

An information bulletin from

**The 5 Ps: Personal Pollution Protection and Prevention Programs of
DELTA LIFE SKILLS**

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**CREATING YOUR ULTIMATE FULL SPECTRUM DIETARY SUPPLEMENT:
Some Suggestions**

2006 LYN HANSHEW, M.D., The author of The 5-in-1 Factor: Replenish Your Health with Five Daily Essentials for Optimal Nutrition. Sound Concepts 15 East 400 South Orem, Utah 84058 (800) 368-3038 <http://www.healthyagingtools.com>

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1. THE SEARCH FOR THE ULTIMATE IN DIETARY SUPPLEMENTS: FIVE CATEGORIES TO CONSIDER

1.1. Introduction

Whether you're just beginning to take more interest in your health, or you've been browsing the aisles of health food stores for years, you're probably aware that there are literally thousands of nutritional supplements currently available. Some are simple multivitamins. Others are extracts from herbs with difficult-to-pronounce names. And in recent years, we've seen the emergence of a number of products called "functional" beverages-liquid products that reportedly provide a wide variety of health benefits.

Is there a problem if these beverages contain nothing more than the juice of one single fruit or plant? Yes -- while they may deliver certain nutrients that are helpful for achieving good health, they're limited because our bodies can't get all the nutrients we need from one single food source. .

Therefore, when we are looking for the very best in a dietary supplement that can deliver all the vitamins, minerals, and phytonutrients our bodies need, there are certain factors we should identify in a product. In this booklet, I'll discuss five aspects we should look for when considering the "ultimate" dietary supplement. We need something that's more than just a functional beverage, something more than just a vitamin or mineral drink. We need something more than just a drink that includes a single fruit or herb. What we need to find is a product that provides the best of all worlds, one that incorporates all of these factors into one, all-encompassing supplement beverage.

1.2. Why Do We Need Supplements?

Before I begin to examine the five areas that comprise the ideal health supplement beverage, I want to briefly discuss the reasons we need to use dietary supplements.

First of all, our food supply is generally poor. The large majority of available foods are highly processed, loaded with refined flours, sugars, trans fats, saturated fats and dozens of chemicals (artificial colors, flavorings and preserving agents), and so on. Although many of these foods are "fortified" with certain vitamins and minerals, they simply don't contain the natural nutrient forms that we should receive.

Beyond that, our soils are suffering from a continual depletion of nutrients. Consequently, our produce, grains and other common food sources are lower in vitamins, minerals and other nutrients we need not only to survive, but also to live healthy lives.

Another reason that supplements are a good ideal is that our exposure to environmental toxins has increased dramatically in recent years. Industrial chemicals, manufacturing waste, consumer goods high in synthetic compounds, and even our foods are all sources of toxins and contaminants that threaten our very health. We need extra ammunition to defend our bodies against the ever growing onslaught of a toxic world.

In addition, the fact that the food supply may not be providing us with adequate levels of all of the nutrients is compounded by Americans' generally poor dietary habits.

Despite the wealth of information about the benefits of following a healthy diet, the USDA estimates that a mere 10 percent of Americans actually eat a "good" diet (and many experts feel the USDA's idea of a good diet is still fairly poor!). For example, only 17 percent -- that's less than one in five! -- of the population consume the recommended number of servings of fruit per day.

Of course with such a poor dietary report card, it shouldn't be a surprise that USDA's *Continuing Survey of Food Intakes by Individuals* (CSFII) revealed adult females failed to meet the recommended daily intake (RDA) for five nutrients -- calcium, vitamin E, vitamin B6, magnesium and zinc. Adult males fell short of the RDA for vitamin E, magnesium and zinc. Not terribly encouraging, is it?

Other research has shown similar results. For example, in an article entitled "The Great American Nutrient Gap," Dr. Melvin Werbach cites research from various scientific journals demonstrating that more than half of all Americans consume significantly less than the recommended intake for calcium, chromium, copper, folic acid, vitamin B6 and vitamin E.

Because the general population is clearly not receiving adequate amounts of nutrients from their diet, this would seem to make a strong case for using dietary supplements as a "nutrition insurance policy." In fact, in the *Journal of the American Medical Association (JAMA)*, it was noted:

"Most people do not consume an optimal amount of all vitamins by diet alone. Pending strong evidence of effectiveness from randomized trials, it appears prudent for all adults to take vitamin supplements." Considering the conservative AMA has not traditionally been in favor of the routine use of dietary supplements, this is truly a landmark recommendation. Another statement made in the same *JAMA* study sheds further light on why the change of position. "Vitamin deficiency syndromes such as scurvy and beri beri are uncommon in Western societies. However, suboptimal intake of some vitamins, above levels causing classic vitamin deficiency, is a risk factor for chronic diseases and common in the general population, especially the elderly." That's right, even though our nutrient intakes are high enough to keep us alive, they are too low in many cases to adequately address all of the body's needs while simultaneously fighting the continual onslaught of disease, environmental toxins and so on.

Finally, another reason that taking nutritional supplements makes sense is the aging process. The biological aging process begins at birth, but dramatic changes start taking place around the age of twenty-five or so. As we age, our bodies slow the production of the compounds that keep us looking and feeling youthful (hormones, collagen, and elastin are just a few) -- resulting in slower metabolism, weight gain, weakened bones, stiffer joints, compromised immunity, poorly functioning digestive and cardiovascular systems, sexual dysfunction, and of course, wrinkled skin. We're also more vulnerable to free radical damage and oxidative stress as we age, which can result in genetic damage, organ and system malfunction, a host of diseases, and other visual signs of aging.

When we look at the total picture of the compelling reasons for nutritional supplementation, it is easy to understand the need for the ultimate daily source of vitamins, minerals, polyphenols, herbs and whole foods to fight disease, minimize the effects of toxins, and enjoy an optimal level of health and wellness.

2. CATEGORY 1: VITAMINS: VITAL FOR OPTIMAL HEALTH

2.1. Introduction

It's no mystery that vitamins are nutrients our bodies need to function. We've probably heard from the time we were small that we should eat our fruits and vegetables, and possibly even had a children's multivitamin sitting by our breakfast bowl each morning.

Well, the message is now even more important. Why?

There are several reasons. As mentioned in the introduction, our health is threatened on more fronts than ever before. Environmental toxins in the form of manufacturing waste, industrial byproducts, pesticides and herbicides, consumer products, food chemicals all flood our environment -- our air, water, soil and food are full of toxic chemicals, many of them very dangerous to our health.

Second, the nutrient density of our food supply has gradually diminished over the last several decades due to farming and agricultural methods. Consequently, the necessary nutrients that we once received only through our diet simply aren't there in adequate amounts. What's the answer? More and more, health experts are pointing to the need for supplementing our diet with products that supply the nutrients that not only sustain life, but also promote a new level of vitality and wellness.

2.2. How Do Vitamins Help Us?

To answer this question, we could write another entire book. In essence, vitamins provide the basic components that allow our body's cells, tissues, organs and systems to function properly and to defend from disease. If we have chronic deficiencies of necessary vitamins, and this is coupled with other nutritional deficiencies, the body gradually begins to break down and suffer from a variety of health conditions.

There are literally dozens of vitamins our bodies need to operate properly and to maintain a high level of health. Below are just a few of the main vitamins and their most important roles:

2.2.1. Vitamin C: Vitamin C is a water-soluble vitamin with a number of biological functions. First and foremost, vitamin C is a powerful antioxidant. This has benefits in many areas.

One of vitamin C's important functions is to protect LDL cholesterol from oxidative (free radical) damage. (Only when LDL is damaged does cholesterol appear to lead to heart disease, and vitamin C may be one of the most important antioxidant protectors of LDL). Vitamin C may also protect

against heart disease by making arteries more flexible and by reducing the "clumping" of blood platelets.

Vitamin C is needed to make collagen, the "glue" that strengthens many parts of the body, such as muscles and blood vessels. Vitamin C also plays important roles in wound healing and as a natural antihistamine. This vitamin also aids in the formation of liver bile and helps to fight viruses and to detoxify alcohol and other substances.

A few recent studies have shown that vitamin C enhances the activity of nitric oxide. Nitric oxide is needed for the dilation of blood vessels, potentially important in lowering blood pressure and preventing spasms of arteries in the heart that might otherwise lead to heart attacks. Vitamin C has reversed dysfunction of cells lining blood vessels. The normalization of the function of these cells may be linked to prevention of heart disease.

Evidence also suggests that vitamin C slows the overall aging process in cells, thereby reducing the risk of age-related conditions such as cataracts, diabetes, and dementia. And other research shows that the vitamin may help protect the body against the accumulation of heavy metal toxins, which can contribute to a wide variety of ailments.

Other studies support the notion that vitamin C improves immune function and may decrease the length and/or severity of common cold and flu infections when taken in large amounts.

2.2.2. Vitamin A: This fat-soluble vitamin has four major functions in the body: (1) It helps cells reproduce normally -- a process called differentiation (cells that have not properly differentiated are more likely to undergo pre-cancerous changes). (2) It is required for healthy vision and eyes. (3) It is required for normal growth and development of the embryo and fetus, influencing genes that determine the sequential development of organs in embryonic development. (4) It may be required for normal reproductive function, with influences on the function and development of sperm, ovaries and placenta.

2.2.3. Vitamin E: Vitamin E is a fat-soluble vitamin and powerful antioxidant that helps protect cell membranes and other fat-soluble parts of the body, such as low-density lipoprotein (LDL, the "bad" cholesterol) from free radical damage.

Several studies, including two double-blind trials, have reported that 400 to 800 IU of natural vitamin E per day reduces the risk of heart attacks. Other recent double blind trials have found either limited benefit or no benefit at all from supplementation with synthetic vitamin E. Additional studies indicate that the tocotrienol forms of the vitamin are more beneficial than the tocopherol forms.

Vitamin E also plays a role in the body's ability to process glucose, and some trials suggest vitamin E supplementation may eventually prove to be helpful in the prevention and treatment of diabetes.

In the last ten years, the functions of vitamin E in the cell have been further clarified. In addition to its antioxidant functions, vitamin E is now known to act through other mechanisms, including

direct effects on inflammation, blood cell regulation, connective tissue growth, and genetic control of cell division -- all very important functions in the body.

2.2.4. Vitamin D: Vitamin D is a fat-soluble vitamin whose most important role is maintaining blood levels of calcium, which it accomplishes by increasing absorption of calcium from food and reducing urinary calcium loss. Both effects keep serum calcium levels balanced in the body and thereby spare the calcium that is stored in bones. When necessary, vitamin D transfers calcium from the bone into the bloodstream, which does not benefit bones. Although the overall effect of vitamin D on the bones is complicated, some vitamin D is necessary for healthy bones and teeth.

