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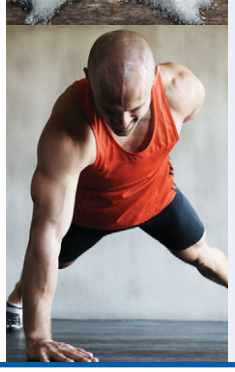

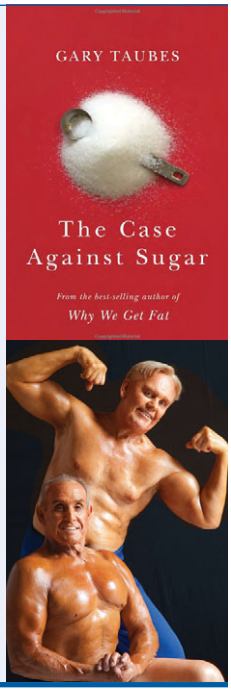

LifeExtension® Magazine

October 2017

Volume Twenty Three / Number Ten

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

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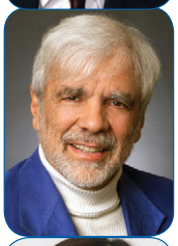

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Not Fit for Human Consumption

BY WILLIAM FALOON

Back in year **1854**, a pioneering physician in London made a heroic effort to demonstrate that drinking **feces-laden** water was dangerous.[1]

Contaminated water breeds bacteria like **cholera** that kill an estimated **95,000** people a year worldwide where **feces-ingestion** continues.[2]

Cigarettes caused greater mortality before the lethal dangers were exposed. Tobacco remains a leading reason for premature death.[3,4]

Sugar may be killing more people than **cholera** or **tobacco**.

If history is any guide, the majority will continue to ingest excess **glucose-spiking** sugars and starches despite the **life-shortening** impact.

The magnitude of today's **carnage** calls for stronger public-health initiatives.

Put simply, there is no reason to add **sugar** to food or drinks. This includes high-fructose corn syrup, high-fructose juices, sucrose, and **starches** that spike blood **glucose** levels.[5-8]

To better understand today's epidemic of **obesity** and **diabetes**, the chart on the next page reveals the surging increase in human **sugar consumption**.

From a nutritional standpoint, there is no need for people to consume **sugars** or **starches**. While **glucose** is essential to sustain life, plenty of **glucose** is synthesized in our liver from **protein** and **fats** we ingest. This natural internal production of glucose is called "**gluconeogenesis**."

The public has been slow to give up their **sugar** addiction. What I find interesting are people who would never tolerate **tobacco** or **feces-laden water**, but have little concern about their **sugar/starch** consumption.

This month's issue describes a major advance in lowering **glucose** and **insulin** blood levels. This natural approach applies not only to those with **diabetic** concerns, but also maturing people seeking to protect against **glucose/insulin toxicity**.

The take-home message is that **sugar** is not fit for human consumption. For those unwilling to alter their diet, novel nutrient extracts have been shown to suppress after-meal **glucose/insulin** blood levels while lowering **hemoglobin A1C**.

It's hard to perceive that something you have consumed your entire life is deadly.

Sugar is so ubiquitous that you might assume people always used it.

The reality is that refined **sugar** consumption has been virtually **zero** throughout most of human history.

In **1700**, for instance, the average person in England is estimated to have consumed about **four pounds** of refined sugar a year. Annual **refined sugar** ingestion has now shot up to over **100 pounds**.[9]

Excess **sugar ingestion** is a factor behind surging rates of obesity,[10-12] cancer,[13-17] vascular disorders,[18-27] dementia,[28-31] and type II diabetes.[11,32-34]

A large part of today's **healthcare cost crisis** could be resolved if people went back to ingesting little or no **sugar**.

How Sugar Addiction Began

When Europeans colonized the Americas, they transmitted infectious illnesses like **smallpox** that decimated native populations that lacked natural immunity against these pathogens.

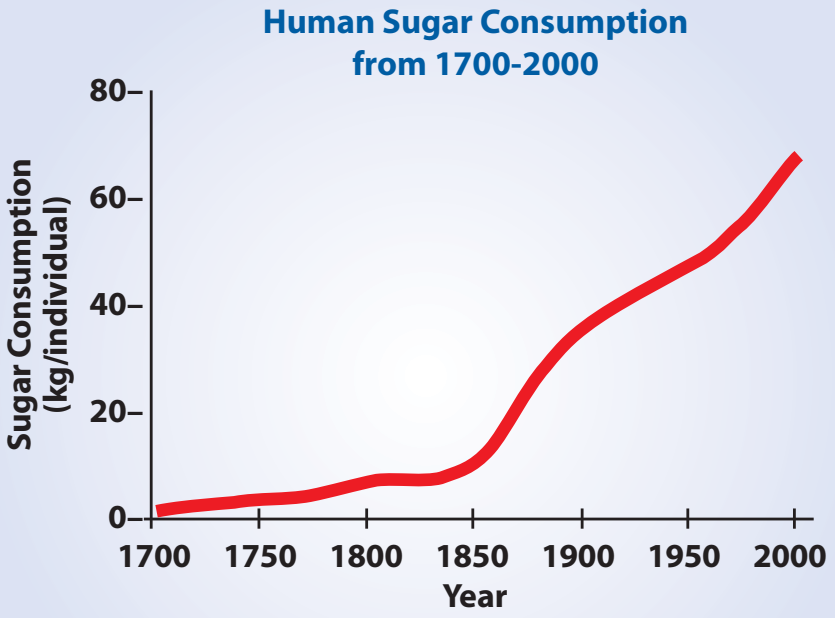
Native Americans in turn taught Europeans about **tobacco** and **sugar cane**, which unknowingly began killing off people who began smoking tobacco and eating refined sugar.

Since average lifespans in the 1700s-1800s were so short, the impact of these poisons (tobacco and sugar) went largely unrecognized.

Sugar reached Europeans in the 1200s from South Asia, but it was so expensive that only the wealthy could afford it. As sugar plantations emerged in the Americas, prices plummeted and a sugar craze was ignited in Europe.

The impact of society's sugar addiction is a global medical crisis that has been centuries in the making.

It's now time to classify **sugar** as a **toxin** analogous to **tobacco**, with harsh warning labels on **high glycemic** food/drink, along with restricted sales to **children**.



General increase in human sugar consumption over past 300 years. Data from 1700-1978 is from UK and data from 1975-2000 is from the US. Not reflected are temporary declines in sugar intake during major wars when food supplies were disrupted.[9]

Similar to how the tobacco industry deceived the public in the 1950s, those selling glucose-spiking foods/beverages today conveniently overlook the lethal consequences.

Is Sugar a Carcinogen?

The history of **sugar** and **tobacco** are closely aligned. Both were initially thought to be harmless. It took centuries for the public to realize the dangers of tobacco.

The scourge of **sugar-inflicted** disease has yet to be recognized by the medical profession.

We at **Life Extension®** advise **cancer patients** to stop all simple **sugar** consumption and cut back on glucose-spiking **starches** like rice, bread, and other wheat/corn products.

Excess **glucose** feeds rapidly dividing **malignant** cells.[35-37] The high **insulin** release that occurs in response to **sugar/starch** ingestion promotes cancer cell proliferation.[38-40]

Researchers at **MD Anderson** last year uncovered another mechanism by which high sugar intake increases **breast cancer** risk and facilitates **lung cancer** metastasis. In the rodent model, high sucrose or fructose intake increases **inflammatory** pathways involved in **cancer** initiation and metastasis.[41]

The volume of data pointing to **sugar** as a probable **carcinogen** is frightening in light of today's excess consumption of **high glycemic** food/drink.[13,14,42,43]

Advertising from the 1950s promoted the nonexistent health benefits of cigarettes.

Our Bodies do not Need Exogenous Sugar

Glucose is essential to sustaining life. So much so that our bodies have developed efficient mechanisms to ensure most of us always maintain adequate blood glucose levels.

In between meals, glucose is created from the breakdown of glycogen in our liver and muscles. Our liver can also utilize **proteins/fats** and convert them to **glucose** via a process called **gluconeogenesis**.

Just imagine the challenges our ancestors faced in wintry months when the only food source was meat. Without the ability to convert the proteins/fat in meat to glucose, early man would not have survived these long periods without access to carbohydrates.

Move forward to modern times. **Sugar/starch** ingestion has surged, but our aging cells have lost much of their **insulin sensitivity**.

So in response to excess **sugar-starch** ingestion, our cells are unable to fully utilize **glucose** because they are resistant to **insulin**. But our liver keeps synthesizing more **glucose** (via gluconeogenesis) and pouring it into our blood. The result for many aging people is constant **glucose/insulin** overload.

These facts make it clear that humans should not ingest significant quantities of **refined sugars**. Even when no simple sugars or starches are consumed, some people still have higher-than-optimal blood glucose/insulin because their livers overproduce **glucose**.

Those who practice strict **calorie restriction** maintain low fasting and after-meal **glucose/insulin** levels.[44] Few, however, are willing to chronically undereat.

An urgent need exists to enable typical people to lower their blood glucose and insulin levels. But studies have shown sugar to be **addictive** in a manner analogous to **cocaine**, according to one published report.[45]

Danger of Excess Insulin

Blood **glucose** increases in response to sugar/starch ingestion, overproduction of glucose (gluconeogenesis) in our liver, and other factors related to aging.

Our **pancreas** responds to glucose by secreting lots of **insulin**, sometimes in a chronic state termed **hyperinsulinemia**.

The problem is that as aging cells become **insulin resistant**, glucose blood levels remain **high** even as the pancreas secretes more **insulin** in an attempt to drive glucose into cells.

Some **prediabetics** will maintain normal **fasting glucose** for years because their pancreas secretes huge amounts of **insulin** that drive down blood **glucose** levels.

Elevated **insulin** has been correlated with virtually every **diabetic** disorder.[46-50]

As has been extensively reported for decades in ***Life Extension Magazine®***, those with elevated **insulin** have sharply higher incidences of degenerative disorders.[51-60]

The encouraging news is that natural **plant extracts** have been identified that can lower cell-damaging **insulin surges**.

When cigarette smoking was so ubiquitous, the public was largely unaware of the dangers of tobacco, analogous to how refined sugar products are marketed today.

Slash Post-Meal Glucose and Insulin

In youth, our body responds to a meal by secreting enough **insulin** to drive **glucose** into cells for energy production or fat storage.

In healthy young individuals, once blood glucose drops to a safe level, insulin production subsides. A delicate balance is then maintained as glucose is modestly released from the liver (gluconeogenesis) along with modest pancreatic insulin secretion.

With aging, our **cells** become **insulin resistant** and lose their ability to efficiently take up glucose. This creates a vicious cycle whereby the pancreas oversecretes **insulin** in what can be a futile attempt to drive **glucose** into cells.

The pathological impact is chronically elevated **glucose** and **insulin** levels.

Despite most aging individuals having too much blood **glucose** and **insulin**, they continue to gorge on refined **sugars** and **starches**. This sets the stage for today's health crisis of **obesity** and **type II diabetes**.[61]

A novel solution has been discovered utilizing natural **plant extracts** that slash ***after-meal*** insulin by as much as **56%** along with impressive reductions in ***after-meal*** glucose and a **0.3%** drop in **hemoglobin A1C** (from **5.65%** to **5.35%**).[62,63]

The unique mechanisms by which these plants function are described in an article that begins on page 26 of this issue.

I hope people reading this editorial will reduce their simple sugar intake to virtually **zero** while cutting back on glucose-spiking starches (rice, white bread, potatoes, corn, etc.).

For those unable to achieve optimal **glucose/insulin** blood levels, the availability of clinically-tested **plant extracts** should provide welcome respite from the impact of glucose-spiking calories.

For longer life,

William Faloon, Co-Founder
Life Extension Buyers Club

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Tribute to a Medical Pioneer—Dr. John Snow (1813-1858)

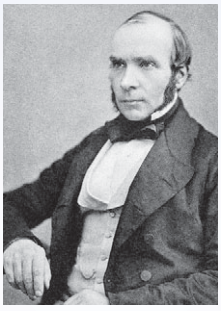
John Snow, MD, is the genius who created the modern science of epidemiology.[1]

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]

Physicians at that time had not yet recognized the "***germ theory***" of disease. Dr. Snow nonetheless concluded that **contaminated water** was the source of a self-replicating **poison** that was killing thousands of London residents.

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

The **medical establishment** did not agree with Dr. Snow's admonition to avoid contaminated drinking water.



Physicians in **1854** attributed cholera and other enteric diseases to the foul smelling gases produced by piles of rotting garbage and raw sewage that characterized London at that time.[1]

Mainstream medicine continues to overlook **proven** methods to prevent, mitigate, or eradicate chronic disorders. The result is that many Americans today 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.

Future historians are likely to lump excessive consumption of **simple sugars** in the same way we view detrimental habits such as tobacco use and unhygienic practices.

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Increased Magnesium Linked to Lower Diabetes Risk

The results of a systematic review and meta-analysis found an association between increasing **magnesium** intake levels and a lower risk of type II diabetes.*

Xin Fang of the Karolinska Intitutet in Stockholm, along with his colleagues, selected for their analysis 25 studies involving a total of 637,922 subjects. Dietary questionnaire responses were analyzed for the amount of magnesium consumed.

Over the course of 4 to 20 years of follow-up, 26,828 cases of type II diabetes were diagnosed.

In comparison with the lowest magnesium consumption group in the meta-analysis population, men whose magnesium intake was higher had a **16%** lower risk of developing diabetes and women had a **19%** lower risk. For each **100 mg**-per-day increase in magnesium intake, the adjusted risk of type II diabetes was reduced by **8%** to **13%**.

Editor's Note: The combined data support a role for magnesium in reducing risk of [type II diabetes], with a statistically significant linear dose-response pattern within the reference dose range of dietary intake among Asian and US populations.

**Nutrients*. 2016 Nov 19;8(11).

Supplement Combo Increases Bone Mineral Density

A trial reported in *Aging* found benefits for a combination of **melatonin**, **strontium citrate**, **vitamin D3** and **vitamin K2** in postmenopausal women with osteopenia, a precursor to osteoporosis.*

The study included 11 women who received a placebo and 11 who received **5 mg** of melatonin, **450 mg** of strontium, **2,000 IU** of vitamin D3 and **60 mcg** of K2 nightly for one year. Bone mineral density, 25-hydroxyvitamin D, and C-reactive protein levels were measured at the beginning and end of the study. Bone turnover rate was assessed by the evaluation of markers in blood samples collected at baseline and months six and 12.

Those who received the nutritional supplements experienced a **4.3%** average increase in bone mineral density in the lumbar spine, a **2.2%** increase in femoral neck density and a trend toward an increase in total left hip density, along with a reduction in bone turnover in comparison with the placebo group.

Editor's Note: Mood and quality of sleep also improved among those who received the nutrients, and C-reactive protein levels significantly declined.

**Aging (Albany NY)*. 2017 Jan; 9(1): 256–285.

Nicotinamide Riboside Supplementation Restores Lost Muscles

A study published in the journal *Cell Metabolism* found potential benefit for supplementation with the NAD precursor **nicotinamide riboside** in muscle maintenance.*

NAD (nicotinamide adenine dinucleotide) is a compound made in the body that supports the mitochondria which serve as cells' power plants, but it declines with age.

The University of Pennsylvania's Joseph Baur, PhD, and colleagues genetically modified mice so the amount of NAD could be restricted to mimic normal aging. While the mice initially tolerated an **85%** decline in intramuscular NAD without loss of spontaneous activity or exercise endurance, they began to experience weakness and muscle-fiber atrophy in early adulthood.

But giving the mice **nicotinamide riboside** resulted in complete reversal of muscle decline.

Researchers also discovered that overexpression of an enzyme known as Nampt, which is involved in making NAD, prevented NAD from declining over the life of the animal and helped preserve exercise capacity. "This was supporting evidence that strategies to enhance muscle NAD synthesis might help to combat age-associated frailty," lead author Dr. David W. Frederick remarked.

Dr. Baur plans to investigate whether restoring NAD could improve specific aspects of muscular dystrophy.

Editor's Note: "[The mice's] muscle tissue looked like that of Duchene's muscular dystrophy [DMD] patients," reported Dr. Baur. "The genes that were turned on and the presence of inflammatory immune cells in the muscles lacking NAD looked very similar to what we see in DMD."

**Cell Metab.* 2016 Aug 9;24(2):269-82.

Alcohol Increases Cancer Risk

The World Cancer Congress reports that consumption of **alcohol** caused over 700,000 cancer cases and about 366,000 **cancer** deaths in 2012.*

Researchers looked at data comparing the cancer risk of drinkers against that of teetotalers. They found that alcohol was responsible for approximately **5%** of new cancer cases per year, as well as **4.5%** of terminal cases.

At one-in-four cases, breast cancer was the type most closely linked to alcohol consumption. Colorectal cancer, at **23%**, was next. In the case of breast cancer, it was especially clear that risk increases with the amount of alcohol consumed, according to study coauthor Kevin Shield of the International Agency for Research on Cancer (IARC).

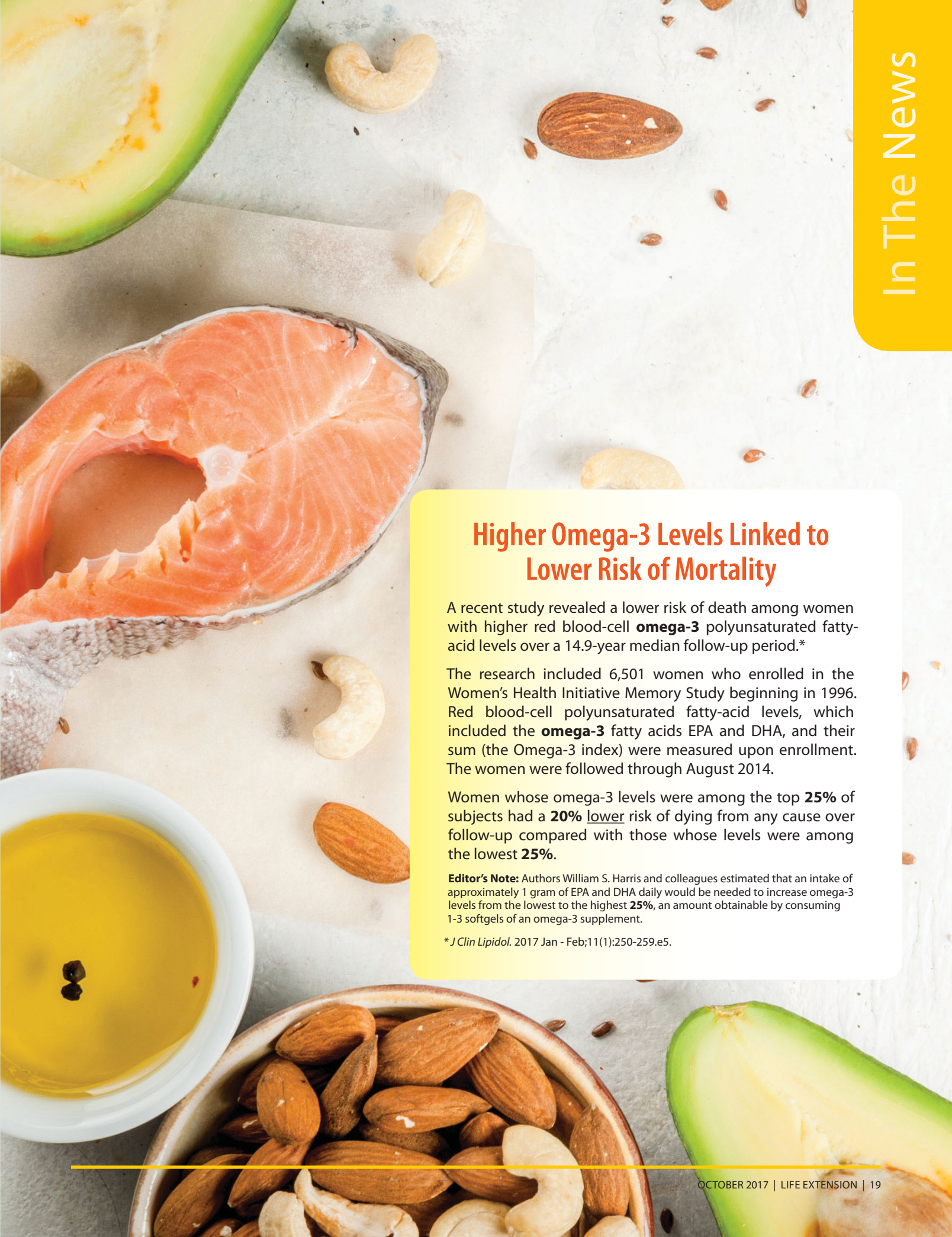
"A large part of the population is unaware that cancer can be caused by alcohol," said Shield.

Regarding deaths, researchers found esophageal cancer and colorectal cancer were the types most strongly linked to alcohol.

Alcohol is considered a "group 1 carcinogen" by the IARC, meaning it's known to cause cancer, but the exact mechanism is currently unknown.

Editor's Note: The report found the majority of alcohol-related cancers were in the US, Australia and Eastern Europe, although developing nations are gradually catching up as drinking becomes more prominent in those areas.

*Available at: https://medicalxpress.com/news/2016-11-alcohol-cancer-toll-revealed.html. Accessed July 10, 2017.



Higher Omega-3 Levels Linked to Lower Risk of Mortality

A recent study revealed a lower risk of death among women with higher red blood-cell **omega-3** polyunsaturated fatty-acid levels over a 14.9-year median follow-up period.*

The research included 6,501 women who enrolled in the Women's Health Initiative Memory Study beginning in 1996. Red blood-cell polyunsaturated fatty-acid levels, which included the **omega-3** fatty acids EPA and DHA, and their sum (the Omega-3 index) were measured upon enrollment. The women were followed through August 2014.

Women whose omega-3 levels were among the top **25%** of subjects had a **20%** lower risk of dying from any cause over follow-up compared with those whose levels were among the lowest **25%**.

Editor's Note: Authors William S. Harris and colleagues estimated that an intake of approximately 1 gram of EPA and DHA daily would be needed to increase omega-3 levels from the lowest to the highest **25%**, an amount obtainable by consuming 1-3 softgels of an omega-3 supplement.

* *J Clin Lipidol.* 2017 Jan - Feb;11(1):250-259.e5.

Greater Micronutrient Intake Associated with Lower Kidney Disease Risk

An article in *Nutrients* reports a lower risk of developing chronic kidney disease among men and women who consumed higher amounts of specific **micronutrients** in comparison with those who consumed lower amounts.*

The investigation utilized data from the Tehran Lipid and Glucose Study, which enrolled 15,005 participants between 1990 and 2001. Follow-up examinations were conducted every three years to update dietary and other measurements. The current study included 1,692 participants in the third follow-up survey, who were followed through 2009-2011. Dietary questionnaire responses provided information concerning nutrient intake.

Subjects whose folate levels were among the top **20%** of participants had a **56%** lower risk of developing chronic kidney disease over follow-up compared to those whose intake was among the lowest **20%**. For those whose intake of vitamins B12, C, D and E were among the top fifth, the risk was lower by **43%**, **62%**, **61%** and **55%** respectively.

Editor's Note: Among minerals, an intake of magnesium that was among the top **20%** was associated with a **59%** lower risk of chronic kidney disease, and for the top intake of potassium, the risk was **53%** lower.

* *Nutrients.* 2016 Apr 20;8(4):217.

Just-Published Protocols in the *Disease Prevention and Treatment* Book

The scientists and writers at **Life Extension®** continuously update the online *Disease Prevention and Treatment* protocol chapters based on the latest research. Recent updates are briefly summarized here with complete versions of these chapters and references available online at:

http://www.lifeextension.com/Protocols

Cancer Chemotherapy

Chemotherapy is a powerful tool in the fight against cancer, but side effects and less-than-ideal drug selection methods have often precluded optimal results.

There are labs available that perform advanced **chemosensitivity testing** and **genetic profiling** to help improve drug selection to better match treatment selection to an individual's cancer.

Intermittent fasting has been shown to ease chemotherapy side effects and may even enhance cancer cells' susceptibility to chemotherapy. Research suggests that the antidiabetic drug metformin, and the spice constituent **curcumin**, may help circumvent cancer cells' resistance to some chemotherapy drugs.

This chapter update reviews numerous strategies for mitigating chemotherapy side effects and potentially improving chemotherapy efficacy using novel drugs, lifestyle and dietary changes, and natural interventions.

Updated Hair Loss Protocol

Half of men experience hair loss by age 50. Among women, **40%** lose some hair by age 70. For both genders, pattern hair loss is the most common type, usually associated with an excess of the male hormone dihydrotestosterone, or DHT.

Available drug and surgical treatments for hair loss are plagued by lack of effectiveness and side effects, and, in the case of surgery, by invasiveness and expense.

But new research has uncovered promising novel treatments for hair loss, such as **platelet-rich plasma**, **topical melatonin**, **and topical vitamin D**. Emerging investigations into hair-follicle stem cells' role in regulating hair growth may lead to new treatments.

Moreover, integrative interventions such as **solubilized keratin**, **essential fatty acids, zinc**, and **saw palmetto extract** have been shown to promote healthy hair growth.

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6. *J Transl Med.* 2015;13:79.

Note: **EGCG** is the acronym for **epigallocatechin gallate**, which is the polyphenol in green tea that has demonstrated the most robust health benefits.

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BY MICHAEL CAMPBELL

Even these "healthy" foods spike blood glucose and insulin levels.

NOT SO SWEET: Deadly Impact of *After-Meal* Blood Glucose Spikes

The most dangerous time of the day is often right after you eat.

That's when **insulin** and **glucose** flood your bloodstream during the digestion of your meal.

Even if you are not **diabetic**, this tidal wave of ***after-meal*** insulin and glucose can cause lasting damage that leads to increased risk of stroke, heart attack, dementia, and diabetes.[1-3]

Life Extension® has expended tremendous effort over the years seeking practical methods to reduce the impact of the **glucose/insulin** spikes that follow most meals.

Scientists have identified two unique plant extracts, **maqui-berry** and **clove extract**, that markedly mitigate ***after-meal*** surges in blood **glucose** and **insulin** levels.

