

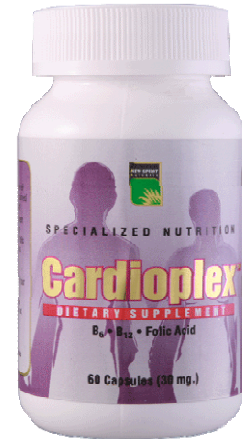


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NATURALS

Cardiovascular Disease

Research is conclusive that cardiovascular disease can be avoided with a healthy Lifestyle and the addition of nutritional supplements that reduce risk factors Including high blood pressure, high cholesterol and triglycerides, high homocysteine, and glucose intolerance.

BY DR. LARRY J. MILAM, H.M.D, PH.D.



Deaths resulting from heart and cardiovascular diseases are at an all time high.

According to the American Heart Association, 1997, fifty percent of all cardiac deaths result from Coronary Heart Disease (CHD), the most deadly cardiovascular disease. Statistics further indicate that Coronary Heart Disease is responsible for more deaths than the next seven causes of death combined.

More than fifty eight million Americans have at least one form of Cardiovascular Disease which includes hypertension, Coronary Heart Disease, stroke or rheumatic heart disease.

- Fourteen million of these have been diagnosed with Systemic Coronary Heart Disease.
- One in nine women and one in six men age fifty four to sixty four years have some form of heart disease.
- After the age of sixty five, one in three women and one in eight men are affected.

In spite of its advanced technology, the United States ranks seventeenth among industrial nations for the incidence of Cardiovascular Disease.

Coronary heart disease (CHD) results from lack of blood flow to the network of blood vessels surrounding the heart and serving the myocardium. These vital arteries, when clogged with plaque consisting of fat, mucopolysaccharides, calcium platelets and smooth muscle cells, narrow and stiffen, forcing the heart to work harder. Constant effort can lead to an enlargement of the heart and congestive heart failure.

Atherosclerosis is the slow, progressive buildup of plaque in the artery wall that can begin as early as childhood and generally takes decades to advance. Plaque formation begins when smooth muscle cells in the middle layer of the arterial wall respond to some irritation of the innerlining such as *smoking, viruses, chemicals in the diet and/or increased stress*, and invade this inner wall. High blood pressure also causes increased stress on the artery walls. These irritations attract platelets and LDL cholesterol and thicken the wall with plaque.

Cholesterol is produced mainly from saturated fats in the liver. The **LDLs** (low-density lipoproteins) are the primary Carriers of cholesterol though the blood and to the plaques, so the higher the intake of saturated fats (which increases cholesterol and LDLs), the greater the potential for plaque formation.

HDLs (high-density Lipoproteins) carry cholesterol away from plaque and out of the bloodstream, back to the liver for reprocessing. Consequently, higher HDL levels reduce the likelihood of plaque formation.

Factors known to cause injuries to artery walls and increase the incidence and extent of plaque formations include:

- Hypercholesterolemia (High Cholesterol)
- Oxidized Low-density Lipoprotein (LDL)
- Diabetes
- Obesity
- Homocysteine
- Diet high in cholesterol and saturated fats
- Hypertension (High Blood Pressure)
- Cigarette smoking

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Hypercholesterolemia (High Cholesterol)

Total cholesterol measurement is the cholesterol contained in all lipoprotein fractions. Research indicates that 60% to 70% of the total is carried on low density lipoprotein (LDL), 20% to 30% on high density lipoprotein (HDL) and 10% to 15% on very low density lipoprotein (VLDL). For general screening purposes, blood cholesterol can be measured using a non-fasting blood sample.

Blood Cholesterol Levels

- **Desirable:** Less than 200mg/dl
- **Borderline High:** 200 to 239mg/dl
- **high (hypercholesterolemia):** 240mg/dl

While a total cholesterol reading can indicate a major risk factor, approximately 40% of those tested require a further lipoprotein analysis. Further tests can identify the various components that are included in the total cholesterol count.

Triglycerides comprise about 95% of the lipids in food and in our bodies. They are the storage form of fat when we eat calories in excess of our energy needs.

Triglyceride-rich lipoproteins known to be atherogenic include= *chylomicrons*, *VLDL* and *LDL*.