Vitamin D plays a role in immunity and blood cell formation and also helps cells replicate correctly, thereby reducing the risk of cancer. Other studies suggest vitamin D may protect people from type-2 diabetes, rheumatoid arthritis and multiple sclerosis. Vitamin D is also needed for adequate blood levels of insulin.

2.2.5. B Vitamins: The vitamin B complex refers to all essential water-soluble vitamins (except vitamin C). For years, "vitamin B" was thought to be a single nutrient that existed in the extracts of liver, rice or yeast. However, it was later discovered that these extracts contained several different vitamins. Consequently, even though the "B vitamins" share the same label, there are in actuality fairly different compounds with very distinct structures and properties.

The B vitamin family includes thiamine (vitamin B1), riboflavin (vitamin B2), niacin (vitamin B3), pantothenic acid (vitamin B5), pyridoxine (vitamin B6), biotin, folic acid and the cobalamins (vitamin B 12).

The functions that the B vitamins perform vary widely, and affect all areas of human health. At a basic level, vitamins B1, B2, B3, and biotin participate in different aspects of energy production, vitamin B6 is essential for amino acid metabolism, and vitamin B 12 and folic acid facilitate steps required for cell division. Each of these vitamins has many additional functions. However, contrary to popular belief, no functions require all B-complex vitamins simultaneously.

Human requirements for members of the B-complex vary considerably -- from 3 mcg per day for vitamin B 12 to 18 mg per day for vitamin B3 in adult males, for example. Therefore, taking equal amounts of each one -- as provided in many B-complex supplements -- makes little sense.

In the end, a deficiency of any B vitamin could have drastic consequences. Dozens of diseases are linked to deficiencies of B vitamins, thereby making their inclusion in a supplement product of paramount importance.

2.2.6. Vitamin K: Needed for proper bone formation and blood clotting, achieved through helping the body transport calcium. Vitamin K is used by doctors when treating an overdose of the drug warfarin. Also, doctors prescribe vitamin K to prevent excessive bleeding in people taking warfarin who require surgery.

There is some evidence suggesting that vitamin K2 (menadione), but not vitamin K1 (phylloquinone, phytonadione), may improve a group of blood disorders known as myelodysplastic syndromes (MDS). These syndromes carry a significantly increased risk of progression to acute myeloid leukemia. More large-scale trials investigating vitamin K2 for MDS are needed to confirm these promising, yet preliminary, results.

Again, when considering a multi-supplement, an important consideration is to look at a liquid form. Liquid vitamin products provide their nutrients in a form more readily absorbed from the intestinal tract and assimilated by the body, thereby making them more effective.

2. Vitamins: A Summary of Benefits

Below are just some of the health conditions and diseases linked to either a deficiency of certain vitamins, or that can be helped by supplementing with vitamins:

Alzheimer's/dementia	anemia ·
autism ·	canker sores ·
carpal tunnel	cataracts ·
syndrome ·	depression ·
chronic fatigue ·	epilepsy ·
diabetes ·	heart disease ·
fibromyalgia ·	high triglycerides
high cholesterol ·	migraines ·
infertility ·	Parkinson's disease
osteoporosis ·	rheumatoid arthritis
PMS ·	
stroke	

3. CATEGORY 2: THE MINERAL-SEA SALT CONNECTION TO GOOD HEALTH

3.1. Introduction

After vitamins, minerals are probably the most well-known nutrient group. However, while most people generally know that minerals are "good for us," they really know very little about what they do.

Most Westerners do a pretty good job of receiving adequate amounts of those minerals that are included in fortified foods (e.g., potassium and calcium), but there are a number of trace minerals that are rarely included in fortified food, and are found even less in the average diet.

As a result, when we are evaluating a supplement product, another of the five key groups to consider is that of minerals. First, we must find a product that provides the full spectrum of minerals. In addition, we should look for a product that is rich in trace minerals, many of which are

insufficiently present in our traditional food supply. Finally, look for a liquid product that makes these mineral forms more available and easily absorbable for the body's use.

3.2. What Are Trace Minerals?

Trace minerals, also called trace elements, are required in tiny amounts by the body and are critical in achieving and maintaining a high level of health. Traditionally, eating fresh grains, fruits, and vegetables grown in nutrient rich soil, drinking mineral rich water, and using natural forms of raw salt in the diet have provided the full spectrum of ionic trace minerals necessary for life.

Unfortunately, naturally occurring, nutrient-rich soil is almost non-existent on commercial farms and bottled water is mostly devoid of trace minerals. On top of this, natural, raw salt is difficult to find, though it is increasing in popularity.

Trace minerals are crucial for the proper functioning of enzyme systems, nerve conduction and muscle function, assisting with transfer of nourishment into cells, providing the framework for tissues, and regulation of organ functions. These "behind the scenes" functions are not possible without a constant, adequate supply of minerals. Even with the many multivitamin and mineral supplements available, most of these products fall short because they do not contain a sufficient amount of the all trace minerals that are necessary for improved wellness.

3.3. Sea Salt: Mineral's Perfect Delivery

When looking to add a mineral supplement -- especially rich in trace minerals -- to your health regimen, an ultimate product must include natural, raw sea salt. Traditional table salt has been chemically treated and refined, removing and destroying any natural minerals and nutrients it might have once contained. Bleaching and anti-caking agents are added to enhance appearance, but the end result is a product that possibly may be unhealthy and even toxic.

While the taste of natural sea salts are better than refined table salt, the best thing about them is that they deliver approximately 80 vital nutrients to your body, many of them trace minerals that you would otherwise rarely consume. The trace minerals that can be found in sea salts will vary, but usually include boron, chromium, gold, silver, cobalt, copper, fluorine, iodine, iron, manganese, molybdenum, selenium, silicon, tin, vanadium, and zinc. In addition, they often provide the other minerals not considered "trace" minerals -- calcium, potassium, magnesium and the like. Consequently, sea salts are a terrific source of the full spectrum of minerals needed by the body to function properly, fight disease and maintain an overall level of excellent health.

3.4. Minerals: Are You Deficient?

The fact is that many Westerners are deficient in several minerals, particularly in the trace minerals, due to the common dietary practices in North America and much of Europe. Numerous studies have implicated the deficiency of nearly every mineral in the development or progression of dozens of diseases. And many experts feel that the standard intake levels suggested by government agencies are on the low end for most vitamins, minerals and other nutrients.

Consequently, as in the case with vitamins, most people could benefit by taking a supplement that supplies a full spectrum of minerals and trace minerals. One of the best delivery systems for minerals is in the liquid form. Liquid natural minerals are more easily absorbed and utilized by the body.

3.5. Minerals: Pivotal Players in Human Health

There is extensive research and documentation about the need for adequate mineral intake and their vital role in health and wellness and prevention of disease and health problems. Here are some examples of various minerals and some of their functions just to give you an idea of the width and breadth of their critical value to human health.

Magnesium is a key substance in the proper functioning of nerves and muscles. It is also needed for the healthy maintenance of bones. Magnesium is often coupled with calcium in supplements because it helps the body absorb the calcium better. It also helps protect the cells lining the inside of the heart from the stress of sudden blood pressure changes.

Among many other things, potassium works closely with sodium and chloride to maintain fluid distribution and pH balance and to augment nerve-impulse transmission, muscle contraction, and regulation of heartbeat and blood pressure. It helps to reduce the rise in blood pressure during mental stress by reducing the blood constricting effects of adrenaline.

Chromium works with insulin to regulate the body's use of sugar and is essential to fatty-acid metabolism. Its contribution to metabolism makes chromium a helpful supplement in weight loss programs. Additional evidence suggests that chromium may help deter atherosclerosis and reduce risk of cardiovascular disease.

Accounting for some 10 percent of the body's mineral content, sulfur is part of every cell, especially in the protein-rich tissues of hair, nails, muscle, and skin. It is an acid-forming mineral that is part of the chemical structure of the amino acids methionine, cysteine, taurine, and Glutathione. It assists in metabolism as part of vitamin B1, biotin, and vitamin B5, helps regulate blood sugar levels as a constituent of insulin and helps regulate blood clotting.

Zinc contributes to many bodily processes, including bone development and growth, cell respiration, digestion and energy metabolism, wound healing, the liver's ability to remove toxic substances (such as alcohol), immune function, the ability to taste, healthy hair growth, and the regulation of heart rate and blood pressure.

Of course, these are only a few of the minerals that our bodies rely on to function normally and optimize a healthy state. Again, as you consider which supplement product to take, remember that a full-spectrum mineral component is crucial, particularly in the area of trace minerals. And sea salts offer an ultimate source of these minerals, especially when provided in a liquid form.

3.6. The Myriad Benefits of Minerals

Below are some of the conditions for which minerals are needed, and for which mineral supplementation may help:

angina · bacterial infection · cancer · cellular metabolism chronic inflammation · dental health · diarrhea · fibroids · heart disease · hypertension · inflammatory bowel disease muscle disorders · osteoporosis · pregnancy health · skin disorders · viral infection	appetite suppression · blood disorders · candidiasis · nervous system disorders chronic stress · diabetes · fatigue · goiter/thyroid dysfunction high blood pressure · immune dysfunction · infertility · neurological disorders · oxidative damage/stress · sexual function/health · toxicity/detoxification · vision problems
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4. CATEGORY 3: A WHOLE-FRUIT BASE: ACTIVE SYNERGY

4. Introduction

Another important aspect to evaluate in a ultimate J,1\functional, full-spectrum beverage supplement is that of its whole-food fruit content. The last few years have seen the emergence of a host of whole-fruit drinks, but most of them only contain the juice of one fruit. Two fruits that have become very well known are the açai berry from the Amazon region and the goji berry, native to the Himalayas. Both of these exotic fruits are teeming with phytonutrients, ranging from B vitamins and essential fatty acids to amino acids and polyphenols. Their traditional medicine use in native cultures over thousands of years, coupled with emerging scientific research, make them two of the most promising whole-fruit ingredients on the market today. And the fact that the entire fruit is utilized in such an ultimate product makes it that much more valuable as a supplement. The consumer is able to enjoy all the synergistic health benefits that are provided by the entire fruit -- not just simply the juice.

So let's proceed and examine the açai fruit.

4.2. Açai: The Amazon's Super-Berry

4.2.1. Introduction

Though small in size, this amazing little berry packs a terrific punch when it comes to supplying crucial nutrients to the human body. Pronounced *ah-saw-ee*, this purple-fleshed berry has enjoyed a long history of use in the indigenous cultures of the Amazon in South America.