In a human trial, researchers found that standardized **maqui-berry** extract delayed and lowered dangerous after-meal glucose levels *and* reduced after-meal insulin spikes (by a startling **56%** compared to the placebo group).[4]

In another human trial, **clove flower** dropped *after*-meal glucose levels to about the same as the *before*-meal values.[5]

The discovery of **natural compounds** that can safely reduce the impact of *after*-meal increases in **glucose** and **insulin** blood levels has significant public health implications.

After-Meal Glucose and Insulin Accelerate Aging

Glucose and insulin in the bloodstream can rapidly climb after any meal, especially a large meal with concentrated carbohydrates.

This ***after-meal*** surge in glucose and insulin spreads throughout the body several hours following a meal.

That means for several hours each day, our tissues are soaked in a high-glucose/high-insulin environment. During the critical two-hour period following a meal, most experts agree that maximum damage can occur due to the surge in glucose and insulin.[6]

Elevated After-Meal Glucose and Insulin Wreaks Systemic Havoc

When insulin and glucose rapidly surge following high carbohydrate meals, tissues and cells within the body can be damaged.

One result is initiation of **inflammatory** responses that create metabolic havoc.[1,7-9]

This may be viewed as one giant, destructive insult that occurs after almost every meal.

These acute changes, which may not be immediately noticeable, do add up over a lifetime. The result is accelerated aging that can hasten the conditions that lead to premature death.

While this phenomenon is most obvious in people who are true diabetics, every human suffers from damage caused by abnormal postprandial (after-meal) metabolism. A brief list of this constant damage inflicted by abnormal postprandial metabolism:

- Cloudiness of the lens with cataracts
- Degeneration of retinas, which leads to potential blindness
- Decline in brain function that opens the door to dementia, including Alzheimer's disease
- Decline in kidney function, leading to renal failure
- Stiffening of heart muscle and arteries, creating the opportunity for stroke, heart attacks and heart failure – all processes that, given enough time, will occur in any of us

In fact, elevated blood glucose concentrations following a meal are highly predictive of future disease risks, even in people whose ***fasting*** blood glucose levels are normal.[1,10]

Even if you are not diabetic, these ***after-meal*** surges in glucose and insulin create damage. Over time, this leads to a downward spiral that harms every organ in the body and accelerates aging processes.

In fact, glucose levels during the ***after-meal*** period are typically so high that glucose chemically bonds to proteins and fats throughout the body. This process is called ***glycation***.

To reduce glycation-induced aging, we need to find ways to minimize our exposure to excessive blood glucose and insulin.

Maqui-Berry Extract Slows Glucose Absorption

Maqui berries have demonstrated many health benefits.

In a new discovery, **maqui-berry extract** has been shown to lower ***after-meal*** rises in both **glucose** and **insulin**.

Research suggests that a standardized extract of **maqui berries** contains compounds known as ***delphinidins***.

These fruit-based compounds *stimulate* a peptide that lowers postprandial (after-meal) blood **glucose** and can have a moderating influence on **insulin** spikes.[11]

The name of this peptide naturally secreted by the body is **glucagon-like peptide-1** (**GLP-1**).

In the stomach, **GLP-1** has the effect of slowing and delaying emptying. This means that glucose from the meal reaches the absorptive tissue in the small intestine later, and in lower quantities, than it would otherwise do. **GLP-1** thus helps limit after-meal **glucose** spikes.[12,13]

Maqui-berry extract has also been shown to slow the rise of after-meal **insulin** levels.[4]

Damaging Effects of Excess Insulin

Insulin is a crucial hormone for the metabolism of carbohydrates, fats, and proteins. In a perfect scenario, after ingestion of foods, insulin is released in moderated amounts to help shuttle glucose into the cells for energy production or storage and then should drop back to pre-meal levels.[14,15]

But for many individuals this is not the case, and the decreased ability of the body's cells to respond to insulin creates a condition known as ***insulin resistance.***

As a result, the pancreas produces more insulin than normal, creating a state of ***hyperinsulinemia*** that sets the path for multiple age-related diseases, like atherosclerosis, hypertension, lipid abnormalities, chronic inflammation, type II diabetes, obesity, and cancer.[16-27]

Once insulin levels begin to rise, it is difficult to control and can lead to multiple degenerative disorders.

Over time, the body becomes ***insulin resistant*** and needs more and more insulin to process a normal meal.

Excess insulin is one of the quickest routes to accelerated aging, thus making **insulin control** a key factor in any longevity program. This is where the benefits of **maqui berry** are of key importance.

Maqui Berry Reduces Glucose and Insulin Spikes

In a promising study, subjects taking a standardized **maqui-berry extract** experienced both a *lower* postprandial blood glucose level *and* a **56%** lower insulin spike at 60 minutes.[4]

For the study, ten volunteers were enrolled who had **fasting** glucose levels less than **100 mg/dL** (which is considered normal). They were given a standard **white rice meal** and their blood glucose levels **two-hours** after were at least **100 mg/dL** but less than **125 mg/dL**. This is considered "altered glucose tolerance," but nowhere near as bad as diabetics whose two-hour after-meal glucose can approach **190 mg/dL**.[4]

Subjects in this study were then given either **200 mg** of standardized **maqui-berry extract** or a similar-looking **placebo**.

Thirty minutes after ingestion of the **maqui-berry extract** or **placebo**, all subjects received a small meal of **75 grams** (about **2.5 ounces**) of white rice, calculated to produce a significant rise in postprandial glucose levels.

Blood was drawn before (baseline) and at 15, 30, 60, 90, 120, and 180 minutes *after* the rice meal for measurements of glucose concentrations.

What You Need to Know

Control Postprandial Blood-Glucose Levels

- **While glucose is an absolute necessity to fuel human life, if elevated it poses a long-term threat to the integrity of our tissues, organs, and systems.**
- **Postprandial (after-meal) elevations in blood glucose and insulin are increasingly recognized as major threats to metabolic health.**
- **Both type II diabetes and cardiovascular disease risks are sharply elevated in people whose postprandial glucose levels are high, but physicians rarely bother to measure postprandial glucose, and even fewer still measure after-meal insulin.**
- **Most physicians, at present, will not prescribe prescription drugs until diabetes is fully-developed—long after the window of opportunity for prevention has closed.**
- **But control of postprandial glucose and insulin is indeed possible, with the introduction of standardized maqui-berry and water-soluble clove extracts.**
- **These natural compounds work by complementary mechanisms to suppress after-meal metabolic derangements, thereby reducing the risk of tissue and cellular damage.**

Results showed that the **single** dose of **200 mg** of standardized **maqui-berry** extract *decreased* both postprandial **glucose** *and* **insulin** levels compared with those subjects taking the **placebo** (See Figure 1 on next page).

Placebo recipients showed a peak postprandial glucose level of approximately **115 mg/dL** at one hour, which had fallen to about **110 mg/dL** by **90** minutes.

Subjects receiving the standardized **maqui-berry extract** did not experience peak glucose concentrations until two hours after the meal and the level was only about **107 mg/dL**. This means that the maqui-berry extract was able to safely slow down the rise in post meal glucose.

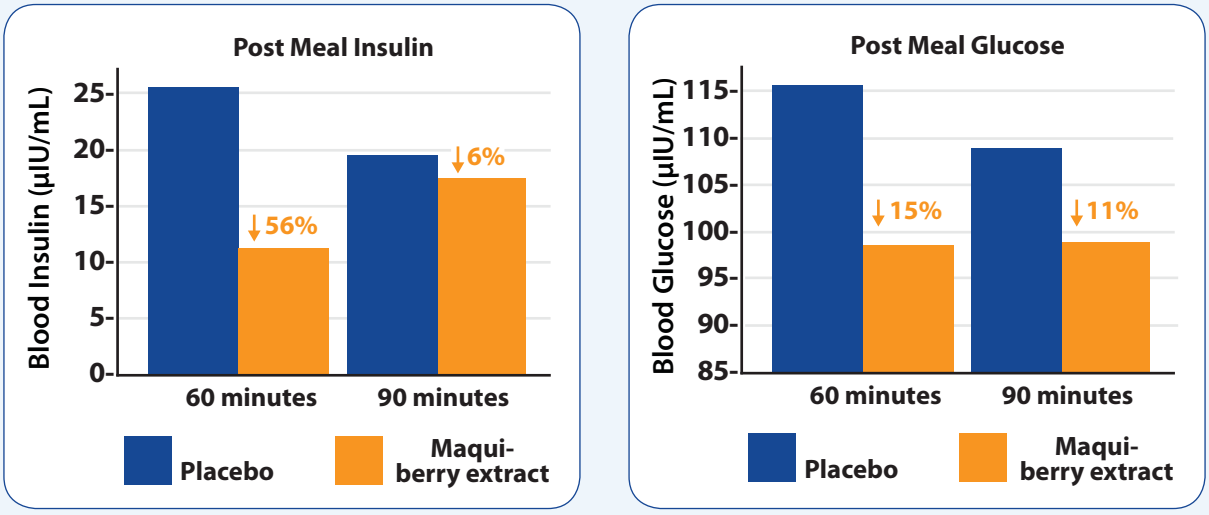
Prior to these two hours, the **maqui-berry** group's **glucose** levels rose only to around **98 mg/dL** at **60** and **90** minutes.

In **placebo** subjects, **insulin** concentrations steadily rose to peak (average of **25.33 µIU/ml**) at 60 minutes. However, in the **maqui-berry** group, **insulin** levels rose much more slowly, on average to **11.22 µIU/ml** at 60 minutes. This is **56%** lower than in the **placebo** group.

In addition, **insulin** level peak in the maqui-berry group was delayed much longer, until 90 minutes. More importantly, the **insulin levels** for the standardized **maqui-berry-extract** group peaked at a much lower level than that of the **placebo** group.[4]

This is of extreme importance, because research increasingly shows that **insulin**, in excess, may be a contributor to a variety of age-related disorders, including some types of **cancer**.[28]

FIGURE 1: Standardized Maqui-Berry Extract Inhibits Postprandial Glucose *and* Insulin Elevations



Standardized maqui-berry extract inhibits postprandial rises in plasma glucose and decreases postprandial insulin.[4] Levels of postprandial glucose (right) and insulin (left), show the percentage decrease in these parameters by standardized maqui-berry extract treatment (orange) as compared to placebo (blue).

Glucose Increases Cancer Mortality

The link between diabetes and increased cancer risk is well established but often overlooked by mainstream medicine. In an alarming **2017** review of the literature, researchers showed that cancer mortality increased in prediabetic individuals.[35]

For the review, the team of researchers evaluated studies between 1966 and 2016 that looked at cancer mortality at the nondiabetic levels (defined as fasting plasma glucose of **<126 mg/dL** and a two-hour plasma glucose of **<200 mg/dL** after oral glucose tolerance test).

From the seven studies identified, men with elevated fasting glucose levels had an *increase* in cancer mortality. Individuals with impaired glucose tolerance (prediabetic) after oral glucose tolerance tests were also at an increase for cancer mortality. For cause-cancer mortality in prediabetics, an increase mortality was seen for stomach, liver, and pancreatic cancers.

The role of elevated glucose levels as an indicator of cancer mortality is evident. The studies discussed in this article provide evidence of two natural extracts that can help control two of the deadliest players in age related diseases, **glucose** and **insulin**.

Maqui Berry Lowers HbA1c Levels

In a separate study, standardized **maqui-berry extract** showed promise in reducing **hemoglobin A1c** (HbA1c).

The study was done on people who were newly-identified as "prediabetic." They had either "mildly" elevated fasting blood glucose (greater than **100 mg/dL** up to **125 mg/dL**), or immediate postprandial glucose of more than **140 mg/dL** or two-hour postprandial glucose of greater than **120 mg/dL**.[29]

After researchers measured and established baseline levels of **HbA1c** in the patient group, all of the subjects were given **180 mg** of standardized **maqui-berry extract**. They were then instructed to take the standardized maqui-berry extract each morning for 90 days and to avoid eating large food portions (especially carbohydrates) on days prior to their follow-ups at the clinic, which lasted 90 days. Then the researchers followed up with measuring HbA1c levels at 30, 60, and 90 days from the start.[29]

Hemoglobin A1c levels declined at 60 days, and by 90 days, this marker of long term glucose control (HbA1c) was down by **0.3%** from **5.65%** to **5.35%** (See Figure 2).[29]

Clove Extract Prevents Postprandial Glucose Spikes

Searching for natural compounds that can be used to control ***after-meal*** blood glucose, researchers also began investigating a water-soluble extract of the **clove flower** bud (*Syzygium aromaticum*).

An analysis of a **water-soluble clove extract** found that it contains **polyphenols** capable of regulating the ***enzyme*** responsible for freeing glucose from its liver storage form.[30]

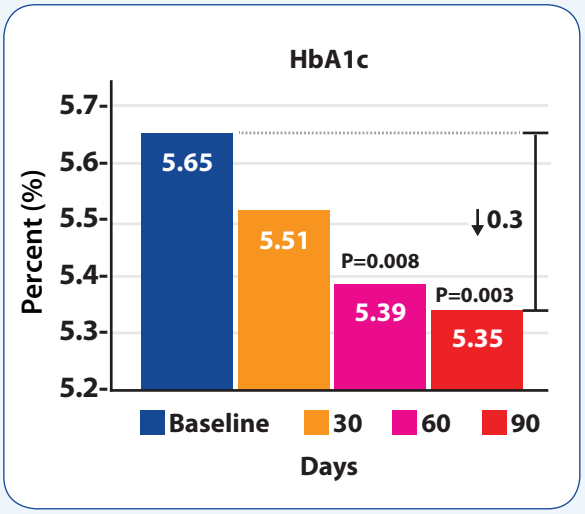
Glucose is stored in the liver and muscle for release during periods of fasting and exercise.

Inhibiting the enzyme ***glycogen phosphorylase*** blocks excess glucose release into the bloodstream.

When fed to diabetic mice, **clove extracts** significantly *suppressed* blood glucose elevations and hemoglobin A1c (HbA1c), which is an indicator of chronic glucose levels.[30]

In order to assess the potential effectiveness of **water-soluble clove extract** in reducing postprandial glucose spikes, researchers assembled a group of **human** volunteers. These study subjects were classified according to their baseline levels into normal and high-glucose groups.[5]

FIGURE 2: Standardized Maqui-Berry Extract Lowers Glycated Hemoglobin Levels



Standardized maqui-berry extract treatment in subjects with prediabetes decreases glycated hemoglobin.[29] Hemoglobin A1c was measured in subjects consuming **180 mg** standardized **maqui-berry** extract daily for 90 days. A1c levels declined **0.3%** after 90 days of **maqui-berry** supplementation.

In this open-label study, all subjects received **250 mg** of a water-soluble **clove extract** once daily for 30 days.

Random blood glucose levels were measured prior to supplementation on day 1, and then on days 12, 24, and 30. Additional blood draws were done two hours following a typical lunch (no special diet was provided).

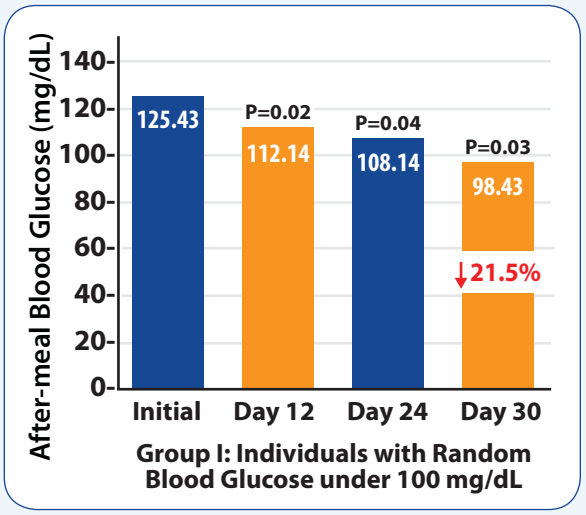
Results from this study showed that in the normal- and high-baseline blood-glucose groups, **postprandial glucose** measurements fell significantly at day 12 and continued to fall throughout the study, to nearly the same level as the before-meal values.[5]

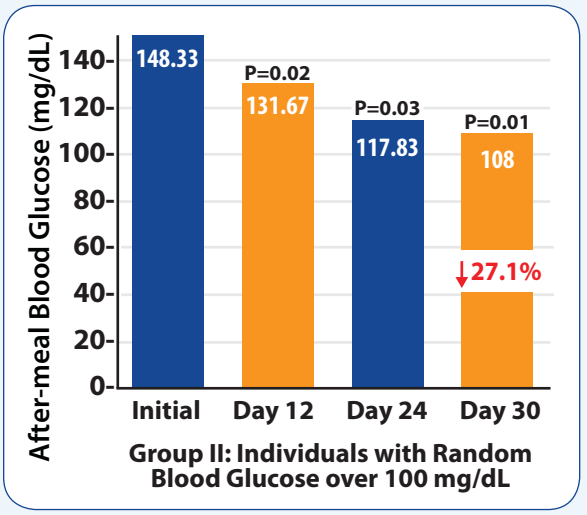
Stated differently, in response to the **clove extract** supplement, ***after-meal*** glucose levels dropped to about the same level as ***before-meal*** values (See Figure 3).

In the group that had the higher baseline blood-glucose levels, the amount of postprandial glucose decreases was ***greater*** than in the normal group, indicating a more powerful effect in this at-risk population.[5]

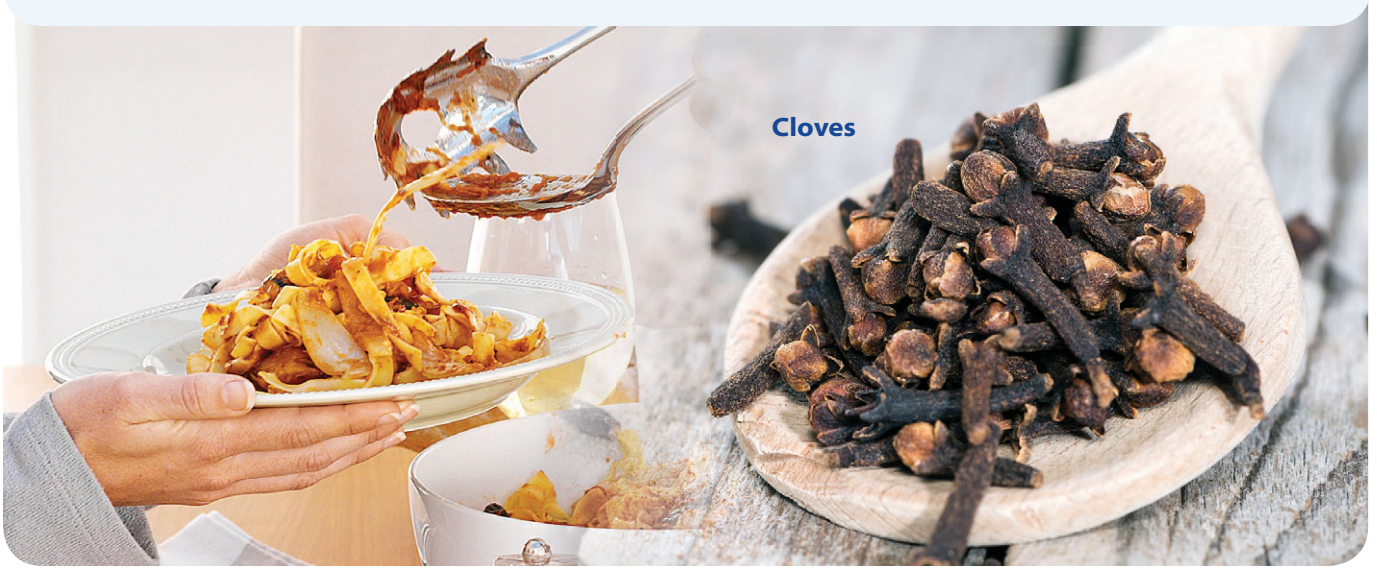
At the same time, no subject experienced abnormally low blood-glucose levels, an important safety feature, especially in comparison with many prescription glucose-lowering drugs that can cause hypoglycemia (low blood sugar).

Figure 3: Clove Extract Reduces After-Meal Blood Glucose in Humans





Two groups of people were studied for 30 days. **Group I** had normal ***after*-meal** glucose. **Group II** had high ***after*-meal** glucose. Daily intake of **250 mg** of **water-soluble clove extract** reduced ***after*-meal glucose** levels by **21.5%** in Group I and by **27.1%** in Group II.



Summary

Although most mainstream physicians still look at **fasting** blood glucose as the primary indicator of a person's sugar-related risk, the published scientific literature increasingly points to other measures—especially postprandial glucose and insulin—as important and sensitive data points.

Elevated glucose and insulin levels two hours after a meal are known to indicate risk related to development of type II diabetes and cardiovascular disease.

In fact, postprandial (after-meal) blood glucose can be high and dangerous even in people with normal **fasting glucose** levels.

This means that everyone—not just those with known elevations in fasting glucose—needs to be alert to postprandial glucose and insulin spikes, and take necessary steps to address metabolic dysfunction.

That's where supplementation with **standardized maqui-berry** and **water-soluble clove extracts** comes in.

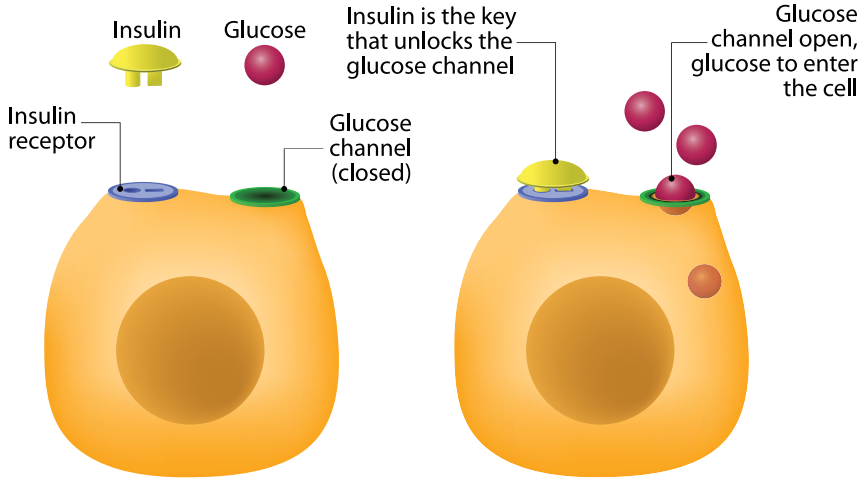
Both extracts have been shown in human studies to significantly lower blood **glucose**, each through a different and complementary mechanism. In addition, **maqui-berry extract** has also demonstrated important **insulin** lowering abilities.

Both can be used to keep postprandial blood glucose and insulin in safer ranges, potentially adding years of high-quality life in diabetics, prediabetics, and non-diabetics alike.

Supplementation with **standardized maqui-berry** and **water-soluble clove extracts** just once per day is a sensible approach to maintaining metabolic health. ●

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

How Does Insulin Work?



Fasting vs. Postprandial (After-Meal) Glucose Elevations

As long ago as 1983, it was evident that nondiabetic older adults with fasting blood glucose levels similar to those of younger people regularly "failed" a **glucose tolerance test.**[31]

A glucose tolerance test measures blood glucose both at a fasting baseline, and then again two hours after a standardized glucose drink, and is an indicator of how well the body can manage a large quantity of glucose.

To pass this test, blood glucose should not rise above **140 mg/dL** at the two-hour mark, indicating ***both*** potent pancreatic insulin secretion ***and*** vigorous uptake of glucose from the blood by insulin-stimulated cellular mechanisms.[32]

Postprandial blood-glucose levels above **140** and below **200 mg/dL** are one indication of so-called ***pre-diabetes***, a condition in which most of the risk factors for diabetes and its complications, including cardiovascular disease, are gradually rising.[7]

Another way of evaluating overall blood-glucose handling in the body is to measure the proportion of glucose that has become "stuck" to hemoglobin protein, which is called ***hemoglobin A1c***, or HbA1c.

The normal value for HbA1c is **5.6%** or lower, while a level of **6.5%** or greater is an indicator of diabetes if found on two separate occasions.[33]

Levels between **5.6%** and **6.5%** are another way of defining ***prediabetes***.[33]

According to **2012** public health data, ***51% of Americans over 65 years of age are prediabetic***, based on fasting blood glucose or HbA1c.[34]

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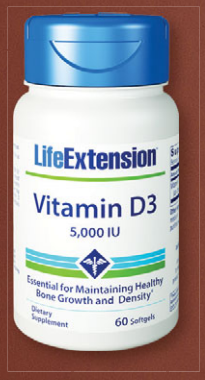

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BY SUSAN CARTWRIGHT

Curcumin
Provides Targeted Cardiovascular Protection

One way to improve heart health is to exercise. But what if you could achieve some of the benefits of exercise without stepping on a treadmill?

According to a recent study, that dream can become a reality with a supplement: **curcumin**.

One reason exercise is so good for the heart is because it improves **endothelial function**. When researchers compared exercise to curcumin supplementation, they found that curcumin was ***just as effective*** as exercise in improving **endothelial function**.

Curcumin combats numerous other heart disease risk factors, including suppressing chronic inflammation, reducing the impact of high glucose, and normalizing blood lipid profiles.

As a result, curcumin can mitigate the cascade of events that leads to heart attacks, heart failure, strokes, and even microvascular complications seen primarily in diabetic people.

In this article, we'll review studies highlighting how **curcumin** can help combat the ***many*** underlying factors that lead to cardiovascular disease.

Multitargeted Heart Protection

Some of the complex changes in the circulatory system that lead to cardiovascular disease begin as early as the mid-twenties, long before symptoms arise.

A prime underlying factor in the development of cardiovascular disease is **metabolic syndrome**, which is a combination of abdominal obesity, hypertension, glucose intolerance, and lipid disturbances. Together, these factors contribute to **chronic inflammation** and oxidative stress, which set us up for atherosclerosis, reduced blood flow to vital organs, and increased risk of heart attack or stroke.[1]

Metabolic syndrome and obesity raise risk for **type II diabetes**—an insidious condition in which damage caused by high blood-sugar levels *rapidly accelerates*, worsening vascular health.[1]

Curcumin, a polyphenol molecule derived from the root of the turmeric plant,[2,3] has multiple modes of action. This makes it a **multitargeted** supplement capable of reducing many of these interrelated risks. Even apparently healthy individuals can derive cardiovascular benefits from regular curcumin supplementation.

