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3 Top Micronutrients for Cardiovascular Health

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STORY AT-A-GLANCE

- Brown University researchers conducted a study to determine which micronutrients are best for your heart
- They unveiled an up-to-date evidence-based map that quantifies the impact of micronutrients on cardiovascular outcomes
- Out of 27 micronutrients, three — omega-3 fats, folate and coenzyme Q10 (CoQ10) — came out on top
- Omega-3 fats decreased mortality from cardiovascular disease, while also reducing heart attacks and coronary heart disease events
- Folic acid, the synthetic version of folate, or vitamin B9, reduced stroke risk, while CoQ10 decreased all-cause mortality events
- Most, but not all, of the micronutrients studied showed "moderate- to high-quality evidence" of reducing risk factors for cardiovascular disease

Heart disease is the No. 1 cause of death in the U.S., killing one person every 34 seconds.[1] Your diet plays a prominent role in your heart health, but the role of individual micronutrients continues to be debated. Brown University researchers conducted a study to determine which micronutrients are best for your heart.[2]

They unveiled an up-to-date evidence-based map that quantifies the impact of micronutrients on cardiovascular outcomes. Out of 27 micronutrients, three — omega-3

fats, folate and coenzyme Q10 (CoQ10) — came out on top.

Micronutrients Benefit Cardiometabolic Health

Micronutrients are vitamins and minerals that your body needs to function optimally. Deficiencies in micronutrients can lead to a range of acute and chronic conditions. In terms of heart health, Brown University researchers conducted a systematic review and meta-analysis involving 884 trials. The study, published in the Journal of the American College of Cardiology, evaluated 27 types of micronutrients used by 883,627 participants.[3]

"For the first time, we developed a comprehensive, evidence-based integrative map to characterize and quantify micronutrient supplements' potential effects on cardiometabolic outcomes," study author Dr. Simin Liu, professor of epidemiology and medicine at Brown University, said in a news release. “Our study highlights the importance of micronutrient diversity and the balance of health benefits and risks.”[4]

Most, but not all, of the micronutrients showed “moderate- to high-quality evidence” of reducing risk factors for cardiovascular disease. Those that were beneficial included:[5]

Folic acid (folate)	Vitamin D	Magnesium	Zinc
Alpha-lipoic acid	Coenzyme Q10	Melatonin	Catechin
Curcumin	Flavanol	Genistein	Quercetin

The study was unique in that it took a comprehensive look at micronutrient supplementation, including phytochemicals and antioxidants. Liu explained:[6]

> *“Research on micronutrient supplementation has mainly focused on the health effects of a single or a few vitamins and minerals. We decided to take a comprehensive and systematic approach to evaluate all the publicly available and accessible studies reporting all micronutrients, including phytochemicals*

and antioxidant supplements and their effects on cardiovascular risk factors as well as multiple cardiovascular diseases."

3 Micronutrients to Support Heart Health

While beta carotene supplementation increased all-cause mortality, omega-3 fats, folate and CoQ10 were highly protective. Here are more details about how these important micronutrients affect your heart health.

1. **Omega-3s —** The study found omega-3 fats decreased mortality from cardiovascular disease, while also reducing heart attacks and coronary heart disease events.[7] This mirrors previous studies, which have also found beneficial effects of omega-3s on heart health. Omega-3 fats derived from krill oil, for instance, have been found to reduce triglyceride levels and help reduce cardiovascular risk.[8]

   Further, people with Type 2 diabetes who used omega-3 supplements had a lower incidence of hospitalization with heart failure — a form of heart disease in which the heart experiences ventricular dysfunction — in another study.[9]

   An omega-3 index test is one of the most important annual health screens that everyone needs, and it's a more important predictor of your heart disease risk than your cholesterol levels. Even research supported by the National Institutes of Health suggests an omega-3 test is a good predictor of overall health and all-cause mortality.[10,11]

   That study measured the omega-3 index in 2,500 participants and found those with the highest omega-3 index had lower risks of heart problems and lower total mortality. The omega-3 index measures of the amount of eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) in the membranes of your red blood cells (RBC). Your index is expressed as a percent of your total RBC fatty acids.

   The omega-3 index has been validated as a stable, long-term marker of your omega-3 status, and it reflects your tissue levels of EPA and DHA. An omega-3

index over 8% is associated with the lowest risk of death from heart disease, while an index below 4% places you at the highest risk of heart disease-related mortality.

The ideal sources for EPA and DHA include cold-water fatty fish, like wild-caught Alaskan salmon, sardines, herring and anchovies. If you do not eat these fish on a regular basis, consider taking a krill oil supplement.

In addition, be aware that your omega-6 to omega-3 ratio should be about 1-to-1 or possibly up to 4-to-1, but most Americans consume far too many omega-6 fats and not enough omega-3. For optimal heart health, in addition to increasing your omega-3, it's important to cut down on industrially processed seeds oils, often referred to as "vegetable oils," found in most processed foods.