Now, açai is gaining popularity worldwide because of new scientific research documenting its health benefits -- most notably its antioxidant properties. This berry has been featured on *Oprah*, NBC's *Today* show, and is highlighted in Dr. Nicholas Perricone's best-selling anti-aging book, *The Perricone Promise*, wherein he calls it one of the top-ten "super-foods." It has been included in a number of nutritional supplements, and it has even made its way into ice creams, drinks, and smoothie products.

4.2.2. What is Açai ?

The egg-shaped açai fruit, approximately one-half inch in size, received its name from local Amazonians in what is modern-day Brazil. The palm tree that bears the fruit also goes by the same names applied to the berry -- *açai*, *açal*, *assai* or *acaizerio*. In other areas of Amazonia, the tree and berry may be referred to as *jicara*, *jucara* or even *palmiteiro*. Its name varies in other parts of the world: *manac* (Trinidad), *manaca* (Suriname), and *naidi* (Colombia).

The açai palm consists of numerous usable parts: roots, stems, fronds and of course, clusters of the açai fruit with its deep purple pulp and very large seed (so large that it makes up 80 percent of the fruit's size). Indigenous peoples of the Amazon area have used all parts of the açai palm for hundreds of years. And now, açai has become a favorite product in most parts of Brazil, having made its way into hair care products, drinks and ice cream products. It's the health benefits, however, that are gaining the attention of researchers around the globe.

4.2.3. A Rich History in Amazonia-and Beyond

Though documented historical references to the fruit are limited, the açai is reported to have made appearances in manuscripts from early Portuguese exploring parties to Amazonia. These texts, combined with oral histories of the area, suggest that natives of the Amazon region have used the berry for generations both as a food staple and for medicinal purposes.

Over time, the popularity of the berry spread outside of the Amazon. Markets in Peru, Venezuela and Bolivia featured the little berry. Eventually, the rest of the world would catch on, and in the last few years, açai has made its way literally around the globe.

When the U.S. National Academy of Sciences (NAS) began investigating the fruit for its potential healing properties and nutritional content, they noted that açai was a common staple in traditional Amazonian homes, being consumed regularly (almost at each meal). The NAS researchers stated that in some areas, the average adult consumed close to two liters of the fruit daily.

4.2.4. Açai's Nutritional Makeup

So why all the notoriety for this little berry from South America? First of all, despite its diminutive size, the açai berry is full of a rich variety of nutrients, many of which are linked to disease prevention and overall well-being.

For instance, its antioxidant content is high in natural anthocyanins, a class of polyphenols known to effectively fight oxidative damage, prevent a variety of disease, and reduce chronic inflammation (another major factor leading to numerous chronic diseases). And its essential fat profile is similar to that of olive oil, which is thought to be a principal reason that rates of heart disease in the Mediterranean are quite low compared to those among Americans, despite levels of consumed fats being similar.

4.2.5. Açai's Impressive Nutrient Profile

The following nutrients are reported to be found in açai :

amino acids ·	B-vitamins (various) ·
biotin ·	boron ·
calcium ·	chromium ·
copper ·	cyanidin-3-Glucoside ·
essential fatty acids ·	folic acid ·
inositol ·	iodine ·
Iron ·	magnesium ·
manganese ·	molybdenum ·
pantothenic acid ·	potassium ·
selenium ·	sodium ·
vitamin A (as beta carotene) ·	vitamin B1 ·
vitamin B2 ·	vitamin B3 ·
vitamin B6 ·	vitamin B12 ·
vitamin C ·	vitamin D ·
vitamin E	Zinc

4.3. Antioxidants -- Disease Risk Factor #1

Free radicals. Oxidation. Antioxidants. We hear and read these terms nearly every day on television, radio and printed media reports. Why? Because they may be a significant piece in a larger puzzle -- the growing and often deadly problem of chronic diseases, which include heart disease, cancer, arthritis, stroke, diabetes, and many others. In fact, research indicates that oxidation is responsible for up to 85 percent of debilitating diseases.

Study after study also reveals that even modest antioxidant intake yields potentially big results in preventing disease and promoting overall wellness. Despite this, most American diets don't contain even the minimum amount of antioxidants necessary for disease protection. Many people are turning to antioxidant supplements to provide additional health support. Açai has emerged as a premiere antioxidant product capable of reversing the daily damage of free radical damage and preventing the onset of chronic diseases.

We all know that free radicals are dangerous. But why? The answer is that they cause oxidative damage, an invisible chemical process in the cell that results in the loss of an electron. We witness the effects of oxidation in the outside world every time we see a banana turn brown, a copper pot become green, or an old car rust away. However, oxidation within the human body can have far worse consequences.

Upon losing an electron, an atom becomes unstable and begins to seek out other atoms from which to steal an electron. As it does this, it sets in motion a chain reaction of atom after atom being "robbed" of an electron and suffering damage to the metabolic processes in the cell. In fact, the average person is exposed to trillions of free radicals per day and thousands of attacks each hour-- and these occur in every metabolic pathway of the body.

The deadly aspect of free radical exposure is that its effects are not felt immediately, but rather accumulate over time. In fact, some experts feel that "normal" aging is actually the result of several decades' worth of oxidative damage.

What about the cumulative effects of oxidation? At the cellular level, it often comes in the form of damaged DNA, which can lead to mutation, incorrect cell replication or outright cell death. Of course, we all know what widespread cellular mutation is called -- that's right, cancer. Other chronic diseases are the result of chronic oxidative damage -- heart disease, arthritis, and diabetes are just a few.

In addition, inflammation is now widely implicated in numerous diseases as well, and often goes hand in hand with free radical damage. Over time, the combination of chronic inflammation and continued oxidation either causes or exacerbates chronic diseases.

4.4. Combating Oxidative Damage and Inflammation

4.4.1. Introduction

There are many ways to combat free radical damage.

First and foremost, we should minimize our exposure to them. That means avoiding the sources of free radicals, primarily a nutrient-poor diet containing trans fats, food chemicals, alcohol and refined carbohydrates, smoking, alcohol and environmental toxins (heavy metals, household cleaners, paints, pesticides/herbicides, and so on). In today's modern world, it's nearly impossible to completely escape exposure to environmental toxins, but we can certainly take steps to quit

smoking, limit alcohol intake, remove dangerous chemicals from our home, eat organic foods, drink purified water, and so on.

But this won't provide us the protection we need from the ravages of free radicals. Experts feel that adding foods high in antioxidants and supplementing with antioxidant rich products will help provide that extra measure or protection that could mean the difference between poor and excellent health.

As mentioned previously, the açai berry contains a potent mix of antioxidant compounds, and is one of the most antioxidant-rich foods known to date. One of the best tests used to identify the antioxidant activity of a particular compound or food is called the OEAC test (Oxygen Radical Absorbance Capacity), which was developed by the National Institutes of Aging. The ORAC, as well as related tests, have been used to measure the antioxidant capability of açai and other well-known antioxidant-rich foods such as spinach, raspberries, blueberries, cranberries, tomatoes and broccoli.

The results are very impressive. Some reports have açai scoring higher than any other food tested, with up to ten times the antioxidants than red grapes and up to twenty five times more anthocyanins (a class of antioxidant polyphenols) than red wine. And açai ORAC scores are reported to range from 185 (for fresh açai) to 610 (for freeze-dried açai), which puts it far above other common fruits and vegetables high in antioxidants.

In addition, recent research from Germany's University of Boon Institute of Nutritional and Food Sciences that was published in the *International Journal of Food Sciences and Nutrition* found several types of açai fruit supplements effective against different types of free radical molecules.

And researchers from the University of Florida also published findings about a açai antioxidant properties in a 2004 issue of the *Journal of Agriculture and Food Chemistry*. The researchers discovered several sources of antioxidant activity in the berry, including bioactive levels of anthocyanins and polyphenolics that demonstrate anticancer effects.

4.4.2. Oxidation, Inflammation and Disease

New research appears constantly confirming that the majority of today's chronic diseases are linked to free radical damage and chronic inflammation. Below are just some of them:

aging ·	Alzheimer's disease ·
asthma ·	cancer ·
cataracts ·	cavities ·
diabetes ·	heart disease ·
high cholesterol ·	immune dysfunction ·
infertility conditions ·	macular degeneration ·
neurological disorders ·	Parkinson's disease ·
respiratory problems	rheumatoid arthritis

4.5. Açai's Top Free Radical Fighters

All of the following are critical free radical fighting compounds found in the açai berry:

- 4.5.1. Polyphenols:** Sixteen different types of bioactive polyphenolic compounds have been identified in açai berry. Polyphenols are antioxidant compounds found in foods such as various vegetables and fruits, grains, tea, and soybeans. Research shows that polyphenolic compounds possess anti-tumor properties and may be useful in the treatment and prevention of cancers of the breast, colon, skin, lung and liver. Other benefits of polyphenols include anti-inflammatory, anti-allergenic, immunostimulatory and cardioprotective properties.
- 4.5.2. Anthocyanins:** Two major anthocyanins have been found in açai , including cyanidin-3-glucoside and cyanidin-3 rutinoside. Anthocyanins are exceptional antioxidant compounds that are believed to reduce heart disease risk by neutralizing free radicals that otherwise would damage blood vessel walls, leading to cholesterol and plaque buildup. Açai is believed to have up to twenty-five times the anthocyanins found in red wine.
- 4.5.3. Vitamin C:** Vitamin C is a powerful antioxidant with anti-inflammatory properties found to improve symptoms of asthma and arthritis. Studies have also found vitamin C supplementation useful in the prevention of atherosclerosis, stroke, and cancer, as well as reducing complications of macular degeneration in diabetics. The vitamin is well known for its immune-boosting abilities and role in removing toxic heavy metals from the body
- 4.5.4. Beta carotene:** One of the numerous carotenoids, beta-carotene, is a proven free radical scavenger associated with lowered risks for several types of cancer including breast, lung, skin and stomach cancers. Research also supports its use for promoting eye health, lowering cholesterol levels, and preventing heart disease.
- 4.5.5. Vitamin E:** Volumes of research have linked vitamin E to a reduced risk of heart attacks and have found it beneficial in lowering LDL (bad) cholesterol levels, especially in its tocotrienol forms. The National Eye Institute also found vitamin E to be one of several antioxidants (including beta-carotene, vitamin C, and zinc) that may help reduce the risk of macular degeneration-related vision loss. New clinical research is also recommending the vitamin for the prevention and treatment of diabetes. Vitamin E is also linked to benefits for inflammation, blood cell and cell division regulation, and connective tissue health.
- 4.5.6. Magnesium:** Deficiency of this mineral is associated with several chronic conditions. As an antioxidant, the mineral improves the antioxidant threshold of the cardiovascular system and increases the body's resistance to free radicals by counteracting the damage by toxic heavy metals. It also protects against free radical

damage to mitochondria (cellular energy producers) and has been used to regulate heart rhythm and blood pressure.