Numerous studies in both humans and animals have demonstrated the powerful impact curcumin supplementation has on reducing cardiovascular disease risks.[2-11]

Inflammation

One of the reasons why **obesity** and **metabolic syndrome** are so harmful is because they contribute to chronic inflammation, which exposes tissues to continuous, low-grade oxidative stress. Inflammation also threatens the integrity of cellular DNA, proteins, and other fundamental structural and functional molecules essential to healthy biological activity.[1]

In short, chronic inflammation is an ***age-accelerating process***.

That's why one of the best ways to protect your heart is to suppress **inflammatory** changes. Doing so allows tissues to heal naturally and recover their lost function—ultimately helping to slow the very process of aging itself.[1]

Well-designed human studies have now demonstrated curcumin's ability to combat chronic inflammation.

In a 2015 randomized controlled trial, subjects with metabolic syndrome took either a placebo or **one gram** a day of curcumin formulated with bioperine, a natural compound added to improve absorption. After 8 weeks, those taking the curcumin experienced significant reductions in markers of chemical stress while boosting natural protective enzyme systems. The end result was a reduction in overall levels of inflammation.[1]

Other recent studies have confirmed that taking **one gram** a day of curcumin enhanced with bioperine for improved bioavailability leads to significant reductions in levels of numerous inflammatory cytokines (signaling molecules) that mediate the myriad destructive effects of chronic inflammation.[12,13]

Lipid Profiles

Another defining feature of metabolic syndrome is disturbances in lipid profiles, particularly elevations in triglycerides and reductions in protective HDL cholesterol.[11] High levels of cholesterol increase the risk of atherosclerosis, which increases the risk of a heart attack or stroke.

Curcumin supplementation favorably benefits lipid profiles.

A **2014** study showed that supplementing with **one gram** a day of a curcumin-bioperine formulation resulted in significant reductions in LDL and total cholesterol, reductions in triglycerides, and significant increases in HDL cholesterol.[11]

Curcumin's effect on triglycerides is especially exciting considering they are minimally affected by statin drugs.[2,10]

Curcumin achieves these benefits because it influences almost all of the pathways by which cholesterol reaches the bloodstream and damages vessels, including absorption from the diet, removal of cholesterol in the liver, transportation of cholesterol out of cells, and removal of cholesterol from tissues throughout the body.[2]

In addition, curcumin's ability to scavenge reactive oxygen species reduces the risk of oxidative damage to lipids, thereby limiting the resulting inflammatory damage that contributes to early plaque formation and arterial narrowing that limits blood flow.[2]

Curcumin also improves the oxidative stress-resisting properties of beneficial HDL cholesterol molecules, increasing their beneficial health effects.[3]

Curcumin's Benefits for Diabetics

Diabetes imposes an enormous amount of oxidative and inflammatory stress on the heart muscle and blood vessels. People with diabetes are ***two to three times*** more likely to die of cardiovascular disease than are nondiabetics.[9]

Curcumin can prevent—and even *reverse*—many of the harmful steps that contribute to cardiovascular disease in diabetics.

In a randomized, controlled clinical trial, subjects with type II diabetes took either curcumin capsules containing **1.5 grams** a day of curcuminoids or placebo for six months.[6] Those taking curcumin experienced significant improvements in measures of ***arterial stiffness***, an important pathology of atherosclerosis that is dangerous because it reduces blood flow, raises blood pressure, and contributes to end-organ disease (e.g., heart, kidney, brain, and other tissues).

What You Need to Know

Curcumin's Heart Benefits

- **Heart disease, stroke, heart failure, kidney disease, and even retinal disorders share a common cause: declining function of the heart and the large and small arteries it supplies with blood.**
- **Modern Big Pharma approaches to cardiovascular disease are virtually all aimed at curing advanced disorders, rather than at preventing them before they begin.**
- **Natural supplements generally surpass drugs as effective preventive agents, particularly curcumin for cardiovascular disease prevention.**
- **Human studies show that curcumin can reduce chronic inflammation induced by obesity and metabolic syndrome, mitigate the impact of elevated blood sugar, and even help apparently healthy adults improve their vascular function.**
- **Animal and laboratory studies demonstrate the mechanisms of curcumin's action, which include reducing the impact of high glucose, normalizing blood lipid profiles, and boosting arterial structure and function.**
- **Curcumin has long been prized for its anti-inflammatory and cancer-preventing properties – now we can add superior cardiovascular prevention to its known benefits.**

Curcumin-supplemented people also experienced reductions in insulin resistance, triglycerides, uric acid, and both visceral fat (abdominal fat that is stored around the organs and is particularly inflammatory) and total body fat levels—all of which represent major reductions in cardiovascular risk.[6] These benefits were likely due to curcumin's ability to significantly raise levels of beneficial ***adiponectin***, while lowering levels of damaging ***leptin***—two fat-derived signaling molecules that influence body fat distribution.[6]

Another cardiovascular complication of diabetes is damage to tiny blood vessels, or ***microangiopathy***, which contributes to diabetic complications such as swelling of the extremities as well as retinal, kidney, and heart disease.[4] Curcumin's ability to help improve blood flow helps alleviate many of these complications.

In one study, subjects with type II diabetes received **one gram** a day of curcumin enhanced with lecithin for improved bioavailability, while control subjects followed usual care practices without supplementation.[4] After four weeks, no changes were observed in the control subjects.

By stark contrast, the subjects taking curcumin experienced significant improvements in measures of blood flow in the capillaries of the skin, improvements in localized control of blood flow, and reductions in the foot swelling. They also experienced significant increases in measurements of tissue oxygen levels, a natural consequence of the improved blood flow.[4]

Finally, another serious consequence of chronically elevated blood sugar is that it produces significant damage in heart and blood vessel tissue.

Perhaps the most immediately threatening of such damage is that done to the heart muscle, which produces a condition called ***diabetic cardiomyopathy***, in which both systolic (during the "squeeze") and diastolic (during the relaxation phase) function of the heart is impaired.[9] Cardiomyopathy leads to early heart failure and increased risk for heart attacks, and it is a major cause of diabetes-related deaths.[9] Curcumin prevents glucose-induced death of heart muscle cells by inhibiting oxidative stress imposed by steady exposure to blood sugar.[14]

These benefits highlight the powerful effect of curcumin supplementation for those suffering from diabetes.

Curcumin vs. Glucose

Curcumin impacts numerous **glucose-related mechanisms**, which makes it of tremendous importance not only to people with diabetes, but to the large group of adults with "high-normal," "borderline," or "prediabetic" blood sugar.

Studies show that curcumin prevents high glucose-induced damage by activating **PPAR-gamma**, a metabolic regulator that increases insulin sensitivity and is anti-inflammatory.[5]

Most importantly, curcumin reduces the glucose-induced production of ***advanced glycation end products*** (AGEs), which are **age-accelerating compounds** important even in nondiabetics and those with borderline-high blood glucose.[15,16]

AGEs form when sugar molecules react with proteins, resulting in structural changes to the proteins that impair their function.[16] In structural proteins, such as the collagen that forms artery walls, AGE-induced damage stiffens and thickens those proteins, resulting in **arterial stiffening** and reduced control of blood flow and pressure.

Curcumin's ability to reduce the formation of AGEs helps reduce these threatening events.

Why Healthy Adults Need Curcumin Too

Even ***seemingly healthy adults*** should be taking active steps to protect their heart health. Even in the absence of other known cardiovascular risk factors (such as obesity, metabolic syndrome, and diabetes), **aging alone** can cause changes in the structure and function of your arteries, leading to endothelial dysfunction and arterial stiffness—both of which are key underlying factors in cardiovascular disease that are especially dangerous because they produce no symptoms of their own.

This highlights curcumin's benefits for all adults—not just those with other known risk factors for heart disease.

The ***endothelium*** is the innermost layer of cells that line your arteries.[8] It secretes myriad signaling molecules that control cell growth, blood vessel tone (relaxed vs. constricted), clotting function, and adhesion of platelets and white blood cells—all of which are intimately involved in vascular health and atherosclerosis.[8]

Impaired endothelial function has been implicated in a wide range of age-related disorders, including atherosclerosis, hypertension, heart failure, ischemia (inadequate blood flow), Alzheimer's disease, and other conditions.

Curcumin has numerous mechanisms that improve the structure and function of the endothelium, which predicts potent effects on all of these conditions.[7,8] This has been clearly seen in studies that compare curcumin supplementation to exercise, which is a well-known way of improving **endothelial function**.

Choosing a Bioavailable Form of Curcumin

Curcumin is among the most promising natural supplements, thanks to its broad spectrum of activities in numerous biological processes. But in its pure, natural form, curcumin has low ***bioavailability***, meaning that only a small amount of an ingested dose typically reaches the circulation.

Intense research has focused on finding a way to increase curcumin's bioavailability.

In this article, natural curcumin, or one of several formulations made to improve its absorption into the blood was used in several studies, indicating the universal benefits of choosing a curcumin supplement modified to boost bioavailability.[1,2,11,13]

One of the better validated bioavailable forms of curcumin is **BCM-95**.[21] It is a patented formula that combines curcumin with other components of the turmeric root.

BCM-95 has been shown to have nearly **seven times** greater bioavailability than that of a standard extract of curcumin.[21]

This means a modest daily dose (**400 mg** of **BCM-95**) makes it possible to achieve higher curcumin blood levels than other "bioavailability-enhanced" preparations.

BCM-95's superior bioavailability makes it the *smart* choice when choosing a form of curcumin to use.

In a study of healthy postmenopausal women, even a low-dose (**150 mg** a day) of curcumin nanoparticles was found to be as effective as moderate aerobic exercise training at improving ***endothelial function***. No changes were detected in control subjects.[17]

A similar study using the same dose of curcumin then showed that the combination of exercise and curcumin supplementation could reduce central (aortic) blood pressure, heart rate, and a measure of arterial stiffness, while exercise alone only reduced blood pressure measured in the arm.[18]

Finally, healthy young individuals who supplemented with **200 mg** a day of a hydrophilic curcumin plus antioxidants for eight weeks demonstrated a statistically—and clinically—significant **3%** improvement in *flow-mediated dilation*, a measure of endothelial function.[19]

Additional Mechanisms

Curcumin works by numerous mechanisms of action to improve arterial health. For example, it enhances nitric oxide (NO) production by activating an enzyme called *endothelial nitric oxide synthase* (eNOS). This improves blood flow by promoting the relaxation of vascular smooth muscle and the dilation of vessels.[5,7]

Another way curcumin helps enhance blood flow and lower blood pressure is by reducing the receptor for *angiotensin*, a signaling molecule that triggers increased blood pressure by stimulating contraction of arterial muscles.[20]

Taken together, these findings demonstrate that curcumin is an extremely versatile nutrient capable of preventing cardiovascular disease through its impact on the physical and oxidative stress that promotes aging in the cardiovascular system.

Summary

Curcumin has long been prized for its potent antioxidant, anti-inflammatory, and immune-modulatory properties. Now we can add superior cardiovascular protection to its known benefits.[2,3,9,20]

Human studies have demonstrated the value of curcumin in reducing the cardiovascular risks associated with obesity, metabolic syndrome, and diabetes.

By reducing the impact of chronic glucose exposure, lipid disturbances, and biochemical stresses, curcumin plays a central role in combatting many of the factors that contribute to heart attacks, heart failure, and strokes.

Curcumin supplementation has also been shown to boost declining endothelial function, reduce arterial stiffening, and prevent the impact of chronic blood sugar exposure—actions that benefit healthy aging adults as well.

No drug can come anywhere close to the multitargeted heart health-promoting actions of curcumin, making this polyphenol one of the most versatile natural supplements available. ●

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

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BY MICHAEL DOWNEY

The Great Sugar Cover-Up

Sugar Industry Paid Harvard Researchers to Exonerate Sugar

What did the **Tobacco Institute** and **Sugar Research Foundation** have in common?

They both covered up **lethal effects** of products sold by their financial benefactors.

Back in the 1960s-1970s, concerns were raised about the adverse effects of excess **sugar** consumption.

To counteract public perception, the **sugar industry** bought and paid for **Harvard** studies that downplayed the harm caused by their product.[1]

Complicit in this conspiracy were highly prominent scientists whose study "conclusions" influenced generations of Americans to eat unhealthy, sugar-laden foods.

Together, these scientists and their food-industry partners may have been responsible for widespread suffering and millions of premature **deaths**.

Of interest to readers of this magazine, one of the Harvard professors who proclaimed **sugar** to be safe was also a vociferous critic of **dietary supplements**.

In the early **1980s** we at **Life Extension**® had to rebut assertions from this **Harvard** professor that people should enjoy a **Coca Cola**® between meals and avoid supplementing with **nutrients** shown to reduce disease risk.

This article exposes the facts behind the great sugar cover up and the horrific impact it has had on human health.

The Smoking Gun

Last year, a grisly discovery uncovered the role of the **sugar industry** in intentionally covering up the lethal dangers of foods and drinks that spike blood glucose levels.

These new revelations, published online on September 12, 2016, by *JAMA Internal Medicine*,[1] came to light after Dr. Cristin Kearns made a discovery while digging through old, dusty boxes of correspondence in a **Harvard** library basement.

Dr. Kearns is a dentist-turned-researcher from the University of California-San Francisco. She found letters between a sugar industry group and two famous Harvard nutritionists, Dr. Fredrick Stare and Dr. D. Mark Hegsted—and the fingerprints of collusion were all over them.

Dr. Stare founded the department of nutrition at **Harvard** in **1942** and was regularly sought out by the media as *the* expert on healthy eating. **Dr. Hegsted** was a member of that department, subsequently holding key positions with the US Department of Agriculture and various top advisory bodies.

Dr. Kearns's paper exposes how Drs. Stare and Hegsted, both now deceased, worked closely with a trade group called the **Sugar Research Foundation**, which successfully influenced public understanding of sugar's role in disease.[1]

Dr. Kearns' deep dive into archives of that era revealed clear evidence that a sugar industry association did more than merely sponsor key review studies on sugar—they controlled them from beginning to end.

The sugar industry association initiated the studies in the first place and influenced their results with the specific goal of eliminating any evidence of sugar as a major risk for coronary heart disease.[1]

Some studies had shown a relationship between high-sugar diets and coronary heart disease. But Big Sugar wanted scientists to focus instead on the link between coronary heart disease and dietary fat and cholesterol.[1]

The sugar association paid the equivalent of over **$48,000** in today's dollars to a trio of respected Harvard nutrition professors—Drs. Stare and Hegsted and another Harvard scientist, Robert McGandy—to produce a research paper to be published in an esteemed peer-reviewed journal.[1] The express objective was to shift the blame for coronary heart disease away from sugar.

Shifting the Blame to Saturated Fat

The biased research review that the sugar association bought appeared in the *New England Journal of Medicine* in 1967. It acknowledged "support" from the sugar industry-funded Nutrition Foundation but failed to mention that the sugar association had specifically paid the scientists and requested rewrites of the report.[2,3]

The first installment demonstrated a close correlation between the amounts of sugar and fat in the diet and mortality in 14 countries. To minimize sugar's involvement, the study team apparently cherry-picked the data—despite having previously published studies linking both fats and sugars to coronary heart disease risk—to lend much greater credence to the studies implicating saturated fat rather than those indicting sugar.[2,3]

The early publications[2,3] by the Harvard scientists tore apart studies that implicated sugar in coronary heart disease and concluded that there was only one dietary change that could prevent it—reducing saturated fat and cholesterol intake. Their official stance discredited the research-proven dangers of sugar.

This wasn't the only instance in which the sugar industry meddled in scientific studies.

In 2015, Dr. Kearns co-published a paper in *PLoS Medicine* revealing how Big Sugar influenced a federal dental-research program to shift focus to other avenues—such as finding a vaccine for tooth decay—instead of exploring the benefits of eating less sugar.[4]

These early instances of avoiding any blame for sugar in coronary and other diseases had a long and disproportionate impact on dietary guidance for many decades, an impact that lingers to this day.

However, the sugar industry would not have been able to manipulate public opinion and public policy so vastly, and for so many decades, if it were not able to buy Dr. Stare and Dr. Hegsted, two of the most prominent and respected nutrition scientists of that era.

Dr. Frederick J. Stare

We may never know whether **100%** of Dr. Stare's nutrition pronouncements were paid for by food giants or whether a few were simply his own wrong-headed opinions. He claimed, for instance, that what Americans ate could not possibly harm their health.[5]

Here are just some of Stare's more unhealthy recommendations and outrageous claims that had enormous influence among the government, media, mainstream medicine, and several generations of the public—and that clearly served the interests of corporate foods:

- Vitamin supplements are unnecessary for any normal, healthy person.[5]
- Sugar is a quick energy food…put a teaspoon in coffee or tea three or four times a day.[5]
- Coca-Cola is a healthy between-meals snack.[5]
- Americans should drink a cup of corn oil a day.[5]
- We get as much food value from enriched refined foods as from natural foods, and sometimes more.[6]
- Eat food additives—they're good for you.[5,6]
- For all practical purposes, white bread and brown bread are identical in food values.[6]

Did evidence play *any* part in Stare's conclusions—or simply the financial might of his department's funders? In any case, his public stances, endorsed by his position at Harvard, may have been responsible for untold levels of unnecessary disease, morbidity, and death.

It's impossible to blame Stare for all deaths from public consumption of excess sugar over the past 50 years. But it's worth noting that the number of worldwide deaths from ischemic heart disease, stroke, and

What You Need to Know

Sugar Industry Bought Pro-Sugar Harvard Research

- **Many people think of sugar as lacking micronutrients but otherwise harmless—exactly what was concluded in research reviews established in the 1960s and 1970s.**
- **Now, hard evidence in *JAMA Internal Medicine* documents that those past reviews were bought and paid for—literally—by the sugar industry to shift the blame for heart disease away from sugar.**
- **Two then-prominent Harvard nutritionists worked closely with the food industry to fix study conclusions. In doing so, they may have, over the next 50 years, condemned millions of people to an early death.**
- **Tragically, despite stringent guidelines for disclosure on researchers instituted by prominent journals, this influence over nutrition science by food industry groups continues to occur.**

diabetes that are ***specifically caused by elevated blood glucose*** was estimated in 2006 to be about **3.2 million** every year.[7-9]

The death toll from higher-than-optimal blood glucose accounts for **21%** of all ischemic heart disease deaths and **13%** of all stroke deaths.[7]

At this mortality rate, total deaths over 50 years from excess sugar intake could equal **158 million**! That grim number is more than **double** the overall number of deaths resulting from World Wars I and II *combined*.[10]

Dr. D. Mark Hegsted

Harvard scientist Dr. D. Mark Hegsted helped draft the 1977 Senate committee report, "Dietary Goals for the United States," that led to the country's first dietary guidelines. He later managed the Department of Agriculture's human nutrition unit.[1,11,12] That he would have subverted the course of investigations into dietary sugar is shocking, but the evidence uncovered by Kearns is undeniable.

John Hickson, vice president and director of research for the Sugar Research Foundation, struck a deal with scientists Hegsted, Stare, and McGandy to pay for a review "to refute our detractors."

Hickson pointed to at least five articles for this review that had implicated sugar as a health threat and that he wanted panned—with "fat metabolism" being implicated instead.[1]

Letters show that Hegsted continued communicating with the Sugar Research Foundation even as he wrote up the research review, with Hickson assuring him along the way that he was pleased with what the study author was writing.

Most compelling, Hegsted wrote to the trade group to explain the reason for a delay—Iowa researchers had produced new evidence linking sugar to coronary heart disease.[1] "Every time the Iowa group publishes a paper, we have to rework a section in rebuttal," Hegsted wrote.[1]

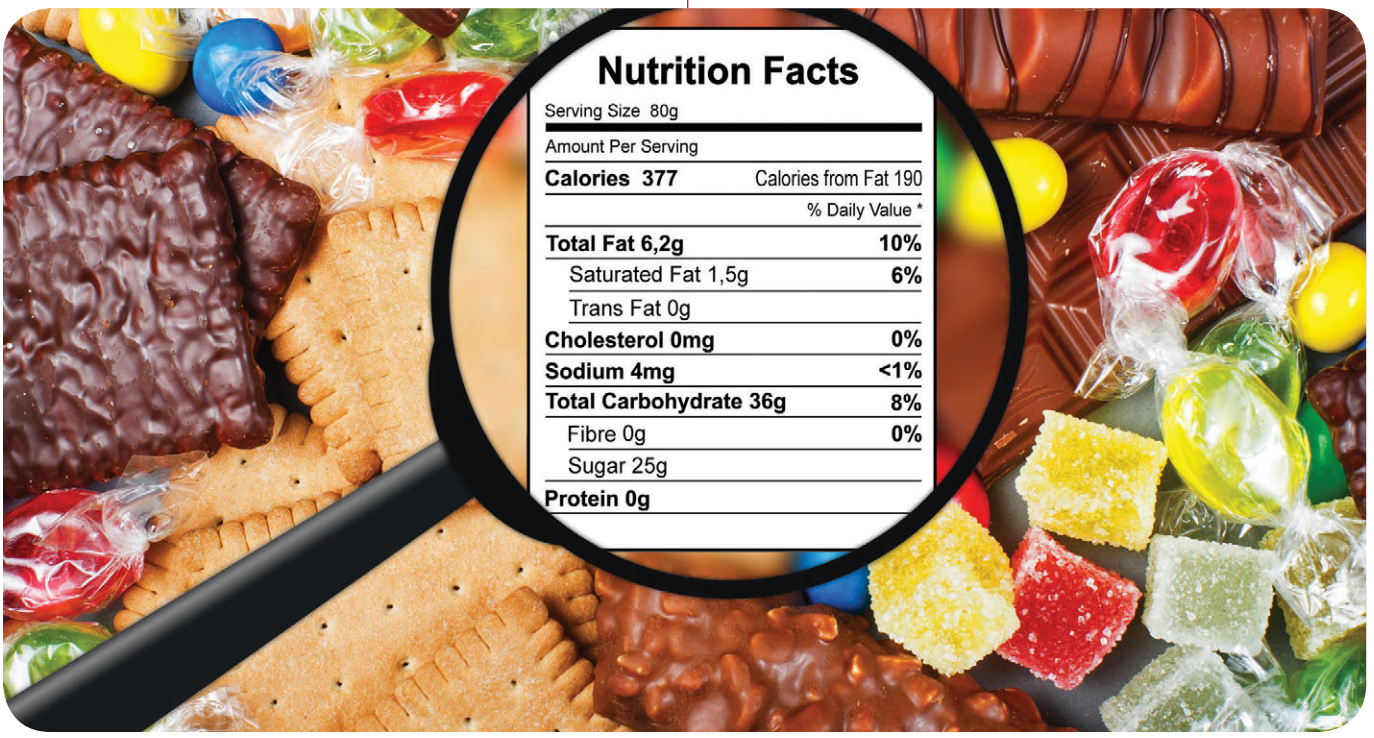
In apparent violation of ethical procedure, Hickson was allowed to review drafts of the paper before it was finalized.[1]

When the papers were later published, the Harvard authors did disclose other industry funding—yet made no mention of the Sugar Research Foundation's involvement.[1]

Industry-Suppressed Facts About Sugar

It is worth remembering that these events occurred at a time when research teams were battling over the question of whether sugar or fat was contributing to coronary heart disease caused by the buildup of plaque in the arteries of the heart.

While both were implicated in early studies, the Harvard research reviews that were initiated and paid for by the sugar industry helped shift the emphasis of the discussion away from sugar and onto fat.



This delayed the development of a scientific consensus on the sugar/heart-disease link for decades. The sugar trade group was even able to cite the studies—which they had commissioned and controlled—in pamphlets that they then provided to policymakers.

As a consequence, for decades, health authorities urged Americans to lower their fat intake—recommendations that led millions to consume low-fat, high-sugar foods that many nutritionists now blame for fueling the obesity and metabolic crisis.[1]

Over 50 years later, evidence that sugar is a strong risk factor for coronary heart disease has finally accumulated. But that message has not been fully reaching the general public or even most mainstream medical practitioners.

We now know that excess glucose damages the delicate endothelial lining of arteries, setting the stage for coronary and cerebral vascular disease.[13] Elevated blood sugar levels also increase the risk of cataract and retinal damage.[14,15]

Like the eyes, the kidneys are a site of intense metabolic activity and are rich in tiny blood vessels (capillaries) that make them particularly vulnerable to the damaging effects of glucose (and advanced glycation end products).[16]

Excess fructose consumption increases the risk of abnormal lipid profiles and inflammation,[17,18] and in fact, the highest consumers of sugar-sweetened beverages have a **20%** higher risk of coronary heart disease.[19]

Also, abundant research links high-normal blood glucose levels to increased breast cancer risk.[20-22] And 2012 findings showed that blood glucose at the high end of normal boosts the risk of significant brain shrinkage in the hippocampus and amygdala, regions involved in memory and other critical cognitive functions.[23]

The Implications for Scientific Research

In the same issue in which Kearns' discovery was presented, the *JAMA Internal Medicine* published a commentary by Marion Nestle, a nutrition expert at New York University who wrote:[24]

> "This 50-year-old incident may seem like ancient history, but it is quite relevant, not least because it answers some questions germane to our current era. Is it really true that food companies deliberately set out to manipulate research in their favor? Yes, it is, and the practice continues."[24]

In 1984, the *New England Journal of Medicine* began requiring authors to disclose conflicts of interest.[1,25]

But as noted in this *JAMA* expose, *The New York Times* obtained emails in 2015 that revealed "cozy" links between Coca-Cola and researchers they sponsored who were conducting studies on the effects of sugary drinks on obesity. More recently, the Associated Press secured emails showing how a candy trade association influenced studies to report that children who eat sweets have a healthier weight.[24]

Studies such as these—and any influence on them by related industries—have great significance for public health. Ultimately, scientific reviews shape policy debates, the direction of further investigative research, and federal agencies' funding priorities.

Kearns' sugar industry revelations represent rare and concrete evidence that the food industry—like the tobacco industry before it—has meddled in the critical science that directly and substantially affects the health of all Americans. And recent examples show that this dangerous influence continues to this day.

