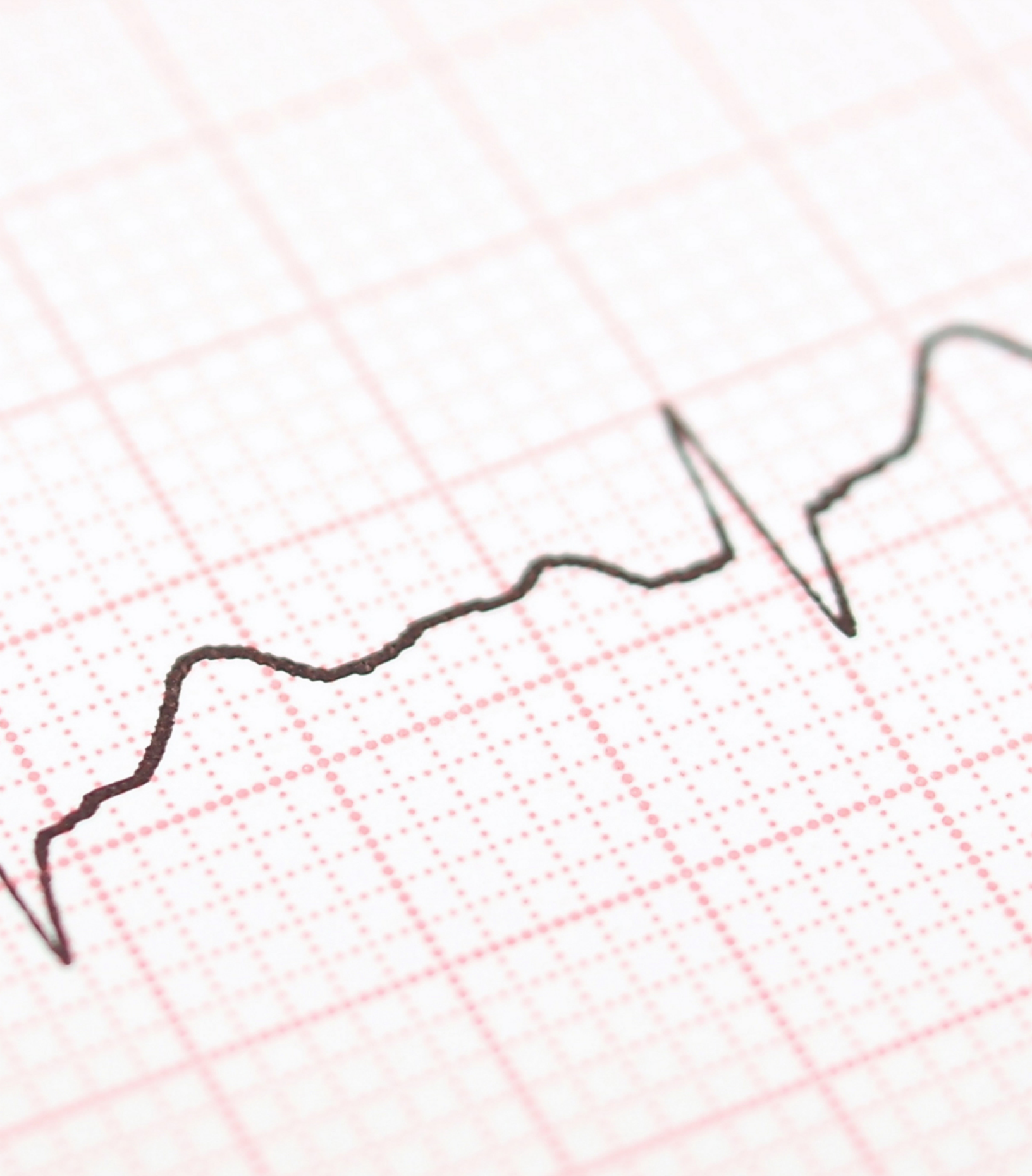


The Integrative Use of Dietary Supplements
for Treating Cardiovascular Disease





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Mortality data show that cardiovascular disease (CVD), as the listed underlying cause of death, accounted for 32.8% (811,940) of all 2,471,984 deaths in 2008, or 1 of every 3 deaths in the United States.

