

CoQH-CF[®]



*A completely soluble, 100% crystal-free
formulation of CoQ₁₀ in the ubiquinol form,
with clinically proven superior bioavailability.*



SOFT GEL
TECHNOLOGIES, INC.

The Crucial Nature of CoQ₁₀

Coenzyme Q₁₀ (CoQ₁₀) is a vitamin-like substance found in virtually all cells of the human body, including the heart, liver, and skeletal muscles, and in most plant and animal cells.

- As an **antioxidant**, CoQ₁₀ protects proteins, LDL (“bad”) cholesterol, and mitochondrial DNA from oxidative damage.*
- As a participant in the production of **cellular energy**, CoQ₁₀ helps ensure the body’s biggest energy consumers — the heart and the brain — are well fed.*

Thanks to these two crucial functions, CoQ₁₀ helps maintain blood pressure already within normal limits,¹ supports the integrity of heart muscle,² increases circulation to the heart,³ improves exercise capacity,^{4,5} and supports a normal heart rhythm.*⁶ Additionally, it may protect against mild memory problems associated with aging.^{7,8*}

Of course, none of these benefits can be realized if CoQ₁₀ isn’t absorbed — and research indicates that the body takes up only a small fraction of traditional powder-based (crystalline) CoQ₁₀.

The CoQ₁₀ Absorption Dilemma

CoQ₁₀ is highly lipophilic (fat-loving) and in its powdered crystalline form is practically insoluble in water. This makes the absorption of typical CoQ₁₀ supplements:

- **Poor:** Less than 1% of orally administered CoQ₁₀ permeates the aqueous environment of the gastro-intestinal tract into the blood.⁹
- **Highly variable:** Some individuals absorb considerably less CoQ₁₀ than others.
- **Strongly dependent on stomach contents:** Foods rich in fat enhance absorption. Making matters worse, CoQ₁₀ is a **large molecule**, contributing to its poor absorption. Plus, when CoQ₁₀ is produced commercially, crystals are formed that melt when they reach 118°F or 48°C. Upon cooling, CoQ₁₀ recrystallizes, which frequently results in even **larger crystals** — and further lowers CoQ₁₀ bioavailability.

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The Crystal-Free Ubiquinol Solution: CoQH-CF®

In order to improve bioavailability, some manufacturers have sought to reduce the particle size of CoQ₁₀, thus increasing its surface area. Suspending fine particles in an emulsion or paste is an effective means of increasing bioavailability. However, there is an even more effective solution: achieving complete solubility.

CoQH-CF® from Soft Gel Technologies is a patent-pending, completely soluble, liquid, crystal-free solution of CoQ₁₀ in its ubiquinol form that is clinically proven to provide superior bioavailability of this key nutrient.

Solubility → Bioavailability → Absorption

CoQH-CF® is a unique, patent-pending formulation of Kaneka QH™ — a patented, stabilized form of ubiquinol — with ingredients that protect it from being oxidized and crystallized: alpha-lipoic acid, d-Limonene, and capric and caprylic acid.

Upon microscopic examination at 200x, a paste of CoQ₁₀ powder and soybean oil exhibits a crystalline structure, while CoQH-CF® is completely devoid of crystals because the CoQ₁₀ has been solubilized.

Ubiquinone Versus Ubiquinol

CoQ₁₀ comes in two forms, ubiquinone (the oxidized form) and ubiquinol (the reduced form).

The dominant form of CoQ₁₀ in human blood and the liver (over 80%) is ubiquinol. Thanks to its two hydroxyl groups, which are not present in ubiquinone, ubiquinol acts as an electron donor. It is these extra electrons that make ubiquinol superior to ubiquinone at providing antioxidant protection and generating energy.* Outside the cells, ubiquinol donates its extra electrons to neutralize free radicals.* Inside the cells, ubiquinol's electrons help produce ATP through the electron transport chain.*

As members of a redox pair, both forms can typically be converted into one another by the body. However, as we age, our ability to convert ubiquinone into ubiquinol diminishes, especially for those with chronic disease states.