As reported in *JAMA Internal Medicine*—referring to those "cozy links" between sugar-based industries and "independent" researchers—"Science is not supposed to work that way."[24]

Summary

Many still view sugar merely as a source of "naked calories," devoid of nutritive value but otherwise harmless.

Although early studies connected sugar to coronary heart disease, this evidence was suppressed by tainted reviews in the 1960s and 1970s that blamed coronary heart disease on saturated fat and cholesterol while exonerating sugar.

Finally, hard evidence from *JAMA Internal Medicine* reveals that these major reviews on sugar's health effects were bought by the sugar industry—potentially causing millions of premature deaths over the decades.

Tragically, according to a commentary in the same *JAMA* issue, this influence by food industry groups continues to this day. ●

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

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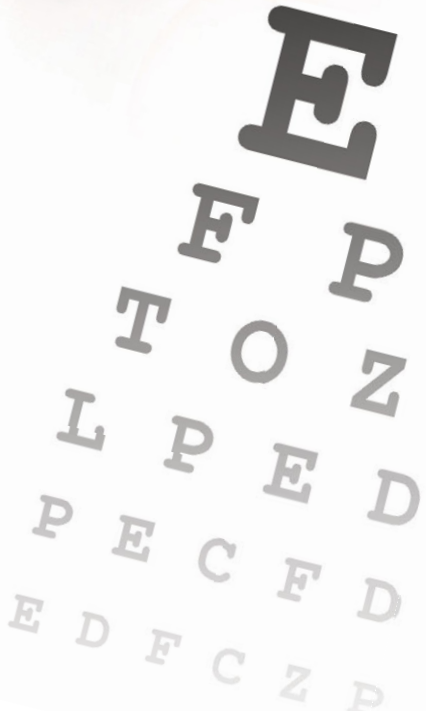

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BY TREY SAMUELSON

Brain-Boosting Benefits of COFFEE

A growing body of literature suggests that moderate coffee consumption delivers a broad range of significant health benefits that go far beyond providing a morning pick-me-up.

Researchers have established that coffee can promote cardiovascular and liver health, and has been found to reduce the risk of a variety of cancers.[1-4]

The fact that coffee has protective effects in so many areas indicates that it acts at fundamental cellular and molecular levels, meaning that it is likely to protect a wide range of tissues and organs.

Two recent high-quality studies have shown that coffee has another valuable benefit: Consuming at least **1-2 cups** per day can boost cognitive function and reduce the risk of cognitive decline,[5,6] including Alzheimer's disease, the most common form of dementia.

Coffee Reduces Risk of Cognitive Decline and Dementia

While hundreds of studies have been published on coffee consumption, inconsistent findings have left open the question of whether it reduces the risk of cognitive disorders faced by aging adults.

When faced with this kind of dilemma, scientists often turn to ***meta-analysis***. This technique combines the results of multiple studies and subjects the pooled data to statistical analyses, allowing for sophisticated interpretation.

Two recent meta-analyses evaluated the impact of coffee intake on cognitive disorders.[5,6] Both articles pooled data exclusively from the strongest kind of epidemiological studies: prospective cohorts. These studies follow groups of healthy people forward in time to determine the impact of a particular exposure (here, coffee intake) on a particular health outcome (here, cognitive decline).

The first new meta-analysis collected data from 11 prospective cohort studies involving a total of 29,155 subjects.[5] It examined the relationship between coffee consumption and the risk for developing cognitive decline or dementia of any kind.

The study found that subjects with the highest daily coffee consumption had a significant **27%** reduction in their risk for developing **Alzheimer's disease**, compared with lower- or non-coffee drinkers. However, the study showed that drinking coffee did not have an effect on other forms of cognitive decline or dementia.

The second new meta-analysis, however, included more participants, and found significant differences not only in Alzheimer's, but also in other cognitive threats. That study included data from nine prospective cohort studies involving 34,282 participants.[6]

It found that, compared with people who drank less than one cup of coffee per day, those drinking one or two cups per day had a significant **18%** reduction in the risk of developing ***any of the following conditions***:

- Alzheimer's disease
- Other forms of dementia
- Cognitive decline (loss of learning and memory without impairment)
- Cognitive impairment

Interestingly, the risk of developing cognitive disorders rose in subjects who drank more than three cups per day.

This produced what researchers call a "J-shaped" association, in which the risk of cognitive disorders is higher at zero cups of coffee a day, drops to a minimum at one to two cups a day, and rises again beyond three cups a day.[6]

A similar "J-shaped" association has in fact previously been reported, but in a more limited study.

A 10-year prospective cohort study in Europe showed that older men who consumed coffee had a 10-year loss of cognitive function of **1.2 points** on a standard mental status examination, while non-coffee drinkers had an *additional* **1.4-point** loss, a significant worsening of cognitive function.[7]

And when those researchers examined the relationship between the *amount* of coffee consumed and cognitive decline, they showed that the decline was smallest (0.6 points) for those drinking about three cups per day. That was **4.3 times** smaller than that of the non-coffee drinkers.

Again, the risk for cognitive decline rose in those drinking more than three cups a day, producing that "J-shaped" association. The bottom line from this meta-analysis is that moderate coffee consumption helps prevent cognitive decline.

Additional Benefits of Coffee

Because coffee is a complex compound composed of many different types of bioactive chemicals, it can be expected to have benefits on many different human disorders, particularly those associated with chemical stress and inflammation.

A **2016** meta-analysis has confirmed that coffee has protective effects against stomach cancer,[8] which kills more than 10,000 Americans annually.[9] The analysis included 22 studies involving 7,631 cancer victims and more than a million controls.[8]

Compared to non-coffee drinkers, regular coffee drinkers had a **7%** reduction in the risk for stomach

cancer. Those drinking larger amounts of coffee had a greater risk reduction. More specifically, those drinking less than **one cup** per day had a **5%** reduction in risk, those who consumed **one to two cups** per day had an **8%** reduction, and those drinking **three to four cups** per day were **12%** less likely to develop stomach cancer, compared with non-coffee drinkers.[8]

Other studies support the anticancer effects of coffee consumption, demonstrating significant protection against malignancies of the liver, brain, breast, prostate, and ovary, as well as against death from *all causes* in women over 50.[2,4,10-13]

Other recently discovered beneficial effects of coffee include protection against chemical-induced liver damage and acute pancreatitis, and a cardioprotective effect of increasing certain compounds in the blood that can decrease chemical and oxidative stress.[1,3,14]

How Does it Work?

Coffee contains thousands of constituents in addition to caffeine.

Chlorogenic acid is one of the most effective active constituents, and it is known to play a vital role in protection against cognitive decline for a very specific reason: It helps prevent the death of brain cells.

A leading contributor to cognitive decline and, ultimately, dementia is the phenomenon called ***excitotoxicity***. Excitotoxicity occurs when brain cells become overactive, particularly in response to the neurotransmitter *glutamate*.

Under glutamate stimulation, calcium ions flow uninhibited into brain cells, triggering the release of enzymes that damage cell structures and ultimately kill brain cells.[15]

Chlorogenic acid is now known to protect brain cells from excitotoxic death by preventing the influx of calcium. Indeed, chlorogenic acid breaks down into ***caffeic acid***, which has an even broader spectrum of protective effects than its parent compound.[16,17]

Some of the benefits of coffee consumption have yet to be attributed to a single component.

Animal studies show that consumption of the equivalent of **two to four cups** of coffee or the same amount of caffeine improved the overall antioxidant capacity in rat brains, thereby reducing the chemical stresses that damage brain cell membranes.[18,19] The animals displayed significantly better performance on tests of memory and cognition as a result of both coffee and caffeine ingestion.[18]

Mice with Alzheimer's disease given caffeinated coffee showed improved immune responses in their brains that may help to clear the "junk protein" called ***beta-amyloid*** that is associated with Alzheimer's dementia.[20]

What You Need to Know

Coffee's Cognitive Benefits

- **Once reviled as a possible cause of cancer, coffee is now widely recognized for its myriad health benefits.**
- **Until recently, reports of coffee's association with brain-protective effects were inconsistent.**
- **Newer, more powerfully designed studies tell a clearer story: Moderate coffee consumption is associated with lower risks of cognitive decline, impairment, and dementia, including Alzheimer's disease.**
- **Coffee contains many constituents, no single one of which seems to provide all of its benefits.**
- **Among the strongest contributors are chlorogenic and caffeic acids, as well as caffeine.**
- **People who drink one to two cups of coffee per day have significantly reduced risks of cognitive issues compared with those who drink no coffee at all.**
- **At consumption rates greater than three to four cups per day, some of the cognitive benefits begin to fall off, however, so moderate consumption remains the goal.**

Summary

Within a generation, coffee has gone from being a suspected carcinogen to a widely recognized inhibitor of age-related disorders.

Already hailed for its cardioprotective and anticancer effects, recent studies now show that coffee consumption is associated with lower risk of cognitive decline, cognitive impairment, and frank dementia, including Alzheimer's disease.

These newer studies have demonstrated that those drinking one to two, and possibly three to four cups of coffee per day, have lower risks for these age-related brain problems.

There's also new data suggesting that coffee consumption is associated with reduced risks of cancer, cardiovascular disease, and organ damage—all apparently related to coffee's ability to quell chemical stresses and subdue **inflammation**.

Detailed laboratory studies demonstrate that components of coffee act by suppressing the excitotoxicity that contributes to brain-cell death and accumulation of toxic proteins in dementia and cognitive decline.

Recent studies show moderate coffee drinking, including modest amounts of caffeine, has both short- and long-term benefits for brain function. ●

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

Are You Drinking the *Right* Coffee?

Drinking moderate amounts of coffee has been found to greatly reduce the risk of most major diseases, including cardiovascular disease, cancer, and liver disease. And now recent studies show that it can reduce the risk of cognitive decline as well.

But are you drinking the *right* coffee in order to most effectively harness those impressive benefits? If you're drinking standard supermarket roasts, you may not be deriving optimal benefits.

That's because modern roasting methods destroy an enormous amount of one of the key sources responsible for coffee's benefits: **polyphenols**, particularly **chlorogenic acid**.

Fortunately, a *new* patented technique has been developed that preserves much of the coffee bean's original polyphenol content. With this new method, the coffee beans are soaked in water and then drained before roasting, which essentially "captures" the polyphenols in the water.[21] Then, after the beans have been roasted, they are placed back in the polyphenol-rich water in order to *reabsorb* the health-promoting polyphenols.[21]

Compared to conventionally processed coffee, this patented technique showed that the new beverages had a higher polyphenol content—representing approximately ***250%*** *more chlorogenic acid.*[21]

As a result, these newer **"polyphenol-retaining"** coffees have the potential to deliver many of coffee's impressive health benefits in less than *half* the number of cups.

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Life Extension® Pilot Study Shows Cognitive Improvement in Coffee-Supplemented Adults

Large meta-analysis studies show that regular coffee consumption can ***protect*** healthy brains against degeneration and resulting dementia.[5,22]

But few studies to date have demonstrated actual ***cognitive improvement*** in people with existing memory problems.

A new **Life Extension**-sponsored pilot study suggests that consumption of a special coffee blend rich in **chlorogenic acid** does indeed ***enhance performance*** on standardized tests of **cognition**.[23]

Life Extension Coffee Study

Life Extension scientists recruited 8 generally healthy volunteers who had self-reported memory complaints to participate in a pilot study of the impact of a proprietary coffee blend (**Rich Rewards® Breakfast Blend**), containing **172 mg** of ***chlorogenic acid*** per **6 oz**. per cup.[23]

Chlorogenic acid is a polyphenol compound with versatile tissue-protective properties.[17,24,25]

In this open-label (no placebo) study, all subjects first went through a two-week "washout" period during which they consumed no caffeine-containing foods or beverages.[23]

Subjects were instructed to drink two six-ounce cups of the coffee in the morning and one in the afternoon. Each six-ounce cup provides approximately **172 mg** of chlorogenic acid and **105** to **148 mg** of caffeine.

Prior to the start of the study, baseline values were recorded for basic health parameters, body composition markers (height, weight, waist and hip circumference), routine lab tests, and the Brief Cognitive Assessment Tool (BCAT), a standardized test used to evaluate cognitive dysfunction. Higher BCAT scores indicate better function.

Subjects were evaluated at intervals during the 60-day study, with repeat BCAT scores determined on days 30 and 60.

By day 60, mean total BCAT scores were up compared with baseline, indicating an increase in cognitive functioning in association with the new coffee regimen.[23]

There were no severe adverse events observed during the study period.

In fact, a significant one-inch reduction in hip circumference, an indication of reduced body-fat mass, was detected, though no other metabolic variables were affected.[23]

This study concluded that significant cognitive improvements had occurred during the course of the study, without significant side effects, and with just 3 smallish cups of the coffee per day.

This is an encouraging finding for everyone who seeks not only to prevent cognitive decline with aging, but also to improve their cognitive function in their everyday lives.

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Comparison of Conventional Coffee to Life Extension's Rich Rewards® Blend

Chlorogenic Acid		Chlorogenic Acid	
Conventional Coffee (Caffeinated)	**92 mg**	**Rich Rewards® Coffee Blend** (Caffeinated)	**172 mg**
Conventional Coffee (Decaffeinated)	**46 mg**	**Rich Rewards® Coffee Blend** (Decaffeinated)	**132 mg**

* US Patent 6,723,368.

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Unique Longevity Benefits of MAGNESIUM

BY ELIZABETH EMORY

Calorie restriction is one of the most effective interventions that reliably slows aging and extends lifespans in numerous species. The problem is that it requires severe reductions in food intake that are nearly impossible for most people to follow.[1,2]

Fortunately, it may be possible to achieve many of the benefits of calorie restriction *without limiting your food intake*.

A cell study published in late **2016** revealed that **magnesium supplementation** mimics a key underlying mechanism of calorie restriction.[1]

That study showed that magnesium reduces or eliminates structures called **R-loops**. These structures are extremely harmful because they contribute to an **unstable genome**.[1] Since unstable genomes lead to cell death and raise cancer risk, stabilizing the cellular genome by eliminating R-loops can powerfully prevent disease and promote longevity.[3-6]

This latest study on magnesium represents a remarkable advance in the ability to replicate the benefits of calorie restriction on health and longevity—without limiting caloric intake.

What Are R-loops?

To understand the new study on magnesium, it's necessary to understand the concept of ***R-loops*** and why preventing their formation is essential for preventing disease and extending lifespan.

R-loops are structures that form when strands of DNA and RNA interfere with each other, causing one strand of DNA to **bulge** away from the main strand, forming a loop.[1,3,7,8] That lone DNA strand is highly vulnerable to damage and mutation.[4,5,7]

Compounding the problem, bulging R-loops interfere with the repair of damaged DNA.[9]

The result of these disruptions is an **unstable genome**, meaning one likely to undergo dangerous mutations. The end result is either **premature cell death** (and consequently loss of tissue function) or **out-of-control cell replication** (and consequently cancer formation).[4,5,7,8]

R-loop accumulation has been linked to numerous diseases, such as cancers of the breast, ovary, and colon, as well as neurodegenerative diseases such as amyotrophic lateral sclerosis (ALS).[5,7]

Add to this the known harmful effects of genomic instability on **longevity** in general, and it's easy to see the tremendous importance of finding ways to suppress the formation of R-loops in human cells.[7,10,11] That's what makes this new magnesium study so exciting.

The Magnesium Connection

Scientists have known for years that calorie restriction promotes **genomic stability** by decreasing the accumulation of R-loops.[1] What they didn't know was *how*. The answer is that calorie restriction increases the amount of **magnesium** in the cells.

The researchers first saw this when calorie-restricted yeast cells began accumulating magnesium ions. This occurred as a result of boosted production of specialized **magnesium transporter complexes**, which pull magnesium into cells.[1]

Next, they found that having a higher concentration of magnesium in the cells powerfully repressed the formation of R-loops. This suggested that magnesium is the link between calorie restriction and R-loop suppression.[1]

They then showed that disrupting the magnesium transporters—or taking magnesium out of the cells' growth medium—*prevented* the calorie-restriction benefit of suppressing R-loop formation.

Together, these findings **confirmed** that magnesium is indeed the connection between calorie restriction and R-loop suppression.[1]

So the important question is: If raising intracellular magnesium is the mechanism by which calorie restriction represses R-loops, is it possible to accomplish this by magnesium supplementation alone? Once again, the encouraging answer is *yes*.

Achieving the Benefits of Calorie Restriction

A series of experiments showed that magnesium significantly prevented R-loop buildup *completely independent of calorie restriction*.[1]

In yeast cells, magnesium supplementation significantly decreased R-loop accumulation by **47%** to **68%**. Even more exciting, it accomplished this entirely without inducing any DNA damage and, in fact, helped to **stabilize** the genome.[1]

Studies in human cells revealed several promising effects of magnesium supplementation.

First, as in the yeast cells, magnesium produced calorie restriction-like reductions in R-loop formation. Two additional findings showed how magnesium's ability to reduce R-loops could have a beneficial impact on ALS and cancer.

As we saw earlier, ALS is linked to R-loop accumulation. This study showed that cells from patients with ALS were found to carry **mutations** that impair activity of the important **magnesium transporters** that pull magnesium into cells.[1] This finding may indicate that ALS—and perhaps related conditions—arise from an inability to suppress R-loops through the magnesium-dependent mechanism.

Perhaps most excitingly, this study found that magnesium's impact on R-loops could help prevent cancer. Healthy cells contain a cancer-suppressor protein called **BRCA2**, which naturally suppresses R-loop formation. But when there are mutations in **BRCA2**, it can no longer block R-loop formation, which opens the door for cancers to form. This study showed that magnesium could **rescue** cancer-prone cells that were deficient in the cancer-suppressor protein BRCA2.[1]

The science behind all of this is very complicated, but the bottom line is this: In cells, supplementation with magnesium—entirely in the absence of calorie restriction—produced the R-loop suppression that is one of the primary cellular mechanisms by which calorie restriction acts.

In other words, magnesium supplementation may be one way to mimic calorie restriction to obtain its benefits without severe compromise to lifestyle.

Summary

Calorie restriction is one of the most effective interventions that reliably increases lifespan in life forms ranging from microscopic, single-celled organisms to complex mammals. But because calorie restriction requires severe reductions in food intake, most humans find it nearly impossible to follow.

A compelling new study has identified magnesium supplementation as a unique way to mimic one of the known cellular effects of calorie restriction, namely, suppression of genome-destabilizing **R-loops**.

Doing so helps cells stabilize the genetic structure, which is an important part of preventing disease and increasing longevity.

This discovery places magnesium in the same potential life-extending category with other nutrients known to mimic individual effects of calorie restriction. ●

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

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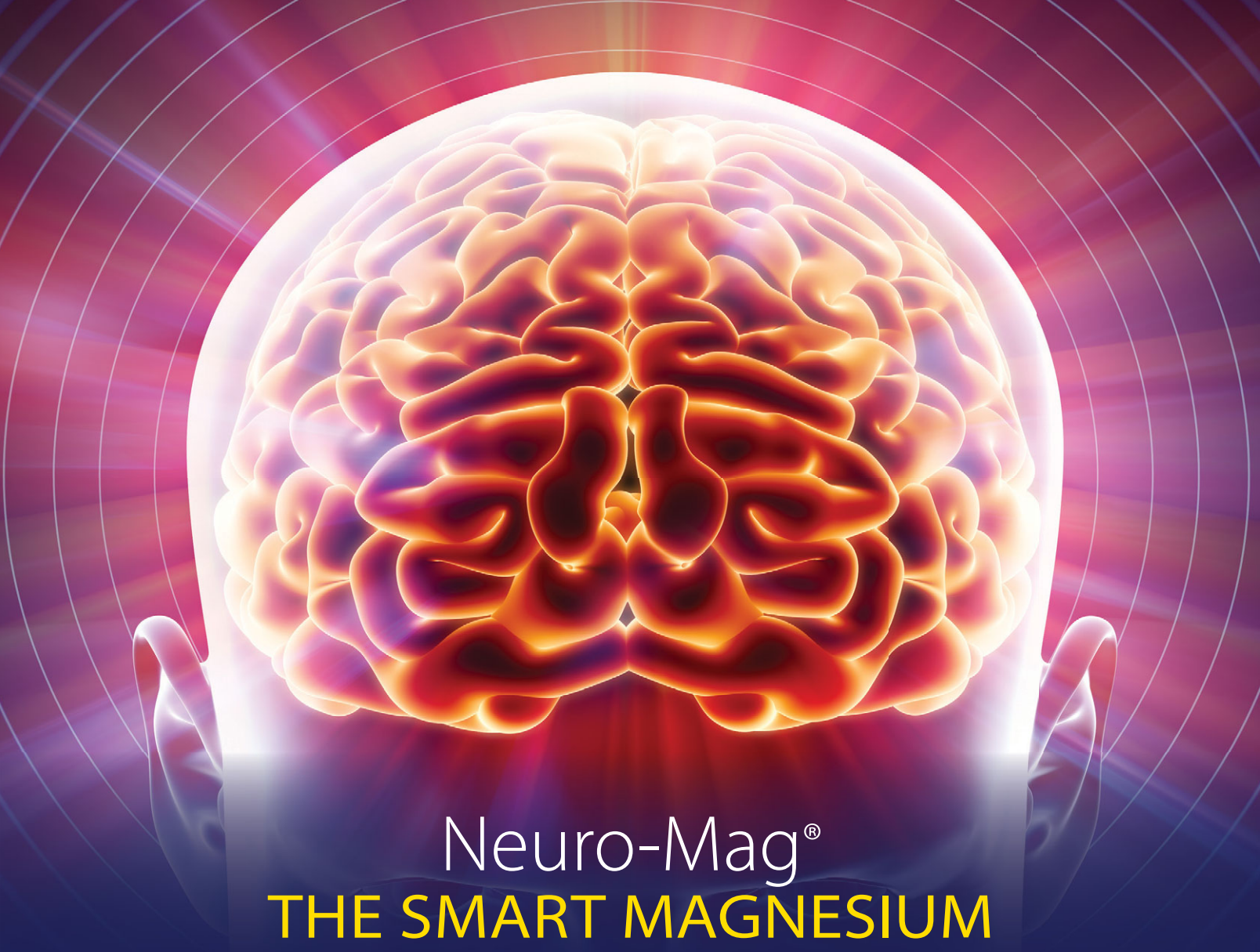

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* *Alzheimers Dis.* 2015;49(4):971-90.

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BY ROBERT GOLDFADEN AND GARY GOLDFADEN, MD

Face-Lifting and Firming Complex

You may feel young on the inside, but your face and neck can tell a different story to the world if you have loose and sagging skin.

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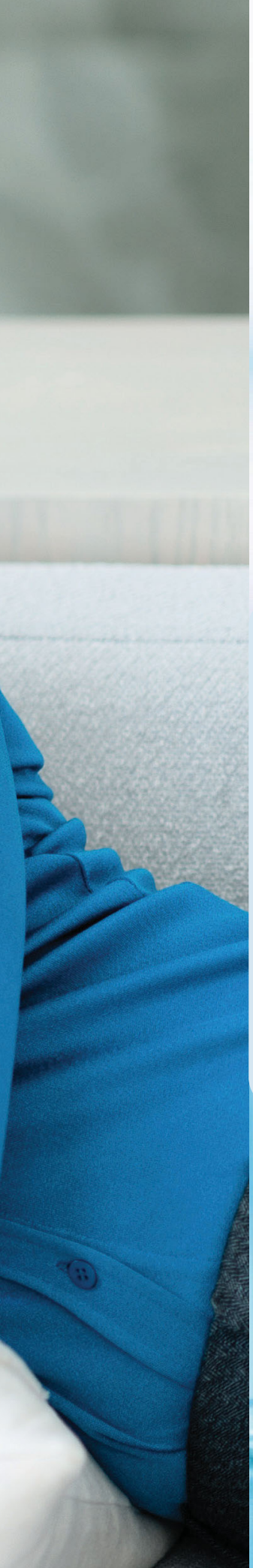

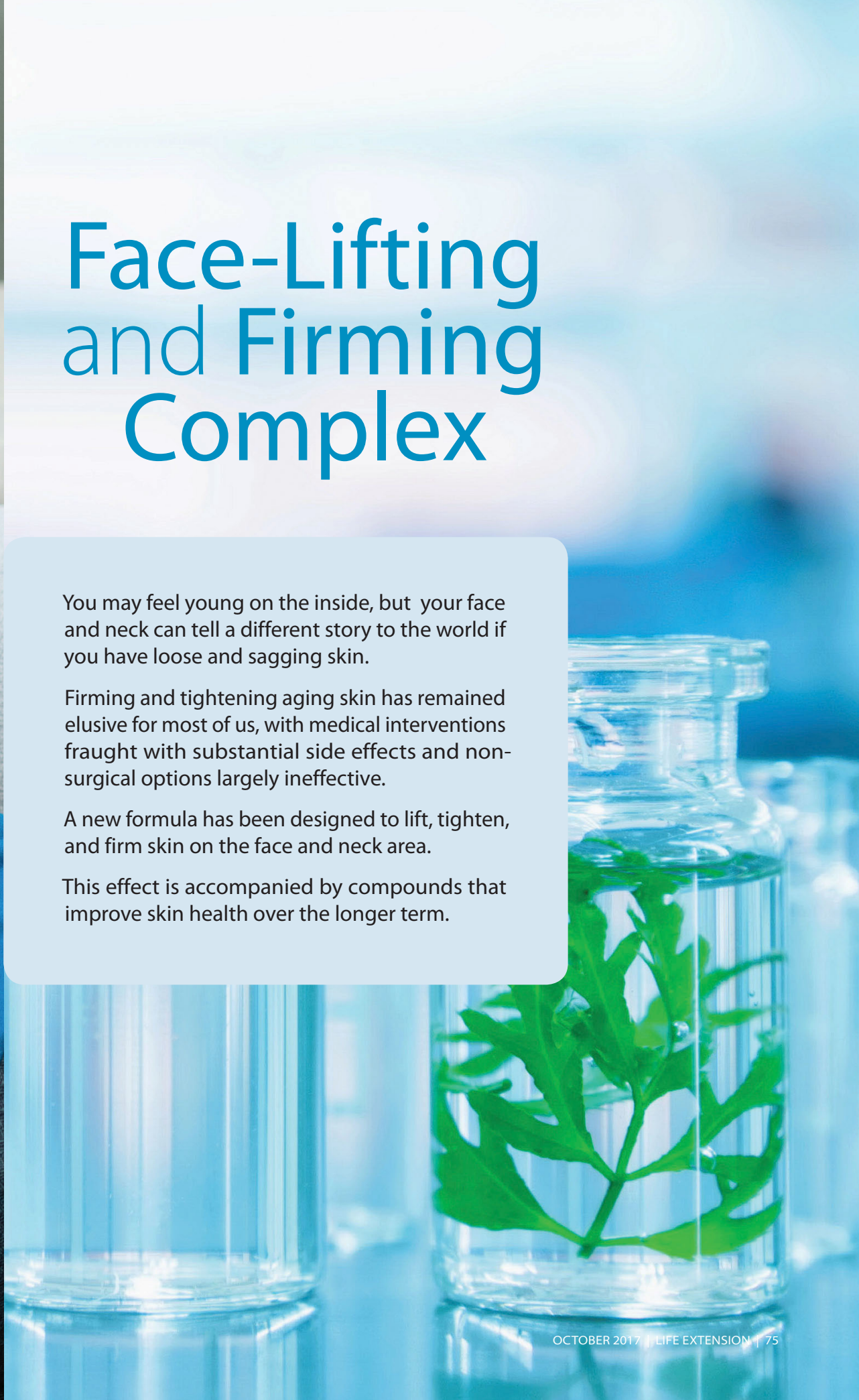

Collagen-Building and Muscle-Relaxing Peptides

Chronic exposure to sunlight and environmental pollutants creates a sea of free radicals and oxidative stress that triggers collagen destruction.[1,2] The loss of collagen as we age compromises the strength, texture, and resilience of our facial skin—leading to sagging, fine lines, and wrinkles.