In every year since 1900, except 1918, CVD accounted for more deaths than any other major cause of death in the U.S. On average, >2200 Americans die of CVD each day, an average of 1 death every 39 seconds.

CVD currently claims more lives each year than cancer, chronic lower respiratory disease, and all accidents combined!

Prevalence of CVD

An estimated 82,600,000 American adults (>1 in 3) have one or more types of CVD. Of these, 40,400,000 are estimated to be over 60 years of age.

Total CVD includes all of the following, except congenital CVD:


- High blood pressure (HBP) – **6,400,000** Americans (defined as systolic pressure ≥ 140 mm Hg and/or diastolic pressure ≥ 90 mm Hg, use of antihypertensive medication, or being told at least twice by a physician or other health professional that one has HBP).
- Coronary heart disease (CHD) – **16,300,000** Americans
- Myocardial infarction or heart attack (MI) – **7,900,000** Americans
- Angina pectoris or chest pain (AP) – **9,000,000**
- Heart failure – **5,700 000** Americans
- Stroke (all types) – **7,000,000** Americans

•Congenital cardiovascular defects – 650,000 to 1,300,000

Of these, racial prevalence estimates of diagnosed conditions for people ≥ 18 years of age in 2010 are:

- Whites only** – 11.7% have HBP, 6.4% have CHD, 23.6% have hypertension, and 2.5% have had a stroke.
- Blacks/African Americans** – 10.9% have HBP, 6.3% have CHD, 33.8% have hypertension, and 3.9% have had a stroke.
- Hispanics or Latinos** – 8.1% have HBP, 5.2% have CHD, 22.5% have hypertension, and 2.6% have had a stroke.
- Asians** – 7.2% have HBP, 4.9% have CHD, 20.5% have hypertension, and 2.0% have had a stroke.
- Native Americans or Alaska Natives** – 12.5% have HBP, 5.9% have CHD, 30.0% have hypertension, and 5.9% have had a stroke (estimate considered unreliable).
- Native Hawaiians or other Pacific Islanders** – 20.2% have HBP, 19.7% have CHD, 40.8% have hypertension, and 10.6% have had a stroke.
- Indian adults** (9%) are about 2-fold more likely than **Korean adults** (4%) to have ever been told they have HBP.
- By 2030, 40.5% of the US population is projected to have some form of CVD.**



A vibrant green leaf with detailed vein structure is positioned at the top of the frame. A single, dark, spherical drop of liquid is shown falling from the leaf's tip. Below the drop, another similar drop is visible, suggesting a continuous flow. At the bottom of the image, the neck and top of a brown glass bottle are shown, with the falling drop about to enter it. The background is a soft, light gray gradient.

An integrative approach

The conventional medical treatment for CVD has limitations.

Taking an integrative approach to cardiovascular health by supplementing with key nutraceuticals may help promote a healthy balance of blood lipids, support healthy blood pressure, support healthy homocysteine levels, and healthy heart function—and ultimately have a positive, mediating impact on CVD.



Following is a discussion about those nutraceuticals.

Artichoke extract

You may have enjoyed steamed or grilled artichokes dipped in butter, but this culinary treat also has medicinal properties. Aside from its well-established effects for promoting liver health and popular use in Europe for the treatment of mild indigestion, (particularly following a high fat meal), artichoke leaf extract also has the ability to reduce total and LDL cholesterol, and the LDL/HDL ratio over 6 to 12 weeks of treatment.

In one double-blind, placebo-controlled study, those using artichoke leaf extract experienced an 18.5% decrease in total cholesterol, compared to 8.6% in the placebo group. The LDL-cholesterol decreased 22.9% in the artichoke group and 6.3% for placebo; and LDL/HDL ratio showed a decrease of 20.2% in the artichoke group and 7.2% in the placebo group. Other research has shown similar results, and artichoke extract may work better in people with higher cholesterol levels. Orally, artichoke extract might increase flatulence in some patients. The typical dose used in research is 1800-1920 mg per day in 2 to 3 divided doses.