Kaneka QH™: The First Commercially Viable Ubiquinol

Unfortunately, ubiquinol is easily oxidized. When exposed to oxygen, it quickly reverts back to the ubiquinone form. This inherent fragility has made it difficult to supply a commercially viable, stable form of ubiquinol to the marketplace.

After a decade of exhaustive research, the scientists at Kaneka Corporation, a leading manufacturer of CoQ₁₀, developed a patented method to stabilize ubiquinol, making it commercially available for the first time as Kaneka QH™.

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CoQH-CF[®]: Ingredients

Kaneka QH[™] Provides Multiple Health Benefits

CoQ₁₀ functions as a carrier to transfer electrons across the membrane of the mitochondria — the energy-producing “factories” within cells — to drive production of adenosine triphosphate (ATP), or cellular energy.* Heart muscles have the greatest concentration of mitochondria — 5,000 per cell — which is one reason why CoQ₁₀ is so important for cardiovascular function.*

In its reduced form, ubiquinol, CoQ₁₀ acts as an antioxidant to protect proteins, LDL (“bad”) cholesterol, and mitochondrial DNA from oxidative damage.* Research has shown that CoQ₁₀ supplementation exerts a sparing effect on vitamin E in healthy subjects, helping to maintain its antioxidant state. It also reduces levels of lipid peroxidation — and thus supports cardiovascular health.*

Several factors can deplete CoQ₁₀ levels in the body:

- Aging
- Certain medications, such as statin drugs
- Certain disease states

CoQH-CF[®] allows individuals who are unable to process CoQ₁₀ effectively on their own (primarily consumers over 40, or those with elevated levels of oxidative stress) to increase blood levels of CoQ₁₀ because the nutrient is already reduced and ready for the body to use from the instant the softgel disintegrates.

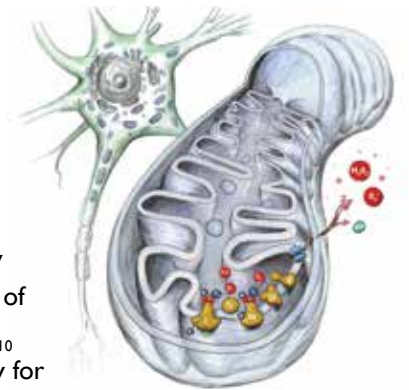


Illustration by N.R. Fuller, Sayo-Art

d-Limonene Solubilizes CoQ₁₀ and Prevents Recrystallization*

Extracted from the oil of citrus fruits, food-grade d-Limonene acts as a non-polar organic solvent that solubilizes CoQ₁₀, without causing significant chemical interactions or degradation.¹⁰ The end result is a liquid, crystal-free, completely soluble CoQ₁₀ — providing superior bioavailability — that does not require heat or synthetic chemical solvents and that fully resists recrystallization at ambient temperatures.

Alpha lipoic Acid Further Stabilizes Ubiquinol*

Also known as ALA, alpha lipoic acid is a versatile antioxidant that further protects the ubiquinol from oxidation.* It is unique in that it is soluble in both aqueous and lipid environments; in other words, it is universally soluble.

Capric and Caprylic Acid Help Dissolve ALA

The two fatty acids capric and caprylic acid help dissolve the ALA so it can perform its protective role inside the softgel.

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CoQH-CF[®] Is Safe and Bioavailable

“Study on safety and bioavailability of ubiquinol (Kaneka QH) after single and 4-week multiple oral administration to healthy volunteers.”

A single-blind placebo-controlled study published in *Regulatory Toxicology and Pharmacology* found that doses of up to 300 mg of ubiquinol were safe and bioavailable.

In the first phase of the study, 15 healthy subjects were administered a single dose of either 150 mg or 300 mg of Kaneka QH[™]. The treatment:

- Showed significant absorption in the gastrointestinal tract after both doses.
- Achieved peak plasma CoQ₁₀ levels (1.88 µg/ml for the low dose and 3.19 µg/ml for the high dose) 6 hours after administration.