Palmitoyl tetrapeptide-7 and **palmitoyl tripeptide-1** are two peptides that stimulate new collagen synthesis in specialized skin cells known as *fibroblasts*. These peptides also attenuate the inflammatory response to UV radiation in the skin to prevent the breakdown of existing collagen.[3]

This dual action makes both peptides wrinkle fighters. In one study, palmitoyl tetrapeptide-7 along with another oligopeptide reduced the depth and volume of wrinkles by **15%** and **18%**, respectively, as well as improved skin roughness and tone after two months of daily application.[4]

In a separate four-week study, palmitoyl tripeptide-1 was found to decrease wrinkle length and wrinkle depth by **39%** and **23%**, respectively.[5]

Excessive muscle contractions from everyday facial expressions like squinting, frowning, and laughing are also an underlying cause of wrinkles. Researchers have developed several peptides—including **acetyl-hexapeptide-8**, **acetyl octapeptide-3**, and **pentapeptide-18**—that interfere with several steps of neurotransmitter release to relax muscle contractions and attenuate wrinkle formation.[5-7]

In a clinical trial lasting **14 weeks**, a serum containing acetyl-hexapeptide-8 and acetyl octapeptide-3 significantly improved facial lines, facial wrinkles, eye lines, and eye wrinkles compared to baseline in participants with mild to moderate photodamaged facial skin.[8]

When researchers topically applied a cream containing pentapeptide-18 twice a day to the aging facial skin of human volunteers between the ages of 39 and 64, they observed an **11.6%** reduction in wrinkle depth.[7]

Plant Stem-Cell Extracts Block Damaging UV Radiation

Plants synthesize secondary metabolites in order to adapt and resist harmful environmental influences such as high temperatures and intense UV radiation.[9]

Three plant stem-cell extracts and their specific secondary metabolites—***Açaí palm*** (ferulic acid), ***Quercus alba*** (tannic acid), and ***Perilla frutescens*** (rosmarinic acid)—stand out for their substantial anti-inflammatory, antioxidant, and antimicrobial activity.[10-12]

In-vitro studies reveal that these plant stem-cell extracts and their secondary metabolites minimize the damaging effects of sun exposure on collagen in human skin by reducing the generation of UV-induced inflammatory cytokines and free radicals, while also raising energy stores in the form of **adenosine triphosphate (ATP)** to boost cellular metabolism and increase collagen synthesis.[10-12]

Human studies show that all three plant stem-cell extracts increase the ability of aging skin to retain water, with this dynamic moisturizing effect observed just **24 hours** after application.[10-12]

Skin Reparative Properties of Snail Mucin

For years, snail breeders have noticed that the skin on their hands stayed moist and healed quickly from scrapes and cuts. This observation sparked researchers' investigation into snail secretion, also known as snail mucin. They soon discovered that it possesses remarkable anti-aging and skin regenerative properties.

For example, **snail mucin** has been shown to:[13]

- Contain **superoxide dismutase (SOD)**, the skin's primary antioxidant defense.
- Increase skin matrix remodeling and assembly.
- Inhibit the expression of several **matrix metalloproteinases (MMPs)** that break down elastin and collagen.
- Promote dermal fibroblast survival and proliferation.

These multiple mechanisms have translated into impressive skin benefits in humans. Twice daily application of snail mucin for three months in patients with aging facial skin reduced deep and fine wrinkles, and improved skin smoothness, roughness, and hydration.[14] Additional research found a significant improvement in fine lines after eight weeks of use.[15]

Hydrate with Hyaluronic Acid

Hyaluronic acid is a molecule that adds volume and fullness to skin owing to its superb moisture-binding properties.[16,17] When you throw in the fact that it also plays a significant role in tissue repair, blood vessel formation, and fibroblast proliferation and migration,[18] it becomes abundantly clear that replenishing lost stores of hyaluronic acid as we age is a key factor in retaining youthful skin.

What You Need to Know

Skin-Lifting and Firming Effects

- **Bioactive compounds have now been combined into one groundbreaking topical formula that lifts and tightens skin on the face and neck area, which restores a more youthful appearance.**
- **Cumulative sun damage, along with excessive repetitive facial movements, are the main culprits behind loose and sagging skin.**
- **Researchers have identified compounds that work together to address these underlying factors by rebuilding and protecting the skin's scaffolding, as well as altering facial-muscle contractions.**
- **Palmitoyl tetrapeptide-7 and palmitoyl tripeptide-1 significantly boost collagen synthesis, while acetyl-hexapeptide-8, acetyl octapeptide-3, and pentapeptide-18 modulate muscle contractions to attenuate wrinkles and fine lines.**
- **Plant stem-cell extracts and their secondary metabolites block the damaging effects of UV radiation on collagen, as well as boost energy in the form of adenosine triphosphate (ATP) for skin rejuvenation.**
- **Snail mucin and hyaluronic acid enhance skin smoothness and hydration.**

Natural Skin-Tightening Agents

As your facial skin loses its elasticity due to aging and harmful ultraviolet rays, it begins to sag and loosen. Research shows that a naturally occurring mineral derived from purified clay (**magnesium aluminum silicate**) works to retract and stretch the skin to leave it visibly tighter and firmer.[19,20] The combination of this natural tightening agent with a biopolymer operates through a similar mechanism to produce a powerful lifting and tightening effect that occurs **within minutes** after application.

In dermatologist test cases, over **90%** of patients using this combination noticed the onset of tightening and firming of loose sagging skin within three to five minutes after application. In comparison to placebo, less than **5%** noticed any tightening effect.[21]

Summary

Firming and tightening loose and saggy skin has been a challenge as most current options are expensive and laden with unwanted side effects.

To solve this problem, researchers have developed a multi-ingredient serum that lifts and tightens skin on the face and neck area. The result is visibly firmer, more defined, younger-looking skin. ●

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

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

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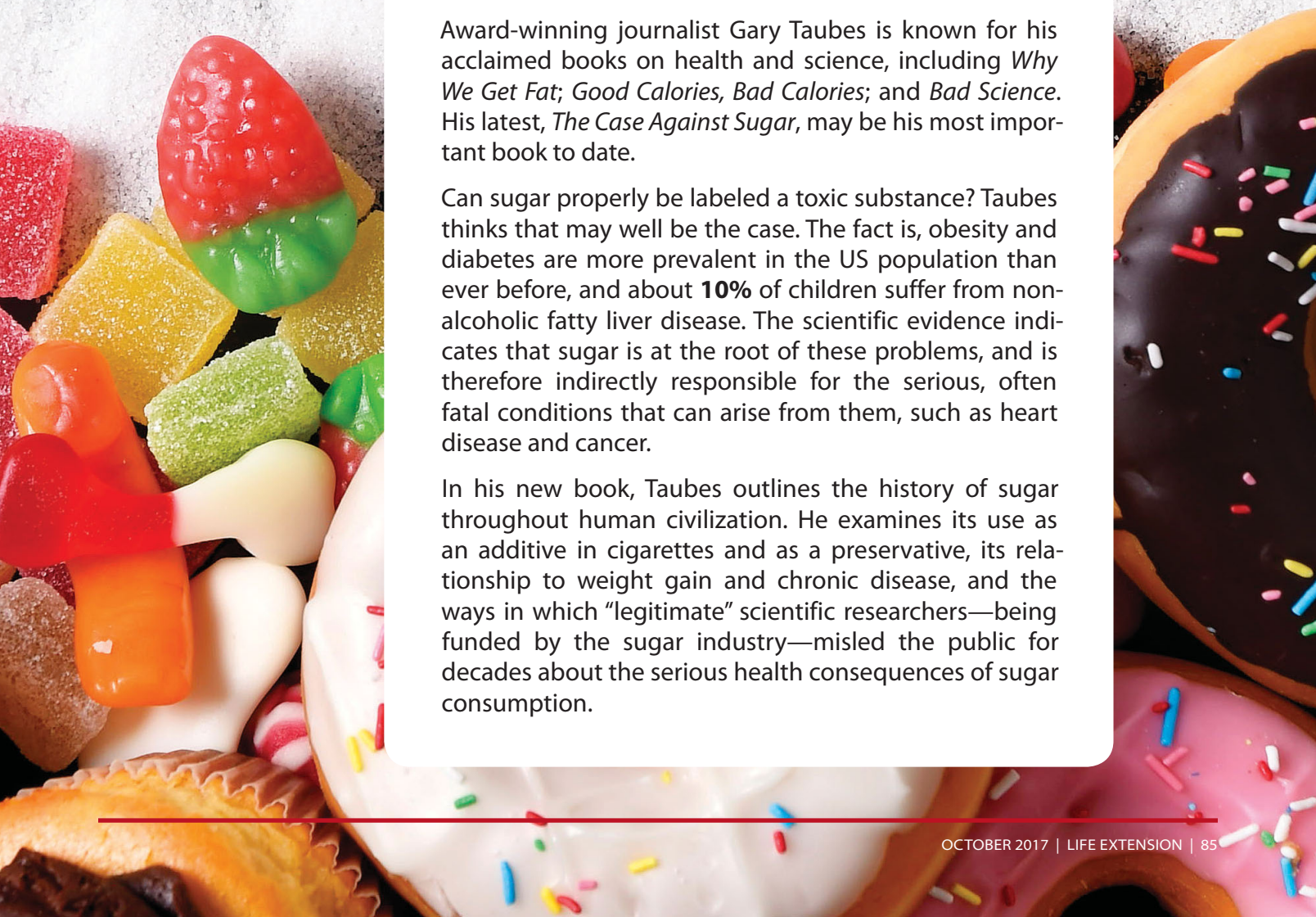
For full product description and to order **MacuGuard® Ocular Support**, call 1-800-544-4440 or visit **www.LifeExtension.com**

BY GARRY MESSICK

Gary Taubes Author of *The Case Against Sugar*



Award-winning journalist Gary Taubes is known for his acclaimed books on health and science, including *Why We Get Fat*; *Good Calories, Bad Calories*; and *Bad Science*. His latest, *The Case Against Sugar*, may be his most important book to date.

Can sugar properly be labeled a toxic substance? Taubes thinks that may well be the case. The fact is, obesity and diabetes are more prevalent in the US population than ever before, and about **10%** of children suffer from non-alcoholic fatty liver disease. The scientific evidence indicates that sugar is at the root of these problems, and is therefore indirectly responsible for the serious, often fatal conditions that can arise from them, such as heart disease and cancer.

In his new book, Taubes outlines the history of sugar throughout human civilization. He examines its use as an additive in cigarettes and as a preservative, its relationship to weight gain and chronic disease, and the ways in which "legitimate" scientific researchers—being funded by the sugar industry—misled the public for decades about the serious health consequences of sugar consumption.

In his interview with ***Life Extension***®, Taubes—a correspondent for the journal *Science* and cofounder and scientific advisor of the Nutrition Science Initiative (NuSI)—touches on these and other fascinating topics.

LE: The news media have recently exposed the shocking connection between the sugar industry's nonprofit organization, founded in 1943, and academic research that was biased in its favor. Tell us about how that situation came about, if you would.

GT: By 1951, the Sugar Association, Inc. (originally the Sugar Research Foundation), had distributed three million dollars in research grants throughout the highest levels of academia—from Princeton and Harvard on the East Coast to the California Institute of Technology on the West. At a time when academic researchers were encouraged to work closely with industry, the **Sugar Association** grants went to some of the most prominent researchers in nutrition, carbohydrate chemistry, and metabolism. The program was exceptional, and the grants themselves would regularly be written up in *Science* and other influential scientific journals.

Among the many researchers that the sugar industry would begin supporting during the war years, two of them—Ancel Keys, at the University of Minnesota, and Fred Stare, founder of the department of nutrition at Harvard—would become lifelong friends of the industry. Drs. Stare and Keys would play critical roles in the 1960s and 1970s, defending the place of sugar in a healthy diet and arguing against the idea that it could be a cause of chronic disease.

LE: How did the Sugar Association, Inc., operate to achieve its goals?

GT: By the early 1950s, the **Sugar Association** would begin fighting public-relations battles on multiple fronts. If Americans were told that sugar caused dental caries, the **Sugar Association**, with the help of the researchers it was funding, would find a way to present the evidence that suggested Americans would be foolish to consume less sugar. When obesity became an issue, as it quickly did, and Americans turned to artificial sweeteners, the **Sugar Association** would take on artificial sweeteners directly.

LE: Nevertheless, independent research over the years has revealed more and more serious disease associations with sugar consumption, especially now that sugar has been established as one of the likely causes of diabetes, much to the industry's chagrin. Can you touch on a few examples?

GT: In 2003, epidemiologists from the Centers for Disease Control, led by Eugenia Calle, published an analysis in *The New England Journal of Medicine* reporting that cancer mortality in the United States was clearly associated with obesity and overweight. They reported the heaviest men and women were **50%** and **60%** more likely, respectively, to die from **cancer** than the lean. This increased risk of death held true for a host of common cancers—esophageal, colorectal, liver, gallbladder, pancreatic, and kidney cancers, as well as, in women, cancers of the breast, uterus, cervix, and ovary.

In 2004, the CDC followed up with an analysis linking cancer to diabetes, particularly pancreatic, colorectal, liver, bladder, and breast cancers. Cancer researchers trying to make sense of this association would later say that something about cancer seems to thrive on the metabolic environment of the obese and the diabetic.

LE: What might that "something" be?

GT: One conspicuous clue…was that the same association was seen with people who weren't obese and diabetic (or at least not yet)

but suffered only from metabolic syndrome and thus were insulin-resistant. The higher their levels of circulating **insulin**, and that of a related hormone known as insulin-like growth factor, the greater the likelihood that they would get cancer.

This link between cancer and insulin was evident with anti-diabetes drugs as well. In 2005, Scottish researchers reported that diabetic patients who took a drug called **metformin**, which works to reduce insulin resistance and therefore lower circulating levels of insulin, also had a significantly reduced risk of cancer compared with diabetics on other medications. That association has been confirmed multiple times, and has led researchers to test whether metformin acts as an anticancer drug, preventing or inhibiting cancer's recurrence in randomized controlled trials.

These observations also served to focus the attention of cancer researchers further on the possibility that insulin and insulin-like growth factors are cancer promoters, and thus that abnormally elevated levels of insulin—caused by insulin resistance, for instance—would increase our cancer risk.

This was an area of research that had emerged in the 1960s, with laboratory work by some of the leading cancer researchers—including Howard Temin, who would later win the Nobel Prize—demonstrating that cancer cells require insulin to propagate; at least they do so outside the human body, growing as cell cultures in the laboratory.

LE: What does the current overall research indicate?

GT: The science on the link between insulin and insulin-like growth factor (IGF) and cancer now has been well worked out. A consensus has been forming, led by some of the most respected cancer researchers—in particular Lewis Cantley, who runs the cancer research program at Weill Cornell medical college, and Craig Thompson, president of the Memorial Sloan Kettering Cancer Center, both in New York City. These researchers believe that cancer is as much a metabolic disease as a "proliferative" disease, and that for cancer cells to procreate, they need to rewire their metabolic programs—how they fuel themselves—to drive their unfettered growth.

Further evidence to support this view is that the major genetic mutations that have been discovered over the years as seemingly responsible for a host of different cancers seem to play critical roles, not just in the proliferation of cells but in regulating the metabolism of cells.

From this perspective of cancer as a metabolic disease, insulin and IGF promote the cancer process through a series of steps. First, insulin resistance and elevated levels of insulin trigger an increased uptake of blood sugar (glucose) as fuel for precancerous cells. These cells then begin producing energy through a mechanism known as aerobic glycolysis that is similar to what bacteria do in oxygen-poor environments. Once cancer cells make this conversion, they burn enormous amounts of glucose as fuel, providing them, apparently, with the necessary raw materials to proliferate.

By metabolizing glucose at such a rapid rate…these cancer cells generate relatively enormous amounts of compounds known technically as "reactive oxygen species" and less technically as "free radicals," and these, in turn, have the ability to mutate the DNA in the cell nucleus. The more glucose a cell metabolizes and the faster it does so, the more free radicals are generated to damage DNA…and the more DNA damage, the more mutations are generated, and the more likely it is that one of those mutations will bestow on the cells the ability to proliferate without being held in check by the cellular processes that work to prevent this pathological process in healthy cells.

The result is a fast-forward acceleration of tumor growth. With this happening, the insulin and IGF in the circulation both work to signal the cell to keep proliferating, and to inhibit the mechanism (technically known as apoptosis, or cell suicide) that would otherwise kick in to shut it down.

LE: What other serious illnesses can sugar lead to by way of diabetes?

GT: Alzheimer's, like cancer, is associated with type II diabetes, an observation that began to emerge from studies in the mid-1990s of 800 elderly residents of Hisayama, Japan; of 7,000 senior citizens in Rotterdam, the Netherlands; and of 1,500 type II diabetics in Rochester, Minnesota. These observations have been confirmed repeatedly since. They suggest that type II diabetics have from one and a half to two times the risk of Alzheimer's dementia of nondiabetics, suggesting in turn, as the Rotterdam investigators did in 1999, that "direct or indirect effects of insulin could contribute to the risk of dementia."

Waist circumference is also associated with Alzheimer's risk—the thicker your waist, the greater your risk—as is body mass index itself, although only in midlife, not

afterward. Getting fatter (as many of us do) in our thirties and forties is associated with an increased risk. Several studies have shown that higher insulin levels—hyperinsulinemia—are associated with increased risk. Hypertension is also associated with increased risk of Alzheimer's.

LE: What do researchers think is the explanation for these associations?

GT: Perhaps high blood sugar is responsible for the increased risk of Alzheimer's disease; the higher the blood sugar, the greater the oxidative stress in the brain, and the greater the production of what are called advanced glycation end products, AGEs. These AGEs are associated with the accumulation of plaques and tangles that may have a causative role.

Here's another way to think about the idea that a cluster of chronic Western diseases associate with insulin resistance, metabolic syndrome, obesity, and diabetes and hence **sugar** consumption: Diabetes, though a discrete diagnosis by our doctors, is not a discrete phenomenon in which bad things suddenly start happening that didn't happen before. It's part of a continuum from health to disease that is defined in large part by the worsening of the metabolic abnormalities—the homeostatic disruption in regulatory systems—that we've been discussing and that are associated with insulin resistance, if not caused by it, and so part and parcel of metabolic syndrome.

As we become ever more insulin-resistant and glucose intolerant, as our blood sugar gets higher along with our insulin levels, as our blood pressure elevates and we get fatter, we are more likely to be diagnosed as diabetic and manifest the diseases and conditions that associate with diabetes. These include not just heart disease, gout, cancer, Alzheimer's… but all the conditions typically perceived as complications of diabetes: blood vessel (vascular) complications that lead to strokes, dementia, and kidney disease; retinopathy (blindness) and cataracts; neuropathies (nerve disorders); plaque deposits in the arteries of the heart (leading to heart attacks) or the legs and feet (leading to amputations); accumulation of advanced glycation end products, AGEs, in the collagen of our skin that can make diabetics look prematurely old, and that in joints, arteries, and the heart and lungs can cause the loss of elasticity as we age.

It's this premature aging of the skin, arteries, and joints that has led some diabetes researchers to think of the disease as a form of accelerated aging. But increasing our risk of contracting all these other chronic conditions means we're also likely to get these ailments at ever-younger ages and thus, effectively, age faster.

LE: In your book, you bring up the question, "How little sugar is still too much?"

GT: It's impossible to say…the clinical trials necessary to begin to answer such a question were never pursued.

The traditional response is that we should eat sugar in moderation. But this is a tautology. We only know we're consuming too much when we're getting fatter or manifesting other symptoms of insulin resistance and metabolic syndrome. At that point, the assumption is that we can dial it back a little and be fine—drink one or two sugary beverages a day instead of three, or, if we're parenting, allow our children ice cream on weekends, say, rather than as a daily treat.

But if it takes years or decades, or even generations, for us to get to the point where we manifest symptoms of metabolic syndrome, it's quite possible that even these apparently moderate amounts of sugar will turn out to be too much to reverse the situation and return us to health. And if the symptom or complication of metabolic syndrome and insulin resistance that manifests first is something other than getting fatter, such as cancer, for instance, we're truly out of luck. ●

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

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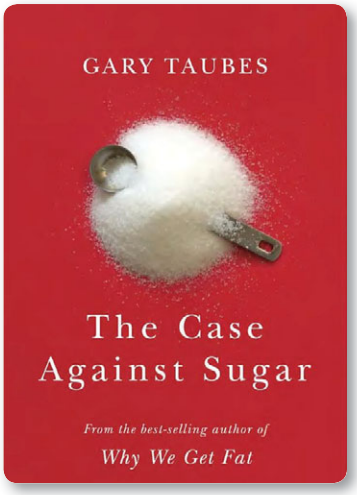

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*High-potency **carnosine** with R-lipoic acid, benfotiamine, taurine, luteolin, and PQQ*

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

Item # 01868 • 120 capsules • Retail Price is $72 • **Your price is $54** • 4 bottles are only $48 each

STRESSED??

Natural Cortisol Balance for a greater sense of calm amid today's stressful challenges.

Natural Cortisol Balance
Item #02012 • 30 vegetarian capsules

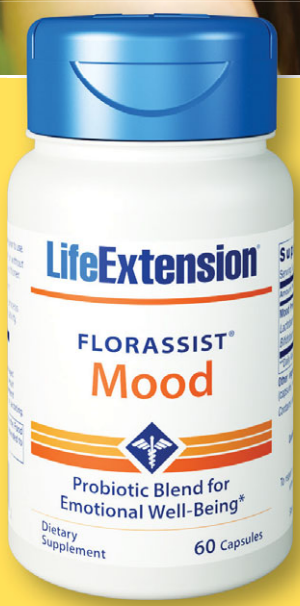
	Retail Price	Your Price
1 bottle	$45	**$33.75**
4 bottles		**$30 each**

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

Non-GMO. Do not take if pregnant or lactating. Keep out of reach of children. Do not exceed recommended dose.

Relora® (magnolia/ phellodendron extracts) is a registered trademark of Interhealth N.I.
Oligonol® (lychee tree fruit/ green tea extracts) is a registered trademark of Amino Up Chemical Co., Ltd.

Probiotic Blend Supports Positive **MOOD** and **RELAXATION**



Research suggests specific ***probiotics*** positively influence biochemical signaling between the gastrointestinal tract and the nervous system—resulting in positive effects on mood.[1]

FLORASSIST® Mood provides **3 billion** colony-forming units of *Lactobacillus helveticus* strain R0052 and *Bifidobacterium longum* strain R0175.

Human clinical research conducted on this dual-probiotic combination demonstrated improvements in mood, reduction in perceived stress, and promotion of relaxation.[2,3]

Two daily capsules of **FLORASSIST® Mood** *naturally* promote relaxation and improve mood.

FLORASSIST® Mood

Item #02000 • 60 capsules

	Retail Price	Your Price
1 bottle	$33	**$24.75**
4 bottles		**$22.50** each

Non-GMO

Contains milk and soybeans.

References

1. *Cell*. 2015 Apr 9;161(2):193-4.
2. *Gut Microbes*. 2011 Jul-Aug;2(4):256-61.
3. *Br J Nutr*. 2011 Mar;105(5):755-64.

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

Ed Urbano (front) and Douglas Brolus (back).

Doug Brolus and Ed Urbano

Staying Fit for Life

BY JON VANZILE

Few teenagers end up becoming lifelong friends with their idols. Yet that's exactly what happened to Doug Brolus when, as a 15-year-old looking to learn more about exercise, he reached out to Jack LaLanne.

By the time Brolus placed his call to LaLanne's television studio, he had already developed the traits that would carry him into the rarefied air of celebrities like Arnold Schwarzenegger and Jay Leno. He was persistent, friendly, charismatic, and most of all, open to learning everything he could about exercise and nutrition.

Brolus, now a buff 58-year-old, grew up in Michigan, far from Muscle Beach or the television studios and stages where the early bodybuilding movement of his youth was taking shape. Still, he was always interested in fitness.

"When I was 9 years old, my father bought me a chin-up bar and I started doing chin-ups," he remembered. "I became proficient and developed biceps and abdominals."

Not too long afterward, he was visiting his grandmother's house when he saw *The Jack LaLanne Show*.

At the time, LaLanne was changing the way Americans thought about nutrition, exercise and fitness. A charismatic showman, LaLanne, who died in 2011 at age 96, was also a pioneer in exercise science. He popularized healthy eating as well as the concept of working muscles to the point of fatigue and taking minimal breaks between sets—both of which are fundamental to weightlifting today.