Beta-sitosterol

Beta-sitosterol is a plant sterol. Plant sterols are natural substances found in small quantities in many fruits, vegetables, nuts, seeds, cereals, legumes, vegetable oils, and other plant sources. Research has demonstrated that taking beta-sitosterol orally significantly reduces total and low-density lipoprotein (LDL) cholesterol levels, but has little or no effect on high-density lipoprotein (HDL) cholesterol levels. LDL is considered to be the “bad cholesterol”, while HDL is considered to be the “good cholesterol”. The way it works is that beta-sitosterol blocks cholesterol absorption in the intestines, which in turn results in lowered LDL cholesterol in the bloodstream.

For the most part, the consumption of about 2 grams daily has been reported to decrease LDL cholesterol levels 9% to 20%, although usual doses have ranged between 800 mg to 6 grams per day and given before meals. Beta-sitosterol is typically given in conjunction with a low-fat diet. Orally, beta-sitosterol is usually well tolerated. Ezetimibe, (Zetia), a medication used to lower cholesterol levels, inhibits intestinal absorption of beta-sitosterol. For most people, 800-2000 mg beta-sitosterol, in divided doses taken before meals, is a good amount.

MSV-60®

Described as one of the most significant remedies in Traditional Chinese Medicine, (TCM), *Salvia miltiorrhiza*, (SM), also known as Dansheng or Dan Shen, has historically been associated with the circulatory and cardiovascular systems, and consequently, has been recommended for conditions surrounding the blood and heart.

In a review of SM's value for this purpose, researchers stated the following; "The demonstration of beneficial effects of *salvia miltiorrhiza* (DanShen) on ischemic diseases has revolutionized the management of angina pectoris, myocardial infarction (MI) or stroke in Chinese society. Experimental studies have shown that DanShen dilated coronary arteries, increased coronary blood flow, and scavenged free radicals in ischemic diseases, so that it reduced the cellular damage from ischemia and improved heart functions. Clinical trials also indicated that DanShen was an effective medicine for angina pectoris, MI, and stroke."

Indeed, individual studies have shown SM has the action of improving the ischemic state of the myocardium by dilating the coronary vessels, as well as decreasing serum lipid peroxides and increasing levels of superoxide dismutase in patients with coronary heart disease. These effects were thought to be the result of SM's ability to inhibit platelet aggregation, reduce blood viscosity, improve myocardial ischemia and protect the cyto-membrane.

SM has even been found to effectively improve and protect myocardial ischemia in patients with CHD who were undergoing non-heart surgery; no side effects were found.

Research in China has shown that SM contains 8 active components.

The most active of these are a blend of Magnesium salviolate B & G. MSV 60° is a patented, 60% standardized extract of the these compounds.

As a cardiovascular support ingredient, MSV 60° has shown remarkable promise in various research and development innovations. For example, in animal research, MSV 60° effectively improves ischemia when coronary flow is hindered by an obstruction. The EKG comparison between control and test groups shows that the infraction areas are greatly reduced in the test group.

Other research has shown that MSV 60° enhances heart muscle strength under hypoxic conditions. In rats, MSV 60° has been shown to inhibit platelet aggregation at a level twice that of aspirin., In addition to this, MSV 60° has shown to promote liver detoxification and to increase superoxide dismutase activity under ischemic conditions.

In terms of drug interactions, research has shown that salicylates in therapeutic concentrations can significantly decrease free SM concentrations, and SM can displace salicylate. Because of both the pharmacokinetic and pharmacodynamic interactions, SM should be avoided in patients taking warfarin.

Hawthorn Leaf and Flowers Extract

Hawthorn has been used traditionally as a cardiac tonic, and current uses include treatment for angina, hypertension, arrhythmias, and congestive heart failure. Furthermore, research indicates it may improve cardiac muscular contractions and blood flow in coronary arteries.

