

# Q-Evail® 100 and 200

Highly Bioavailable Ubiquinone



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Q-Evail® provides a highly bioavailable ubiquinone, also known as coenzyme Q10 (CoQ10). Ubiquinone is present everywhere in the human body. The etymology of the term reflects this ubiquitous nature, as ubiquinone is a blend of the Latin ubique for everywhere and the English quinone, an inorganic, aromatic compound.<sup>1,2</sup>

The number 10 refers to the biochemical structure of CoQ10, which consists of 10 isoprene units attached to a benzoquinone "head."<sup>3,4</sup> CoQ10 is especially important as a key component of the mitochondrial electron transport chain, making it critical for cellular energy (adenosine triphosphate [ATP]) generation. For this reason, organs and tissues with high energy demands (i.e., the heart, skeletal muscles, kidneys, and liver) have the highest concentrations of CoQ10.<sup>5</sup>

CoQ10 is also one of the body's most crucial lipid-soluble antioxidants, helping to protect the structural lipids in circulating lipoprotein particles and the mitochondrial and lysosomal membranes from oxidative damage. In addition, CoQ10 is the only endogenously synthesized fat-soluble antioxidant.<sup>6</sup> CoQ10 being reduced to ubiquinol and then oxidized to ubiquinone also serves to recycle other antioxidants, such as vitamins C and E.<sup>3,7-10</sup> CoQ10 may also help support healthy aging, physical energy levels, mitochondrial health, and neurological function.<sup>7,8,11</sup>

Q-Evail® is manufactured using Designs for Health's proprietary Evail™ emulsification technology, which is designed to enhance the bioavailability and absorption of bioactive ingredients. The Evail™ process uses quillaja extract along with delta- and gamma-tocotrienols and medium chain triglycerides (MCTs) to support absorption.

## Ingredient Highlights

- Formulated with Evail™ technology to optimize bioavailability and absorption
- Ubiquinone in either 100 mg or 200 mg to support cellular energy production

## CoQ10 Form and Function

CoQ10 exists in both ubiquinone and ubiquinol forms. In the mitochondrial electron transport system, CoQ10 undergoes continuous reversible oxidation and reduction. It is converted to ubiquinol (reduced form) when it accepts electrons, and it is converted to ubiquinone (oxidized form) when it donates electrons. In its ubiquinol form, CoQ10 functions as a potent antioxidant due to its ability to donate electrons, thus serving as a primary scavenger of free radicals and protecting against lipid peroxidation in cell membranes and lipoprotein particles.<sup>5</sup> Most healthy individuals are able to convert ubiquinone to ubiquinol. It has been demonstrated that 80% to 95% of circulating CoQ10 after oral ingestion of a ubiquinone supplement is in the form of ubiquinol.<sup>12-14</sup>

CoQ10 is synthesized in the body and can also be obtained in small amounts from certain dietary sources, such as fish, poultry, and beef (organ meats, in particular), with smaller amounts occurring in plant foods. However, endogenous synthesis and CoQ10 obtained through the diet may be inadequate to meet the body's demands under certain circumstances. For example, advanced age, cardiovascular disease, metabolic disorders, neurodegenerative disorders, mitochondrial disorders, various illnesses, and the use of select medications are all associated with CoQ10 deficiencies and/or an increased need for CoQ10.<sup>3,5,7,15</sup>

## Benefits\*

- May help promote cellular energy generation
- Helps support efficient cardiac function
- Supports healthy antioxidant status
- May promote healthy aging
- May support healthy cognitive function

## Q-Evail® 100

### Supplement Facts

Serving Size 1 softgel

Amount Per Serving	% Daily Value
Coenzyme Q10 (Ubiquinone)	100 mg *

\*Daily Value not established.

**Other Ingredients:** Medium chain triglycerides, softgel ingredients (bovine gelatin, glycerine, purified water, annatto [color]), quillaja extract, DeltaGold® tocotrienols.

## Q-Evail® 200

### Supplement Facts

Serving Size 1 softgel

Amount Per Serving	% Daily Value
Coenzyme Q10 (Ubiquinone)	200 mg *

\*Daily Value not established.