Triglyceride levels are an important indicator

- **Normal** Less than 200mg/dl
- **Borderline high** 200 to 400mg/dl
- **High** 400 to 1000mg/dl
- **Very high** Greater than 1000mg/dl

Triglycerides in the very high range place patients at risk for pancreatitis¹. Patients with a deficiency of lipoprotein lipase (LPL) will also have very high triglyceride levels.²

Chylomicrons are the largest particles of the lipoprotein. They are made in the intestines to transport digested fats (mainly triglycerides) into circulation to be carried to the liver and other organs. Once in the bloodstream, the triglycerides in the chylomicrons are hydrolyzed by lipoprotein lipase. When approximately 90% of the triglyceride is hydrolyzed, the particle is released back into the blood as a *remnant*. There, chylomicron remnants are metabolized by the liver, but some deliver cholesterol to the arterial wall as plaque and are, thus, considered atherogenic.

The consumption of high-fat meats produces more chylomicrons and remnants. Therefore, reducing your consumption of highly processed meat by-products and meats may be necessary to create a more desirable balance in the bloodstream.

VLDLs (Very Low-Density Lipoproteins) are made in the intestines and the liver to carry fats throughout the body. Though they carry mostly triglycerides, they carry a small component of cholesterol to the tissues.



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LDLs (Low-Density Lipoproteins) are made by the liver (and possibly by transformation of VLDLs in the blood) and are the primary molecular complexes that carry cholesterol in the blood to the organs and cells. LDLs are conclusively linked to CHD development and acute events.³ Consequently, LDLs are the primary blood lipid target for intervention efforts. *A decrease of 1mg/dl in LDL cholesterol results in about one to two percent decrease in the relative risk of CHD.*⁴ There are a number of factors that can cause an increase in LDL cholesterol, including:

- Aging
- Genetics
- Diet
- Reduced Estrogen Levels (post menopausal women)
- Progestins
- Diabetes
- Hypothyroid
- Nephritic Syndrome
- Obstructive Liver Disease
- Obesity
- Some steroid and anti-hypertension drugs

Of these factors, an improper diet and obesity are the most prevalent. Diets high in saturated fats elevate LDL by down regulating the LDL receptors in the liver. ⁵ Lowering one's LDL cholesterol has been shown to regress lesions, delay progression of atherosclerosis and reduce events, morbidity and mortality.⁶

HDLs (High Density Lipoproteins) are large, dense protein-fat molecules that circulate in the blood, picking up used or unused cholesterol and taking it back to the liver as part of a recycling process. HDLs may be the most protective form of lipoprotein in preventing the buildup of cholesterol.

People with higher HDL levels have less risk of cardiovascular disease because their cholesterol is cleared more readily from the blood.

It also appears that HDL may be able to collect cholesterol from artery plaque, thus reversing the atherosclerotic process that leads to heart attacks. HDL will deliver cholesterol to the VLDL, converting them to LDL, which have more density. The liver removes the LDLs from the blood and converts their cholesterol into bile acids, which are then eliminated. High HDL levels are, therefore, associated with low levels of chylomicrons, VLDL remnants, and small LDL particles. *As such, a high HDL cholesterol level (greater than 60mg/dl) is considered to be a negative risk factor, and a low HDL cholesterol level (less than 35mg/dl) is considered to be a positive risk factor.*⁷

There are major factors that increase HDL levels:

- Exogenous estrogen helps raise HDL levels. Women have less cardiovascular risk than men, possibly because of this hormone.
- Exercise
- Loss of excess body fat
- Moderate consumption of alcohol (one to two drinks/day is associated with a 40% to 50% reduction in CHD). The use of alcohol, however, is not recommended as an intervention strategy.⁸
- Good Dietary Practices

HDL can be lowered by obesity, inactivity, cigarette smoking, anabolic steroids, progesterone dominant oral contraceptives, beta-adrenergic blocking agents, hypertriglyceridemia, and genetic and poor dietary factors.⁹

*In general, a 1mg/dl increase in HDL cholesterol has been shown to reduce the risk of Cardiovascular Heart Disease by two to three percent.*¹⁰



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A Desirable Blood Lipid Profile

