

Advantages of Krill Oil Over Fish Oil

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Research Demonstrates Superiority of Krill Oil Compared to Fish Oil

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By Dr. Mercola

For many years now, my favorite source of [omega-3 fats](#) — if you are not regularly eating safe sources of seafood like wild Alaskan salmon, sardines or anchovies — has been krill oil. In fact, I was one of the first to promote krill as an exceptional source of animal-based omega-3.

Krill oil is often compared to fish oil, but there are actually a number of differences between the two that makes krill a more ideal option. I was initially criticized for my recommendation of krill as a healthier and more environmentally friendly option than fish oil.

But over the years krill began receiving more attention by researchers, and each time a new study about krill oil hit the journals, its list of health benefits grew longer and the differences between fish oil and krill oil became more clearly pronounced.

Research shows krill oil has a number of advantages over fish oil, including the following:

Higher potency

Studies have shown that [krill oil](#) may be 48 times more potent than fish oil. This means you need far less of it than fish oil, as confirmed by a 2011 study published in the journal *Lipids*.¹

Researchers gave subjects less than 63 percent as much krill-based EPA/DHA as the fish oil group, yet both groups showed equivalent blood levels — meaning the krill was more potent.

Contains phospholipids

Fatty acids are water soluble, but they can't be transported in their free form in your blood — they require "packaging" into lipoprotein vehicles. In krill oil, the omega-3 fat is attached to phospholipids, which means your body can readily absorb it.

In fish oil, the omega-3s are attached to triglycerides that must be broken down in your gut to its base fatty acids of DHA and EPA. About 80 to 85 percent is simply eliminated in your intestine. Studies confirm krill oil is absorbed 10 to 15 times better than fish oil.

It's also able to efficiently cross your blood-brain barrier to reach important brain structures.

Phospholipids are also one of the principal compounds in high-density lipoproteins (HDL), which you want more of, and by allowing your cells to maintain structural integrity, phospholipids help your cells function properly. (You can learn more about this in the video above.)

Contains phosphatidylcholine

When you consume fish oil, your liver has to attach it to phosphatidylcholine in order for it to be utilized by your body. Krill oil already contains phosphatidylcholine, which is another reason for its superior bioavailability.

Phosphatidylcholine is composed partly of choline, the precursor for the vital neurotransmitter acetylcholine, which sends nerve signals to your brain, and for trimethylglycine, which protects your liver.

Choline is important to brain development, learning and memory. In fact, choline plays a vital role in fetal and infant brain development, so it's particularly important if you are pregnant or nursing.

Resists oxidation

Fish oil is quite prone to oxidation, and oxidation leads to the formation of free radicals. Consuming free radicals further increases your need for antioxidants.

Fish oil is very low in antioxidants whereas krill oil contains [astaxanthin](#) — probably the most potent antioxidant in nature — which is why krill oil is so stable and resistant to oxidation.

(According to industry expert Rudi Moerck, Ph.D. the vast majority of [fish oil](#) being sold is actually rancid before you even open the bottle, because it doesn't have this protective antioxidant.)

Independent Oxygen Radical Absorbance Capacity (ORAC) evaluations have established that krill oil (courtesy of the astaxanthin) has over 300 times the antioxidant power of vitamin A and vitamin E; 47 times that of lutein; over 34 times the antioxidant power of CoQ10.

Contaminant-free

Fish are very prone to mercury and other heavy metal contamination, courtesy of widespread water pollution. Antarctic krill is not prone to this contamination.

Not only are they harvested from cleaner waters, but since krill is at the bottom of the food chain, it feeds on phytoplankton and not over other contaminated fish.

Environmentally sustainable

Krill is far more sustainable than fish because it's the largest biomass in the world, making krill harvesting one of the most sustainable practices on the planet. Harvesting of krill is also carefully regulated, and only 1 to 2 percent of the total krill biomass is harvested each year.

The krill population is monitored by The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR). The Marine Stewardship Council (MSC) certifies that harvesting is done in compliance with strict sustainability criteria to avoid overfishing.

For more information, please read my 2009 article that goes into the [sustainability aspects of krill harvesting](#) in greater depth.

Superior metabolic influence

Researchers have found that krill oil is vastly superior to fish oil when it comes to having a beneficial influence on your genetic expression and metabolism.

Genes have "switches" that can be flipped on and off, which control virtually every biochemical process in your body, and nutrients like omega-3 fats control those switches.

Fatty acids help to direct metabolic processes such as glucose production, lipid synthesis, cellular energy, oxidation, and dozens of others. We now know that various types and sources of omega-3 fat affect liver tissue differently, which is what a 2011 study² in *Frontiers in Genetics* was designed to examine.

