg, 200 veg. caps</td>
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<td>00059</td>
<td>DMG - 125 mg, 60 tablets</td>
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<td>01570</td>
<td>DNA PROTECTION FORMULA - 60 veg. caps</td>
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<td>00544</td>
<td>DOG MIX - 100 grams powder</td>
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<td>00321</td>
<td>DR. PROCTOR'S ADVANCED HAIR FORMULA - 2 oz</td>
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<td>00320</td>
<td>DR. PROCTOR'S HAIR FORMULA SHAMPOO - 8 oz</td>
<td>24.95</td>
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<td>00899</td>
<td>DUAL-ACTION MICRODERMABRASION ADV. EXFOLIATE - 2.4 oz</td>
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<td>01528</td>
<td>ECHINACEA EXTRACT - 250 mg, 60 veg. caps</td>
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<tr>
<td>01498</td>
<td>ENDOTHELIAL DEFENSE™ w/FULL-SPECTRUM POMEGRANATE™ - 60 softgels</td>
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<td>00997</td>
<td>ENDOTHELIAL DEFENSE™ w/GLISODIN® - 60 veg. caps</td>
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<td>00625</td>
<td>EPA/DHA (MEGA) - 120 softgels</td>
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<td>EUROPEAN LEG SOLUTION DIOSMIN 95 - 600 mg, 30 veg. tabs</td>
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<td>01706</td>
<td>EXTRAORDINARY ENZYMES - 60 caps</td>
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<td>EYE PRESSURE SUPPORT w/MIRTGENOL® - 30 veg. caps</td>
<td>38.00</td>
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**SUB-TOTAL OF COLUMN 7**

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<td>FACE MASTER® PLATINUM</td>
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<td>FAST-ACTING JOINT FORMULA - 30 caps</td>
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<td>FAST-C® w/DIHYDROQUERCETIN - 120 veg. tabs</td>
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<td>20053</td>
<td>FEM DOPHILUS® - 30 caps</td>
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<td>FEM DOPHILUS® - 60 caps</td>
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<td>FEMMENESSENCE MACAPAUSE® - 120 veg. caps</td>
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<td>FERNBLOCK® w/RED ORANGE COMPLEX (ENHANCED) - 30 veg. caps</td>
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<td>FIBER FOOD CAPS - 200 veg. caps</td>
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<td>FIBRINOVEN RESIST™ - 30 veg. caps</td>
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<td>FOLATE (OPTIMIZED) (L-METHYLFOLATE) - 1000 mcg - 100 veg. caps</td>
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<td>01641</td>
<td>FOLIC ACID + B12 CAPSULES - 200 veg. caps</td>
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<td>FORSKOLIN - 10 mg, 60 veg.caps</td>
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<td>FUCOIDAN w/MARITECH® 926 (OPTIMIZED) - 60 veg. caps</td>
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<td>00993</td>
<td>FUCOXANTHIN-SLIM® - 90 softgels</td>
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<td>GAMMA E TOCOPHEROL/TOCOTRIENOLS - 60 softgels</td>
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<td>01394</td>
<td>(OPTIMIZED) GARLIC - 200 veg. caps</td>
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<td>01301</td>
<td>GHI PITUITARY SUPPORT DAY FORMULA - 120 vegetarian tabs</td>
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<td>GHI PITUITARY SUPPORT NIGHT FORMULA - 120 veg. caps</td>
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<td>01228</td>
<td>GINGER FORCE - 60 softgels</td>
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<td>01658</td>
<td>GINKGO BILOBA CERTIFIED EXTRACT™ - 120 mg, 365 veg. caps</td>
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<tr>
<td>01648</td>
<td>GINKGO EXTRACT 28/7 (SUPER) - 120 mg, 100 veg. caps</td>
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<td>00756</td>
<td>GLA WITH SESAME LIGNANS (MEGA) - 60 softgels</td>
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<td>00345</td>
<td>(L)-GLUTAMINE CAPSULES - 500 mg, 100 caps</td>
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<td>00141</td>
<td>(L)-GLUTAMINE POWDER - 100 grams</td>
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<td>GLUCOSAMINE/CHONDROITIN CAPSULES - 100 caps</td>
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<tr>
<td>01541</td>
<td>GLUTATHIONE, CYSTEINE &amp; C - 100 veg. caps</td>
<td>20.00</td>
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**SUB-TOTAL OF COLUMN 8**

LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS

SEPTEMBER 2013
### Buyers Club Order Form

#### Do not hallucinate.

#### Raw Text Content

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<thead>
<tr>
<th>No.</th>
<th>G CONTINUED</th>
<th>Retail Each</th>
<th>Member Each</th>
<th>Qty</th>
<th>Total</th>
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<tbody>
<tr>
<td>00314</td>
<td>L-GLUTATHIONE (MEGA) - 250 mg, 60 caps</td>
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<tr>
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<td>Buy 4 bottles, price each</td>
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<td>01731</td>
<td>GLYCEMICPRO™ TRANSGLUCOSIDASE - 60 veg. caps</td>
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<td>Buy 4 bottles, price each</td>
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<td>GLYCINE - 1,000 mg, 100 veg. caps</td>
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<tr>
<td></td>
<td>Buy 4 bottles, price each</td>
<td>10.80</td>
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**Note:** The table continues with products listed under categories such as I, J, K, etc., each with their respective retail and member pricing, quantity, and total. Products listed include various dietary supplements, such as vitamins, minerals, and herbal extracts, each with specific quantities and prices for both regular and member purchases. The footer includes a note on life extension members receiving 25% off the retail price of all products, and a call to order with provided phone numbers.
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<tr>
<th>No.</th>
<th>Description</th>
<th>Retail Each</th>
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<th>Qty</th>
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**SUB-TOTAL OF COLUMN 11**

**SUB-TOTAL OF COLUMN 12**

Life Extension Members receive 25% off the retail price of all products September 2013
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**To order call: 1.954.766.8433 or 1.800.544.4440**

**CONTINUED**

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<thead>
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<th>No.</th>
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<th>Retail Each</th>
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**Sub-Total of Column 13**

**Sub-Total of Column 14**

**SEPTEMBER 2013**

**LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS**
### Buyers Club Order Form

**To order online visit: www.LifeExtension.com**

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**SUB-TOTAL OF COLUMN 15**

**SUB-TOTAL OF COLUMN 16**

**LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS**

**SEPTEMBER 2013**
Buyers Club Order Form

To order call: 1.954.766.8433 or 1.800.544.4440

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* These products are not 25% off retail price.
** Not eligible for member discount or member renewal product credit.
*** Due to license restrictions, this product is not for sale to customers outside of the USA.
† Member pricing not valid on this item.
†† Due to license restrictions, this product is not for sale to Canada.

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Two Per Day

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Name

Address

City     ST     ZIP

Email

Phone

☐ Check enclosed (payable to Life Extension Foundation®)

☐ Charge my cc:

Card #     Exp.
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Jarrow Formulas® is a probiotic pioneer and has a complete line of probiotic products, including the #1 seller in the U.S.† - Jarro-Dophilus EPS®.

† #1 in Unit Volume in the Natural Channel, according to SPINS, a market research and consulting firm for the Natural Product Industry (SPINScan Natural, 52 Weeks Ending 06/01/2012).

www.Jarrow.com

To order 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.
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Theralac®
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A Partnership in Heart Health

New Chapter Zyflamend & Life Extension Super Omega-3

A Holistic Approach to Cardiovascular Health

Maintaining heart health and a strong cardiovascular system are vital to a healthy body. Diet and exercise are the most important factors. Scientists and doctors both agree that a program of preventive health today is preferable to a treatment program tomorrow. But unfortunately, most Americans don’t eat enough heart-healthy foods or get enough exercise. We now know that there are several additional factors that can support cardiovascular health, including:

- Supporting the body’s healthy inflammation response
- Consuming “good fats” such as Omega-3 fatty acids

What is the Inflammation Response?

