



Background

Coenzyme Q10 (CoQ10; also known as ubiquinone) is a vitamin-like compound with broad distribution in plants, bacteria, fungi, and all animal tissues. It plays an important role in the generation of cellular energy (particularly in skeletal and cardiac muscle), enhances the immune system, and acts as a free-radical scavenger. CoQ10 is not considered an essential nutrient, even though small quantities are produced in the tissues, and therefore is not recognized as a vitamin; however, it does possess some vitamin-like qualities, including benefits under certain circumstances when ingested. CoQ10 protects the stability of cell membranes, protects DNA from free-radical oxidative damage, and is capable of recycling and regenerating other antioxidants such as vitamins E and C. CoQ10 is used widely in Japan, Europe, and Russia for the treatment of cardiovascular disease. Other purported uses for CoQ10 are for neurological disorders such as Huntington's disease, Parkinson's disease, muscular dystrophy, and migraine headaches. It has also been purported to strengthen antioxidant defense during exercise training and increase exercise tolerance. CoQ10 is available in chewable tablets, caplets, capsules, strips, lozenges, powders, and liquids.

Dose Range and Upper Limit

Food and Nutrition Board DRI:

RDA/AI: Not established.

Upper Limit: Not established.

Doses Used In Randomized Clinical Trials: Doses of 1200 to 2400 mg daily have been used clinically for Parkinson's disease patients without adverse effects.¹ Supplementation with CoQ10 (90-100 mg/day for four to eight weeks) by athletes does not seem to improve exercise capacity,^{2,3} although the data are mixed. A small randomized controlled trial in elite Japanese athletes demonstrated that 300 mg CoQ10 for 20 days reduced concentrations of serum creatine kinase (CK; an energy reservoir) and myoglobin (which transports oxygen in the muscles) after intense exercise, suggesting reductions in exercise-induced muscle injury,⁴ whereas 120 mg CoQ10 for 20 days was shown to increase creatine kinase activity after exertion.⁵ 300 mg of CoQ10, but not 100 mg, was found to improve subjective scoring of fatigue and physical performance (bicycle ergometer) during fatigue-inducing workload trials with healthy volunteers.⁶

Toxicology Data: Preclinical and clinical studies indicate CoQ10 is safe for use as a dietary supplement. Orally, CoQ10 is generally well tolerated.² No toxic effects have been described for CoQ10 supplementation in humans.²

Evaluation of Potential Benefits

Taking CoQ10 does not improve aerobic power in athletes,² and more research is needed on other facets of athletic performance.

Potential Detrimental Effects on...

Military Performance: CoQ10 can cause gastrointestinal side effects (nausea, vomiting, diarrhea, appetite suppression, heart-burn), although infrequently.²

Military Survivability: No data found.

Other Health Risks

No data found.

Interactions with Medications or Other Bioactive Substances

May interact with antihypertensive medications and warfarin.²

May (theoretically) interact with other herbs or supplements with hypotensive effects such as cat's claw, fish oil, stinging nettle, theanine, L-arginine, and others.²

For details of these and other potential interactions, visit the Natural Medicines Comprehensive Database.²

Withdrawal Effects

No data found.

Concern and Benefit Estimate (see Dietary Supplement Risk Matrix)

Benefit potential: Low

Risk (safety concern): Minimal

Classification score: 5

While CoQ10 plays an important role in the generation of cellular energy, as a supplement it has not been shown to improve aerobic power in athletes. Clinical studies indicate CoQ10 is safe for use and generally well tolerated.²

References

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4. Kon M, Tanabe K, Akimoto T, Kimura F, et al. Reducing exercise-induced muscular injury in kendo athletes with supplementation of coenzyme Q10. Br. J. Nutr. 2008;100(4):903-9.
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6. Mizuno K, Tanaka M, Nozaki S, Mizuma H, et al. Antifatigue effects of coenzyme Q10 during physical fatigue. Nutrition. 2008;24(6):293-9.