4.6. Açai Berry for Heart Health

For more than twenty years, the so-called "French Paradox" has baffled researchers. Why do the French people, who on average consume far more high-fat cheese, wine, meat and chocolate, suffer from significantly lower rates of cardiovascular disease than Americans? Additionally, health professionals have also been examining the benefits of the typical Mediterranean diet, which is constitutes a similar paradox. Although people living in Mediterranean countries tend to consume relatively high amounts of fat, they have far lower rates of cardiovascular disease than countries like the United States, where. similar levels of fat are consumed.

Fortunately, it appears that the as açai berry may provide the best of both the French Paradox and the Mediterranean diet when it comes to heart health. As mentioned, analysis of the berry has revealed that it contains up to twenty-five times the polyphenols than red wine, the principal source of heart protection found in the average French diet. One group of polyphenols -- called "anthocyanins" -- seems to be a major player in as açai nutritional arsenal.

One anthocyanin in particular, cyanidin-3-glucoside, is a potent antioxidant and anti-inflammatory agent. Just how powerful is it? Consider this statement from researchers recently published in the journal *Hypertension*: "Anthocyanins are polyphenols, and there are several reports mentioning their beneficial effects. For example, cyanidin-3-glucoside exhibits free radical scavenging activity; suppresses inflammation; protects against endothelial dysfunction, vascular failure, and myocardium damage; prevents obesity; ameliorates hyperglycemia; and seems to help prevent cardiovascular disease."

In their study, the researchers discovered that cyanidin3-glucoside enhanced the production of nitric oxide in the cells of blood vessel walls. This is important because nitric oxide allows blood vessel walls to relax and expand, resulting in less stress on the heart, decreased risk of blockage and an increased blood flow to the heart and the rest of the body.

Free radicals have been found to attack the lining of arteries and blood vessel walls resulting in inflammation. Research shows that over time, this problem leads to the buildup of fatty plaque deposits, a risk factor for stroke and heart disease. One way to help prevent cardiovascular problems related to oxidation is to take an antioxidant that will prevent free radical damage to our vascular system. Because açai berry has the highest ORAC rating to date for antioxidant activity, it may be the best antioxidant choice for heart health.

Many benefits of the Mediterranean diet are attributed to the widespread use of olive oil. Interestingly, açai 's fat profile is quite similar to that of olive oil, with its key fat being oleic acid, an omega-9 fatty acid that has attracted the attention of health experts and scientists around the world.

Oleic acid constitutes an impressive 60 percent of açai total fat content, and has been shown in various studies to lower levels of LDL cholesterol. LDL is the form of cholesterol that is typically oxidized and embedded in the artery walls, leading to arterial plaque and eventually heart disease. Other studies indicate that oleic acid maintains levels of HDL cholesterol, the form that contributes a healthy cardiovascular system. And a 2003 study in the *Journal of Lipid Research* found that oleic acid positively modifies the membrane structure of various tissues, which the author attribute to its ability to lower high blood pressure and prevent tumor growth.

Açai also contains several other heart-friendly compounds. These include beta-sitosterol, calcium, potassium, vitamin E and dietary fiber, all of which have been shown by research to protect the heart from disease through various mechanisms.

4.7. Açai's All-Around Potency

Besides its very impressive antioxidant profile, the açai fruit also contains several other health-promoting phytonutrients that can help further bolster its antioxidant properties. These include several amino acids, B vitamins, essential fatty acids, minerals (calcium, chromium, selenium, zinc and iron), as well as dietary fiber. Dietary fiber is a widely known way to increase cardiovascular health, as well as promoting the health of the colon, regulating cholesterol; and lowering risks for diabetes, hypertension, cancer and obesity. Essential fatty acids are also linked to healthy cholesterol levels and reduced heart disease risk. This synergistic combination of phytonutrients offers more complete wellness protection because each compound in açai berry works together to offer antioxidant protection, lower disease risk and promote health.

4.8. The Cancer Connection

Because free radicals alter cell function and can damage DNA, it is not hard to see how they may be implicated in the development of cancer. And various studies suggest that free radical are either a primary cause of or exacerbating agent in the progression of cancer. The antioxidant protection of açai berry may lower cancer risk by neutralizing free radicals before they can damage cells, but açai may also have the potential to treat existing cancer. In fact, a 2006 study from researchers at the University of Florida found that the fruit may actually prompt a self-destruct mechanism (called apoptosis) in cancer cells. In the study, açai triggered cell death in 86 percent of leukemia cells tested.

Steven Talcott, one of the UF research team, stated this about the results, "Açai berries are already considered one of the richest fruit sources of antioxidants. We are encouraged by the findings. . . . Compounds that show good activity against cancer cells in a model system are most likely to have beneficial effects in our bodies."

4.9. Goji: Health Secret from the Himalayas

4.9.1. Introduction

Another terrific choice to include in the whole-food fruit category is the goji berry. Never heard of it, you say? Well, you're in the same boat as a lot of Americans, but that is changing.

Goji, also known as wolfberry, has recently made its way from the Himalayas of Tibet and surrounding regions to health food store shelves in the United States, Canada and Europe. In fact, its emergence has been so dramatic that it's caught the attention of scientists and doctors alike, and is the focus of more than sixty scientific papers listed on PubMed (an online database of all major medical journals).

Why all the commotion about goji? First of all, it's a nutrient treasure trove, containing up to twenty-one trace minerals (such as zinc, calcium, selenium and phosphorous), various carotenoids (such as beta-carotene), more than five hundred times the vitamin C as oranges, essential fatty acids, several B vitamins and several terpenoids. Perhaps most important are the berry's polysaccharides, complex "sugars" that are increasingly being viewed as tremendously important in the body's defense against disease.

4.9.2. Living Longer, Living Better

The goji berry may be best known for its supposed longevity-enhancing properties. Grown, gathered and eaten for ages in Tibet, China and surrounding areas, the berry enjoys almost a legendary status among the people. In fact, in Tibet, there is a two-week long festival held every year in honor of the berry.

Stories of the life-giving properties of the berry abound in Central Asia. Perhaps the most well known (though it is probably impossible to verify) is that of Li Qing Yuen, who reportedly lived to be 252 years old. The story goes that Li, who was born in 1678, became interested in the herbal and medicinal traditions of Western China. One day, at the age of fifty, he was out on a walk and met a very old man, who briskly out walked Li despite their obvious difference in age.

Impressed by the man's vigor, Li petitioned the man for his secret to such energy and health. The man responded that he had been eating a "soup" of goji every day, and if Li did the same, he would surely discover a new standard of health. So Li Qing Yuen did just that, and continued to consume the soup daily until he died.

Some areas of China are reported to enjoy significantly longer lifespans than Westerners. Various reports state that in Pinghan and the surrounding county, there are more than seventy centenarians and 237 residents who have reached their nineties, making it one of the highest concentrations of "old-timers" per capita in the world.

Modern science backs the general longevity qualities of the amazing goji berry. In a recent study, several groups of elderly people were given the berry daily for three weeks. The results were

nothing short of impressive. More than two-thirds of the patients experienced a significant improvement in their T-cell activity and interleukin-2 numbers doubled. In addition, measures of the patients' optimism, appetite, sleep patterns all increased substantially. Interestingly about 35 percent of the patients recovered at least partial sexual function.

Other anecdotal data supports the long-life theory attached to the goji berry. Various observations suggest that various groups in China, Mongolia, Tibet and surrounding areas not only live significantly longer than North Americans, they also are free from modern-day chronic diseases such as heart disease, diabetes, cancer and autoimmune function-related conditions (such as rheumatoid arthritis).

Now that the rest of the world is beginning to catch on to the potential benefits of the little goji berry, it's time to investigate what modern science has to say.

4.9.3. Goji's Natural Sugars: "Sweet" Way to Improved Health

Glyconutrients. Glycobiology. Polysaccharides. While we've all heard plenty of vitamins, minerals and antioxidants, these are terms not well-known to many. Simply stated, polysaccharides and glyconutrients ("glyco" means "sugar" in Latin) are complex "sugars" that fulfill a host of functions in the human body. The last several years have revealed the critical properties these nutrient sugars lend the body in the areas of immune function, combating disease and cellular communication. So important is this area of research that four of the last eight Nobel Prizes in health have been awarded for work in glycobiology and cellular communication and their association with health and longevity.

The truth is, most "sugars" aren't sweet (most of us think "sweet," however, when we hear the word "sugar" due to the prevalence of sucrose in our diets). But they do provide protection against invading pathogens such as bacteria and viruses and participate in the recognition of cancer cells and foreign toxins that should be eliminated from the body.

So how do glyconutrients work? Well, they are special compounds whose principal job is to communicate to the rest of the body, telling it what should and what shouldn't be in it. These polysaccharides are actually found in all the body's cells, where they are pushed to the outer edge of the cell membrane, creating a sort of "fuzz." As cells rub against each other, the "fuzz" of the saccharides allows for the cells to communicate between each other.

When a foreign invader, such as a bacteria, virus or other microbe, enters the body and begins bumping up against other immune cells, the immune cells are able to recognize it as an enemy and mount an offensive to quickly destroy it. This literally happens in milliseconds.

What's important to remember is that the human body does not produce these glyconutrients. We must get them through our diet. And as we age, our body's ability to perform in the area of immunity is diminished; thus, the ability of our cells to communicate becomes even more important. Cells communicate with each other in their own language, which is an important aspect of human health and longevity. If our cells are missing the right amount of polysaccharides, they

won't be able to effectively communicate with other cells. The result is a communication breakdown between cells and ultimately between tissues, organs and organ systems. This means that the organs and cells that constitute the immune system won't be as effective at fighting disease, and the rest of the body won't be able to perform their functions to full capability. This leads to more physical stress, more disease, and an overall lowered level of well-being.

4.9.4. Goji: Unique in Its Glyconutrients

Some reports state that not only is the goji berry rich in polysaccharides overall, it also contains four polysaccharides that are completely unique to it-that is, they aren't found in any other food. These unique glyconutrients appear to serve as directors and carriers of the instructions the cells use to communicate. Some experts refer to them as "master molecules," and feel that they command and control many of the body's most crucial biochemical defense systems and balance the body's chemistry.