It compared the livers of mice fed krill oil to those fed fish oil by looking at the gene expression triggered by each. Although both fish oil and krill oil contain omega-3s, they differ greatly in how they affect the genes controlling your metabolism. Krill oil:

- Enhances glucose metabolism in your liver, whereas fish oil does not
- Promotes lipid metabolism; fish oil does not
- Helps regulate the mitochondrial respiratory chain; fish oil does not
- Decreases cholesterol synthesis, whereas fish oil increases it

So, krill oil will help lower your triglyceride and cholesterol levels and increase your energy production, whereas fish oil does neither.

Last year, an Italian study^{3,4} confirmed that krill oil helps improve lipid and glucose metabolism and mitochondrial function, which may help protect against hepatic steatosis (fatty liver disease) caused by an unhealthy diet (such as diets high in unhealthy fats).

By stimulating certain mitochondrial metabolic pathways, including fatty acid oxidation, respiratory chain complexes and the Krebs cycle, krill oil helps restore healthy [mitochondrial energy metabolism](#).

Krill Oil May Benefit Dozens of Diseases

Krill oil has been shown to help prevent or reverse at least two dozen different diseases, including but not limited to those listed below.^{5,6} Of course, were you to extend the search to include everything related to omega-3 fats, the list of benefits would be even more extensive since the gifts of krill oil include everything known to be good about omega-3s. That said, studies looking at krill oil specifically have found it can benefit:

Cardiovascular disease, hyperlipidemia; lowering blood pressure, [triglyceride levels](#)⁷ and LDL (bad) cholesterol, and raising HDL (good) cholesterol.⁸

Inflammation, lowering C-reactive Protein¹¹

Oxidative stress¹²

Research even suggests omega-3 from krill oil can outperform statins plus exercise for lowering cholesterol.

In one study, six weeks of supplementation lowered cholesterol levels by 33 percent.⁹

Meanwhile, patients taking a statin drug combined with a low-fat diet and daily exercise for several months lowered their cholesterol by an average of 20 percent.¹⁰

Arthritis: [Osteoarthritis and Rheumatoid arthritis](#) (RA).^{13,14}

Metabolic syndrome,¹⁶ including obesity, fatty liver,¹⁷ and [type 2 diabetes](#) (by reducing inflammation and blood sugar)

Premenstrual syndrome (PMS) and dysmenorrhea¹⁸

In one study, 300 mg of krill oil per day significantly reduced inflammation, pain, stiffness and functional impairment after just seven days, and even more profoundly after 14 days.¹⁵

Neurological/cognitive dysfunction, including: memory loss, brain aging, learning disorders and ADHD,¹⁹ autism and dyslexia,²⁰ [Parkinson's disease](#)

Colon cancer²¹

Kidney disease²²

Crohn's disease

Autoimmune disorders, such as lupus and nephropathy

Preventing premature delivery, and promoting infant brain development

Unique Partnership Ensures Sustainability While Promoting Research

As mentioned, the Antarctic krill biomass is under the management of an international organization of 25 countries called the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR).²³ It's responsible for the management of sustainable krill fishery and the monitoring of krill stock. CCAMLR is well-organized and has developed robust research programs to help ensure successful conservation measures in the Southern Ocean.

They also have the authority to further micromanage, on a season-to-season basis, to counteract any concerns they may have regarding the strength of the krill population during a particular harvesting season. In addition, the MSC certifies that krill fishing vessels harvest the krill in compliance with strict sustainability criteria. Aker BioMarine's Antarctic krill has been MSC-certified since 2010.²⁴ According to the MSC:²⁵

"Aker BioMarine has taken significant steps to protect other species living in the Antarctic Southern Ocean. This includes using a bespoke 'Eco-Harvesting' method which has a fine mesh, monitored by underwater cameras, to prevent anything larger than krill being caught. Recent research shows that bycatch of juvenile species is around 0.2 percent of the total catch."

Aker BioMarine also provides financial support to scientific institutions, and allows independent scientists to use its

on-board research platforms at no cost. Five days a year, they also allow independent scientists to tag along to specific areas to document environmental impacts on both krill and predators that depend on krill for their survival.

Last year, Aker BioMarine co-founded the Antarctic Wildlife Research Fund (AWR), which is a collaboration between scientists, businesses — including Mercola.com²⁶ — and leading environmental groups.

The aim is to raise funds for research into krill and its role in the Antarctic ecosystem. According to AWR Chair Mark Epstein, "The creation of the Antarctic Wildlife Research Fund is crucial to expanding our knowledge of krill populations in the Southern Ocean," and I'm proud to support this endeavor to ensure the conservation of the Antarctic.

