

## BOOSTING YOUR *Fertility*

### AGING, EGGS, AND SUPPLEMENTS

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With changing career landscapes, ever-rising levels of education, and a larger focus on building a life before children, couples are having children later, and may wonder if it will even be possible by the time they are ready to have children.

In order to reproduce, a person needs to produce *gametes*, either eggs or sperm. People who produce sperm (generally speaking, cis-men who have functional testicles) can produce 90 million<sup>1</sup> per day for a large majority of their lives, although the quantity and vitality of those sperm may reduce over time. In contrast, people who produce eggs, also known as *oocytes* (generally speaking, cis-women who have a menstrual cycle) are born with the total amount of eggs they will ever have. As both the eggs and their carrier age, there is an increased possibility of abnormalities in the way these eggs mature and express their genes. These changes are the basis for many fertility challenges, including difficulty conceiving and recurrent miscarriage. These changes may also lead to genetic variabilities, such as Down Syndrome.

This all results in a bit of a conundrum for couples wanting children later in life. However, targeted nutrient supplementation can boost egg quality, delay egg aging, and improve pregnancy outcomes. This approach can complement, and perhaps even reduce the need for, assisted reproductive technologies (ART) in older couples.

### *Functional fertility*

Nutraceuticals (taken from the terms nutrition and pharmaceuticals), often called supplements, are concentrated food-based constituents, like vitamins and minerals. In general, these products are offered as pills or powders to provide the user with higher, more therapeutic doses than could easily be obtained through diet, even a very healthy one. Evidence for the effectiveness and safety of nutraceuticals for certain conditions varies, but quite a bit of research has been done to explore the merits of using nutraceuticals to promote egg quality.

**Co-enzyme Q10 (CoQ10)**, also referred to as *ubiquinol* or *ubiquinone*, plays an important role as a whole-body antioxidant, protecting cells—including eggs—from damage and reducing the impacts of aging, both for the body and the eggs. CoQ10 has been shown to improve the metabolism of oocytes and protect against genetic damage, which enhances their ability to divide properly. This seems to reduce the likelihood of chromosomal abnormalities or non-viable pregnancies. There is value in using CoQ10 to promote healthy aging in general, and it's easily found and generally considered safe for most people, but may cause some mild digestive upset.<sup>2</sup>

**L-carnitine/Acetyl-L-carnitine** is an amino acid which improves the energy metabolism of the oocyte, and appears to improve egg quality as people age. Both L-carnitine (LC) and acetyl-L-carnitine (ALC) are beneficial for improving fertility outcomes, but LC appears to be more effective at improving energy metabolism, while ALC appears to be a better antioxidant, protecting eggs from stress. LC and ALC are both safe supplement options on their own, and can be used as a combination product or as a single ingredient.<sup>3</sup> There are some interactions between LC, ALC, and some prescription drugs, so it's important to check with your healthcare team before using either one if you are already taking pharmaceuticals.

**Myo-inositol** has proven very effective for improving pregnancy

rates, specifically in individuals with polycystic ovarian syndrome (PCOS). Myo-inositol improves the quality of chromosomes (how DNA is organized) in eggs, and can also prevent delayed or improper maturation. This makes it helpful for all individuals experiencing metabolic conditions, such as diabetes or PCOS, in addition to normal aging. In some cases, myo-inositol may be combined with small doses of melatonin to further improve the quality of eggs.<sup>4,5</sup> Myo-inositol is a very safe nutraceutical with few adverse effects or interactions, but may cause mild digestive upset. It is often recommended to start with a lower-than-suggested dose and slowly build to the full dose over a week or two.

**Melatonin** is a hormone naturally produced by the body, long touted for its sleep-inducing properties. Much like CoQ10, melatonin can also positively impact the quality of maturing eggs by preventing oxidation in the ovary. This can protect eggs against premature aging, genetic damage, and the ever-changing environment within the ovaries that directly influences their health. Melatonin is generally considered safe for most people, but may lead to next-day drowsiness. Melatonin is available in various doses, so it's suggested to start low and go slow!<sup>5,6</sup>

**HOLISTIC SUPPORTS** While supplements are a great way to boost the quality of aging eggs, other factors besides age can contribute to difficulty conceiving in all people, including metabolic health issues, notably PCOS, stress, and environmental toxicity. Unfortunately, mitigating these determinants is not fully within the control of the individual, and populations that are systematically marginalized due to social and economic structures are more likely to be harmed by these factors.

However, any effort on the part of individuals, including maintaining a healthy diet of colourful fruits and veggies, abstaining from smoking, avoiding excessive alcohol, engaging in frequent movement, prioritizing sleep, and actively minimizing stress all have significant effects on fertility—not to mention many other health outcomes. Further, avoiding known toxins commonly implicated in impaired fertility, such as plastic packaging and food containers made with bis-phenol A (BPA), produce that carries a high burden of pesticides (visit the Environmental Working Group's annual dirty dozen list for more), and personal care products containing fragrance, parfum, and phthalates,<sup>7</sup> is a great place to start!

Everyone's health can benefit from aiming for a good lifestyle. However, if you're concerned about your chances of conceiving, talk to your healthcare provider about whether adding these specific nutrients into your daily routine is a good idea. It is recommended to begin supplementing for 12-16 weeks prior to trying to conceive (although you can certainly have fun trying in the meantime!). •

For references visit [ecoparent.ca/EXTRAS/SPR22](https://ecoparent.ca/EXTRAS/SPR22)