4.9.5. Goji's Nutrient Profile

Below are just some of the primary constituents of the goji berry, and a brief overview of their potential health benefits.

- 4.9.5.1. Vitamin C:** Contains significantly more of the vitamin than does the same weight of oranges.
- 4.9.5.2. Minerals:** Goji contains twenty-one trace minerals, which includes germanium, a mineral rarely found in food sources that has anti-cancer abilities.
- 4.9.5.3. Amino Acids:** Goji contains nineteen amino-acids, which serve as the building blocks of protein and are necessary for a myriad of other body functions and processes.
- 4.9.5.4. Antioxidants:** The berry's spectrum of antioxidants possesses a variety of health-promoting properties. These include beta-carotene, zeaxanthin, and several terpenoids.
- 4.9.5.5. Protein:** Goji is comprised of about 13 percent protein, which is more than what whole wheat contains.
- 4.9.5.6. Beta-sitosterol:** The berry's beta-sitosterol content helps fight inflammation and is linked to cholesterol reduction and protects the cardiovascular system.
- 4.9.5.7. Essential fats:** Goji contains several essential fatty acids (EFAs), which assist in a variety of functions. These include the production of hormones, protecting the heart and vascular system, protecting the brain, and promoting health of the genitourinary tract in men.

4.9.5.8. Terpenes: The berry's sesquiterpene content may be responsible for several of its properties, including protecting the cardiovascular system, fighting cancer, acting as an antibacterial and anti-fungal agent, and possibly working against hepatitis.

4.9.6. Goji: An Overview of Potential Benefits

The following are the principal areas in which the remarkable goji berry may be helpful in preventing disease and raising your health to a new, more vibrant level.

4.9.6.1. Increase Longevity: Traditional use for centuries in Central Asia, coupled with modern science, support the notion that the goji berry may be able to help you live a longer and healthier life.

4.9.6.2. Protect the Cardiovascular System: A 1998 study demonstrated that goji may be able to prevent and/or reverse high blood pressure. Goji's antioxidant content also appears to be effective at lowering blood levels of LDL cholesterol, and also protecting it from oxidation (the main cause of atherosclerosis).

4.9.6.3. Prevent/Treat Cancer: Goji appears to contain several compounds that have anticancer properties, namely its polysaccharides, sesquiterpenes and antioxidants. Several institutions around the world are currently investigating the berry's ability to fight cancer, most with promising results.

4.9.6.4. Lose Weight: In one study, patients were given goji daily. Results were impressive, with a majority of patients losing significant weight. Another study suggests that goji's polysaccharides may encourage weight loss by converting food into energy instead of fat storage.

4.9.6.5. Aid in Sleep Dysfunction: Several studies in Asia have found that people with sleep problems, notably elderly persons, experience substantial improvement in sleep quality with consumption of goji.

4.9.6.6. Improve Eyesight: Recent research from China indicates that the fruit may be helpful in both preventing and reversing problems of vision, including cataracts, macular degeneration and overall sight.

4.9.6.7. Improve Immune Function: Several studies have focused on goji berry's immune-boosting properties. Most of these have found that its polysaccharides are especially powerful immuno-modulating agents.

4.9.6.8. Fight Diabetes: Several studies, coupled with centuries of traditional use, indicate the berry may help improve the body's ability to both utilize insulin and stabilize blood glucose levels.

4.9.6.9. Detoxify/Strengthen Blood: Studies have shown that goji can help "clean" blood and enhance the health of individual blood cells so they perform their duties more effectively. One study dramatically reversed the "sick" state of the blood of elderly patients.

4.9.6.10. Reduce Inflammation: Goji appears to be able to minimize the effect of superoxide, a powerful free radical that often causes an chronic inflammatory state, thereby contributing to arthritis and other related conditions.

4.9.6.11. Menopause/Reproductive Health: The berry has long been used for treating various conditions related to the reproductive health of women: infertility, menopause, morning sickness, PMS-like symptoms and so on.

4.9.6.12. Improve Memory: Tradition has long held that goji berry can preserve one's memory and mental, function well into old age.

4.9.6.13. And many more!

4.10. Cancer: A New Frontier

Another of the more impressive qualities of goji is its apparent ability to fight cancer. The renowned Memorial Sloan-Kettering Cancer Center in New York has a web page devoted to scientific evidence involving *Lycium* (goji's Latin name) and its benefits in preventing and treating cancer. The institution, states the following about the berry, "A polysaccharide isolated from *Lycium* has been shown to have anti-tumorigenic, immune enhancing and hepato-protective properties in vivo." It then continues, "Data from an observational study done in China in 1994 involving 75 cancer patients suggest that *Lycium barbarum* polysaccharides may be beneficial when used with certain cancer treatments."

Cancer is obviously one of the scariest threats to our health. For decades, hearing the phrase, "You have cancer," was almost a death sentence. And despite advances in detecting and treating cancer, still little emphasis is placed on preventive therapies. That's why natural, holistic options like goji berry -- supported by scientific research -- offer hope and excitement to many cancer sufferers.

It appears that goji's unique polysaccharides are at the heart of its anticancer properties. Gojis polysaccharides are being studied for their effect on tumor growth, their potential in preventing the onset of cancer, and their ability to neutralize the side effects of cancer radiation and chemotherapies.

It's certainly worth noting that several Chinese institutions are studying the berry for its anticancer properties. Most of these are focusing on the polysaccharide content of goji.

5. CATEGORY 4: THE POWER OF POLYPHENOLS

5.1. Introduction

Another critical area to consider when choosing a dietary supplement or functional beverage is that of its polyphenol content. What are polyphenols? In simple terms, they comprise a large family of a variety of compounds found in numerous plants and botanicals. One of their major functions in nature is to provide the coloring in plants, fruits and vegetables. They also are responsible for the changing of leaf colors in autumn. These colors -- often called pigments -- also play a pivotal role in protecting the plant from parasites, predators and disease.

But most important is the exciting potential of polyphenols in fighting a variety of human diseases -- including cardiovascular disease, cancer and diabetes -- and improving overall wellness.

Some of the more well-known sources of polyphenols include red wine, olive oil, cocoa, pomegranate, as well as a number of other fruits and vegetables. But perhaps the most promising source of these health-boosting polyphenolic compounds is green tea.

5.2. Green Tea: From Traditional Treatment to Polyphenol Powerhouse

5.2.1. Introduction

Camellia sinensis, the famous tea plant, is the source of both "black" tea, oolong tea, and green tea. Certainly there are differences between the two teas, most due to the processing of black tea (which removes many of its beneficial compounds). Green tea is made from unfermented leaves and is reported to contain one of the highest concentrations of polyphenols known among the botanical world.

Historically speaking, green tea has been consumed throughout the ages in India, China, Japan, and Thailand. In traditional Chinese and Indian medicine, green tea was long used as a stimulant, diuretic (to 'promote the excretion of urine), astringent (to control bleeding and help heal wounds), and to treat problems of the heart and vascular system. It was also used for gastrointestinal problems, to control blood sugar levels, fight fevers, and treat mental dysfunction (dementia and related problems).

The earliest known reference to tea as a health aid dates to 2737 B.C. For most of China's history, tea was expensive, and typically reserved for the wealthy segments of society. It was only relatively recently (about 1300 A.D.) that tea consumption spread from the upper classes to the general population. Later, as the Chinese developed their impressive navy, the tea plant would make its way across the globe to Europe and Africa. An interesting side note to this is that tea was an indispensable food staple for the sailors. The vitamin C content of the plant was enough to prevent scurvy, a condition that killed or significantly affected many European sailors of the same era. The first shipment of tea to Europe in 1606 by the Dutch East India Trading Company was green tea.

Tea has played a significant role in the culture of East Asia for many centuries both as a staple beverage, a healing agent and a symbol of status. It is certainly not surprising to find that its emergence is credited to religious or royal origins, and still enjoys a status of popularity.

5.2.2. Green Tea for Great Health

5.2.2.1. Introduction

As discussed throughout this manuscript, we face many threats to our health, a majority of which are the result of an unhealthy lifestyle combined with environmental toxins. Consequently, the risk of numerous cancers, cardiovascular disease, stroke, diabetes and many other ailments are higher than ever.

Consequently, our need for protection -- particularly through our diet -- is also greater than ever. And science is helping us identify those foods and natural substances that can prevent and reverse disease, optimize the function of our immune systems, and help us enjoy an overall improved level of wellness.

Science has shown us that green tea is high in various polyphenols, particularly in the catechin family. Epigallocatechin-3-gallate (EGCG) is the best researched of all the green tea polyphenols. Interestingly, green tea contains roughly 30 to 40 percent polyphenols while black tea contains only 3 to 10 percent polyphenols. Green tea also contains the alkaloids caffeine, theobromine, and theophylline, which are responsible for green tea's stimulant effects.

Green tea is one key food identified by modern science as representing a literal arsenal against today's most insidious chronic disease. Results of extensive studies involving both animals and people have been nothing less than impressive. The following provide overviews of those conditions for which green tea potentially may be useful.

5.2.2.2. Atherosclerosis/High Cholesterol

Population-based studies indicate that the antioxidant properties of green tea may help prevent atherosclerosis, particularly coronary artery disease. Other studies show it has the ability to lower total cholesterol while raising levels of HDL (the "good" cholesterol).

5.2.2.3. Cancer

As already discussed, green tea seems to possess at least several compounds that fight cancer. The cancer-protective effects of green tea have been reported in several population-based studies. For example, cancer rates tend to be low in countries such as Japan where green tea is regularly consumed. The cancers for which green tea appears to have an effect include bladder cancer, breast cancer, colorectal cancer, esophageal cancer, lung, prostate, stomach and skin. Numerous studies are on-going investigating the potential mechanisms by which the plant may combat the onset and progression of cancer.

5.2.2.4. Gastrointestinal Health

It appears that green tea may help reduce inflammation associated with Crohn's disease and Ulcerative Colitis, the two major types of inflammatory bowel disease. Also, if green tea proves to be helpful for preventing colon cancer, this would be an added benefit for those with IBD due to their increased risk of colon cancer.

5.2.2.5. Diabetes/Blood-Glucose Control

For centuries, green tea has been used in traditional medicine to control blood sugar in the body. Animal studies suggest that green tea may help prevent the development of Type 1 Diabetes and slow its progression once it has developed. Researchers surmise that green tea may help regulate glucose in the body.