- Cholesterol – less than 200mg/dl
- HDL – greater than 35mg/dl

For women aged fifty to sixty nine, HDL of greater than 50mg/dl is desirable

- LDL – less than 130mg/dl

Homocysteine, an amino acid, is positively associated with an increased risk of CHD and peripheral artery disease.¹¹ At any given time, 25% to 45% percent of patients with CHD may have high serum homocysteine levels. These high levels translate into dangerous blood clots and injury to the endothelial or protective cells in blood vessels.¹²

Research has shown that inadequate dietary intake of folate (found in green leafy vegetables) and vitamins B₁₂ and B₆ increase plasma homocysteine levels.¹³

Low dietary folate intake, lack of exercise, older age, smoking and coffee consumption (more than one cup a day) were associated with higher levels of homocysteine in a large population study.¹⁴ Of these factors, smoking, coffee consumption and folate intake were the strongest predictors of homocysteine levels.¹⁵

Adults with hyperhomocysteinemia (greater than 10umol/L) are **thirty times** more likely to have premature cardiovascular disease.¹⁶

Increasing folate intake by two hundred micrograms per day reduces homocysteine levels by 4umol/L.¹⁷ **A 1 umol/L rise in 10% in homocysteine level is associated with a 10% increase in CVD risk.**¹⁸

Oxidative Stress

Heart and coronary blood vessels are highly susceptible to oxidative stress. Oxidation of LDL in the vessel wall hastens the atherogenic process by increasing LDL uptake and increasing vascular tone and coagulability.¹⁹

Dietary factors that can decrease LDL oxidation include vitamin C, vitamin E, beta-carotene, selenium, flavonoids, Magnesium and monounsaturated fats. In contrast, iron, copper, zinc and saturated fat increase LDL oxidation.²⁰ Consuming foods high in nutrients that theoretically could reduce the oxidation potential is prudent.

Some general dietary factors that can assist in the possible prevention of CHD

Fatty acids may differ in their length and their degree of saturation. They are commonly composed of a series of 16-18 carbon molecules attached to hydrogen molecules. The number of hydrogen molecules is what determines the saturation of the fat. When each carbon has its maximum number of hydrogens attached, the fat is said to be saturated - that is, filled to capacity with hydrogen.

Saturated fatty Acids (SFA), commonly found in animal meats, are hard at room temperature. Lard and butter are common saturated animal fats. Coconut and palm oil are two saturated vegetable oils.

In general, Saturated Fatty Acids (SFA) tend to elevate blood cholesterol in all lipoprotein fractions when substituted for carbohydrate or other fatty acids.²¹ While every person does not respond the same, some studies have developed equations to predict the blood cholesterol response for changes in the consumption of SFA. ***It is estimated that for every 1% increase in total energy intake from saturated fatty acids, a 2.7 mg/dL increase in plasma cholesterol level is predicted.***²²

Many candy bars contain significant amounts of the SFA's, so limiting consumption of them along with milk, cheese, butter and animal products is advised.

Unsaturated fats are of two varieties, *monounsaturated* and *polyunsaturated*. When only one area of the carbon chain can accept a hydrogen atom, the fatty acid is said to be monounsaturated. Oleic acid, present in olive oil, is a monounsaturated fat that is used extensively in the Mediterranean diet and has been shown in some epidemiological studies to have a negative association with CHD.²³ These populations also consume more fruits and vegetables than many other populations, so more studies are needed.



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When more than one area of the carbon chain can accept additional hydrogen atoms, the fat is said to be *polyunsaturated*. Oils in this category include safflower, soybean, peanut, corn and cottonseed. Unsaturated fats are unstable at room temperature and sensitive to interaction with oxygen, light and heat. Dark glass, refrigeration and the use of antioxidants (vitamin E and beta-carotene) and chemicals (BHA and BHT) are commonly used to protect them from oxidation.

Hydrogenation is another way of dealing with the spoilage problem of unsaturated oils. With chemically induced hydrogen saturation of the carbon bonds, the structure of the unsaturated oils is changed. This alters the way the body metabolizes these fats and often changes the physical form, as with margarine. These hydrogenated products are consumed in large amounts in the American culture and they are now being recognized for their role in raising blood cholesterol, rather than lowering it, thereby increasing the risk of cardiovascular disease.

Trans-fatty acids (stereoisomers) are produced in the hydrogenation process. Trans-fatty acids are also present in beef, butter and milk fats. Cookies and crackers made from partially hydrogenated vegetable oils contain three to nine percent trans-fatty acids, and many snack foods contain eight to ten percent. The major sources of trans-fatty acid in the U. S. diet are stick margarine's, shortening, commercial frying fats and high fat baked goods (Food and Nutrition Science Alliance, 1994).

