

## Coenzyme Q10 — Energy for Life

By Jack Challem, The Nutrition Reporter™

Coenzyme Q10 may have a perplexing name, but there's nothing strange about what this vitamin-like nutrient can do.

CoQ10, as it is commonly known, has fundamental and far-reaching effects on health. Discovered in 1957, its role in cellular energy production formed the basis of the 1978 Nobel Prize in chemistry. That's a pedigree that few other nutrients can claim.

The late Karl Folkers, Ph.D., who spent most of his life studying CoQ10 and B vitamins, once told me that he and his colleagues regretted calling it a "coenzyme," a term that few people other than biochemists understand. CoQ10 should have been called a vitamin from the beginning, he said.

We need CoQ10 to make the energy that powers cells. Energy has been called the "currency of life," and the implications are profound when you consider that every one of the body's 70 trillion cells depends on CoQ10 for energy production. Secondary to its role in energy production, CoQ10 also functions as an antioxidant.

Our energy-generating activity takes place in mitochondria, tiny structures in our cells that break down the most basic food molecules and convert them to the pure chemical form of energy, known as ATP (adenosine triphosphate). CoQ10 shuttles around energy-carrying electrons in the biochemical path leading up to ATP production.

Without CoQ10, we can't make ATP. And when CoQ10 levels are low, our cellular, tissue, and total energy levels start to falter. The most active tissues—muscle, including the heart, brain, and liver—contain the most mitochondria and also have the greatest CoQ10 requirements.

### **BENEFITS MANY HEALTH ISSUES**

***Heart Diseases.*** In the 1960s, Japanese physicians started to see the potential benefits of CoQ10 supplements. Healthy heart cells, comprising perhaps the most important muscle in the body, contain the largest numbers of mitochondria. After all, the typical heart must have the energy to beat 100,000 times a day and 37 million times a year.

The Japanese doctors were treating patients with cardiomyopathy and heart failure, diseases caused not by cholesterol, but by a catastrophic loss of energy in the heart. They found that CoQ10 supplements helped

restore normal heart function to many of their patients. By the early 1980s cardiologists Peter Langsjoen, M.D., of Tyler, Texas, and his colleagues had started using CoQ10 to successfully treat patients with cardiomyopathy and heart failure. They published studies clearly demonstrating the benefits of CoQ10.

In a recent study, Italian doctors noted that 21 heart failure patients had impressive improvements after four weeks of taking CoQ10 (100 mg, three times daily). As a general rule CoQ10 supplements of 300 mg daily can significantly improve a weak heart's ability to pump blood.

***Boosting Energy Levels.*** CoQ10 can also boost energy levels, increase stamina, and reduce fatigue. Dr. Langsjoen described 16 patients ranging from 80 to 88 years old who took an average of 220 mg of CoQ10 daily (range of 60 to 480 mg daily). The patients were in generally good health for their age except for fatigue and labored breathing when doing physical work. After three months, all of the patients stated that they felt better and had less fatigue after physical exertion. The benefits lasted for as long as the patients took CoQ10 supplements—for several years—and the patients' heart function improved as well.

Recent studies have confirmed that CoQ10 supplements boost energy levels and enhance stamina. In one study, Japanese researchers reported that people were able to cycle faster and achieved quicker recovery times after just one week of taking 300 mg of CoQ10 daily. Another study, conducted at Baylor University in Waco, Texas, also found that both trained and untrained men and women had greater endurance after taking 200 mg of CoQ10 for two weeks.

***Chronic Fatigue Syndrome.*** Just recently, a team of European doctors reported that low levels of CoQ10 were common in 58 people with chronic fatigue syndrome (CFS). All of the CFS patients had abnormally low CoQ10 levels, and almost half of them had CoQ10 levels below the lowest level found in healthy patients. More evidence: CFS patients risk dying of heart failure 25 years earlier than people in the general population, another link that points to low CoQ10 levels.

***Neurological Diseases.*** Brain cells also require large amounts of energy, and CoQ10 can benefit some neurological disorders. A study conducted at 10 U.S. hospitals discovered that CoQ10 supplements reduced the symptoms and slowed the progression of Parkinson's disease. Eighty patients were given 300, 600 or 1,200 mg of CoQ10 or placebos daily for sixteen weeks. All of the patients taking CoQ10 had less severe symptoms than those in the placebo group. The highest dose of CoQ10 provided the greatest benefits.

Inherited ataxias, another type of neurological disease, affect coordination and arm and leg function. Researchers reported that taking 300 to 3,000 mg of CoQ10 daily helped patients with hereditary ataxias, improving their strength and coordination, and reducing the frequency of seizures. A separate study of 77 patients with Friedreich ataxia found that a combination of 400 mg of CoQ10 and 2,100 IU of natural vitamin E led to a significant reduction in symptoms.

***Breast Cancer and Other Cancers.*** Some of the most tantalizing research has focused on CoQ10 and cancer. In the 1990s, Danish surgeon Knud Lockwood, M.D., reported patient case histories in which large amounts (almost 400 mg daily) of CoQ10 led to remissions and prevented metastases (the spread of a disease to other parts of the body) in recurrent breast cancers. He wrote that CoQ10 does not have direct anti-tumor properties, but that it probably helps energize the body's anti-cancer immune cells.

