

# Krill Oil

COMMON NAME: Krill Oil

SCIENTIFIC NAME: *Euphausia superba*

## NOT RECOMMENDED - EVIDENCE

### LEVELS OF EVIDENCE



**Recommended:**

Several well-designed studies in humans have shown positive benefit. Our team is confident about its therapeutic potential.



**Recommended with Caution:**

Preliminary studies suggest some benefit. Future trials are needed before we can make a stronger recommendation.



**Not Recommended - Evidence:**

Our team does not recommend this product because clinical trials to date suggest little or no benefit.



**Not Recommended – High Risk:**

Our team recommends against using this product because clinical trials to date suggest substantial risk greater than the benefit.

### Evaluated Benefits

No evidence of efficacy or not indicated

## Source

Krill is a small red shrimp-like marine invertebrate crustacean that flourishes in extremely cold waters. Antarctic krill (*Euphausia superba*), in particular, produces oil that contain high levels of eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), also known as long-chain omega-3 fatty acids, a class of compounds reported to aid in lowering both blood lipids and blood pressure when used as a dietary supplement.

Krill oil is comprised of triglycerides and phospholipids, which constitute 30–65% of the content. The major phospholipid is phosphatidylcholine; 40% of the total fatty acids are attached to the phosphatidylcholine. Krill oil also contains antioxidants, including vitamins A and E, and astaxanthin.

## Indications/Population

Lowering of triglycerides

Patients with hypertriglyceridemia

## Mechanism of Action

Following consumption, omega-3 fatty acids are incorporated into cell membranes in all tissues of the body. Omega-3's counteracts intracellular lipolysis in adipocytes by suppressing adipose tissue inflammation. In addition, omega-3 increases extracellular lipolysis by lipoprotein lipase (LPL) in adipose, heart, and skeletal muscle and enhances hepatic and skeletal muscle  $\beta$ -oxidation, which contributes to reduced fatty acid delivery to the liver. Omega-3 could activate transcription factors, which control metabolic pathways in a tissue-specific manner, regulating nutrient traffic and reducing plasma triglycerides. Omega-3 reduces VLDL production. Triglyceride synthesis could be reduced by n-3 fatty acids in three general ways: reduced substrate (i.e., fatty acids) availability, which could be secondary to increase in beta-oxidation, decreased free fatty acids delivery to the liver, and decreased hepatic fatty acids synthesis; increased phospholipid synthesis; or decreased activity of triglyceride-synthesizing enzymes (diacylglycerol acyltransferase or phosphatidic acid phosphohydrolase)

## Side Effects

- Facial skin oiliness
- Bloating, diarrhea, and flatulence
- Decreased platelet function
- While krill oil may raise choline delivery to the intestine, the quantity of choline in a usual week's worth of pills is less than in one-half ounce of steak, or one-sixteenth of an egg yolk.

## Dosing

1–3 grams daily of DHA (Most krill oil preparations contain much less than this dose.)

## Drug Interactions/Cautions

Theoretically, some people who are allergic to shellfish might also be allergic to krill oil supplements. There is no reliable information showing how likely people with seafood allergy are to have an allergic reaction to krill oil; however, until more is known, advise patients allergic to seafood to avoid or use krill oil supplements cautiously.

## Notes

Krill oil has been proven effective in lowering triglyceride levels.

Krill oil taken in pill form is not as effective as larger doses of omega-3s in “fish oils”, although “fish oils” can be more expensive.

Krill oil may also decrease inflammations measured by hs-CRP (C-reactive protein). Bioavailability of EPA and DHA from krill oil seems to be higher than from that from fish oil. Doses in usual pills are so much lower that many consider krill oil not as useful for use as “fish oil” or DHA supplements.

The American Heart Association dietary guidelines for long-chain n-3 PUFAs and fish intake for primary prevention of coronary diseases are 2 servings of fatty fish per week. This recommendation will provide an amount of 250–500 mg EPA and DHA per day. This is equivalent to 6–9 capsules of krill oil daily. More (900 mg daily) is really what the data reviewed indicate is needed — often 18 krill oil capsules daily to get the recommended DHA. Since krill oil comes with phosphate choline in an amount that would likely lead to a change in bacteria in your gut and increased inflammation in your cardiovascular system, we recommend the 900 mg of DHA from a source other than krill oil.

Krill oil has “Generally Recognized as Safe” (GRAS) status in the United States.

## References

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