Research indicates that trans-fatty acids inhibit the enzyme delta-6 desaturase which converts linoleic acid to GLA. GLA is the precursor for PGE1, one of the most potent inhibitors of platelet aggregation.²⁴ ***Increased levels of trans-fatty acid intake (six percent of energy) lowers HDL cholesterol ("good cholesterol").***

Essential Fatty Acids (EFA) include linoleic, linolenic and arachidonic acids.

They are all polyunsaturated fatty acids that cannot ordinarily be synthesized in the body. Omega-3 and omega-6 fatty acids help decrease the production of inflammatory thromboxanes, thereby reducing the likelihood of platelet aggregation, and lower blood pressure.²⁵ Omega-3 and omega-6 can be found in plant sources such as flaxseed, pumpkinseed, borage, evening primrose and blackcurrant seed oils.

North Americans typically get more omega-6 oils than omega-3 oils in their diet, thereby upsetting the optimum omega-3 to omega-6 ratio of 1:1.

Omega-3 fatty acids – eicosapentaenoic acid (EPA) and docosahexaenoic (DHA) – are commonly found in fish. The weekly consumption of deep, cold water fish or supplements (one or two grams per day of a combination of EPA and DHA), help balance omega-3 fatty acid levels²⁶ and significantly reduce serum triglycerides, raise HDL and prolong bleeding time by reducing platelet aggregation, thus preventing thrombosis.²⁷

Soluble fibers – pectin, gums, mucilage's, algal polysaccharides, and some hemicelluloses – in legumes, oats, Fruits and psyllium lower serum cholesterol and LDL cholesterol, while raising HDL.²⁸ Of the total recommended fiber intake (twenty five to thirty grams per day for adults), approximately six to ten grams should be from soluble fiber. This level can be easily achieved by consuming the recommended five or more servings of fruits and/or vegetables per day and six or more servings of whole grains. Numerous studies have shown that psyllium (five grams twice a day) can significantly lower total cholesterol and LDL cholesterol.²⁹

Alcohol effects both the total triglyceride and HDL cholesterol levels. In some population studies, moderate levels of alcohol consumption (one to two cups daily) have been associated with decreased risk of myocardial infraction and CHD mortality (in white men only). Wine, particularly made from dark skin grapes, contains resveratrol, an antifungal compound, which has been shown to increase HDL cholesterol and inhibit LDL oxidation.³⁰ This is particularly true in the French culture where they historically experience lower rates of CVD, despite a high-fat diet. It is now possible to get the benefits of resveratrol in supplement form without consuming alcohol.

Obesity has been shown to be a significant factor in Coronary Heart Disease. How obesity affects atherogenesis is not clear, but it is probably related to the coexisting factors seen in obese individuals – specifically, glucose intolerance and diabetes, hypertension, and dyslipidemia.³¹ Weight distribution (upper body abdominal versus lower-body) is also predictive of CHD risk factors and effects glucose tolerance and serum lipid levels.³² A waist-to-hip ratio of less than 0.8 for women and 0.9 for men is recommended.



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Stress is a hallmark risk factor in CHD. Recent studies show clear and compelling evidence that psychosocial factors such as stress and depression contribute significantly to the development and manifestation of heart disease. Recent studies indicate that plasma homocysteine may be an important factor linking stress and the risk of heart disease.³⁵

Nutritional support such as vitamins and antioxidants have been shown to help reduce the effect of the stress response at the physiological level. They include antioxidant nutrients such as, *coenzyme Q10*, *Vitamin E* and *green tea polyphenols*.