In 2009, Danish physician Niels Hertz, M.D., reported the results of 41 cancer patients who took 300 mg of CoQ10 and several other supplements in addition to receiving conventional therapies. All of the patients had poor prognoses—end-stage cancers, including those of the breast, esophagus, lung, pancreas, and prostate, with metastases to other organs. Niels and a British colleague calculated the expected survival of the patients with their respective types of cancer, and then compared their actual survival time. Although some of the patients had a decrease in survival time, three-fourths of the patients lived an average of five months longer than expected. In many cases, patients lived two years longer than expected.

***Migraines and Tinnitus.*** Peter S. Sandor, M.D., of University Hospital, Zurich, Switzerland, treated 42 patients with a history of migraines, giving them either CoQ10 (100 mg, three times daily) or placebos. After three months, half the patients taking CoQ10 had fewer and shorter headaches and less headache-related nausea. Hardly anyone in the placebo group improved. Other studies have found similar benefits. Meanwhile, other research has found that CoQ10 (100 mg, three times daily) may help people with chronic ringing or buzzing in the ears.

## **STATIN DRUGS DEplete COQ10**

Cholesterol-lowering statin drugs, such as Lipitor®, Zocor®, Crestor®, Pravachol®, and Vytorin®, are among the most widely prescribed medications in the world. These drugs block an enzyme involved in making cholesterol and CoQ10. In other words, statins inhibit the body's

natural production of CoQ10. Not surprisingly, many of the side effects of statins affect muscles and the liver, tissues that are highly dependent on CoQ10.

Researchers have documented that microscopic muscle damage begins occurring within days of taking statin drugs. In many people, this muscle damage is serious enough to cause myalgia, or muscle pain. Some people develop rhabdomyolysis (pronounced rab'-do-mi-ol'-i-sis), which is the most serious type of muscle breakdown.

CoQ10 can protect against these side effects. Dr. Langsjoen described 50 heart patients he treated for serious statin side effects, including muscle pain, fatigue, difficulty breathing, and nerve pain or numbness. He referred to the collective symptoms as “statin cardiomyopathy.” Dr. Langsjoen asked the patients to stop taking their statin drugs and instead take CoQ10 supplements, with an average dose of 240 mg daily. After almost two years of follow up, he noted a significant reduction in statin-related symptoms, as well as either stable or improved heart function. The number of patients complaining of fatigue decreased from 84 to 16 percent, and the prevalence of muscle pain among the patients declined from 64 to 6 percent.

It's not as though the drug companies are unaware of the statin-CoQ10 interaction. Twenty years ago, in 1990, the giant drug company Merck was granted two patents for combining statin drug (Zocor®) with CoQ10. If you're taking statins, take 100 to 200 mg of CoQ10 daily. CoQ10 will not interfere with the cholesterol-lowering effect of statins. However, do give serious thought to safer and more natural cholesterol-lowering alternatives, such as plant sterols.

## **TIPS FOR TAKING COQ10**

*You'll find two basic forms of CoQ10 in supplements.* The most common is chemically known as ubiquinone. Over the past couple of years, some companies have begun selling the ubiquinol form of CoQ10. The body routinely converts ubiquinone to ubiquinol and back, but ubiquinol is technically the active form. (Chemists refer to it as the “reduced” form.) Some people seem to benefit more from ubiquinol, possibly because it is better absorbed. In addition, as you age, the body can't make the conversion from ubiquinone to ubiquinol as efficiently, so it may be wise to take the ubiquinol form. If you need to take very large amounts of CoQ10, try the ubiquinol form.

*Work with your cardiologist if you take prescription drugs, such as digitalis and ACE inhibitors for heart failure or cardiomyopathy. As*

CoQ10 strengthens your heart muscle, you'll need less of the drugs. But you need the expertise of a cardiologist to monitor your heart function. Langsjoen has found that the severity of heart failure decreases significantly after his patients start taking CoQ10 supplements.

*If you're generally in good health, consider increasing CoQ10 amounts relative to your age.* The reason is that your ability to make CoQ10 will decrease as you get older. As a general guideline, consider taking 30 to 50 mg daily if you're between 20 and 30 years old, 100 mg daily if you're between 30 and 50 years old, and 200 mg daily if you're age 50 or older. If you have a serious health problem, you may have to increase your CoQ10 to 300 to 400 mg daily—but it would be wise to find a nutritionally oriented physician to work with.

*Because it's fat soluble, take CoQ10 with a small amount of fat (e.g., peanut butter or other food) to enhance its absorption.* You can further enhance the energy-boosting effect by also taking L-carnitine (or acetyl-L-carnitine), alpha-lipoic acid, ribose, creatine monohydrate, and quercetin. Finally, if you want to boost your food intake of CoQ10, include some organ meats, such as heart and liver (think giblets) in your diet.

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