PROLOG
HEALTH

# CoQ10 100mg

| Supplement Facts | | |
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| Serving Size: 1 Softgel<br>Servings Per Container: 50 | | |
| | Amount per Serving: | DV% |
| Vitamin E (from Mixed Tocopherols) (soy free) | 30 IU | 100% |
| **Coenzyme Q10** | **100 mg** | + |

* Percent Daily Values are based on 2,000 calorie diet.
+ Daily Value not established.

**Suggested Use:** As a dietary supplement, take 1 softgel 1 to 2 times daily, preferably with meals.

**Other Ingredients:** Softgel capsule (bovine gelatin, water, glycerin, organic caramel color), Organic Extra Virgin Olive Oil, Sunflower Lecithin and Silica

**Not manufactured with** wheat, gluten, soy, corn, milk, egg, fish or shellfish ingredients.

**Non-GMO**

For more information or to purchase, visit www.prologhealth.com

## The Scientific Basis:

Coenzyme Q10 tissue concentrations decrease after 30 years of age and perhaps, in part, this contributes to the aging process. The timing of the age-related decline in CoQ10 availability coincides with the decline in fertility and the increase in embryo aneuploidy. Low plasma CoQ10 levels and spontaneous abortions have been correlated and levels of CoQ10 in the follicular fluid correlate with egg cell maturation and embryo grade during *in vitro* fertilization. The egg and possibly the granulosa and cumulus cells as well as the uterine (endometrial) environment may also benefit from CoQ10 supplementation resulting in increased reproductive capacity.

Optimal maturation of the human egg cell depends on its biochemical influences and these determine the competence of the resulting embryo. Adverse environmental factors include aging, oxidative stress, obesity, smoking, alcohol, and psychologic stress. A proper diet, frequent aerobic exercise, and appropriate nutritional supplements have beneficial effects. The function of mitochondria, and energy production itself, decrease with age, adversely affecting ovarian function, the ability of the chromosomes to separate at cell division, and the competence of the embryo. In the study detailed below, involving aging mice, the mitochondrial cofactor CoQ10 reversed most of these age-related changes. Only a small study using a shorter duration of treatment compared with the mouse model has been performed in humans.

To determine if aging influences the function of mitochondria in mice oocytes, Casper and colleagues performed a series of investigations in which aging (12-month-old mouse eggs) were compared with younger (10-week-old mouse eggs). From these assays, it was determined that mitochondria are not fully functional in older eggs, as demonstrated by the diminished metabolic activity, increased mitochondrial membrane potential, and lower citrate/ATP ratio. Further, various genes regulating the function of mitochondria were not fully operational. The older mice produced oocytes with increased spindle defects and frequent chromosomal misalignment. However, many of these mitochondrial abnormalities could be partially or completely reversed by supplementation with the mitochondrial nutrient CoQ10. Ubiquinone delayed age-related egg loss; in fact, the number of primordial, primary, and early secondary follicles in ovaries of CoQ10 treated mice was increased compared with age-matched controls, resulting in ovulation of a higher number of egg cells. Mice supplemented with CoQ10 had improved breeding performance: the number of live pups born to mothers in the 13th month of age was decreased, but it normalized after CoQ10 was given.

In this study, it was also observed that eggs from aging females were surrounded by fewer cumulus cells (CCs), suggesting that eggs in older mice could be under increased metabolic stress. Treatment with CoQ10 resulted in a higher number of CCs surrounding each egg, indicating that the effects of treatment are not isolated to the egg cells only. Because CoQ10 treatment improved embryo quality and breeding outcomes of aging mice, the expression of CoQ10 synthesis genes in CCs of young and old females was studied. Results of that expression study revealed that CCs of older females had decreased expression of several enzymes involved in CoQ10 production.

To determine if diminished CoQ10 production by oocytes could be responsible for reproductive aging, the researchers disrupted enzyme production of young mice. The inactivation of the *Pdss2 enzyme* and subsequent inhibition of CoQ10 synthesis in the egg cells caused exhaustion of ovarian reserve by the age of three to four months. The reduction of the number of follicles and very poor response to ovulation was observed as early as two months of age. Those egg cells that survived and ovulated had many of the same defects observed in aged eggs, including decreased ATP production and poor mitochondrial activity. These results confirmed that an aging phenomenon could be produced in young animals by an isolated decrease in CoQ10 production in the egg and that this aging effect could be reversed by supplementation of the animals with CoQ10.

In a follow up human study, Casper's group then investigated CoQ10 supplementation (600 mg/day for two months) in older women undergoing IVF. In a randomized double-blind study in a small number of women, array comparative genomic hybridization (aCGH) of the oocyte polar bodies revealed no significant effect on oocyte aneuploidy, although the frequency of oocyte aneuploidy was 46.5% with CoQ10 treatment compared with 62.8% in the placebo-treated group. Larger and longer studies will be required to determine if there is any positive benefit of CoQ10 on the reproductive outcome of aged women.]

In addition, CoQ10 has been shown to improve sperm concentration and motility in comparison to placebo. A trial of 212 men with unexplained deficits in sperm count, motility and morphology were randomly assigned to receive CoQ10 300 mg daily or oral placebo for 26 weeks. A significant difference in sperm density and motility was noted with CoQ10 treatment. In another study by Safarinejad, there was an improvement of spontaneous conception rates in the partners of men receiving CoQ10. Fertilization rates after intracytoplasmic sperm injection (ICSI) have also been improved by treatment of oral CoQ10 at 60 mg daily. In combination with other antioxidants, (L-carnitine, vitamin E and vitamin C) Gvozdjakova and colleagues demonstrated improvement in sperm function and a pregnancy rate of 45% after six months of therapy.

Oxidative stress is associated with aging, obesity, smoking, alcohol intake, poor semen quality, as well as reduced oocyte and embryo quality. Increasing dietary and supplemental antioxidants is appropriate for both partners, particularly those over the age of 35 years. Antioxidants improve vascular and erectile function and will have favorable effects on long-term health. The average dietary intake of CoQ10 is approximately 10-fold lower than the supplemental dose used in clinical trials showing improved sperm and egg quality. CoQ10 intake from food alone may be insufficient to optimize fertility.

Some supplements may have side effects, may affect underlying medical conditions, or may interact with prescription medications. Therefore, Prolog Health vitamins and supplements are recommended for use under the direct supervision of your physician.

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**Disclaimer:** None of the above statements have been evaluated by the United States Food and Drug Administration (FDA). These products are not intended to diagnose, treat, cure or prevent any disease. Please consult your health care professional before taking any and all supplements. Individual results may vary.

**Every Prolog Health product exceeds the standards and requirements set forth in the FDA's Code of Federal Regulation (21 CFR, 111) Current Good Manufacturing Practices (CGMP).**

**All products are made in the USA, with all ingredients from the USA.**