He also loved his stunts. Throughout his life, LaLanne was known for amazing feats such as swimming the length of the Golden Gate Bridge underwater or doing more than 1,000 push-ups in 23 minutes.

For Brolus—himself an outgoing kid—finding LaLanne was like coming home. Brolus had started weightlifting at age 11 and was already developing the abs that would make him semi-famous in the smaller world of natural bodybuilding. By high school, he was winning pitching contests in baseball and going out for football. Reaching out to LaLanne seemed like a natural thing to do.

"I was 15 when I called his studio," Brolus said. "I left a message with my name and number. I didn't think he'd call back, but he did, and we became friends."

Before long, Brolus was invited out to LaLanne's Hollywood Hills home, where LaLanne showed him some exercise techniques in his private gym and they hit it off. The resulting friendship changed Brolus's life. Over the next decades he became a regular visitor to California, where he met the heavyweights of the emerging bodybuilding world, including Joe Weider, co-founder of the International Federation of Bodybuilding, and the soon-to-be-legendary Arnold Schwarzenegger.

"I still go to California every year," Brolus says from his home in Michigan. "Every year I always call Arnold and sometimes see him. He's always interested in what I'm doing."

A Life of Exercise

One of the most remarkable aspects of Brolus's story is how unlikely it all is. As he proudly notes, he is self-taught in nutrition and exercise science, relying on resources like ***Life Extension Magazine***®. Professionally, he's an anatomical artist who has drawn "every single part" of the human anatomy, but his interest in nutrition and exercise is purely amateur and his competitive career as a bodybuilder was short.

At age 19, he won Best Abdominals in the Mr. Michigan contest, but that proved to be the highest level he would achieve in the world of bodybuilding—for a very good reason. Brolus wasn't afraid to train hard and ate a clean diet, but he drew the line at using steroids.

"I did compete in Mr. Michigan, but I was competing against guys full of anabolic steroids, and I refused to put those in my body," he says. "I got tired of being beat out by these guys full of drugs. It was like running a Volkswagen against a Ferrari."

He even found this to be true in the so-called "natural" competitions, like the Mr. Hercules Natural Contest. The athletes there simply took drugs that weren't tested for, or came up with ways around the testing protocols. At the end of the day, it just wasn't worth it to Brolus to sacrifice his health.

Today, Brolus works out twice a week, getting up at 5 a.m. on Tuesdays and Saturdays for several-hour gym sessions. He alternates between heavy exercises to build muscle and lighter reps to develop fast-twitch muscles and maintain his lean physique.

Brolus relies on supplements to address a number of issues, including longevity and disease prevention, reducing inflammation, and of course maximizing his results from the gym.

For his diet, he relies on turkey and baked salmon as his primary proteins, typically accompanied by salads and fruit. For breakfast, he'll often have eggs, plus one tablespoon of honey four times a week. At lunch, he relies on figs and dates, Greek yogurt with pineapple, and more lean protein. He often adds barrel-aged apple cider vinegar with meals for its high potassium content.

"I also eat three apples a day," he says. "One with breakfast, one with lunch, and one with dinner. They're full of nutrients and pectin."

Brolus is also a big fan of **Life Extension®**.

"I always tell people that ***Life Extension Magazine*** is one of the best I've ever seen," he says. "The research is great and **Life Extension** has the highest quality supplements to back it up."

Ed Urbano: An Inspired Friend

Once upon a time, Doug Brolus changed his life with a phone call—so it's only fitting that he would later pay it forward when he received a call from a Californian named Ed Urbano.

Urbano was a full-time carpenter by trade who had exercised on and off for most of his life, until he retired. After retirement, however, he started hitting the gym much harder, going four times a week and keeping up a rigorous program of weightlifting and cardio.

"I got some surprises about how it worked," the 74-year-old recalls. "I thought as long as I hit the iron hard and heavy, I'd build muscle. But you're lucky just to maintain at my age. The results came slow."

He discovered Brolus online and called him to ask a question, only to hit it off and launch a friendship after Brolus mentioned he was still traveling to California once a year to meet with friends and do the occasional photo shoot.

"One year, he said to me, 'Why don't you come along?'" Urbano remembers. "So I did, and it was the opportunity of a lifetime. I met Arnold and Jay Leno on the shoot. It was incredible, and I couldn't believe it was happening."

It was actually Urbano who introduced Brolus to **Life Extension**. Urbano says he relies almost exclusively on **Life Extension** products as the highest-quality supplements on the market. He stocks up during the annual **Life Extension** Super Sale to prepare for the year ahead and enthusiastically recommends the company's supplements to other "older guys" who want the kind of results he gets.

Today, Brolus and Urbano are planning for another photo shoot and still getting lots of attention for their fitness level. As Urbano notes, he knows plenty of people his age who "can't walk across a room" while he credits regular exercise with allowing him to stay strong and healthy even into his mid-70s.

In fact, if there's any takeaway from their story, it's this: the benefits of exercise and good nutrition are available to anyone, old or young, male or female. Both Brolus and Urbano are self-taught and motivated purely by their own gains and health. The fact that it ended up taking them into the pages of ***Life Extension Magazine***, and into meetings with fitness superstars, is a happy side effect of a lifelong interest in staying as healthy as possible for as long as possible—and simply having fun.

"I still can't believe I'm going to be in a magazine," Urbano says when asked if this is his first time appearing in a health magazine. "I'd love to know that I helped someone get excited about weight training. Everybody can make a difference in their body and go for their personal best. You can have quality until the end." ●

Doug Brolus's Personal Supplement Stack

Doug Brolus painstakingly designed his own supplement regimen, based on his personal goals of increasing his health and longevity, and getting the most from his weight training. These are the supplements he takes:

- Vitamin C
- Vitamin D
- Vitamin E
- B-complex
- Multimineral complex at breakfast
- Flax seed oil
- Olive leaf extract
- Probiotics

Doug Brolus's booklet, *Developing Prize Winning Abdominals*, is available online for $7.99 at premierbodybuildingandfitness.com

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

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Item #01945 • 60 vegetarian capsules

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1 bottle	$12	**$9**
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For full product description and to order **BioActive Complete B-Complex**, call **1-800-544-4440** or visit **www.LifeExtension.com**

Non-GMO

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

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New Zealand Whey Protein Concentrate derived from grass-fed, free-range cows living in New Zealand not treated with growth hormone.

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- Help maintain lean muscle mass,
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- Promote anabolic metabolism.

Natural chocolate and **natural vanilla** flavors.

References
1. *Altern Med Rev*. 2004 Jun;9(2):136-156.
2. *J Nutr Biochem*. 2003 May;14(5):251-8.
3. *Toxicol In Vitro*. 2003 Feb;17(1):27-33.
4. *Br J Nutr*. 2011 May;105(10):1465-70.
5. *Int J Sport Nutr Exerc Metab*. 2006 Oct;16(5):494-509.

Contains milk.
Non-GMO

New Zealand Whey Protein Concentrate (Vanilla)

Item #01770 • 500 grams

	Retail Price	Your Price
1 bottle	$30	**$22.50**
4 bottles		**$19.95 each**

New Zealand Whey Protein Concentrate (Chocolate)

Item #01771 • 640 grams

	Retail Price	Your Price
1 bottle	$30	**$22.50**
4 bottles		**$19.95 each**

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ASTARTE

Jarro-Dophilus® Women contains the clinically tested Astarte® strains which are protected by U.S. Patent 8,846,027 and European Patent 2,509,610. Astarte® is owned by HSO Health Care GmbH, Vienna, Austria, and licensed in the U.S. to Jarrow Formulas, Inc. Other international patents pending.

*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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Calcium • Phosphorus • Iron

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Glucose

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Creatinine • BUN/creatinine ratio
eGFR (estimated glomerular filtration rate)

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Hematocrit • MCV (mean corpuscular volume)
MCH (mean corpuscular hemoglobin)
MCHC (mean corpuscular hemoglobin concentration)
RDW (red blood cell distribution)
White blood cell count
Immune Cell Differentiation Count
Platelet count

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◯ **FOOD SAFE ALLERGY TEST – BASIC** (LCM73001)** — **$198**
This test measures delayed (IgG) food allergies for 95 common foods.

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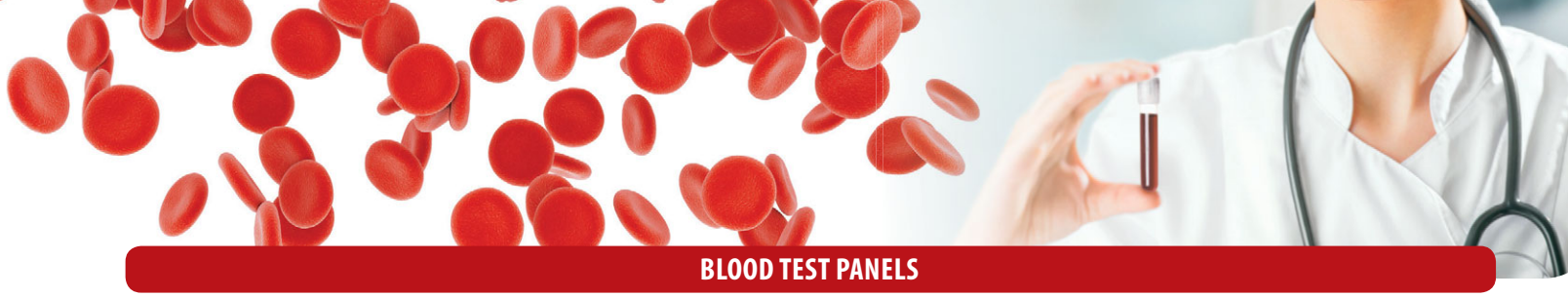
In the cardiovascular system ApoE is involved in the transportation of fat molecules into your cells. E4 is associated with increased levels of cholesterol and triglycerides, which leads to atherosclerosis, heart disease and stroke.



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CBC/Chemistry Profile • DHEA-S • PSA (prostate-specific antigen) Homocysteine • C-Reactive Protein (high-sensitivity) Free Testosterone • Total Testosterone • Estradiol • TSH for thyroid function • Vitamin D (25-hydroxyvitamin D) • Hemoglobin A1c

MALE HORMONE ADD-ON PANEL* (LCADDM) — $120
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To provide an even more in-depth analysis of a man's hormone status, Life Extension has created this panel as an addition to the Male Life Extension Panel. This panel provides information about a testosterone metabolite that can affect the prostate; and the hormone pregnenolone that acts as a precursor to all other steroid hormones.

MALE ELITE PANEL (LC100016)* — $575
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MALE COMPREHENSIVE HORMONE PANEL (LC100010)* — $299
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YOUR PRICE

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FEMALE HORMONE ADD-ON PANEL* (LCADDF) — $125
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FEMALE ELITE PANEL (LC100017)* — $575
CBC/Chemistry Profile • Free and total Testosterone • Total Estrogens Estradiol • Estrone • DHEA-S • Progesterone Pregnenolone DHT • FSH • LH • TSH • Free T3 • Free T4 • Reverse T3 • IGF-1 • SHBG • HbA1c Vitamin D 25-OH • hs-CRP • Ferritin • Homocysteine • Hemoglobin A1c

FEMALE COMPREHENSIVE HORMONE PANEL (LC100011)* — $299
CBC/Chemistry Profile • DHEA-S, Estradiol • Total Estrogens Progesterone • Pregnenolone • Total and Free Testosterone • SHBG TSH • Free T3
This panel now includes Free T4 and Cortisol with no increase in price!

FEMALE BASIC HORMONE PANEL (LC100013) — $75
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HEALTHY AGING PANEL-COMPREHENSIVE (LC100026)* — $249
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DIABETES MANAGEMENT PROFILE – COMPREHENSIVE (LC100040) — $129
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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 $35 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.

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D,L-Phenylalanine Capsules
L-Arginine Caps
L-Carnitine
L-Glutamine
L-Glutamine Powder
L-Lysine
L-Taurine Powder
L-Tyrosine Powder
Super Carnosine
Taurine

Blood Pressure & Vascular Support

Advanced Olive Leaf Vascular Support with Celery Seed Extract
Arterial Protect
Blood Pressure Monitor Arm Cuff
Dual Action Blood Pressure
Endothelial Defense™ with Pomegranate Complete and CORDIART™
Endothelial Defense™ with GliSODin®
Natural BP Management
NitroVasc with CORDIART™
Pomegranate Complete
Pomegranate Fruit Extract
Triple Action Blood Pressure AM/PM
VenoFlow™

Bone Health

Bone Restore
Bone Restore with Vitamin K2
Bone Strength Formula with KoAct®
Bone-Up™
Calcium Citrate with Vitamin D
Dr. Strum's Intensive Bone Formula
Strontium Caps

Brain Health

Acetyl-L-Carnitine
Acetyl-L-Carnitine Arginate
Blast™
Brain Shield® Gastrodin
CocoaMind™
Cognitex® Basics
Cognitex® with Brain Shield®
Cognitex® with Pregnenolone & Brain Shield®
Cognizin® CDP-Choline Caps
DMAE Bitartrate (dimethylaminoethanol)
Dopa-Mind™
Ginkgo Biloba Certified Extract™
Huperzine A
Lecithin Granules
Memory Protect
Migra-Eeze™
Neuro-Mag® Magnesium L-Threonate
Neuro-Mag® Magnesium L-Threonate with Calcium and Vitamin D3
Optimized Ashwagandha Extract
PS (Phosphatidylserine) Caps
Vinpocetine

Cholesterol Management

Advanced Lipid Control
Cho-Less™
CHOL-Support™
Red Yeast Rice
Theaflavins Standardized Extract
Vitamin B3 Niacin Capsules

Digestion Support

Artichoke Leaf Extract
Digest RC®
Effervescent Vitamin C - Magnesium Crystals
Enhanced Super Digestive Enzymes
Enhanced Super Digestive Enzymes w/Probiotics
EsophaCool™
Esophageal Guardian
Extraordinary Enzymes
Gastro-Ease™
Ginger Force®
Pancreatin
Regimint
Tranquil Tract™
TruFiber™
WellBetX PGX plus Mulberry

Energy Management

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Asian Energy Boost
D-Ribose Powder
D-Ribose Tablets
Forskolin
Mitochondrial Basics with BioPQQ®
Mitochondrial Energy Optimizer with BioPQQ®
NAD+ Cell Regenerator™
Optimized NAD+ Cell Regenerator™ with Resveratrol
PQQ Caps with BioPQQ®
Rhodiola Extract
RiboGen™ French Oak Wood Extract
Triple Action Thyroid

Eye Health

Astaxanthin with Phospholipids
Brite Eyes III
Certified European Bilberry Extract
Eye Pressure Support with Mirtogenol®
MacuGuard® Ocular Support
MacuGuard® Ocular Support with Astaxanthin
Tear Support with MaquiBright®

Fish Oil & Omegas

OMEGA FOUNDATIONS® Mega EPA/DHA
OMEGA FOUNDATIONS® Mega GLA with Sesame Lignans
OMEGA FOUNDATIONS® Super Omega-3 EPA/DHA with Sesame Lignans & Olive Extract
OMEGA FOUNDATIONS® Super Omega-3 Plus EPA/DHA with Sesame Lignans, Olive Extract, Krill & Astaxanthin
OMEGA FOUNDATIONS® Provinal® Purified Omega-7
OMEGA FOUNDATIONS® Vegetarian DHA
Organic Golden Flax Seed

Food

California Estate Extra Virgin Olive Oil
Rich Rewards® Breakfast Blend
Rich Rewards® Breakfast Blend Natural Mocha Flavor
Rich Rewards® Breakfast Blend Natural Vanilla Flavor
Rich Rewards® Breakfast Blend Whole Bean Coffee
Rich Rewards® Decaf Roast
Stevia Sweetener

Glucose Management

CinSulin® with InSea^{2}® and Crominex® 3+
Glycemic Guard™
Mega Benfotiamine
Tri Sugar Shield®

Heart Health

Aspirin (Enteric Coated)
BioActive Folate & Vitamin B12 Caps
Cardio Peak™ with Standardized Hawthorn and Arjuna
Homocysteine Resist
Optimized Carnitine with GlycoCarn®
Super Ubiquinol CoQ10
Super Ubiquinol CoQ10 with BioPQQ®
Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™
Super-Absorbable CoQ10 Ubiquinone with *d*-Limonene
TMG Powder
TMG Liquid Capsules

Hormone Balance

DHEA (Dehydroepiandrosterone)
Inner Power
Pregnenolone
Triple Action Cruciferous Vegetable Extract with Resveratrol
Triple Action Cruciferous Vegetable Extract

Immune Support

AHCC®
Enhanced Zinc Lozenges
Immune Modulator with Tinofend®
Immune Protect with PARACTIN®
Immune Senescence Protection Formula™
Kinoko® Gold AHCC
Kinoko® Platinum AHCC
Kyolic® Garlic Formula 102
Kyolic® Reserve
Lactoferrin (apolactoferrin) Caps
NK Cell Activator™
Optimized Garlic
Optimized Quercetin
Peony Immune
ProBoost Thymic Protein A
Reishi Extract Mushroom Complex
Standardized *Cistanche*
Ten Mushroom Formula®
Zinc Lozenges

Inflammation Management

5-LOX Inhibitor with AprèsFlex®
Advanced Bio-Curcumin® with Ginger & Turmerones
Black Cumin Seed Oil
Black Cumin Seed Oil with Bio-Curcumin®
Boswella
Cytokine Suppress™ with EGCG
Serraflazyme
Specially-Coated Bromelain
Super Bio-Curcumin®
Zyflamend® Whole Body

Joint Support

Arthro-Immune Joint Support
ArthroMax® Advanced with UC-II® & AprèsFlex®
ArthroMax® with Theaflavins & AprèsFlex®
ArthroMax® Herbal Joint Formula
Bio-Collagen with Patented UC-II®
Fast-Acting Joint Formula
Glucosamine/Chondroitin Capsules
Krill Healthy Joint Formula
MSM (Methylsulfonylmethane)

Kidney & Bladder Support

Cran-Max® Cranberry Whole Fruit Concentrate
Optimized Cran-Max® with Ellirose™
Uric Acid Control
Water-Soluble Pumpkin Seed Extract

Liver Health & Detoxification

Anti-Alcohol with HepatoProtection Complex
Calcium D-Glucarate
Chlorella
Chlorophyllin
European Milk Thistle
Glutathione, Cysteine & C
HepatoPro
Liver Efficiency Formula
N-Acetyl-L-Cysteine
PectaSol-C®
Silymarin
SODzyme® with GliSODin® & Wolfberry

Longevity & Wellness

Ageless Cell™
Alpha-Lipoic Acid
AppleWise Polyphenol Extract
Berry Complete
Blueberry Extract
Blueberry Extract with Pomegranate
DNA Protection Formula

Enhanced Berry Complete with Acai
Essential Daily Nutrients
Grapeseed Extract with Resveratrol & Pterostilbene
Mediterranean Whole Food Blend
Mega Green Tea Extract (decaffeinated)
Mega Green Tea Extract (lightly caffeinated)
Optimized Fucoidan with Maritech® 926
Optimized Resveratrol
Optimized Resveratrol with Nicotinomide Riboside
pTeroPure®
Pycnogenol® French Maritime Pine Bark Extract
Resveratrol with Pterostilbene
RNA (Ribonucleic Acid)
Super R-Lipoic Acid
X-R Shield

Men's Health

Mega Lycopene Extract
PalmettoGuard® Saw Palmetto with Beta-Sitosterol
PalmettoGuard® Saw Palmetto/Nettle Root Formula with Beta-Sitosterol
Pomi-T®
Prelox® Natural Sex for Men®
Super MiraForte with Standardized Lignans
Triple Strength ProstaPollen™
Ultra Natural Prostate

Minerals

Boron
Extend-Release Magnesium
Ionic Selenium
Iron Protein Plus
Magnesium (Citrate)
Magnesium Caps
Only Trace Minerals
Optimized Chromium with Crominex® 3+
Sea-Iodine™
Se-Methyl L-Selenocysteine
Vanadyl Sulfate
Zinc Caps

Miscellaneous

Potassium Iodide
Solarshield® Sunglasses

Mood & Stress Management

5 HTP
L-Theanine
Natural Cortisol Balance
Natural Stress Relief
SAMe (S-Adenosyl-Methionine)

Multivitamins

Children's Formula Life Extension Mix™
Comprehensive Nutrient Packs ADVANCED
Life Extension Mix™ Capsules without Copper
Life Extension Mix™ Capsules
Life Extension Mix™ Powder without Copper
Life Extension Mix™ Powder
Life Extension Mix™ Tablets with Extra Niacin
Life Extension Mix™ Tablets without Copper
Life Extension Mix™ Tablets
Once-Daily Health Booster
One-Per-Day Tablets
Two-Per-Day Capsules
Two-Per-Day Tablets

Personal Care

Anti-Aging Rejuvenating Scalp Serum
Biosil
Dr. Proctor's Advanced Hair Formula
Dr. Proctor's Shampoo
European Leg Solution Featuring Certified Diosmin 95
Face Master Platinum Facial Toning System
Hair, Skin & Nail Rejuvenation Formula w/VERISOL®
Hair Suppress Formula
Life Extension Toothpaste
Sinus Cleanser
Venotone
Xyliwhite Mouthwash

Pet Care

Cat Mix
Dog Mix

Probiotics

Bifido GI Balance
FLORASSIST® Balance
FLORASSIST® GI with Phage Technology
FLORASSIST® Heart Health
FLORASSIST® Immune Health
FLORASSIST® Mood
FLORASSIST® Oral Hygiene
FLORASSIST® Throat Health
Jarro-Dophilus® for Women
Theralac® Probiotics
TruFlora® Probiotics

Skin Care

Advanced Anti-Glycation Peptide Serum
Advanced Growth Factor Serum
Advanced Lightening Cream
Advanced Peptide Hand Therapy
Advanced Triple Peptide Serum
Advanced Under Eye Serum with Stem Cells
Amber Self MicroDermAbrasion
Anti-Aging Face Oil
Anti-Aging Mask
Anti-Aging Rejuvenating Face Cream
Anti-Glycation Serum with Blueberry & Pomegranate Extracts
Antioxidant Facial Mist
Anti-Redness & Adult Blemish Lotion
Broccoli Sprout Cream
Collagen Boosting Peptide Serum
DNA Repair Cream
Essential Plant Lipids Reparative Serum
Eye Lift Cream
Face Rejuvenating Anti-Oxidant Cream
Fine Line-Less
Healing Formula
Healing Vitamin K Cream
Hyaluronic Facial Moisturizer
Hyaluronic Oil-Free Facial Moisturizer
Hydrating Anti-Oxidant Facial Mist
Hydroderm
Lifting & Tightening Complex
Melatonin Cream
Mild Facial Cleanser
Multi Stem Cell Skin Tightening Complex
Neck Rejuvenating Anti-Oxidant Cream
Resveratrol Anti-Oxidant Serum
Shade Factor™
Shade Factor™ Sunscreen Lotion
Shade Factor™ Sunscreen Spray
Skin Care Collection Anti-Aging Serum
Skin Care Collection Body Lotion
Skin Care Collection Day Cream
Skin Care Collection Night Cream
Skin Firming Complex
Skin Lightening Serum
Skin Restoring Phytoceramides with Lipowheat®
Skin Stem Cell Serum
Skin Tone Equalizer
Stem Cell Cream with Alpine Rose
Tightening & Firming Neck Cream
Triple-Action Vitamin C Cream
Ultimate MicroDermabrasion
Ultra Eyelash Booster
Ultra Lip Plumper
Ultra Wrinkle Relaxer
Under Eye Refining Serum
Under Eye Rescue Cream
Vitamin C Serum
Vitamin D Lotion
Vitamin E-ssential Cream
Youth Serum

Sleep

Bioactive Milk Peptides
Enhanced Natural Sleep® with Melatonin
Enhanced Natural Sleep® without Melatonin
Fast-Acting Liquid Melatonin
Glycine
L-Tryptophan
Melatonin
Optimized Tryptophan Plus

Sports Performance

Creatine Capsules
Creatine Whey Glutamine Powder (Vanilla Flavor)
New Zealand Whey Protein Concentrate (Natural Chocolate and Vanilla Flavor)
Tart Cherry with CherryPure®
Whey Protein Isolate (Chocolate and Vanilla Flavor)

Vitamins

Ascorbyl Palmitate
Benfotiamine with Thiamine
Beta-Carotene
BioActive Complete B-Complex
Biotin
Buffered Vitamin C Powder
Fast-C® with Dihydroquercetin
Gamma E Mixed Tocopherol Enhanced with Sesame Lignans
Gamma E Mixed Tocopherol/Tocotrienols
High Potency Optimized Folate
Inositol Caps
Liquid Emulsified Vitamin D3
Liquid Vitamin D3
Low-Dose Vitamin K2
Methylcobalamin
MK-7
Natural Vitamin E
No Flush Niacin
Optimized Folate (L-Methylfolate)
Pantothenic Acid (Vitamin B-5)
Pyridoxal 5'-Phosphate Caps
Super Absorbable Tocotrienols
Super K with Advanced K2 Complex
Vitamin B12
Vitamin B6
Vitamin C with Dihydroquercetin
Vitamin D3 with Sea-Iodine™
Vitamin D3
Vitamins D and K with Sea-Iodine™

Weight Management

7-Keto® DHEA Metabolite
Advanced Anti-Adipocyte Formula
Advanced Natural Appetite Suppress
AMPK Metabolic Activator
CalReduce Selective Fat Binder
DHEA Complete
Garcinia HCA
HCActive™ Garnicia Cambogia Extract
Integra-Lean®
Mediterranean Trim with Sinetrol™-XPur
Optimized Irvingia with Phase 3™ Calorie Control Complex
Optimized Saffron with Satiereal®
Super Citrimax®
Super CLA Blend with Sesame Lignans
Waist-Line Control™

Women's Health

Advanced Natural Sex for Women® 50+
Breast Health Formula
Femmenessence MacaPause®
Natural Estrogen
Progesta-Care®
Super-Absorbable Soy Isoflavones
Ultra Soy Extract