Germany's Commission E has validated the use of Hawthorn in cases of cardiac insufficiency. They found that Hawthorn resulted in an improvement of subjective findings as well as an increase in heart work tolerance and a decrease in pressure/heart rate product.

Likewise, clinical research has confirmed that hawthorn is beneficial in treating stage II (mild) congestive heart failure. As a matter of fact, it has been shown to be as effective as the drug captopril (Capo-

ten®) for treating patients with early-stage congestive heart failure.

With regard to angina, hawthorn extract taken three times per day improved heart function and exercise tolerance in angina patients.

Garlic bulb

Garlic has significant contributions to make toward cardiovascular health. First are garlic's lipid-lowering effects. Thirteen trials involving a total of 795 participants demonstrated a positive correlation between garlic supplementation and lipid-lowering effects. Six randomized, double-blind, placebo-controlled, as well as two double-blind, multi-center studies supported the use of garlic in treating elevated lipid conditions including hyperlipidemia and hypercholesterolemia. Two meta-analyses on the effect of garlic on total cholesterol found a statistically significant reduction in total cholesterol levels.

Second is garlic's antihypertensive effect. Two randomized, double-blind, placebo-controlled studies and one randomized, open, parallel group, comparison study (159 total participants) demonstrated the antihypertensive effects of garlic. A systematic review and meta-analysis of randomized controlled trials was conducted to determine the effect of garlic on blood pressure. Eight trials, including 415 participants, were identified. Of the seven trials that compared the effect of garlic with a placebo, 3 demonstrated a significant reduction in systolic blood pressure and 4 in diastolic blood pressure.

Third is garlic's antiplatelet effect. One randomized, double-blind, placebo-controlled, crossover study and two double-blind, placebo-controlled studies involving a total of 214 subjects indicate the potential use of garlic as a coronary disease preventative due to its positive impact on platelet function.

Finally, in the longest clinical trial on garlic to date, garlic's ability to prevent and possibly reverse atherosclerosis was tested in a randomized, double-blind, placebo-controlled, four-year study in which 152 men and women were given garlic as tablets.

The subjects possessed significant plaque buildup and at least one additional cardiovascular risk factor. After the four years, garlic subjects had an average 2.6% reduction in plaque volume while the placebo group's plaque increased 15.6%.

Researchers concluded that garlic has a preventive and possibly curative role in arteriosclerosis therapy.

CoEnzyme Q10

Coenzyme Q10 is a powerful antioxidant that protects the body from free radicals and helps preserve vitamin E. Coenzyme Q10 has helped some people with congestive heart failure—an effect reported in an analysis of eight controlled trials and found in some, though not all double-blind studies. Coenzyme Q10 may take several months to show beneficial results. People with congestive heart failure taking coenzyme Q10 should not stop taking it suddenly because sudden withdrawal may exacerbate the symptoms of congestive heart failure.

Similar improvements have been reported in people with cardiomyopathies—a group of diseases affecting heart muscle. Research (including double-blind studies) in this area has been consistently positive.

Also, due to its effect on heart muscle, researchers have studied coenzyme Q10 in people with heart arrhythmias. Preliminary research in this area reported improvement after approximately one month in people with premature ventricular beats (a form of arrhythmia) who also suffer from diabetes.

Angina patients taking 150 mg per day of coenzyme Q10 report a greater ability to exercise without problems. This has been confirmed in independent investigations.

Coenzyme Q10 appears to increase the heart's tolerance to a lack of oxygen.

Perhaps as a result, preliminary research has shown that problems resulting from heart surgery occurred less frequently in people given coenzyme Q10 compared with the control group.