B Complex Vitamins help rejuvenate mood and emotional well being by facilitating carbohydrate metabolism and the cellular conversion of glucose to usable energy.³⁶ Deficiencies of B vitamins, including *vitamin B6*, *vitamin B12* and *folate* have been shown to contribute to psychological distresses and symptoms such as depression, irritability, fatigue and other psychiatric disturbances that correlate to the progression of coronary heart disease.³⁷

Chinese medicine offers many herbs and herbal combinations that have been useful for centuries to help alleviate the psychological and physiological effects of stress. Herbs such as, rehmannia root (*Rehmannia glutinosa*), dong quai root (*Angelica sinensis*) schizandra fruit (*Schizandra chinensis*), scophularia root (*Scophularia ningpoensis*), salvia root (*Salvia miltiorrhiza*), and codonopsis root (*Codonopsis pilosula*) soothe irritability and restlessness, produce a calming effect on the central nervous system and have antihypertensive qualities.³⁸

Calcium is needed for muscular activity and in regulating the heartbeat. Heart function is mediated by several minerals: calcium stimulates contraction, magnesium supports the relaxation phase, and sodium and potassium are also important in generating the electrical impulse. Calcium supplements produce small decreases in LDL cholesterol in hypercholesterolemic men. In a double-blind placebo-controlled trial, 1200 mg of calcium citrate was reported to lower LDL cholesterol by 4.4% and increase HDL cholesterol by 4.1% in men on a Step I Diet (Bell et al., 1992).³⁹

Magnesium is considered the “anti-stress” mineral. It is a natural tranquilizer, as it functions to relax skeletal muscles as well as the smooth muscles of blood vessels and the gastrointestinal tract. (While calcium stimulates muscle contraction, magnesium relaxes them.) Because of its influence on the heart, magnesium is considered important in preventing coronary artery spasm, a significant cause of heart attacks. To function optimally, magnesium must be balanced in the body with calcium, phosphorus, potassium and sodium chloride. For example, with low magnesium, more calcium flows into the vascular muscle cells, which contracts them, leading to tighter vessels and higher blood pressure. Adequate magnesium levels prevent this. Besides preventing heart attacks, Magnesium also has a mild effect on lowering blood pressure and is often recommended to prevent hypertension. Magnesium supplements also increase HDL level, decrease platelet aggregation and prolongs clotting time. Magnesium is often depleted by stress.

Hawthorne (*Crateagus oxyacantha*) contains active constituents found in the leaves, flowers and berries that may help lower blood pressure and pressure rate product (an indicator of economization of cardiac work). They may also increase the ejection fraction – the percentage of blood leaving the heart during each beat.⁴⁰ The higher the ejection fraction, the better the heart’s ability to pump oxygen-rich blood throughout the body. Hawthorn is also believed to dilate coronary blood vessels, reduce peripheral vascular resistance and increase myocardial perfusion.⁴¹ In animal studies, hawthorn has been shown to increase peripheral and coronary artery blood flow and decrease arterial blood pressure.

Bioflavonoids are also known as vitamin P for “permeability factor”. This name was given to this group of nutrients because they increase the strength of the capillaries and regulate their permeability, allowing the passage of oxygen, carbon dioxide and nutrients through the capillary walls. As such, vitamin P helps prevent hemorrhage and rupture of these tiny vessels. Bioflavonoids are closely associated with vitamin C, in that natural forms of vitamin C are more effective than are synthetic ascorbic acids without the bioflavonoids in the equivalent amounts.

Lipoic Acid is being referred to as the most versatile and powerful of all antioxidants.⁴² Because of its small, unique chemical structure, it is both fat and water soluble and is thus able to work its miracles in both the watery and fatty portions of the cell. Lipoic acid is the only antioxidant that can recycle or regenerate itself and four other crucial antioxidants: vitamins E and C, glutathione and coenzyme Q10. This means that when an antioxidant like vitamin E or C is exhausted and depleted, lipoic acid rushes in to restore it to its full antioxidant powers. Lipoic acid neutralizes nitrogen radicals, including nitric oxide, the free radical most apt to injure brain cells.



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Studies (particularly by Dr. Lester Packer, one of the world's leading authority on antioxidants) indicate that lipoic acid may keep you from having a stroke and, if you have one, it may help limit the damage and speed your recovery.⁴³ In animal studies conducted by Dr. Packer, strokes were induced by blocking the carotid artery that carries blood and oxygen to the brain. In such strokes, blood flow is disrupted, but then suddenly resumes as the blockage dissipates. This is the most dangerous part of the stroke and is referred to as *reperfusion*, when the oxygen rushes back into the brain. This rush provokes a burst of free radical formation in the brain of such magnitude that the brain's ordinary antioxidant defenses cannot handle it. As a result, defenseless brain cells are injured and killed, resulting in temporary or permanent damage and possibly death. Dr. Packard's research proved that lipoic acid performed magic by preventing free radical damage to vulnerable parts of the brain and dramatically increased stroke survival.⁴⁴