A longer phase of the study followed 78 healthy subjects who took three different doses of Kaneka QH[™] (90 mg, 150 mg, or 300 mg) or a placebo for 4 weeks. The results showed that:

- CoQ₁₀ levels rose in a dose-dependent fashion for the entire treatment period — reaching a peak plasma concentration of 7 µg/ml at 28 days for the 300-mg group.
- CoQ₁₀ levels approached peak plasma levels after two weeks and then rose more slowly for another two weeks.
- Once supplementation ceased, plasma CoQ₁₀ levels dropped back to baseline levels after two weeks, indicating the need for on-going supplementation.

CoQH-CF[®] Has Superior Bioavailability Compared with CoQ₁₀ Crystalline Powder

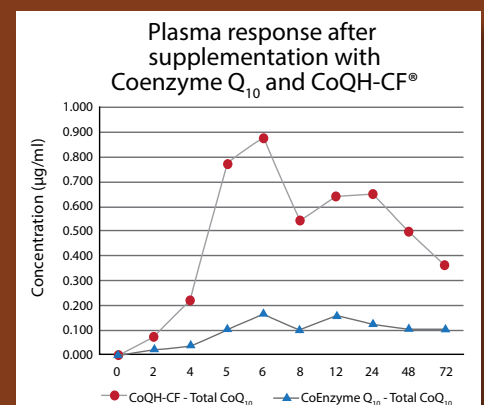
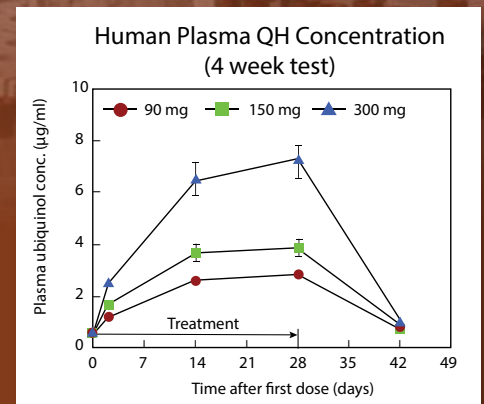
“A randomized, double-blind trial on the bioavailability of two CoQ₁₀ formulations”

Researchers compared the oral bioavailability of a single dose of 100 mg of CoQH-CF[®] (as a hermetically sealed softgel) versus a single dose of 100 mg of standard CoQ₁₀ crystalline powder (in a two-piece hard shell). Ten subjects over 60 years of age participated in this randomized, double-blind, two-arm crossover human clinical trial published in the *Journal of Functional Foods*.

Compared to CoQ₁₀ crystalline powder, supplementation with CoQH-CF[®] achieved:

- **Significantly higher plasma concentrations of CoQ₁₀** at 5, 6, 8, 12, 24, 48 and 72 hours post-dose.
- **4.3x higher plasma area under the curve of reduced and total CoQ₁₀.**
- **3.3x higher plasma area under the curve of oxidized CoQ₁₀.**
- **Faster peak blood levels of CoQ₁₀,** with total CoQ₁₀ reaching maximum plasma concentrations 15.5 ± 29.6 hours after supplementation, versus 26.5 ± 25.8 for CoQ₁₀ crystalline powder.

The researchers concluded that “...reduced Coenzyme Q₁₀ liquid softgel formulation was found to be superior to the commercial formulation of Coenzyme Q₁₀ for bioavailability.”





Who Should Take CoQH-CF®?

CoQH-CF® is the perfect nutritional supplement for anyone who:

- **Is Over 40**

People who are young and healthy can easily convert ubiquinone (the form of CoQ₁₀ featured in most supplements) to ubiquinol (the form used by the body to neutralize free radicals and create energy in the form of ATP). But with age, we produce less CoQ₁₀ and we become less efficient at converting ubiquinone to ubiquinol. By providing CoQ₁₀ already reduced to its ubiquinol form, CoQH-CF® supplies the body with ready-to-use CoQ₁₀.

- **Has elevated level of oxidative stress***

One of the primary benefits of CoQ₁₀, particularly in the ubiquinol form featured in CoQH-CF®, is to provide antioxidant protection.* Equipped with two hydroxyl groups, ubiquinol acts as an electron donor, which means it can help neutralize unstable free radicals (oxidants) — without becoming a free radical itself.*

- **Is Taking Statins**

Certain medications, such as statin drugs, and certain disease states can deplete CoQ₁₀ levels in the body. Supplementation can restore CoQ₁₀ stores to normal levels (at least 0.8 µm/ml).