**Other Ingredients:** Medium chain triglycerides, softgel ingredients (bovine gelatin, glycerine, purified water, annatto [color]), quillaja extract, DeltaGold® tocotrienols.

Statin drugs, used for lowering cholesterol, are the most well-known pharmaceutical factors that impair CoQ10 synthesis. CoQ10 is synthesized through the mevalonate pathway — the same biochemical pathway upon which statins exert their effects through inhibition of the enzyme 3-hydroxy-3-methylglutaryl (HMG) coenzyme A (CoA) reductase. These drugs negatively impact CoQ10 synthesis because synthesis occurs several steps subsequent to enzyme inhibition. Along with the decreasing production of cholesterol, itself, the effect of statins on decreasing the supply of CoQ10 potentially contributes to many of the side effects.<sup>16,17</sup> The effect of these commonplace drugs is so profound that researchers have posited that “statins may be causative in coronary artery calcification and can function as mitochondrial toxins that impair muscle function in the heart and blood vessels through the depletion of coenzyme Q10 and ‘heme A,’ and thereby ATP generation.”<sup>18</sup>

Cardiac muscle has a very high demand for energy and reducing synthesis of CoQ10 would logically have a major impact on the heart’s capacity to generate this energy. Statins are associated with cardiomyopathy and may even be a contributing causal factor in heart failure, particularly with preserved ejection fraction.<sup>19</sup> Administration of CoQ10 in conjunction with statin discontinuation has been shown to be helpful for individuals in this context and significantly improved measures of cardiac function and statin-associated side effects, such as fatigue, memory loss, peripheral neuropathy, myalgia, and muscle weakness.<sup>19</sup>

Cardiac muscle is not the only muscle that may be negatively impacted by statin drugs. Statin-associated muscle symptoms (SAMS) affecting skeletal muscle (with aches ranging from minor to severe, muscle cramps, weakness, and in rare instances, rhabdomyolysis) are likely due to depletion of CoQ10: “Since CoQ10 is fundamentally important to mitochondrial function and cellular energy production (ATP), the depletion of CoQ10 and resultant mitochondrial dysfunction is hypothesized as the primary pathophysiologic cause of SAMS. Therein lies the rationale for using exogenous supplementation of CoQ10 to ameliorate SAMS.”<sup>4</sup> Evidence is somewhat mixed, but overall, the findings support the use of CoQ10 to ameliorate the effects of statins regarding myopathy,<sup>20,21</sup> including a 2018 meta-analysis of randomized controlled trials that were published in the *Journal of the American Heart Association*.<sup>22</sup> Statin-induced cognitive decline is another area of concern for medical professionals and their patients.<sup>23</sup>

CoQ10 supplementation may be beneficial for patients with cardiac concerns unrelated to statin use. Heart failure (HF) is “inherently an energy deprived state”<sup>24</sup> and several systematic reviews indicate that CoQ10 supplementation is beneficial for individuals with HF.<sup>25</sup> Patients with HF have been shown to have myocardial CoQ10 deficiency, and this correlates with symptom severity and left ventricle ejection fraction (LVEF). In patients with HF compared to a placebo, CoQ10 has been documented to significantly improve cardiac output, stroke volume, and LVEF.<sup>26</sup> Researchers note that as an adjunctive treatment for HF, CoQ10 is safe and “improves symptoms and functional status, and reduces major adverse cardiovascular events, such as death from HF, sudden cardiac death, and hospitalization due to HF worsening.”<sup>26</sup> In addition to death from cardiovascular events, CoQ10 supplementation was also shown to significantly reduce all-cause mortality compared to a placebo.<sup>27,28</sup>

**Recommended Use:** Take 1 softgel per day with a meal or as directed by your health-care practitioner.

*For a list of references cited in this document, please visit:*

<http://www.designsforhealth.com/techsheet-references/q-evail-references.pdf>

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**\*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.**

**To contact Designs for Health, please call us at (860) 623-6314, or visit us on the web at [www.designsforhealth.com](http://www.designsforhealth.com).**

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