A preventive dose of 10 to 50 milligrams of lipoic acid a day is recommended for health people. (Dr. Packer takes 100 mg daily, half in the morning and half in the late afternoon or evening.)⁴⁵

Lecithin Over 25 years ago, Dr. Lester M. Morrison, director of a research unit at Los Angeles Country General Hospital first published (Geriatrics, January, 1958) his findings that lecithin could be used to lower cholesterol levels. He reported that 80% of his patients suffering from high serum cholesterol levels showed an average decrease of 41% in serum cholesterol after taking lecithin for several weeks.

Instead of "blocking" absorption of cholesterol in the digestive tract as other cholesterol reducing agents did, lecithin enhanced the metabolism of cholesterol in the digestive system and aided in its transport through the circulatory system. The lecithin acted as an emulsifier and broke down the fats and cholesterol in the diet into tiny particles and held them in suspension, preventing them from sticking to blood platelets or arterial walls.

**While we all know that traditional clinical care is necessary and important,
it often falls short in the area of prevention.**

For the past forty years, clinical trials have shown that numerous dietary risk factors affect serum lipids, atherogenesis, and CHD. Most inhabitants of industrialized countries consume diets that are atherogenic.

The goal of dietary intervention is mainly to affect the lipid profile i.e., reduce triglycerides, cholesterol, and low-density lipoproteins, and increase high-density lipoproteins. To achieve this, we recommend a diet high in fiber, fruits and vegetables, along with a balanced spectrum of vitamins and nutritional supplements. In addition, we recommend reducing the intake of saturated fats, sugar, alcohol and caffeine contaminating beverages. It is now indicative that the sooner one employs preventative measures, the more likely they will prevent the development of CVD.

Possible Warning Signs of Circulation Problems

Weak or irregular heartbeat	Varicose veins	High blood cholesterol	Inhibited liver function
High Triglycerides	Circulation ulcers	Cold hands/feet	Hands/feet go to sleep
High blood pressure	Senility	Tension in chest	Chest pain
Leg cramps	Poor vision	Bruising easily	Numbness and tingling
Arthritis	Kidney stones	Fatigue	Often drowsy
Nosebleeds	Low exercise tolerance	Sighing frequently	Breathing loudly
Dizzy when standing up	High altitude reaction	Swelling ankles	Anemia
Ringing in the ears	Short of breath climbing or walking	Pain in left arm (can include elbows & hands)	1996 Health Watchers System



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Cardioplex™
Cardioplex™ is a unique combination of nutritional and herbal supplements aimed at supporting optimal cardiac health.[†] High levels of homocysteine have been linked to increased risk of coronary artery disease. The combination of folic acid, Vitamin B₆, and Vitamin B₁₂ has been shown to effectively lower homocysteine levels.[†]

Directions: 1 capsule per day with your favorite juice.

† This statement has not been evaluated by the Food & Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

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SPECIALIZED NUTRITION

Cardioplex™

DIETARY SUPPLEMENT

B₆ • B₁₂ • Folic Acid

60 Capsules (30 mg.)

Supplement Facts

Serving Size: 1 Capsule	Servings Per Container: 60
Amount Per Serving	
% Daily Values	
Magnesium 150 mg (Ascorbic Acid Chelate)	37.5%
Folic Acid	400 mcg 100%
Vitamin B ₆ (Pyridoxine HCl)	15 mg 250%
Vitamin B ₁₂ (Cyanocobalamin)	150 mcg 2500%
Alpha Lipoic Acid	10 mg **
Hawthorn (Crataegus Oxycantha), Standardized to 18% Vitexin (Leaves & Fruit)	200 mg **
Citrus Bioflavonoids	25 mg **
Apple Pectin (Malus domestica), (Fruit)	25 mg **
Leactin (Soy)	55 mg **

†† Daily Values based on 2000 Dietary Guidelines.
** Daily Values not established.

These statements have not been evaluated by the FDA. Information contained in this bulletin is for informational purposes only and is not intended to diagnose, treat, cure, or prevent any disease. In all cases, its is recommended that you consult with your healthcare professional before initiating a supplement program.

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Footnotes

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