L-Taurine

Taurine, an amino acid, helps the heart pump. Research (some double-blind) has repeatedly shown to help those with CHF. In one study, where taurine was administered orally on CHF patients for six weeks, significant positive changes were observed in the measured parameters. In another double-blind, randomized, crossover, placebo-controlled study, a benefit of taurine over placebo was demonstrated. The researchers concluded; “The results indicate that addition of taurine to conventional therapy is safe and effective for the treatment of patients with congestive heart failure”. In one clinical trial where results were measured based on established New York Heart Association functional classes, (the lower the class, the better for the CHF patient), the researchers reported, “Thirteen of the 15 patients who were designated as New York Heart Association (NYHA) functional class III or IV before receiving taurine could be designated as class II after they completed the study”. A deficiency of taurine is thought by some researchers to play an important role in elevating blood pressure in people with hypertension. Limited taurine research has found that supplementation lowers blood pressure in animals and people (at 6 grams per day), possibly by reducing levels of the hormone epinephrine.

Vitamin B-6, Vitamin B-12 & Folic Acid

Homocysteine is a by-product of normal protein metabolism. It is formed from the conversion of the amino acid methionine. Since high levels of homocysteine is not a good thing for the cardiovascular system, the body has a built-in mechanism to partially convert it back into methionine and other beneficial, non-toxic amino acids. If, however, this process is out of wack a bit, homocysteine builds up in bodily fluids and tissues. This could be a real problem since moderately high levels of homocysteine can raise heart disease risk independent of other known risk factors such as elevated serum cholesterol and hypertension. Although not all researchers are in agreement about the relationship between homocysteine and heart disease, homocysteine nonetheless seems to promote atherosclerosis, as well as being a risk factor for stroke.

Vitamin B6, folic acid, and vitamin B12 each function as cofactors for enzymes that can lower homocysteine

levels. A substantial amount of research has shown that supplementing with these nutrients can reduce homocysteine levels. As a matter of fact, due to the substantial body of research present, there are at least ten reviews and meta-analyses that have been compiled which demonstrate the efficacy of these nutrients in lowering homocysteine.

Astragalus Root Extract

Astragalus is primarily used for its immune stimulating and adaptogenic properties. However, research does exist which demonstrates a role in cardiovascular health. For example, patients with heart failure were treated with Astragalus, resulting in significant increases in cardiac output and stroke volume. Also, intravenous administration of Astragalus decreased erythrocyte sodium content and increased the sodium pump activity in a double-blind trial on patients with coronary heart disease.

In another study, ninety-two patients with ischemic heart disease were treated with Astragalus. Not only did they get significant relief from angina, but also the effective rate of EKG improvement was 82.6%. Speaking of angina, 20 patients with angina pectoris were given Astragalus for two weeks and evaluated by echocardiogram. Cardiac output increased from 5.09 +/- 0.21 to 5.95 +/- 0.18 L/min (P<0.01). Adenosine triphosphatase (ATPase) activity was not inhibited with Astragalus, unlike that of digitalis. Finally, the saponins contained in Astragalus were found to have a positive effect on the function of the heart through the inhibition of the formation of lipid peroxides in the myocardium, as well as by decreasing blood coagulation.



Astragalus Root

Lycopene

In Europe, researchers have found a statistically significant association between high dietary levels of the carotenoid antioxidant lycopene and a 48% lower risk of heart disease.

Likewise, lycopene has been found to be low in the blood of people with atherosclerosis, particularly if they are smokers. Although no association between atherosclerosis and blood level of any other carotenoid, (e.g., beta-carotene), was found, the results of this study suggested a protective role for lycopene.

In another study, women with the highest intake of tomato-based foods, rich sources of the antioxidant lycopene, had a reduced risk for cardiovascular disease compared to women with low intake of those foods. The study also showed a positive trend that the highest dietary levels of lycopene may also be protective against cardiovascular disease.

Conclusion

Supplementation with artichoke, beta-sitosterol, MSV-60®, hawthorn leaf and flowers extract, garlic bulb, coenzyme Q10, taurine, vitamins B-6, B-12 and folic Acid, astragalus root extract and lycopene may be part of an effective treatment for CVD and for promoting cardiovascular health.

References can be found at :www.nutriculamagazine.com