You can follow the progress of AWR-funded scientists on their [Extreme Scientist](#) page. Below is a video taken by some of the researchers working in this cold and beautiful place.

Most People Can Benefit From Omega-3 Supplementation

While I recommend getting most of your nutritional needs met by real food, there are instances in which supplementation makes great sense. Animal-based omega-3 is one, as most fish are simply too contaminated to eat large amounts of safely. (Exceptions include wild-caught Alaskan salmon and smaller fatty fish like sardines and anchovies.)

Make no mistake about it, animal-based omega-3 fats are really critical for optimal health, and many Americans are sorely deficient in this nutrient. Making matters worse, most people also consume far too many damaged omega-6 fats, found in vegetable oils and processed foods.

According to research²⁷ published in 2009, omega-3 deficiency may cause or contribute to as many as 96,000 premature deaths each year. Low concentrations of EPA and DHA have been shown to result in an increased risk of death from *all* causes and accelerate cognitive decline. Those suffering from depression have also been found to have lower levels of omega-3 in their blood than non-depressed individuals.

Regardless of your age and sex, adding a high-quality animal-based omega-3 supplement like krill oil to your daily diet is one of the simplest and most effective strategies you can implement to protect your health. Pregnant women need to pay particular heed to this advice, as most women have major deficiencies of this fat, and that can spell trouble for your child.

It's important to realize that your body cannot form omega-3 fats, so a fetus must obtain all of its omega-3 fats from its mother's diet. Hence a mother's dietary intake and plasma concentrations of DHA directly influence the DHA status of the developing fetus, which can impact your child's brain development and eye health.

Likewise, breast feeding infants are dependent on the omega-3 fat from breast milk, so it's essential that women have adequate supplies of omega-3 to support both their own and their child's health during this time.

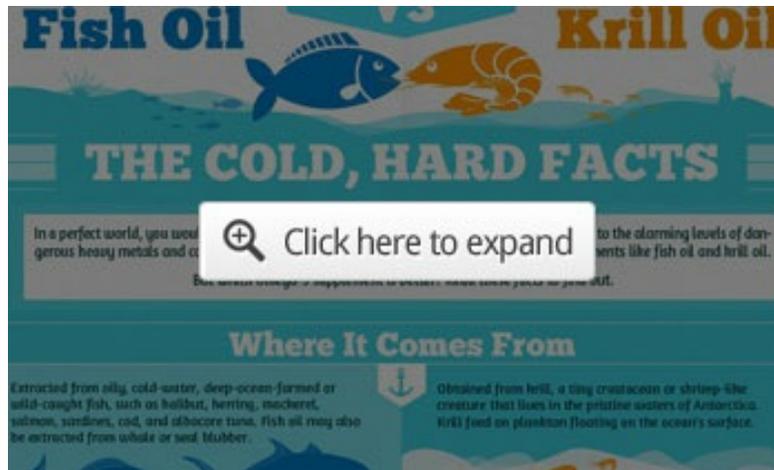
Considerations When Buying Krill Oil Supplements

When selecting a krill oil supplement, keep the following factors in mind:

- Make sure it's made from Antarctic krill, as it is by far the most abundant.
- Verify that the company has a valid sustainability certification from The MSC,²⁸ which ensures it's harvested in compliance with international conservation standards.

- The krill oil should be cold-processed to preserve its biological benefits. Make sure hexane is not used to extract the oil from the krill. Unfortunately, some of the most popular krill oils on the market use this dangerous chemical agent.
- The oil should also be free of heavy metals, PCBs, dioxins and other contaminants.
- Hard capsules are preferable to softgels for the fact that the latter allows more oxygen reach the contents, which promotes oxidization (i.e. speeds up rancidity). In the absence of oxygen, no oxidation can take place. Even though krill oil contains astaxanthin, which significantly decreases oxidation, hard capsules add additional protection, assuring maximum freshness and effectiveness.

Krill Oil Has Many Benefits and Virtually No Downsides



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As you can see, krill oil outperforms regular fish oil in a number of different ways. For starters, you need far less to get the same results, so it's a more affordable choice. And, while animal-based omega-3 fat is important for overall health, the omega-3 in krill oil appears to be particularly effective for supporting normal lipid levels and cardiovascular health.

Krill oil is also the most environmentally sustainable form of animal-based omega-3, which is an important consideration. I'm also really pleased that AWR will be able to conduct important environmental research while helping ensure the sustainability of krill fishing in the Antarctic. It's an exciting project for sure.