5.2.2.6. Liver Disease

Certain studies, particularly population-based studies, suggest that men who drink more than 10 cups of green tea per day are less likely to develop disorders of the liver. Green tea also appears to protect the liver from the damaging effects of toxic substances such as alcohol. Other animal studies demonstrated that green tea offers protection against the development of liver tumors.

Additional animal and human studies have found that the catechin content in green tea may help minimize the effects of viral hepatitis. In these studies, catechin was isolated from green tea and used in very high concentrations.

5.2.2.7. Other Potential Applications

Several other applications are claimed by supporters of green tea, and include the following:

- weight loss (increasing fat metabolism as energy source)
- improvement of cognition
- slowing progression/prevention of Alzheimer's
- treating arthritis
- treating multiple sclerosis
- preventing lowered T-cell counts due to HIV infection

Green tea represents a terrific choice when it comes to both polyphenol content, and as a choice for a supplement beverage. In fact, its popularity has soared so much that there are various forms in which it is sold -- not just as a supplement or tea. Smoothie stores incorporate it into their drinks, and other restaurants offer a wide variety of green tea-based beverages. So when considering a top-notch functional liquid supplement, green tea should be on your list of required ingredients.

5.2.3. EGCG: Green Tea's "Big Gun"

One of the reasons green tea boasts of such a powerful arsenal for improving health is its high content of epigallocatechin-3-gallate (EGCG). Interestingly, green tea is one of only a few known sources of this catechin compound.

Several studies show that it possesses a wide range of anticancer properties, potentially inhibiting the growth of breast cancer, leukemia and other types of cancer. In addition, a study at the University of Kansas concluded that EGCG was more than 100 times as effective as vitamin C at neutralizing free radicals.

In one study, published in the journal *Blood*, application of EGCG helped kill leukemia cells by interrupting the communication signals they need to survive. The Mayo Clinic study, led by Neil E. Kay, M.D., shows that green tea's EGCG interrupted survival signals between the leukemia cells, prompting the cells to die in eight of 10 patient samples tested in the laboratory.

In addition, researchers in Spain and England demonstrated that EGCG may prevent cancer cells from growing by binding to a specific enzyme. The researchers discovered that for the first time, EGCG inhibits the enzyme dihydrofolate reductase, which is a recognized, established target for anticancer drugs. Scientists know that green tea has about five times as much EGCG as regular tea, and that EGCG is probably just one of a number of anti-cancer mechanisms in green tea. Finally, EGCG appears to be an inhibitor of tumor necrosis factor, a gene expression compound that promotes the growth of cancer cells and their surrounding tissue.

And cancer isn't the only condition for which EGCG may be helpful. Recently, scientists from the University of South Florida found it may also delay the onset of Alzheimer's disease. The researchers injected mice with (EGCG) and found it decreased production of beta-amyloid, a protein that forms the plaques that damage the brains of Alzheimer's victims. Several months of injections reduced plaque formation by as much as 54 percent, the research team reported in the *Journal of Neuroscience*.

5.3. Grape Seed Extract

Another premiere source of polyphenols is grape seed extract, which is exactly what it sounds like -- an extract from the seeds of grapes. However, you can't find the rich polyphenol content in just any grape -- they are highest in red grapes (instead of white). That's one reason why there's been so much attention given lately to the benefits of red wine.

The seeds of the red grape contains a family of compounds known for their potent antioxidant properties and other wellness-promoting properties. These are called oligomeric proanthocyanidins (OPCs), and while they are present in a wide variety of fruits and vegetables, including pine bark (Pycnogenol), the seeds of red grapes are one of the richest sources of these powerful polyphenols.

5.4. What Are OPCs?

The OPCs are generally part of the flavonoids or polyphenols category. Each group in this category can differ substantially based on their polymer arrangement. In essence, some compounds in this group have longer molecular chains than others, determining their function and use in the human body. But generally, the OPCs seem to improve health in several ways. The following are the principal benefits of OPCs:

- They are powerful free radical scavengers and reduce oxidative damage.
- They protect the heart from cholesterol oxidation and reduce the risk of atherosclerosis.
- They appear to strengthen blood vessel walls.
- They minimize edema (a combination of fluid, swelling and inflammation).
- They offer protection to the eye from oxidative damage, lowering risk of cataracts and macular degeneration.

Over the last few decades, much discussion in the health and science worlds has been had regarding the "French Paradox." This phenomenon describes rates of heart disease in France that are much lower than in the U.S., despite higher consumption levels of fats, cheese, and alcohol. Researchers believe that it's the high consumption of red wine (and thus its polyphenol/catechin content, not alcohol) that contributes to this lower rate of cardiovascular disease. In addition, other studies suggest that in areas where red grapes are consumed (as wine, juice or in whole), rates of other diseases -- including cancer, arthritis, and dementia -- are generally lower. It is thought that the seeds of red grapes are particularly high in several polyphenolic compounds, especially the OPCs.

Obviously, the principal form of protection that grape seed extract provides is that of a free radical scavenger. This capability is at the heart of its other health benefits. So keeping that in mind, let's take a look at the potential ways that grape seed extract may benefit your health.

5.5. Heart/Vascular Protection

Various studies have investigated the ability of OPCs and grape seed's other polyphenols to protect against heart and vascular conditions. The results across the board are very impressive, indeed demonstrating that grape seed extract can contribute to improved cardiovascular health. The primary form of protection probably comes in the form of its antioxidant compounds. Free radicals contribute to heart disease in at least two ways.

First, they attack the healthy tissue of the blood vessel walls, causing inflammation and attracting agents the body sends to "coat" the injured area. One of these substances is cholesterol. While this is fine for a short-term fix, if the injury process is repeated and repeated, then the result is an unwanted build-up of cholesterol and other substances in the blood vessel -- what we typically call atherosclerosis.

Free radicals also oxidize the cholesterol that is flowing through the bloodstream. This leads to the formation of a substance that essentially acts as a "splinter" that embeds itself in the blood vessel wall. Again, this draws the inflammatory and immune response of the body, and if it happens over

time, the result is a clogged, inflamed blood vessel that will eventually be so damaged it will rupture, or become so clogged that it will cause a heart attack.

A 2006 study published in the *International Journal of Cardiology* investigated the effects of grape seed extract on rats suffering from injured hearts. The results once again supported that grape seed extract can protect the heart. The researchers said, "This study demonstrates that [grape seed extract] has a significant effect in the protection of heart against myocardial injury."

5.6. Blood Vessel Health

The cardiovascular benefits of grape seed extract includes the apparent ability to strengthen the walls of the body's blood vessels. Various studies show that the polyphenols in grape seed are actually incorporated into the tissue of blood vessels, where they exert a protective effect against free radicals, toxins and other agents that cause inflammation and injury.

OPCs are primarily used in Europe as a treatment for problems of the blood vessel system -- varicose veins, venous insufficiency, capillary fragility and disorders of the retinal capillaries. Several studies have found that grape seed extract prevents or reverses these conditions, not only because of its ability to neutralize free radicals, but also because the tissues of the blood vessels actually incorporate the polyphenols into its structure, where they provide an enhanced measure of protection against damaging oxidants. Studies suggest they also inhibit the effects of the lysosomal enzyme that governs the release of other enzymes that damage the body's connective tissues.

5.7. Cancer

A primary area of free radical research focuses on their effects on cancer -- can free radicals either cause or contribute to the progression of cancer? The answer appears to be an overwhelming "yes."

In one study, researchers measured the ability of grape seed extract to inhibit the activity of human breast and lung cancer cells. The results suggested that grape seed extract was effective in promoting cell death in the cancer cells, but that the growth and viability of the normal cells were maintained. Another cell study examined the effects of grape seed extract on preventing the cell damage, DNA damage and cell death that occurs when cells are exposed to tobacco. The researchers found that tobacco exposure causes oxidative tissue damage and apoptosis (cell death), which can be reduced up to 85 percent by antioxidants such as vitamins C and E and grape seed extract. In the study, grape seed extract was about five times more effective than vitamins C or E alone. It also appears that the combination of the vitamins with grape seed extract is even more effective in preventing cell damage and death.

An impressive study published in a 2006 issue of *Carcinogenesis* revealed that grape seed extract is effective at restricting the activity of highly metastatic breast cancer cells. For some years, the medical profession has been reluctant to accept the notion that polyphenolic compounds in grape seed could be beneficial in preventing and/or treating breast cancer. Concerning the results of their study, the researchers state, "These data suggest that GSPs [grape seed proanthocyanins] possess chemotherapeutic efficacy against breast cancer, including inhibition of metastasis."

Another study, published in a 2006 issue of the journal *Cancer Research*, researchers found that grape seed extract was able to inhibit the activity of aromatase, the enzyme that converts androgen to estrogen. Aromatase is found at higher levels in breast cancer tissues than normal breast tissues. Other studies have also suggested that grape seed extract, through its rich polyphenol content, could be potent inhibitors of aromatase. In this study, grape seed extract was found to inhibit aromatase activity and reduce androgen-dependent tumor growth in breast cancer tumors.

Finally, other 2006 studies indicates that grape seed extract promotes the apoptosis (programmed cell death) of prostate cancer cells, as well as the inhibition of skin cancer cell activity.

5.8. Vision/Eye Health

A 2006 study published in the journal *Cataract Refraction Surgery* investigated the effect of supplementation of grape seed extract on the formation of cataracts. In the study, rats were given a compound that is known to cause cataracts. After three weeks of supplementing the rats' diet with grape seed extract, the researchers found that the formation and progression rates of cataracts was significantly less in those rats receiving the grape seed than those not receiving it. The researchers had this to say about the results, "Routine consumption of grape seed proanthocyanidin extract in the form of food or dietary supplement may offer a prophylactic measure against onset and progression of cataract."

5.9. Other Benefits

Other recent research suggests that grape seed extract and its polyphenols, OPC and other phytonutrients, may play a part in preventing or treating a variety of other health conditions. For instance, a 2006 study found that application of grape seed extract inhibited the oxidative process that leads to several types of gum disease. Again, the researchers pointed to the antioxidant effects of grape seed, stating, "Our findings demonstrate that proanthocyanidins have potent antioxidant properties and should be considered a potential agent in the prevention of periodontal diseases."

6. CATEGORY 5: THE ALL-IMPORTANT HERBAL

6.1. Introduction

Another area crucial to making a highly effective and full-spectrum supplement is that of the "herbal" or botanical. What's an herbal? Well, it's just like it sounds -- it's an herb (and interestingly, "herb" means plant). Thus, an herb is any form of plant that is used as a medicine.

Herbal medicine is the folk and traditional medicinal practice based on the use of plants and plant extracts.