- **Wishes to strengthen cardiovascular or brain health***

Because of its role in energy production, CoQ₁₀ supports the functioning of organs with a high demand for energy, such as the heart and brain.* The heart muscle in particular is in constant need of a ready supply of energy to efficiently pump blood throughout the body. In fact, the majority of cardiac tissue is abundant in mitochondria requiring ample and consistent levels of CoQ₁₀ for proper functioning.*

- **Is looking for a non-dietary way to increase CoQ₁₀ levels**

Most people don't eat enough foods containing CoQ₁₀ — such as fatty fish, organ meats, and whole grains — to raise blood levels of the nutrient. In fact, the average dietary intake of CoQ₁₀ is only 3-5 mg a day, much lower than what's needed to have any effect on CoQ₁₀ concentrations. CoQH-CF® has been clinically demonstrated to achieve significantly higher plasma concentrations of CoQ₁₀ compared with CoQ₁₀ crystalline powder.



CoQH-CF® Delivery Systems

CoQH-CF® is an off-the-shelf formulation available in two potencies: 50 and 100 mg translucent softgels.

As a completely soluble, liquid, crystal-free solution of CoQ₁₀ clinically proven to provide superior bioavailability, CoQH-CF® is the ubiquinol CoQ₁₀ of choice for discriminating manufacturers.

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in the ubiquinol form,
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References

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CoQH-CF[®]



CoQH-CF[®] Highlights

Available exclusively from Soft Gel Technologies, CoQH-CF[®] is a completely soluble, 100% crystal-free formulation clinically demonstrated to provide superior bioavailability of CoQ₁₀.

Why CoQH-CF[®]?

- **Several factors can deplete CoQ₁₀.** Research shows that aging, certain medications such as statin drugs, and certain disease states can deplete CoQ₁₀ levels in the body. Therefore, for many people, supplementation is indicated to replenish CoQ₁₀ stores to normal levels.
- **CoQ₁₀ in crystalline powder form is difficult to absorb.** Because of its highly lipophilic (fat-loving) structure, CoQ₁₀ is practically insoluble in water, making its absorption poor, highly variable, and strongly dependent on stomach contents. Plus, the CoQ₁₀ molecule is large in size, contributing to its poor absorption, and when heated and re-cooled, even larger crystals are created.
- **The most effective solution for achieving CoQ₁₀ bioavailability is complete solubility.** Suspending fine particles of CoQ₁₀ in an emulsion or paste is an effective means of increasing bioavailability. However, the most effective solution is to achieve complete solubility. Thanks to Soft Gel's crystal-free technology, CoQsol-CF[®] is a completely soluble, liquid, crystal-free solution of CoQ₁₀. This patent-pending formula combines ubiquinol with ingredients that protect it from being oxidized and crystallized, including alpha-lipoic acid, d-Limonene, and capric and caprylic acid.
- **CoQH-CF[®] is already in the reduced ubiquinol form.** The body produces CoQ₁₀ in the ubiquinone form, but it converts it to ubiquinol for use in neutralizing free radicals and generating energy.* With age, we become less efficient at this conversion process. CoQH-CF[®] starts working immediately upon ingestion and absorption — no conversion needed.
- **CoQH-CF[®] is stable.** Ubiquinol easily oxidizes and converts back to ubiquinone on contact with air. CoQH-CF[®] features Kaneka QH[™], a patented and stabilized form of ubiquinol that is protected from oxidation. Soft Gel further takes great care when working with Kaneka QH[™] to prevent the introduction of oxygen through the manufacturing process.
- **CoQH-CF[®] has clinically proven superior bioavailability.** A double-blind study found that, compared to a single dose of 100 mg of standard CoQ₁₀ crystalline powder, a single dose of 100 mg of CoQH-CF[®] achieved:
 - Significantly higher plasma concentrations of CoQ₁₀ at various time points
 - 4.3 times higher plasma area under the curve of reduced and total CoQ₁₀
 - 3.3 times higher plasma area under the curve of oxidized CoQ₁₀
 - Faster peak blood levels of CoQ₁₀

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