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
	A						
01524	**ACETYL-L-CARNITINE** • 500 mg, 100 veg. caps	34.00	25.50	22.50			
01874	**ACETYL-L-CARNITINE ARGINATE** • 90 veg. caps	52.00	39.00	35.00			
01628	**ADRENAL ENERGY FORMULA** • 60 veg. caps	24.00	18.00	16.50			
01630	**ADRENAL ENERGY FORMULA** • 120 veg. caps	46.00	34.50	31.50			
01828	**ADVANCED LIPID CONTROL** • 60 veg. caps	30.00	22.50	20.25			
02119	**AGELESS CELL™** • 30 softgels	40.00	30.00	27.00			
00681	**AHCC®** • 500 mg, 30 caps	59.98	44.99				
24404	**AHCC® (KINOKO® PLATINUM)** • 750 mg, 60 veg. caps	84.95	63.71				
29727	**AHCC® (KINOKO® GOLD)** • 500 mg, 60 veg. caps	74.95	52.47				
00457	**ALPHA-LIPOIC ACID W/BIOTIN** • 250 mg, 60 caps	37.00	27.75	24.00			
02207	**AMPK METABOLIC ACTIVATOR** • 30 veg. tabs	38.00	28.50	24.00			
01509	**ANTI-ADIPOCYTE FORMULA W/MERATRIM® & INTEGRA LEAN®** (Advanced) • 60 veg. caps	39.00	29.25	27.00			
02140	**ANTI-ALCOHOL w/HEPATOPRO COMPLEX** • 60 caps	22.00	16.50	15.00			
01625	**APPLEWISE POLYPHENOL EXTRACT** 600 mg, 30 veg. caps	21.00	15.75	14.25			
01039	**ARGININE/ORNITHINE** • 500/250, 100 caps	17.99	13.49				
00038	**ARGININE/ORNITHINE POWDER** • 150 grams	22.95	17.21	14.25			
01624	**(L)-ARGININE CAPS** • 700 mg, 200 veg. caps	26.50	19.88	17.44			
02004	**ARTERIAL PROTECT** • 30 veg. caps	44.00	33.00	29.00			
01617	**ARTHROMAX® W/THEAFLAVINS & APRÈSFLEX®** 120 veg. caps	44.00	33.00	30.00			
01618	**ARTHROMAX® ADVANCED W/UC-II® & APRÈSFLEX®** 60 caps	36.00	27.00	24.00			
02108	**ARTHROMAX® HERBAL JOINT FORMULA** • 60 veg. caps	40.00	30.00	27.00			
01404	**ARTHRO-IMMUNE JOINT SUPPORT** • 60 veg. caps	32.00	24.00	21.00			
00919	**ARTICHOKE LEAF EXTRACT** • 500 mg, 180 veg. caps	30.00	22.50	21.00			
01533	**ASCORBYL PALMITATE** • 500 mg, 100 veg. caps	22.50	16.88	15.00			
00888	**ASHWAGANDHA EXTRACT** (Optimized) • 60 veg. caps	10.00	7.50	6.75			
01805	**ASIAN ENERGY BOOST** • 90 veg. caps	24.00	18.00	16.50			
01066	**ASPIRIN** • 81 mg, 300 enteric coated tablets	6.00	4.50	4.00			
01923	**ASTAXANTHIN WITH PHOSPHOLIPIDS** • 4 mg, 30 softgels	16.00	12.00	10.50			
	B						
00920	**BENFOTIAMINE W/ THIAMINE** • 100 mg, 120 veg. caps	19.95	14.96	13.95			
00925	**BENFOTIAMINE** (Mega) • 250 mg, 120 veg. caps	30.00	22.50	20.25			
01206	**BERRY COMPLETE** • 30 veg. caps	21.00	15.75	14.00			
01496	**BERRY COMPLETE W/ACAI** (Enhanced) • 60 veg. caps	29.00	21.75	19.50			
00664	**BETA-CAROTENE** • 25,000 IU, 100 softgels	11.50	8.63				
01622	**BIFIDO GI BALANCE** • 60 veg. caps	20.00	15.00	13.50			
01873	**BILBERRY EXTRACT** • 100 mg, 90 veg. caps	36.00	27.00	24.00			
01512	**BIOACTIVE MILK PEPTIDES** • 30 caps	18.00	13.50	12.00			
01631	**BIO-COLLAGEN W/PATENTED UC-II®** • 40 mg, 60 small caps	36.00	27.00	24.00			
††01006	**BIOSIL™** • 5 mg, 30 veg. caps	19.99	15.99				
††01007	**BIOSIL™** • 1 fl oz	31.99	25.59				
00102	**BIOTIN** • 600 mcg, 100 caps	7.50	5.63	4.88			
01709	**BLACK CUMIN SEED OIL** • 60 softgels	16.00	12.00	10.50			
01710	**BLACK CUMIN SEED OIL W/BIO-CURCUMIN®** • 60 softgels	32.00	24.00	22.50			

SUBTOTAL OF COLUMN 1

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
01008	**BLAST™** • 600 grams of powder	26.95	20.21				
02025	**BLOOD PRESSURE** (Dual Action) • 60 veg. tabs	44.00	33.00	28.00			
70000	**BLOOD PRESSURE MONITOR (ACCUFIT™)** • med/lg cuff	79.99	49.99				
70004	**BLOOD PRESSURE MONITOR** • Digital wrist cuff	69.95	52.46				
02024	**BLOOD PRESSURE** (Triple Action AM/PM) • 60 veg. tabs	44.00	33.00	28.00			
01214	**BLUEBERRY EXTRACT** • 60 veg. caps	22.50	16.88	15.00			
01438	**BLUEBERRY EXTRACT W/ POMEGRANATE** • 60 veg. caps	30.00	22.50	20.25			
01506	**BONE FORMULA** (DR. STRUM'S INTENSIVE) • 300 caps	56.00	42.00	37.50			
01726	**BONE RESTORE** • 120 caps	22.00	16.50	14.25			
01727	**BONE RESTORE W/VITAMIN K2** • 120 caps	24.00	18.00	16.50			
01725	**BONE STRENGTH FORMULA W/KOACT®** • 120 caps	45.00	33.75	30.00			
00313	**BONE-UP®** • 240 caps	28.95	21.71	20.41			
01661	**BORON** • 3 mg, 100 veg. caps	5.95	4.46	3.94			
00202	**BOSWELLA** • 100 caps	38.00	28.50	22.50			
01802	**BRAIN SHIELD® GASTRODIN** • 300 mg, 60 veg. caps	33.00	24.75	22.50			
01253	**BRANCHED CHAIN AMINO ACIDS** • 90 caps	19.50	14.63	12.75			
01942	**BREAST HEALTH FORMULA** • 60 caps	34.00	25.50	22.50			
00893	**BRITE EYES III** • 2 vials, 5 ml each	34.00	25.50	24.00			
01203	**BROMELAIN** (Specially-coated) 500 mg, 60 enteric coated tablets	21.00	15.75	14.25			
	C						
01653	**CALCIUM CITRATE W/VITAMIN D** • 300 caps	24.00	18.00	15.94			
01651	**CALCIUM D-GLUCARATE** • 200 mg, 60 veg. caps	18.00	13.50	11.25			
†01823	**CALREDUCE SELECTIVE FAT BINDER** 120 mint chewable tablets	45.00	33.75	28.50			
01700	**CARDIO PEAK™ w/STANDARDIZED HAWTHORN & ARJUNA** 120 veg. caps	36.00	27.00	24.00			
00916	**CARNITINE W/GLYCOCARN®** (Optimized) • 60 veg. caps	36.00	27.00	24.00			
01532	**L-CARNITINE** • 500 mg, 30 veg. caps	15.00	11.25	9.90			
01829	**CARNOSINE** • 500 mg, 60 veg. caps	36.00	27.00	24.00			
02020	**CARNOSINE** (Super) • 500 mg, 60 veg. caps	40.00	30.00	27.00			
01932	**CAT MIX** • 100 grams powder	14.00	10.50	8.25			
02199	**CHILDREN'S FORMULA LIFE EXTENSION MIX™** 120 chewable tablets	25.00	18.75	17.00			
00550	**CHLORELLA** • 500 mg, 200 tablets	23.98	17.99				
01571	**CHLOROPHYLLIN** • 100 mg, 100 veg. caps	24.00	18.00	15.00			
01359	**CHO-LESS™**• 90 capsules	35.00	26.25				
01910	**CHOL-SUPPORT™** • 60 liquid veg. caps	48.00	36.00	32.00			
01504	**CHROMIUM W/CROMINEX®** 3+ (Optimized) 500 mcg, 60 veg. caps	9.00	6.75	6.00			
01503	**CINSULIN® W/INSEA2® AND CROMINEX® 3+** • 90 veg. caps	38.00	28.50	25.50			
01906	***CISTANCHE*** (Standardized) • 30 veg. caps	20.00	15.00	12.00			
01818	**CITRIMAX®** (Super) • 180 veg. caps	40.00	30.00	28.50			
00818	**CLA BLEND W/SESAME LIGNANS** (Super) 120 softgels	36.00	27.00	24.75	19.75		
02103	**COCOAMIND™** • 14 packets	24.00	18.00	16.00			
01896	**COGNITEX® W/BRAIN SHIELD®** • 90 softgels	60.00	45.00	39.00	36.00		
01897	**COGNITEX® W/PREGNENOLONE & BRAIN SHIELD®** 90 softgels	62.00	46.50	39.75	37.50		

SUBTOTAL OF COLUMN 2

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
01421	**COGNITEX® BASICS** • 60 softgels	38.00	28.50	26.25	24.00		
01659	**COGNIZIN® CDP-CHOLINE CAPS** • 250 mg, 60 veg. caps	36.00	27.00	25.50			
01945	**COMPLETE B-COMPLEX** (BioActive) • 60 veg. caps	12.00	9.00	8.00			
02198	**COMPREHENSIVE NUTRIENT PACKS ADVANCED** • 30 packs	90.00	67.50	61.50			
01949	**COQ10 w/*d*-LIMONENE** (Super-Absorbable) • 50 mg, 60 softgels	25.00	18.75	16.50	15.00		
01948	**COQ10 w/*d*-LIMONENE** (Super-Absorbable) 100 mg, 100 softgels	46.00	34.50	28.00	26.25		
01951	**COQ10 w/*d*-LIMONENE** (Super-Absorbable) 100 mg, 60 softgels	30.00	22.50	20.00			
01929	**COQ10** (Super Ubiquinol) • 100 mg, 60 softgels	56.00	42.00	36.00	33.00		
01733	**COQ10 w/BIOPQQ®** (Super Ubiquinol) • 100 mg, 30 softgels	54.00	40.50	33.00	30.00		
01426	**COQ10 w/ENH MITOCHONDRIAL SUPPORT™** (Super Ubiquinol) • 100 mg, 60 softgels	62.00	46.50	39.00	36.00		
01425	**COQ10 w/ENH MITOCHONDRIAL SUPPORT™** (Super Ubiquinol) • 50 mg, 100 softgels	58.00	43.50	34.50	31.50		
01427	**COQ10 w/ENH MITOCHONDRIAL SUPPORT™** (Super Ubiquinol) • 50 mg, 30 softgels	20.00	15.00	12.00			
01431	**COQ10 w/ENH MITOCHONDRIAL SUPPORT™** (Super Ubiquinol) • 200 mg, 30 softgels	62.00	46.50	39.00	36.00		
00862	**CRAN-MAX®** • 500 mg, 60 veg. caps	17.50	13.13	11.25			
01424	**CRAN-MAX® WITH ELLIROSE™** (Optimized) • 60 veg. caps	18.00	13.50	12.00			
01529	**CREATINE CAPSULES** • 120 veg. caps	10.95	8.21	6.94			
01746	**CREATINE WHEY GLUTAMINE POWDER** • 454 grams (vanilla)	30.00	22.50	19.50			
00407	**CURCUMIN®** (Super Bio) • 400 mg, 60 veg. caps	38.00	28.50	26.25			
01924	**CURCUMIN® W/GINGER & TURMERONES** (Advanced Bio) 30 softgels	30.00	22.50	20.25			
01804	**CYTOKINE SUPPRESS™ W/EGCG** • 30 veg. caps	30.00	22.50	20.25			
	COSMESIS						
80157	**ADVANCED ANTI-GLYCATION PEPTIDE SERUM** • 1 oz	53.00	39.75	34.50			
80165	**ADVANCED GROWTH FACTOR SERUM** • 30 ml	65.00	48.75	42.75			
80154	**ADVANCED LIGHTENING CREAM** • 1 oz	65.00	48.75	42.75			
80155	**ADVANCED PEPTIDE HAND THERAPY** • 4 oz	46.00	34.50	29.25			
80152	**ADVANCED TRIPLE PEPTIDE SERUM** • 1 oz	65.00	48.75	42.75			
80140	**ADVANCED UNDER EYE SERUM W/STEM CELLS** • .33 oz	49.00	36.75	31.50			
80139	**AMBER SELF MICRODERMABRASION** • 2 oz	49.00	36.75	31.50			
80158	**ANTI-AGING FACE OIL** • 1 oz	59.00	44.25	39.00			
80118	**ANTI-AGING MASK** • 2 oz	72.00	54.00	47.52			
80151	**ANTI-AGING REJUVENATING FACE CREAM** • 2 oz	65.00	48.75	42.75			
80153	**ANTI-AGING REJUVENATING SCALP SERUM** • 2 oz	46.00	34.50	29.25			
80134	**ANTI-GLYCATION SERUM W/BLUEBERRY & POMEGRANATE EXTRACTS** • 1 oz	33.00	24.75	23.51			
80133	**ANTIOXIDANT FACIAL MIST** • 2 oz	32.00	24.00	22.80			
80105	**ANTI-REDNESS & ADULT BLEMISH LOTION** • 1 oz	74.50	55.88	49.17			
80144	**BROCCOLI SPROUT CREAM** • 1 oz	46.00	34.50	29.25			
80156	**COLLAGEN BOOSTING PEPTIDE SERUM** • 1 oz	59.00	44.25	39.00			
80141	**DNA REPAIR CREAM** • 1 oz	49.00	36.75	31.50			
80108	**ESSENTIAL PLANT LIPIDS REPARATIVE SERUM** • 1 oz	74.95	56.21	49.46			
80163	**EYE LIFT CREAM** • 0.5 fl oz	59.00	44.25	39.00			
80123	**FACE REJUVENATING ANTIOXIDANT CREAM** • 2 oz	69.50	52.13	45.87			

SUBTOTAL OF COLUMN 3

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
80107	**FINE LINE-LESS** • 1 oz	74.50	55.88	49.17			
80137	**HEALING FORMULA ALL-IN-ONE CREAM** • 1 oz	53.00	39.75	34.07			
80102	**HEALING VITAMIN K CREAM** • 1 oz	79.50	59.63	52.47			
80109	**HYALURONIC FACIAL MOISTURIZER** • 1 oz	58.00	43.50	38.28			
80110	**HYALURONIC OIL-FREE FACIAL MOISTURIZER** • 1 oz	58.00	43.50	38.28			
80138	**HYDRATING ANTIOXIDANT FACE MIST** • 4 oz	39.95	29.96	28.50			
80103	**LIFTING & TIGHTENING COMPLEX** • 1 oz	74.50	55.88	49.17			
80135	**MELATONIN CREAM** • 1 oz	33.00	24.75	20.33			
80114	**MILD FACIAL CLEANSER** • 8 fl. oz	59.00	44.25	38.94			
80159	**MULTI STEM CELL SKIN TIGHTENING COMPLEX** • 1 oz	59.00	44.25	39.00			
80122	**NECK REJUVENATING ANTIOXIDANT CREAM** • 2 oz	64.00	48.00	42.24			
80150	**RENEWING EYE CREAM** • 1/2 oz	65.00	48.75	42.75			
80142	**RESVERATROL ANTI-OXIDANT SERUM** • 1 oz	46.00	34.50	29.25			
80166	**SKIN FIRMING COMPLEX** • 1 fl. oz	53.00	39.75				
80112	**SKIN LIGHTENING SERUM** • 1/2 oz	85.00	63.75	56.10			
80130	**SKIN STEM CELL SERUM** • 1 oz	74.00	55.50	51.75			
80164	**SKIN TONE EQUALIZER** • 0.4 fl oz	59.00	44.25	39.00			
80143	**STEM CELL CREAM W/ALPINE ROSE** • 1 oz	66.00	49.50	43.50			
80148	**TIGHTENING & FIRMING NECK CREAM** • 2 oz	39.00	29.25	26.25			
80161	**TRIPLE ACTION VITAMIN C CREAM** • 1 oz jar	59.00	44.25	39.00			
80162	**ULTIMATE MICRODERMABRASION** • 8 fl. oz	39.00	29.25	26.25			
80160	**ULTRA EYELASH BOOSTER** • 0.25 oz (2 units $39)	59.00	44.25				
80116	**ULTRA LIP PLUMPER** • 1/3 oz	64.00	48.00	42.24			
80101	**ULTRA WRINKLE RELAXER** • 1 oz	89.95	67.46	59.82			
80113	**UNDER EYE REFINING SERUM** • 1/2 oz	74.50	55.88	49.17			
80104	**UNDER EYE RESCUE CREAM** • 1/2 oz	74.50	55.88	49.17			
80129	**VITAMIN C SERUM** • 1 oz	85.00	63.75	56.10			
80136	**VITAMIN D LOTION** • 4 oz	36.00	27.00	25.25			
80145	**VITAMIN E-ESSENTIAL CREAM** • 1 oz	28.00	21.00	19.50			
80149	**YOUTH SERUM** • 1 oz	65.00	48.75	42.75			
	D						
00658	**7-KETO® DHEA METABOLITE** • 25 mg, 100 caps	28.00	21.00	18.00			
01479	**7-KETO® DHEA METABOLITE** • 100 mg, 60 veg. caps	40.00	30.00	27.00			
01640	**DHA** (Vegetarian) • 30 veg. softgels	20.00	15.00	13.50			
00607	**DHEA** • 25 mg, 100 tablets (Dissolve in mouth)	14.00	10.50	8.81			
01478	**DHEA COMPLETE** • 60 veg. caps	48.00	36.00	32.40			
00335	**DHEA** • 25 mg, 100 caps	16.00	12.00	11.00			
00454	**DHEA** • 15 mg, 100 caps	14.00	10.50	9.00			
00882	**DHEA** • 50 mg, 60 caps	19.00	14.25	12.75			
01689	**DHEA** • 100 mg, 60 veg. caps	24.00	18.00	16.50			
01358	**DIGEST RC®** • 30 tablets	19.95	14.96	12.75			
02021	**DIGESTIVE ENZYMES** (Enhanced Super) • 60 veg. caps	22.00	16.50	15.00			
02022	**DIGESTIVE ENZYMES w/PROBIOTICS** (Enhanced Super)• 60 veg. caps	28.00	21.00	18.00			
01671	**D, L-PHENYLALANINE** • 500 mg, 100 veg. caps	18.75	14.06	12.00			
01540	**DMAE BITARTRATE** • 150 mg, 200 veg. caps	18.00	13.50	11.25			

SUBTOTAL OF COLUMN 4

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
01570	**DNA PROTECTION FORMULA** • 60 veg. caps	34.00	25.50	24.00			
01931	**DOG MIX** • 100 grams powder	18.00	13.50	11.25			
02006	**DOPA-MIND™** • 60 veg. tabs	44.00	33.00	28.00			
00321	**DR. PROCTOR'S ADVANCED HAIR FORMULA** • 2 oz	39.95	29.96	24.00			
00320	**DR. PROCTOR'S HAIR SHAMPOO** • 8 oz	24.95	18.71	16.50			
	E						
01997	**ENDOTHELIAL DEFENSE™ w/POMEGRANATE COMPLETE AND CORDIART™** • 60 softgels	68.00	51.00	46.50			
00997	**ENDOTHELIAL DEFENSE™ w/GLISODIN®** • 60 veg. caps	54.00	40.50	36.00			
01937	**EPA/DHA** (Mega) • 120 softgels	20.00	15.00	13.50			
02009	**ESOPHACOOL™** • 120 chewable tablets	20.00	15.00	13.50			
01737	**ESOPHAGEAL GUARDIAN** (Berry flavor) • 60 chewable tablets	36.00	27.00	24.00			
01042	**EUROPEAN LEG SOLUTION DIOSMIN 95** 600 mg, 30 veg. tabs	20.00	15.00	13.50			
01706	**EXTRAORDINARY ENZYMES** • 60 caps	26.00	19.50	18.00			
02008	**(CALIFORNIA ESTATE) EXTRA VIRGIN OLIVE OIL** • 500 ml (16.9 fl. oz)	33.00	24.75	22.50			
01514	**EYE PRESSURE SUPPORT W/MIRTOGENOL®** • 30 veg. caps	38.00	28.50	25.50			
	F						
*01054	**FACE MASTER® PLATINUM** • Facial Toning System	199.00	199.00				
00965	**FAST-ACTING JOINT FORMULA** • 30 caps	39.00	29.25	27.00			
01717	**FAST-C® W/DIHYDROQUERCETIN** • 120 veg. tabs	26.00	19.50	18.00			
01064	**FEMMENESSENCE MACAPAUSE®** • 120 veg. caps	34.99	26.24				
02125	**FLORASSIST® GI w/PHAGE TECHNOLOGY** • 30 liquid veg. caps	33.00	24.75	22.50			
01821	**FLORASSIST® HEART HEALTH** • 60 veg. caps	32.00	24.00	21.00			
02124	**FLORASSIST® IMMUNE HEALTH** • 30 veg. caps	26.00	19.50	18.00			
02120	**FLORASSIST® ORAL HYGIENE** • 30 lozenges	20.00	15.00	13.00			
01825	**FLORASSIST® BALANCE** • 30 liquid veg. caps	32.00	24.00	21.00			
02000	**FLORASSIST® MOOD** • 60 caps	33.00	24.75	22.50			
01920	**FLORASSIST® THROAT HEALTH** • 30 lozenges	20.00	15.00	13.50			
01913	**FOLATE HIGH POTENCY** (Optimized) • 5,000 mcg, 30 veg. tablets	18.00	13.50	12.00			
01939	**FOLATE** (Optimized) • 1,000 mcg, 100 veg. tablets	15.00	11.25	10.00			
01842	**FOLATE + VITAMIN B12** (BioActive) • 90 veg. caps	12.00	9.00	8.00			
01544	**FORSKOLIN** • 10 mg, 60 veg. caps	16.00	12.00	10.50			
01513	**FUCOIDAN W/MARITECH® 926** (Optimized) • 60 veg. caps	36.00	27.00	24.75			
	G						
02070	**GAMMA E MIXED TOCOPHEROL/TOCOTRIENOLS** • 60 softgels	40.00	30.00	27.00			
02075	**GAMMA E MIXED TOCOPHEROL w/ENHANCED SESAME LIGNANS** • 60 softgels	32.00	24.00	21.75			
01394	**GARLIC** (Optimized) • 200 veg. caps	24.95	18.71	15.75			
02100	**GASTRO-EASE™** • 60 veg. caps	44.00	33.00	30.00			
**01122	**GINGER FORCE®** • 60 liquid caps	34.95	26.21				
01658	**GINKGO BILOBA CERTIFIED EXTRACT™** 120 mg, 365 veg. caps	50.00	37.50	33.00			
00756	**GLA WITH SESAME LIGNANS** (Mega) • 60 softgels	19.50	14.63	13.50			
00345	**(L-) GLUTAMINE CAPSULES** • 500 mg, 100 veg. caps	14.95	11.21	10.13			
00141	**(L-) GLUTAMINE POWDER** • 100 grams	22.00	16.50	15.00			
00522	**GLUCOSAMINE/CHONDROITIN CAPSULES** • 100 caps	38.00	28.50	24.00			
01541	**GLUTATHIONE, CYSTEINE & C** • 100 veg. caps	20.00	15.00	13.50			

SUBTOTAL OF COLUMN 5

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
02122	**GLYCEMIC GUARD™** • 30 veg. caps	42.00	31.50	28.00			
01669	**GLYCINE** • 1,000 mg, 100 veg. caps	12.00	9.00	8.10			
01411	**GRAPE SEED EXTRACT W/RESVERATROL & PTEROSTILBENE** 100 mg, 60 veg. caps	36.00	27.00	25.50			
01620	**GREEN COFFEE EXTRACT COFFEEGENIC®** 400 mg, 90 veg. caps	32.00	24.00	21.00			
00953	**GREEN TEA EXTRACT** (Mega) • lightly caffeinated, 100 veg. caps	30.00	22.50	18.00			
00954	**GREEN TEA EXTRACT** (Mega) • decaffeinated, 100 veg. caps	30.00	22.50	18.00			
	H						
01074	**5 HTP** • 100 mg, 60 caps	27.95	20.96				
**02002	**HAIR, SKIN & NAIL REJUVENATION FORM W/VERISOL®** 90 tabs	32.00	24.00	22.00			
01738	**HCA** (Garcinia) • 90 veg. caps	17.00	12.75	11.25			
29754	**HCACTIVE™ GARCINIA CAMBOGIA EXTRACT** • 90 caps	30.00	22.50				
01393	**HEPATOPRO** • 900 mg, 60 softgels	50.00	37.50	34.50			
02121	**HOMOCYSTEINE RESIST** • 60 veg. caps	26.00	19.50	17.50			
01527	**HUPERZINE A** • 200 mcg, 60 veg. caps	40.00	30.00	27.00			
00661	**HYDRODERM®** • 1 oz	79.95	59.96	49.00			
	I						
01704	**IMMUNE MODULATOR W/TINOFEND®** • 60 veg. caps	17.00	12.75	11.25			
00955	**IMMUNE PROTECT W/PARACTIN®** • 30 veg. caps	29.50	22.13	19.91			
02005	**IMMUNE SENESCENCE PROTECTION FORMULA™** • 60 veg. tabs	40.00	30.00	27.00			
01049	**INNERPOWER™** • 530 grams powder	42.00	31.50				
01674	**INOSITOL CAPSULES** • 1,000 mg, 360 veg. caps	62.00	46.50	43.50			
01292	**INTEGRA-LEAN® AFRICAN MANGO IRVINGIA** 150 mg, 60 veg. caps	28.00	21.00	18.00			
30731	**IONIC SELENIUM** • 2 oz, 300 mcg	13.69	10.27				
01677	**IRON PROTEIN PLUS** • 300 mg, 100 caps	28.00	21.00	19.50			
01492	**IRVINGIA W/PHASE 3™ CALORIE CONTROL COMPLEX** (Optimized African Mango) • 120 veg. caps	56.00	42.00	36.00			
	J, K, L						
52142	**JARRO-DOPHILUS® PROBIOTIC FOR WOMEN** 30 enteric-coated veg. caps	27.95	20.96				
00056	**JARRO-DOPHILUS EPS®** • 60 veg. caps	23.95	17.96				
01834	**K W/ADVANCED K2 COMPLEX** (Super) • 90 softgels	30.00	22.50	20.25			
01600	**KRILL HEALTHY JOINT FORMULA** • 30 softgels	32.00	24.00	21.75			
01050	**KRILL OIL** (Jarrow) • 60 softgels	33.95	25.46				
00316	**KYOLIC® GARLIC FORMULA 102** • 200 veg. caps	27.45	20.59				
00789	**KYOLIC® RESERVE** • 600 mg, 120 caps	28.95	21.71				
01681	**LACTOFERRIN** • 60 caps	44.00	33.00	30.00			
00020	**LECITHIN** • 16 oz granules	18.00	13.50	12.00			
02155	**LIFE EXTENSION MIX™** • 315 tablets	80.00	60.00	52.00	43.75		
02157	**LIFE EXTENSION MIX™ W/EXTRA NIACIN** • 315 tablets	80.00	60.00	52.00	43.75		
02154	**LIFE EXTENSION MIX™** • 490 caps	90.00	67.50	58.00	47.50		
02156	**LIFE EXTENSION MIX™ POWDER** • 14.81 oz	80.00	60.00	52.00	43.75		
02165	**LIFE EXTENSION MIX™** • 315 tablets w/o copper	80.00	60.00	52.00	43.75		
02164	**LIFE EXTENSION MIX™** • 490 caps w/o copper	90.00	67.50	58.00	47.50		
02166	**LIFE EXTENSION MIX™ POWDER** • 14.81 oz w/o copper	80.00	60.00	52.00	43.75		
01608	**LIVER EFFICIENCY FORMULA** • 30 veg. caps	18.00	13.50	12.00			