Finding healing powers in plants is certainly not a new idea. People in all continents have long used hundreds, if not thousands, of indigenous plants for treatment of various ailments dating back to prehistory.

The first generally accepted use of plants as healing agents are depicted in the wall paintings of the Lascaux caves in France, which have been dated to between 13,000 and 25,000 B.C.

Plants have an almost limitless ability to synthesize aromatic substances, most of which are phenols or their oxygen-substituted derivatives such as tannins. Most are secondary metabolites, of which at least 12,000 have been isolated, a number estimated to be less than 10 percent of the total. In many cases, these substances serve as plant defense mechanisms against predation by microorganisms, insects, and herbivores. Many of the herbs and spices used by humans to season food yield useful medicinal compounds.

The use of and search for drugs and dietary supplements derived from plants have accelerated in recent years. Pharmacologists, microbiologists, botanists, and natural-products chemists are combing the Earth for herbs that could be developed for treatment of various diseases. In fact, many modern drugs have been derived from plants.

Many of the pharmaceuticals currently available to Western physicians have a long history of use as herbal remedies, including opium, aspirin, digitalis, and quinine.

At the top of the list of premier herbals to consider for the "ultimate" health supplement are two highly esteemed and widely used products -- Korean ginseng and maitake mushroom.

6.2. Korean Ginseng: Asian Health King

6.2.1. Introduction

If you're looking for a natural product that brings years of experience to the table, ginseng takes the cake. Used for millennia (that's right -- thousands of years) in Korea, northern China, and other East Asian countries, ginseng (*Panax ginseng*) enjoys nearly legendary status among many Asian peoples for its health-giving properties. Additionally (and unbeknownst to many), the North American variety of ginseng has been used for centuries by first nations people for many of the same reasons their Asian counterparts used the root.

6.2.2. What is Ginseng?

Ginseng is a wild plant root that was used as food and a medicinal agent as far back as 5,000 years ago. Its use as a food and healing agent are recorded throughout many historical texts of Asian cultures. Because of its extensive use leading to scarcity, the root had to be attentively cultivated in 16th-century China.

The Chinese word for ginseng (*jen-shen*) means "man root," referring to the shape of the root having two legs. This played a part in the remarkable level of reverence shown the root over the years -- man cultures have held it in high esteem for its supposed healing powers. One can find a variety of types of *Panax ginseng* products in Asian markets, most of them differing in their preparations.

6.2.3. What Does Ginseng Do?

The biochemical mechanisms of ginseng remain unclear, although there is extensive literature that deals with ginseng's effects on the brain (memory, learning, and behavior), neuroendocrine function, carbohydrate and lipid metabolism, immune function, and the cardiovascular system. Many of the reports are often contradictory, perhaps because the ginsenoside content of ginseng root or root extracts can differ, depending on the species, method of extraction or even the season of collection. Ginseng does have the potential to help with blood sugar levels and some studies show that it can reduce blood lipid levels as well.

6.2.4. Constituents of Ginseng

The roots of Asian and North American ginseng (which is very similar to *Panax ginseng*, and has been used by first nations people for centuries) contain several saponins called ginsenosides that are believed to contribute to the root's adaptogenic properties. They are used in traditional Chinese medicine to improve stamina and combat fatigue and stress. Saponins are promising natural compounds found in many plants, herbs, roots, and beans, possessing potential in the prevention and treatment of cardiovascular disease. For instance, they inhibit the formation of lipid peroxides (fat oxidation) in cardiac muscle or in the liver, they influence the function of enzymes contained in them, they decrease blood coagulation, cholesterol, and sugar levels in blood, and they stimulate the immune system. Some saponins may even have anti tumor properties.

6.3. Adaptogens: Making the Body "Normal"

Ginseng enjoys its immense popularity in large part because of its reported powers as an adaptogen. What's an adaptogen, you ask? In simple terms, an adaptogen is a substance that allows the body to "normalize" a particular condition. For instance, if one's blood pressure is too high, the adaptogen will lower it to normal levels. If it is too low, the adaptogenic agent will raise it to normal levels.

Other criteria of what constitutes an adaptogen state that the agent should cause no harm to the body, nor should it lessen the performance of one body system while improving the performance of another. In addition, its actions should be nonspecific, providing resistance to a wide range of harmful physical, chemical and biological factors.

For centuries, traditional healers in China, Korea and other Asian countries have used *Panax ginseng* for its ability to help the body "adapt" and normalize any number of health conditions.

6.4. Research on Korean Ginseng

6.4.1. Introduction

Dozens of studies have investigated the health benefits of ginseng, with many of them finding evidence to support the claims of avid supporters and historical uses of thousands of years. It must be stated, however, that many of the studies failed to find support of certain benefits. Consequently,

it's difficult to find a consensus on all potential benefits of the root among health and science professionals.

The following are areas where research does strongly suggest that there is scientific evidence that ginseng can potentially benefit someone suffering from that particular disorder.

6.4.2. Mental Function

Several studies have found indications that *Panax ginseng* might improve mental function. However, the studies have varied considerably in their results, making it somewhat difficult to discern the actual cognitive effects of ginseng. A double-blind, placebo-controlled study found that *Panax ginseng* can improve some aspects of mental function. Over one hundred healthy, middle-aged adults were given either ginseng or placebo. The results showed that ginseng improved abstract thinking ability. However, there was no significant change in reaction time, memory, concentration, or overall subjective experience between the two groups.

Another double-blind study of 50 men demonstrated that use of a *Panax ginseng* extract improved the ability to complete a detail-oriented editing task. A double-blind, placebo-controlled trial of 60 elderly people found that 50-100 days of treatment with *Panax ginseng* produced improvements in numerous measures of mental function, including memory, attention, concentration, and ability to cope. Benefits were still evident at the 50 day follow-up.

In addition, three double-blind, placebo-controlled studies evaluated combined treatment with *Panax ginseng* and ginkgo and found some evidence of improved mental function.

6.4.3. Common Cold and Flu

Several studies suggest that ginseng may help prevent and/or fight the common cold and flu. A double-blind, placebo-controlled study enrolled 227 participants at three medical offices in Milan, Italy. Half were given ginseng, the other half placebo. Four weeks into the study, all participants received influenza vaccine. The results showed a significant decline in the frequency of colds and flu in the ginseng group compared to the placebo group (15 versus 42 cases). Also, antibody measurements in response to the vaccination rose higher in the treated group than in the placebo group.

Two other double-blind, placebo-controlled studies found some evidence that American ginseng may be able to prevent flu-like illness in the elderly. In these trials, enrolling a total of about 100 people, use of American ginseng reduced the number of viral respiratory infections (technically, influenza virus or RSV virus infection) by about 90 percent.

Finally, the results of a large study indicates that *Panax quinquefolius* has the potential to prevent colds.

6.4.4. Type-2 Diabetes

A double-blind study evaluated the effects of *Panax ginseng* on 36 patients with adult-onset diabetes. The authors attributed this benefit to a spontaneously increased level of physical activity in the ginseng group. However, these same researchers subsequently reported possible benefit with Korean red ginseng, a specially prepared form of *Panax ginseng*.

Two smaller studies suggest that improved blood sugar control is a potential benefit of supplementing with North American ginseng (*Panax quinquefolius*). One study suggests that North American ginseng with low ginsenoside content is not effective. The researchers of these studies also evaluated *Panax ginseng*, and in contrast to the study reported in the previous paragraph, did not find benefit.

6.4.5. General Well-Being

A double-blind study compared the effects of a nutritional supplement with and without *Panax ginseng* extract on the feeling of well-being in 625 people whose average age was about 40. The patients taking the ginseng-containing supplement reported significant improvement compared to those in the control group.

Similar findings were reported in a double-blind, placebo-controlled study of 36 people newly diagnosed with diabetes. Another study of 120 people found improvement in general well-being among women aged 30 to 60 years and men aged 40 to 60 years, but not among men aged 30 to 39 years.

6.4.6. Sexual Dysfunction

Two double-blind trials have discovered evidence that Korean red ginseng may improve erectile function. In one of the two trials, participants received either placebo or, Korean red ginseng for 8 weeks. The results indicate that while using Korean red ginseng, men experienced significantly better sexual function than while they were taking placebo.

6.4.7. Cancer Prevention

An observational study on ginseng and cancer prevention has been widely publicized. This study was conducted in South Korea and followed more than 4,500 men and women over the age of 39 for about four years. Those who regularly consumed *Panax ginseng* were compared with otherwise similar individuals who did not.

The reported results were impressive. Those who used ginseng showed a 60 percent decrease in risk of death from cancer, including lung and gastric cancer. The more ginseng consumed, the greater the effect.

However, many experts feel the study is flawed. Particularly problematic is the fact that even those who used ginseng less than three times per year experienced a 54 percent reduction in cancer risk.

Three uses in a year constitutes a very occasional rate of use, and it is difficult to believe that such infrequent use of ginseng could reduce cancer mortality by more than half.

6.4.8. Other Uses

While research may not yet support all the reported uses of ginseng, centuries of traditional use, as well as much anecdotal data suggests ginseng may help with the following:

- blood disorders/hemorrhaging ·
- alcoholism recovery ·
- depression ·
- insomnia/sleep dysfunction
- Alzheimer's disease ·
- cardiovascular disease ·
- high blood pressure ·
- menstrual disorders ·
- menopausal symptoms ·
- gastrointestinal complaints/digestion ·
- stimulation of endocrine system ·
- asthma and bronchitis ·
- adrenal stress

6.4.9. Ginseng: Facts at a Glance

- Ginseng's primary constituents include more than 25 saponin triterpenoid glycosides called ginsenosides ·
- Ginseng also contains flavonoids, glycans, peptides, polysaccharides, vitamins A and 86, and zinc ·
- Centuries of traditional use, combined with modern science, suggests that ginseng may provide a variety of potential health benefits. It does this through the following actions:
 - It acts as an adaptogen
 - It relieves inflammation
 - It exhibits anti-tumor activity
 - It improves diabetic condition
 - It strengthens cardiovascular system
 - It soothes irritated tissues, especially mucous membranes
 - It lowers blood sugar levels
 - It stimulates the immune system
 - It acts as a tonic for the nervous system
 - It acts as adrenal support

6.5. Maitake: King of Mushrooms

6.5.1. Introduction

Another product that would fit the "herbal" category of the ideal full-spectrum dietary supplement is maitake mushroom. Scientists have identified dozens of edible mushrooms around the globe, with several of them possessing considerable health benefits. At the top of this list is the maitake mushroom.