Our body’s inflammation response is a natural healing process. We often think of the inflammation response as something we can feel—such as in our joints and muscles where there are large numbers of sensitive nerve endings. But we can also have a response we can’t feel, where sensitive nerves aren’t concentrated—including in the heart and blood vessels. Whether we’re aware of it or not, this inflammation response can affect every organ and cell.

Extensively Researched Herbal Blend

New Chapter’s Zyflamend represents a scientific breakthrough in supporting a healthy inflammation response.* Zyflamend is formulated based on a large body of scientific research showing its ten herbs and spices contain hundreds of plant compounds that support a healthy inflammation response.* Just as important as a daily multivitamin, Zyflamend is the patented herbal protocol to help your whole body’s natural inflammation process stay balanced and healthy every day.* Zyflamend has been studied at leading research institutions and shown to benefit multiple areas of health, including heart health.*

Super Omega-3
120 Softgels Item #01482
Retail Price: $32.00
Member Price: $24.00

Zyflamend
120 Softgels Item #01051
Retail Price: $66.95
Member Price: $45.11

Omega-3 is Important for Cardiovascular Health

Life Extension’s Super Omega-3 is a premium, scientifically validated fish oil concentrate. Super Omega-3 EPA/DHA with Sesame Lignans and Olive Fruit Extract promotes a healthy heart.† Fish oils (and other fatty acids) have a tendency to oxidize, rendering them nutritionally inferior. Scientific studies show that when added to fish oil, sesame lignans safeguard against oxidation and direct fatty acids toward pathways that help with inflammatory reactions.‡ To further emulate the benefits of a Mediterranean diet, Super Omega-3 delivers standardized, high-potency olive fruit extract. Research shows that when combined with olive oil, fish oil supplements help with inflammation better than fish oil alone.§


To order Zyflamend or Super Omega-3, call 1-800-544-4440 or visit www.LifeExtension.com

* These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
Top Off Your TESTOSTERONE Naturally

Low Testosterone Levels May Lead to:
Reduced Sex Drive • Less Energy
Cloudy Thinking • Weight Gain
Cardiovascular Issues

Maintaining healthy testosterone levels is one of the most important steps you can take to regain your health and improve your performance. With research showing that by the time a man is 60 years old, he may produce 60% less testosterone than he did in his 20s, the time is now to add Life Extension’s Super MiraForte with Standardized Lignans to your supplement regimen.

Each daily dose of Super MiraForte with Standardized Lignans contains the following testosterone supporting ingredients:
- 1500 mg Chrysin
- 15 mg Bioperine®
- 850 mg Muira puama
- 282 mg Nettle root
- 15 mg Chelated elemental zinc
- 320 mg Maca
- 33.4 mg HMRlignan™
- Norway Spruce lignan extract

The retail price for a bottle of 120 capsules of Super MiraForte with Standardized Lignans is $62. If a member buys four bottles, the price is reduced to $42 per bottle.

To order Super MiraForte with Standardized Lignans call 1-800-544-4440 or visit www.LifeExtension.com


Caution: If you are taking any medication, use only under physician supervision. Men with existing prostate cancer may not be able to use this product. Elevations in free testosterone can unmask an occult (hidden) prostate cancer. Anyone with this concern should have a baseline PSA prior to using this product and a follow-up PSA test 60 days later. If a significant elevation of PSA is found, discontinue this product and advise physician. Do not take more than 15 mg per day of Bioperine®.

Bioperine® is a registered trademark of Sabinsa Corp. HMRlignan™ is a registered trademark used under sublicense from Linnea S.A.

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.
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