SUBTOTAL OF COLUMN 6

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
01639	**5-LOX INHIBITOR W/APRÈSFLEX®** • 100 mg, 60 veg. caps	22.00	16.50	15.00			
01678	**L-LYSINE** • 620 mg, 100 veg. caps	9.00	6.75	6.00			
00455	**LYCOPENE** (Mega) • 15 mg, 90 softgels	35.00	26.25	22.50			
	M						
01992	**MACUGUARD® OCULAR SUPPORT w/SAFFRON•** 60 softgels	25.00	18.75	17.50			
01993	**MACUGUARD® OCULAR SUPPORT w/SAFFRON & ASTAXANTHIN•** 60 softgels	44.00	33.00	30.00			
01459	**MAGNESIUM CAPS** • 500 mg, 100 veg. caps	12.00	9.00	7.50			
01682	**MAGNESIUM (CITRATE)** • 160 mg, 100 veg. caps	12.00	9.00	7.50			
02107	**(EXTEND-RELEASE) MAGNESIUM** • 60 veg. caps	13.00	9.75	8.75			
01908	**MEDITERRANEAN TRIM WITH SINETROL™-XPUR** 60 veg. caps	18.00	13.50	12.00			
02109	**MEDITERRANEAN WHOLE FOOD BLEND** • 90 veg. caps	44.00	33.00	30.00			
01668	**MELATONIN** • 300 mcg, 100 veg. caps	5.75	4.31	3.75			
01083	**MELATONIN** • 500 mcg, 200 veg. caps	18.00	13.50	12.00			
00329	**MELATONIN** • 1 mg, 60 caps	5.00	3.75	3.47			
00330	**MELATONIN** • 3 mg, 60 veg. caps	8.00	6.00	5.16			
00331	**MELATONIN** • 10 mg, 60 veg. caps	28.00	21.00	18.00			
00332	**MELATONIN** • 3 mg, 60 veg. lozenges	8.00	6.00	5.16			
01734	**MELATONIN** (Fast-Acting Liquid) • 2 fl. oz (Citrus-Vanilla)	12.00	9.00	8.25			
01787	**MELATONIN TIMED RELEASE** • 300 mcg, 100 veg. tabs	12.00	9.00	8.25			
01788	**MELATONIN TIMED RELEASE** • 750 mcg, 60 veg. tablets	8.00	6.00	5.25			
01786	**MELATONIN TIMED RELEASE** • 3 mg, 60 veg. tabs	12.00	9.00	8.25			
02101	**MEMORY PROTECT** • 36 day supply	24.00	18.00	16.00			
01536	**METHYLCOBALAMIN** • 1 mg, 60 veg. lozenges (vanilla)	9.95	7.46	6.00			
01537	**METHYLCOBALAMIN** • 5 mg, 60 veg. lozenges (vanilla)	32.00	24.00	18.75	17.25		
00709	**MIGRA-EEZE™** (Butterbur) • 60 softgels	33.00	24.75	22.00			
01522	**MILK THISTLE** (European) • 60 veg. caps	34.00	25.50	22.50			
01922	**MILK THISTLE** (European) • 60 softgels	28.00	21.00	18.75			
01925	**MILK THISTLE** (European) • 120 softgels	44.00	33.00	30.00			
01940	**MIRAFORTE w/STANDARDIZED LIGNANS** (Super) • 120 veg caps	62.00	46.50	42.00			
01869	**MITOCHONDRIAL BASICS W/BIOPQQ®** • 30 caps	44.00	33.00	30.00			
01868	**MITOCHONDRIAL ENERGY OPTIMIZER w/BIOPQQ®•**120 caps	72.00	54.00	48.00			
00065	**MK-7** • 90 mcg, 60 softgels	28.00	21.00	18.75			
00451	**MSM** (Methylsulfonylmethane) • 1,000 mg, 100 caps	14.00	10.50	8.96			
	N						
01534	**N-ACETYL-L-CYSTEINE** • 600 mg, 60 veg. caps	14.00	10.50	9.25			
01904	**NAD+ CELL REGENERATOR™** • 100 mg, 30 veg. caps	22.00	16.50	15.00			
02144	**NAD+ CELL REGENERATOR™ NICOTINAMIDE RIBOSIDE** 250 mg, 30 veg. caps	42.00	31.50	28.00			
02145	**NAD+ CELL REGENERATOR™ W/RESVERATROL** (Optimized) 30 veg. caps	50.00	37.50	34.00			
01807	**NATURAL APPETITE SUPPRESS** (Advanced) • 60 veg. caps	38.00	28.50	25.50			
00984	**NATURAL BP MANAGEMENT** • 60 tablets	44.00	33.00	30.00			
02012	**NATURAL CORTISOL BALANCE** • 30 veg. caps	45.00	33.75	30.00			
01892	**NATURAL ESTROGEN** • 60 veg. tabs	38.00	28.50	25.50			
01626	**NATURAL SEX FOR WOMEN® 50+** (Advanced)•90 veg. caps	59.00	44.25	34.00			
01444	**NATURAL SLEEP®** • 60 veg. caps	13.00	9.75	7.50			

SUBTOTAL OF COLUMN 7

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
01551	**NATURAL SLEEP® w/ MELATONIN** (Enhanced) • 30 caps	22.00	16.50	15.00			
01511	**NATURAL SLEEP® W/O MELATONIN** (Enhanced) • 30 caps	20.00	15.00	13.50			
01445	**NATURAL SLEEP® MELATONIN** • 5 mg, 60 veg. caps	18.00	13.50	12.00			
00987	**NATURAL STRESS RELIEF** • 30 veg. caps	28.00	21.00	18.00			
01603	**NEURO-MAG® MAGNESIUM L-THREONATE** • 90 veg. caps	40.00	30.00	27.00			
01602	**NEURO-MAG® MAGNESIUM L-THREONATE w/CALCIUM & VITAMIN D3** • 225 grams • Lemon flavor	40.00	30.00	27.00			
01990	**NITROVASC w/CORDIART™** • 30 veg. caps	18.00	13.50	12.00			
01903	**NK CELL ACTIVATOR™** • 30 veg. tablets	45.00	33.75	31.50			
00373	**NO FLUSH NIACIN** • 800 mg, 100 caps	19.00	14.25	12.75			
	O						
01824	**OLIVE LEAF VASCULAR SUPPORT w/CELERY SEED EXTRACT** (Advanced) • 60 veg. caps	36.00	27.00	24.00			
01988	**OMEGA-3 PLUS EPA/DHA w/SESAME LIGNANS, OLIVE EXTRACT, KRILL & ASTAXANTHIN** (SUPER)• 120 softgels	45.00	33.75	31.50	24.75		
01983	**OMEGA-3 EPA/DHA w/SESAME LIGNANS & OLIVE EXTRACT** (Super) • 60 softgels	18.00	13.50	12.00	9.38		
01982	**OMEGA-3 EPA/DHA w/SESAME LIGNANS & OLIVE EXTRACT** (Super) • 120 softgels	32.00	24.00	21.00	17.05		
01984	**OMEGA 3 EPA/DHA w/SESAME LIGNANS & OLIVE EXTRACT** (Super) • 120 enteric coated softgels	34.00	25.50	23.25	18.00		
01985	**OMEGA 3 EPA/DHA w/SESAME LIGNANS & OLIVE EXTRACT** (Super) • 60 enteric coated softgels	20.00	15.00	13.50	10.50		
01986	**OMEGA 3 EPA/DHA w/SESAME LIGNANS & OLIVE EXTRACT** (Super) • 240 small softgels	32.00	24.00	21.00	17.25		
02091	**ONCE-DAILY HEALTH BOOSTER** • 60 softgels	54.00	40.50	38.00			
02113	**ONE-PER-DAY** • 60 tablets	22.00	16.50	15.00			
01328	**ONLY TRACE MINERALS** • 90 veg. caps	15.00	11.25	9.38			
	P						
01789	**PALMETTOGUARD® SAW PALMETTO W/BETA-SITOSTEROL** 30 softgels	15.00	11.25	10.50	9.00		
01790	**PALMETTOGUARD® SAW PALMETTO/ NETTLE ROOT W/BETA-SITOSTEROL** • 60 softgels	28.00	21.00	19.50	18.00		
*00342	**PECTA SOL-C® MODIFIED CITRUS PECTIN** • 454 grams powder	113.95	96.86				
*01080	**PECTA SOL-C® MODIFIED CITRUS PECTIN** • 270 veg. caps	82.95	70.51				
01811	**PEONY IMMUNE** • 60 veg. caps	36.00	27.00	24.00			
**00673	**PGX® PLUS MULBERRY** (WellBetX®) • 180 veg. caps	34.95	26.21				
01953	**POMEGRANATE COMPLETE** • 30 softgels	24.00	18.00	15.75			
00956	**POMEGRANATE FRUIT EXTRACT** • 30 veg. caps	19.50	14.63	13.16			
**01837	**POMI-T®** • 60 veg. caps	35.00	26.25	24.00			
00577	**POTASSIUM IODIDE** • 130 mg, 14 tabs	6.95	5.21	3.94			
01500	**PQQ CAPS W/BIOPQQ®** • 10 mg, 30 veg. caps	24.00	18.00	13.50	12.00		
01647	**PQQ CAPS W/BIOPQQ®** • 20 mg, 30 veg. caps	40.00	30.00	24.00	21.00		
00302	**PREGNENOLONE** • 50 mg, 100 caps	26.00	19.50	16.50			
00700	**PREGNENOLONE** • 100 mg, 100 caps	30.00	22.50	20.25			
**01373	**PRELOX® NATURAL SEX FOR MEN®** • 60 tablets	52.00	39.00	36.00			
00525	**PROBOOST™ THYMIC PROTEIN A** • 30 packets	66.60	49.95				
01441	**PROGESTA-CARE®** • 4 oz cream	36.39	27.29	25.72			
01928	**PROSTATE FORMULA** (Ultra Natural) • 60 softgels	38.00	28.50	26.25	24.00		
01909	**PROSTAPOLLEN™** (Triple strength) • 30 softgels	28.00	21.00	18.75			

SUBTOTAL OF COLUMN 8

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
01742	**PROTEIN-ISOLATE** (Whey) Vanilla • 403 grams	30.00	22.50	19.50			
01743	**PROTEIN-ISOLATE** (Whey) Chocolate • 437 grams	30.00	22.50	19.50			
01770	**PROTEIN CONCENTRATE** (New Zealand Whey) Vanilla 500 grams	30.00	22.50	19.95			
01771	**PROTEIN CONCENTRATE** (New Zealand Whey) Chocolate 640 grams	30.00	22.50	19.95			
01812	**PROVINAL® PURIFIED OMEGA-7** • 30 softgels	27.00	20.25	18.00			
01676	**PS CAPS** (Phosphatidylserine) • 100 mg, 100 veg. caps	54.00	40.50	36.00			
01508	**PTEROPURE®** Pterostilbene• 50 mg, 60 veg. caps	32.00	24.00	22.50			
01209	**PUMPKIN SEED EXTRACT** (Water-soluble) • 60 veg. caps	20.00	15.00	13.50			
01637	**PYCNOGENOL® FRENCH MARITIME PINE BARK EXTRACT** 100 mg, 60 veg. caps	64.00	48.00	45.00			
01217	**PYRIDOXAL 5'-PHOSPHATE** • 100 mg, 60 veg. caps	22.00	16.50	14.85			
	Q, R						
01309	**QUERCETIN** (Optimized) • 250 mg, 60 veg. caps	22.00	16.50	15.00			
01030	**RED YEAST RICE** (Bluebonnet) • 600 mg, 60 veg. caps	18.08	13.56				
00605	**REGIMINT** • 60 enteric-coated caps	19.95	14.96	14.00			
01708	**REISHI EXTRACT MUSHROOM COMPLEX** • 60 veg. caps	30.00	22.50	20.25			
01410	**RESVERATROL W/PTEROSTILBENE** • 100 mg, 60 veg. caps	36.00	27.00	24.00			
02031	**RESVERATROL W/NICOTINAMIDE RIBOSIDE** (Optimized) • 30 veg. caps	42.00	31.50	27.00			
02030	**RESVERATROL** (Optimized) • 60 veg. caps	46.00	34.50	31.00			
00889	**RHODIOLA EXTRACT** • 250 mg, 60 veg. caps	14.00	10.50	9.00			
01900	**RIBOGEN™ FRENCH OAK WOOD EXTRACT** 200 mg, 30 veg. caps	36.00	27.00	24.75			
00972	**(D) RIBOSE POWDER** • 150 grams	27.50	20.63	18.56			
01473	**(D) RIBOSE TABLETS** • 100 veg. tabs	32.00	24.00	21.00			
01609	**RICH REWARDS® BREAKFAST GROUND COFFEE** • 12 oz. bag	13.00	9.75				
01730	**RICH REWARDS® BREAKFAST BLEND GROUND COFFEE** Natural Mocha • 12 oz. bag	15.00	11.25	10.50			
01729	**RICH REWARDS® BREAKFAST BLEND GROUND COFFEE** Natural Vanilla • 12 oz. bag	15.00	11.25	10.50			
01612	**RICH REWARDS® BREAKFAST BLEND WHOLE BEAN COFFEE** 12 oz. bag	13.00	9.75				
01610	**RICH REWARDS® DECAFFEINATED ROAST GROUND COFFEE** 12 oz. bag	14.00	10.50				
01208	**R-LIPOIC ACID** (Super) • 240 mg, 60 veg. caps	49.00	36.75	33.75			
00070	**RNA CAPSULES** • 500 mg, 100 caps	17.95	13.46	12.12			
	S						
01432	**SAFFRON W/SATIEREAL®** (Optimized) • 60 veg. caps	36.00	27.00	24.00			
01935	**SAMe** (S-ADENOSYL-METHIONINE) 200 mg, 30 enteric coated tablets	25.00	18.75	16.50			
01933	**SAMe** (S-ADENOSYL-METHIONINE) 400 mg, 30 enteric coated tablets	36.00	27.00	24.00			
01934	**SAMe** (S-ADENOSYL-METHIONINE) 400 mg, 60 enteric coated tablets	66.00	49.50	45.00			
01740	**SEA-IODINE™** • 1,000 mcg, 60 veg. caps	8.00	6.00	5.40			
01879	**SE-METHYL L-SELENOCYSTEINE** • 200 mcg, 90 veg. caps	11.00	8.25	7.50			
00318	**SERRAFLAZYME** • 100 tablets	18.00	13.50	12.00			
01938	**SHADE FACTOR™** • 120 veg. caps	44.00	33.00	30.00			
02110	**SHADE FACTOR™ SUNSCREEN LOTION** • 4 fl. oz	20.00	15.00	13.00			

SUBTOTAL OF COLUMN 9

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
02118	**SHADE FACTOR™ SUNSCREEN SPRAY** • 6 fl. oz	22.00	16.50	14.25			
01884	**SILYMARIN** • 100 mg, 90 veg. caps	14.00	10.50	9.50			
01249	**SINUS CLEANSER** • 4 oz. bottle	25.00	18.75				
02129	**SKIN CARE COLLECTION ANTI-AGING SERUM** • 1.75 fl. oz	60.00	45.00	37.50			
02132	**SKIN CARE COLLECTION BODY LOTION** • 6 oz	28.00	21.00	18.00			
02130	**SKIN CARE COLLECTION DAY CREAM** • 1.65 fl. oz	50.00	37.50	33.00			
02131	**SKIN CARE COLLECTION NIGHT CREAM** • 1.65 fl. oz	39.00	29.25	27.00			
01596	**SKIN RESTORING PHYTOCERAMIDES w/LIPOWHEAT®** 30 liquid veg. caps	25.00	18.75	17.25			
00961	**SODZYME® w/GLISODIN® & WOLFBERRY** • 90 veg. caps	28.00	21.00	18.00			
00657	**SOLARSHIELD® SUNGLASSES** • Smoke color	12.99	9.74	8.63			
01097	**SOY EXTRACT (ULTRA)** • 150 veg. caps	76.00	57.00	50.00			
01649	**SOY ISOFLAVONES (SUPER ABSORBABLE)** • 60 veg. caps	28.00	21.00	18.75			
00432	**STEVIA™** (Better) • 100 packets, 1 gram each	9.95	7.46				
00438	**STEVIA™ ORGANIC LIQUID SWEETENER** (Better) • 2 oz	11.00	8.25				
01476	**STRONTIUM** • 750 mg, 90 veg. caps	20.00	15.00	13.50			
01778	**SUPER SELENIUM COMPLEX** • 200 mcg, 100 veg. caps	14.00	10.50	9.00	8.25		
	T						
02023	**TART CHERRY W/CHERRYPURE®** 60 veg. caps	20.00	15.00	14.00			
01827	**TAURINE** • 1,000 mg, 90 veg. caps	13.00	9.75	9.00			
01918	**TEAR SUPPORT w/MAQUIBRIGHT®** • 60 mg, 30 veg. caps	18.00	13.50	12.00			
00133	**L-TAURINE POWDER** • 300 grams	20.00	15.00	12.66			
*13685	**TEN MUSHROOM FORMULA®** • 120 veg. caps	41.95	35.66				
01304	**THEAFLAVIN STANDARDIZED EXTRACT** • 30 veg. caps	18.00	13.50	12.00			
01683	**(L) THEANINE** • 100 mg, 60 veg. caps	24.00	18.00	15.38			
***01038	**THERALAC® PROBIOTICS** • 30 caps	47.95	35.96				
00668	**THYROID FORMULA** (Metabolic Advantage™) • 100 caps	21.95	16.46				
00349	**TMG POWDER** • 50 grams	14.00	10.50	8.25			
01859	**TMG** • 500 mg, 60 liquid veg. caps	13.00	9.75	9.00			
01400	**TOCOTRIENOLS** (Super-absorbable) • 60 softgels	30.00	22.50	21.00			
01278	**TOOTHPASTE** • 4 oz (Mint) tube	9.50	7.13	6.50			
01917	**TRANQUIL TRACT™** • 60 veg. caps	52.00	39.00	34.50			
01468	**TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT** 60 veg. caps	24.00	18.00	16.50			
01469	**TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT w/RESVERATROL** • 60 veg. caps	32.00	24.00	22.20			
02003	**TRIPLE ACTION THYROID** • 60 veg. caps	36.00	27.00	24.00			
01803	**TRI SUGAR SHIELD®** • 60 veg. caps	36.00	27.00	24.00			
01386	**TRUFIBER™** • 180 grams	32.95	24.71				
01389	**TRUFLORA® PROBIOTICS** • 32 veg. caps	42.95	32.21				
01722	**L-TRYPTOPHAN** • 500 mg, 90 veg. caps	33.00	24.75	22.50			
01721	**TRYPTOPHAN PLUS** (Optimized) • 90 veg. caps	32.00	24.00	21.75			
02116	**TWO-PER-DAY** • 60 tablets	10.50	7.88	7.13			
02115	**TWO-PER-DAY** • 120 tablets	20.00	15.00	13.50			
02114	**TWO-PER-DAY** • 120 caps	22.00	16.50	15.00			
00326	**L-TYROSINE** • 500 mg, 100 tablets	13.50	10.13				

SUBTOTAL OF COLUMN 10

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
	U, V						
01921	**URIC ACID CONTROL** • 60 veg. caps	24.00	18.00	16.50			
00213	**VANADYL SULFATE** • 7.5 mg, 100 veg. tablets	15.00	11.25	9.38			
02102	**VENOFLOW™** • 30 veg. caps	52.00	39.00	36.00			
00408	**VENOTONE** • 60 caps	18.95	14.21	12.00			
01327	**VINPOCETINE** • 10 mg, 100 veg. tablets	18.00	13.50	10.50			
00372	**VITAMIN B3 NIACIN** • 500 mg, 100 caps	7.65	5.74	4.99			
02028	**VITAMIN B5** • 500 mg, 100 veg. caps (Pantothenic Acid)	11.00	8.25	7.50			
01535	**VITAMIN B6** • 250 mg, 100 veg. caps	12.50	9.38	8.25			
00361	**VITAMIN B12** • 500 mcg, 100 lozenges	8.75	6.56	5.44			
01634	**VITAMIN C w/DIHYDROQUERCETIN** 1,000 mg, 60 veg. tablets	10.00	7.50	6.75			
00927	**VITAMIN C w/DIHYDROQUERCETIN** 1,000 mg, 250 veg. tablets	27.00	20.25	18.00			
00084	**VITAMIN C POWDER** (BUFFERED)• 454 grams	23.95	17.96	16.50			
01736	**VITAMIN C-MAGNESIUM CRYSTALS** (EFFERVESCENT) 180 grams	20.00	15.00	13.50			
01732	**VITAMIN D3** • 2,000 IU, 1 fl. oz, Mint flavor	28.00	21.00	18.75			
01753	**VITAMIN D3** • 1,000 IU, 90 softgels	7.00	5.25	4.50			
01751	**VITAMIN D3** • 1,000 IU, 250 softgels	12.50	9.38	8.44			
01713	**VITAMIN D3** • 5,000 IU, 60 softgels	10.00	7.50	6.50			
01718	**VITAMIN D3** • 7,000 IU, 60 softgels	14.00	10.50	9.45			
01758	**VITAMIN D3 W/SEA-IODINE™** • 5,000 IU, 60 caps	14.00	10.50	9.38			
00864	**VITAMIN D3 LIQUID** • 2,000 IU, 1 fl. oz	28.00	21.00	18.75			
01840	**VITAMINS D AND K W/SEA-IODINE™** • 60 caps	24.00	18.00	16.50			
01863	**VITAMIN E** (Natural) • 400 IU, 90 softgels	28.00	21.00	19.50	18.00		
01936	**VITAMIN K2** (Low dose) • 45 mcg, 90 softgels	18.00	13.50	12.00			
	W						
01902	**WAIST-LINE CONTROL™** • 120 veg. caps	42.00	31.50	28.50			
	X, Y						
01919	**X-R SHIELD** • 90 veg. caps	15.00	11.25	9.75			
00409	**XYLIWHITE™ MOUTHWASH** • 16 oz	10.00	7.50				
	Z						
01813	**ZINC HIGH POTENCY** • 50 mg, 90 veg. caps	7.95	5.96	5.25			
01561	**ZINC LOZENGES** • 60 veg. lozenges	9.00	6.75	6.00			
01961	**ZINC LOZENGES** (Enhanced) • 30 veg. lozenges	12.00	9.00	6.00			
**01051	**ZYFLAMEND® WHOLE BODY** • 120 liquid veg. caps	72.95	54.71				
	BOOKS						
33998	**THE RIGHT TO TRY** by Darcy Olsen • 2016	26.99	20.24				
33885	**THE BLUE ZONES SOLUTION** by Dan Buettner • 2015	26.00	19.50				
33877	**THE TRUTH ABOUT MEN AND SEX** by Abraham Morgentaler, MD, FACS • 2015	16.99	12.74				
33875	**DOCTORED: THE DISILLUSIONMENT OF AN AMERICAN PHYSICIAN** • by Sandeep Jauhar • 2015	26.00	19.50				
33874	**MISSING MICROBES** • by Martin J. Blaser, MD • 2014	28.00	21.00				
33873	**EATING ON THE WILD SIDE** • by Jo Robinson • 2014	16.00	12.00				

SUBTOTAL OF COLUMN 11

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
DPT05	**DISEASE PREVENTION AND TREATMENT, EXPANDED FIFTH EDITION** (Hardcover) • 2014	69.95	39.95	36.00			
33865	**THE RESTORATION OF THE HUMAN BODY [IN 7 PARTS]** by Sergey A. Dzugan, MD, PhD • 2014	29.95	22.46				
33862	**I'M TOO YOUNG FOR THIS** • by Suzanne Somers • 2013	26.00	19.50				
33835	**PHARMOCRACY** • by William Faloon • 2011	24.00	9.60	8.00			
33958	**THE VITAMIN D SOLUTION** by Michael F. Holick, PhD, MD (Paperback) • 2013	16.00	12.00				
33838	**YOUR GUIDE TO HEALTHY SKIN THE NATURAL WAY** by Gary Goldfaden, MD • 2012	26.00	15.00				
33815	**KNOCKOUT** • by Suzanne Somers • 2009	25.99	17.00				

SUBTOTAL OF COLUMN 12

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