2. **Folate —** The Journal of the American College of Cardiology study revealed that folic acid reduced stroke risk.[12] Folic acid is the synthetic version of folate, or vitamin B9, and it's the most important dietary determinant of homocysteine. Elevated levels of homocysteine (Hcy) are a risk factor for coronary artery disease and are found in most patients with vascular disease.[13] According to a literature review published in Advances in Therapy:[14]

> *"Several mechanisms have been proposed for Hcy's pathogenesis related to vascular disease. Hcy can cause endothelial injury, dysfunction of DNA, proliferation of smooth muscle cells, oxidative stress, decreased function of glutathione peroxidase, impaired nitric oxide synthase, and inflammation."*

Evidence suggests that daily folic acid supplementation lowers homocysteine levels. "In fact, it has been shown that folic acid supplementation of 0.5 to 5.0 mg can lower Hcy levels by 25% and, thus, may decrease the risk of cardiovascular disease … Given that folic acid is cheap and effective, this should be a viable option for patients with high-risk for cardiovascular adverse events," the researchers explained.[15]

In an animal study, folic acid was also found to prevent age-related structure changes and dysfunction of the heart that may lead to heart failure.[16] It reduced cellular senescence, a hallmark of aging. The best way to increase your levels of this important micronutrient is to eat foods rich in natural folate, such as asparagus, avocados, Brussels sprouts, broccoli and spinach.

3. **CoQ10 —** CoQ10 decreased all-cause mortality events, according to the Journal of the American College of Cardiology study.[17] Ubiquinol — the reduced, electron-rich form of CoQ10 that your body produces naturally — plays an important role in the electron transport chain of your mitochondria, where it facilitates the conversion of energy substrates and oxygen into the biological energy (adenosine triphosphate, or ATP) needed by your cells for life, repair and regeneration.

   It's a fat-soluble antioxidant, meaning it works in the fat portions of your body, such as your cell membranes, where it mops up potentially harmful byproducts of metabolism known as reactive oxygen species (ROS). As such, ubiquinol and CoQ10 supplements help protect your mitochondrial membranes from oxidative damage.

   Many conditions, including heart disease, appear to be rooted in mitochondrial dysfunction.[18] CoQ10 is used by every cell in your body, but especially your heart cells. Cardiac muscle cells have about 5,000 mitochondria per cell.[19] For further comparison, mitochondria make up about 35% of the volume of cardiac tissue and only 3% to 8% of the volume of skeletal muscle tissue.[20]

   In other research, CoQ10 has been found to help improve atrial fibrillation (AFib).[21] AFib is an abnormal, often rapid, heart rhythm that occurs when the atria, your heart's upper chambers, beat out of sync with the ventricles, the heart's lower chambers. It's a common symptom in those with heart failure or heart disease. In addition, CoQ10 influences several other aspects of heart health, including:

   - **High blood pressure —** CoQ10 acts directly on your endothelium, dilating your blood vessels and lowering blood pressure.[22,23] CoQ10 also decreases aldosterone, a hormone that makes you retain salt and water.[24,25] When

aldosterone goes down, excess salt and water are excreted through your kidneys, often causing your blood pressure to go down.

- **Systemic inflammation —** Supplementing with 60 milligrams (mg) to 500 mg of CoQ10 for eight to 12 weeks can significantly reduce tumor necrosis factor alpha (TNF-α), IL-6 and C-reactive protein (CRP);[26,27] three measures of widespread inflammation.
- **Stroke —** Systemic inflammation, oxidative stress and nerve cell damage play a role in the development of stroke. Research suggests supplementing with CoQ10 can reduce ischemic lesions and improve outcomes in patients who have been treated with a statin drug after having a stroke (statins reduce CoQ10 levels in your body).[28]

Your body can naturally make CoQ10, but genetic alterations in metabolism, poor diet, oxidative stress, chronic conditions and aging can all interfere with CoQ10 production and lead to CoQ10 deficiency. Statin drugs can also deplete CoQ10.

Ubiquinol production ramps up from early childhood until your mid- to late 20s. By the time you hit 30, it begins to decline.[29] Young people are able to use CoQ10 supplements quite well, but older people do better with ubiquinol, as it's more readily absorbed.

A Personalized Approach Is Best

There's no one-size-fits-all approach when it comes to supporting your heart health. Indeed, the featured study researchers noted that "an optimal nutritional strategy to promote cardiometabolic health will likely involve personalized combinations of these nutrients."[30]

However, healthy diet, exercise, stress reduction and heart-based connections — i.e., strong and positive relationships — are **key to heart and overall health**. As mentioned, I also believe an omega-3 index test is one of the most important annual health screenings you can receive.

GrassrootsHealth makes testing easy through its D*Action+Omega-3 consumer-sponsored research project.[31] You can find the GrassrootsHealth omega-3 index test kit on the GrassrootsHealth website.[32]

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