6.5.2. What Is Maitake?

The maitake mushroom has been used as a food and healing agent in China, Japan and other Asian countries for thousands of years. In Japan, maitake mushroom is called "king of mushrooms" because it is a very large mushroom (the size of a basketball), which grows deep in the mountains of northeastern Japan.

In the late 1980s, Japanese scientists identified the maitake to be more potent than lentinan, shiitake, suehirotake, and kawaratake mushrooms, all used in traditional Asian medicine for immune function enhancement and other health problems. Historically, maitake has been used as a tonic and adaptogen to help promote wellness and vitality. Traditionally, consumption of the mushroom was thought to prevent high blood pressure and cancer -- two applications that have been the focal point of modern research.

6.5.3. How Does Maitake Mushroom Work?

Maitake, like most mushrooms, contains complex polysaccharides (including beta-d-glucan) that promote the immune system. Maitake has also been shown in studies to possess other amazing properties. For example, the July 1997 issue of *Biological and Pharmaceutical Bulletin* published results from animal studies that suggest maitake may lower LDL cholesterol while raising HDL cholesterol (the beneficial type).

Another study in a 2005 issue of the journal *Nutrition* found that maitake helped enhance anti-tumor effects in mice by activating several immune cells, including T-cells. The researchers concluded that maitake may ultimately provide a potential benefit in the area of immune function.

6.5.4. Benefits of Maitake

6.5.4.1. Cancer

A 2005 study found that polysaccharides (glyconutrients) in maitake exhibited an antitumor effect through the activation of macrophage cells and T-cells. The study also found that maitake's "D-fraction" component could decrease the effective dosage of a chemotherapy agent used to control carcinoma in mice. The researchers stated the following about the results, "These results suggest that maitake D-fraction can [increase] the proliferation, differentiation, and activation of immunocompetent cells and thus provide a potential clinical benefit for patients with cancer."

A recent study found that D-fraction, a potent polysaccharide found in maitake, was highly effective on canine (dog) cancer cells, either by inhibiting cell growth or by directly killing cells. Similar effects were also seen using human cancer cells.

A 2002 study suggests that patients receiving D-fraction from maitake may experience an increase in the activity of natural killer cells and their cytotoxic effect on tumors. The researchers noted that "maitake D-fraction markedly suppressed tumor growth. . . This suggests that maitake D-fraction activates NK cells even on the 20th day after treatment."

In addition, a recent study investigating the cancer fighting effects of maitake's beta-glucan found that the polysaccharide may have great a potential as an alternative therapy for prostate cancer.

Finally, a 2006 study from Chinese researchers suggests that maitake extract could accelerate the antitumor activity of certain chemotherapy agents, and protect against the toxic effects of such chemical therapies. The researchers state, "[The results suggest] the combination might increase cytotoxic efficacy and decrease toxicity of some chemotherapeutic agents in cancer treatment."

6.5.4.2. High Blood Pressure/Diabetes

A. 2002 study from the journal: *Molecular Cell Biochemistry* found that whole maitake and two extracts were successful in lowering high blood pressure in rats. The study also found that the maitake forms displayed significant anti-diabetic activity.

6.5.4.3. High Cholesterol/Triglycerides

Recent studies have looked at the ability of maitake to positively affect cholesterol and triglyceride levels. One such study, which used a dried maitake powder, yielded impressive results. The data suggested that maitake has the potential ability to alter lipid metabolism by inhibiting the accumulation of fats in the liver and blood.

6.5.4.4. Hepatitis

A 2006 study from the journal *Antiviral Research* revealed evidence that maitake extract may be useful in treating hepatitis B. The Chinese research team stated, "These results indicate that [maitake], in combination with Interferon (a pharmaceutical copy of a naturally produced virus-fighting protein), might provide a potentially effective therapy against chronic HBV infections."

6.5.5. Maitake: Benefit Summary

Modern science has uncovered evidence suggesting that maitake mushroom, as well as its primary ingredients (beta-glucan and d-fraction), may do the following:

- Enhance immune function
- Treat hepatitis B and side effects

- Lower cholesterol and triglyceride levels
- Normalize blood-glucose levels/anti-diabetic activity
- Suppress tumor cell growth
- Lower high blood pressure

7. WAIORA'S ESSENTIAL DAILY NUTRIENTS: Essential Nutrition for Your Daily Health and Well-being. Information extracted from the website. This is the product that incorporates this information in one easily consumable liquid formulation. Available at: <http://my.waiora.com/home.php?475030>



7.1. Introduction

We are a society of convenience, fast food and sedentary lifestyles. Many of us would rather get a drive-thru burger than prepare a nutritious meal. And, even when we do all we can to eat right, we can't be assured we're getting the nutrients -- vitamins, minerals, amino acids, essential fatty acids, antioxidant, etc. -- our bodies need to stay healthy. Fresh fruits and vegetables have been grown in nutrient-depleted soil and crops are often harvested prematurely to meet supermarket demand. Furthermore, the most nutritious parts of foods are stripped away when we cut off the stalks, peel off the skin and/or cook them.

It's Not Just a Juice!

Essential Daily Nutrients is a high-potency, multi-nutrient liquid supplement that tastes great and provides the recommended daily allowance (RDA) of naturally derived vitamins A, B, C, D, and E. This powerful supplement also contains the RDA of the minerals chromium, copper, iodine, iron, manganese, molybdenum, selenium and zinc, as well as a mineral boost from calcium, potassium, magnesium and a blend of 60 other trace minerals found in Tahitian sea salt.*

We've infused green tea, grape seed extract, and Maitake Mushroom to help support your immune system, as well as Red Korean Ginseng and a host of B vitamin to help increase alertness and concentration, support memory, and promote energy, stamina and endurance naturally. Waiora's Essential Daily Nutrients supplement is provided in a whole-food fruit base of Açai and Goji berry, and combined with other exotic, high ORAC fruits-pineapple, cranberry, cherry, passion fruit,

orange and agava nectar- to help replenish your body's cells, tissues and organs, fight free radicals and help repair oxidation damage.*

Key Benefits

- It's your daily vitamin product.
- It's your daily mineral product.
- It's your daily polyphenol (super-charged antioxidant) product.
- It's your daily herbal product.
- It's your daily whole-food fruit product.

7.2. 15 Reasons to Use Waiora's Essential Daily Nutrients

1. *Promotes overall wellness.** The anthocyanins in the Açai fruit are similar to the compounds in red wine. They aid in the fight against weight gain and promote wellness both in mind and body. The Açai fruit has been shown to have 33 times the anthocyanins (*a powerful antioxidant*) than red wine grapes (*six times the antioxidants of Mangosteen*). *
2. *Great source of protein and amino acids.* The Açai fruit has more protein than eggs and is loaded with amino acids including: Tryptophan, Threonine, Isoleucine, Leucine, Lysine, Methionine, Cystine, Phenylalanine, Tyrosine, Valine, Arginine, Histidine, Alanine, Aspartic acid, Glutamic acid, Glycine, etc. Goji berries also contain 18 amino acid (*including eight that are essential for life*) and contain more protein than whole wheat. *
3. *Helps support healthy vision.** Key vitamins (*A and B2*), antioxidants (*including Açai*) and carotenoids (*include beta-carotene and zeaxanthin*) help support vision health. *
4. *Supports digestive health.** Vitamins (*B1, B3*), minerals, enzymes and co-factors (*like coenzyme Q10-from Goji berries*) are not only vital nutrients they aid digestion, transference of nutrients and help chemical interaction. *
5. *Supports a healthy cardiovascular and circulatory system.** Powerful antioxidants (*grape seed and green tea*), vitamins (*B, C and E*), essential fatty acids, Betaine and beta-sitosterols (*from Goji berries*) help maintain healthy blood pressure, cholesterol, and homocysteine levels to support a healthy cardiovascular system. These fatty acids also transport and aid the absorbency of fat-soluble vitamins A, E, D and K.*
6. *No artificial sweeteners or sugar added.* Stevia, agava nectar and other fruit sources serve as natural sweeteners for Waiora's *Essential Daily Nutrients*.
7. *Provides a full-spectrum of key nutrients.* Powerful vitamins, minerals (*trace, ionic and sea salt minerals*) antioxidants, and high ORAC fruits (*Açai, Goji, pineapple, cranberry,*

cherry, passion fruit, agava nectar, etc) provide nutrients needed to replenish your body's cells, tissues and organs; fight free radicals and help reverse oxidative stress and free radical damage. *

8. *Superior product formulation.* Contains vitamins, minerals, antioxidants, essential fatty acids, amino acids, electrolytes, high ORAC and whole-food fruits, and much more! A significant amount of testing has been performed to ensure all they key nutrients meet label claims.
9. *It's not just a juice; it's 5 products in 1!* It's your daily vitamin product. It's your daily mineral product. It's your daily polyphenol (*high ORAC, high antioxidant*) product. It's your daily herbal product. It's your daily whole-food fruit product.
10. *A complete MINERAL profile.* Waiora's Essential Daily Nutrients product not only includes key minerals like calcium, magnesium, chromium, copper, iodine, iron, manganese, selenium, and potassium, it includes 60 trace minerals found naturally in Tahitian sea salt.
11. *A complete VITAMIN profile.* This superior product formulation meets or exceeds the government's recommended daily allowances (RDA) for vitamins A, B, C, D, and E. Each vitamin has been derived from natural fruit or mineral sources and will help replenish the health of your body. *
12. *Easy to Share.* Each bottle contains a week's supply of the nutrients your body needs to stay healthy, active and youthful. Small compact size makes it convenient for travel and to share with friends and family.
13. *Environmentally friendly packaging.* Doing our part to be socially and environmentally conscious, Waiora has packaged our new *Essential Daily Nutrients* product in recyclable, glass bottles. The boxes are also made from recycled paper. Please support the environment by recycling the glass bottles and cardboard box.
14. *Helps support your immune system.** Fortified with vitamins (*A & C*), minerals (*copper, selenium and zinc*), antioxidants (*grape seed extract and green tea*), and Maitake mushroom (*with beta-glucans*), Waiora's *Essential Daily Nutrients* helps support your body's natural defenses. *
15. *Provides youthful energy and mental acuity.** B vitamin, minerals (*manganese and molybdenum*), natural herbs (*Red Korean Ginseng*) and key fruits not only promote healthy energy, they promote a more active, youthful feeling. Red Korean Ginseng, B vitamins, EFAs (*essential fatty acids*) and Açai help increase alertness and concentration, support memory, and promote mental focus safely and naturally. *

* *Legally required disclaimer:* These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure or prevent any disease.