

Krill Oil Helps Preserve Muscle and Boost Your Energy Levels

Analysis by [Dr. Joseph Mercola](#)

August 12, 2026

STORY AT-A-GLANCE

- › Krill oil helps preserve muscle and boost energy in elderly adults and people who are trying to lose weight (especially when reducing calories significantly over time)
- › A study found that people taking 4 grams of krill oil daily retained more muscle strength and size while fasting compared to those who took a placebo
- › In adults over 65, krill oil improved grip strength, thigh muscle thickness, and neuromuscular response — even without added exercise — after just six months of use
- › Krill oil helped muscle cells burn fat more efficiently and increased levels of leucine, a key amino acid that signals your body to build new muscle tissue
- › Krill oil also activated genes that help transport sugar into muscle cells for energy use, supporting both metabolic health and muscle performance from the inside out

Krill oil, a marine-sourced oil extracted from tiny shrimp-like creatures living in the Antarctic, has become widely popular due to its omega-3 fats and astaxanthin content. It has been widely studied and recognized for its cardiovascular, cognitive, and anti-inflammatory benefits.

Now, newer research points to yet another distinct advantage from this impressive marine oil — the ability to preserve muscle health and promote optimal energy levels.

Krill Oil Helps Retain Your Muscle While Losing Weight

A clinical trial from the University of Glasgow, published in the journal *Obesity*, investigated krill oil's benefits during weight loss, particularly in helping protect muscle mass and strength. The first of its kind, this study focused on adults who were doing alternate-day fasting to lose weight by reducing their calorie intake without long-term starvation or nutrient deficiency.^{1,2}

- **The research participants** — The study followed 41 male and female adults between the ages of 25 and 65 who had a higher-than-average body mass index (BMI), putting them in the overweight or obese categories. These individuals were randomly assigned to receive either a placebo or 4 grams per day of krill oil.
- **All participants followed an alternate-day fasting regimen** — On fasting days, they were only allowed to eat 500 calories during a two-hour window. On non-fasting days, they could eat normally — though binge eating or overeating was prohibited. The experiment was conducted over an eight-week period.
- **What stood out was the difference in physical function between the two groups** — The participants who took krill oil retained significantly more muscle mass and strength than those who didn't. The krill oil group also performed better in a common physical test that measures how quickly someone can rise out of a chair — a useful indicator of lower body strength and coordination.
- **Another standout performance metric was handgrip strength** — This simple measure is actually a strong predictor of overall health outcomes, especially in older adults. In fact, I've written an article on how [grip strength is a reliable biomarker of your biological age](#). In this study, participants taking krill oil maintained more of their grip strength than those who were given a placebo.
- **Biologically, the krill oil group also showed improved markers of metabolic health** — They had higher blood levels of omega-3 fats, specifically eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) — nutrients known to help reduce

inflammation and support muscle integrity. The study also noted a reduction in systolic blood pressure in the krill oil group, which supports heart health during weight loss.

Your muscles are critical not just for strength, but for metabolism, blood sugar control, and long-term weight maintenance. Losing too much is a serious health risk — which is why krill oil is beneficial for anyone planning to lose weight. According to Stuart Gray, Ph.D., professor at the University of Glasgow and one of the co-authors of this study:

*"In this study we have found that krill oil can help to preserve our muscle mass and strength as we lose weight. As maintenance of muscle is very important for our overall health and quality of life, these are extremely exciting findings."*³

Krill Oil Also Helped Older Adults Build Muscle Strength and Thickness

Gray was also one of the authors of a previous study that investigated krill oil's muscle-boosting benefits, this time on healthy older adults. Published in *Clinical Nutrition*, the randomized, double-blind, placebo-controlled clinical trial sought to find out how krill oil affects muscle strength, size, and function in this age group — and whether long-term supplementation could help offset the age-related decline in muscle quality and performance.⁴

- **The researchers focused on 102 men and women, all aged 65 or older** — The selected participants were relatively inactive — reporting less than one hour of physical activity per week — which made them ideal candidates for studying interventions aimed at preserving muscle health. One group received a placebo, while the test group took 4 grams of krill oil every day for six months.
- **Muscle function indicators were measured** — At both the start and end of the study, the researchers measured thigh strength, grip strength, muscle thickness, and markers of metabolic health in the blood — all indicators of muscle function.

- **What happened next was measurable and meaningful** — After six months, the krill oil group showed a 9.3% increase in thigh muscle strength, a 10.9% boost in grip strength, and a 3.5% increase in thigh muscle thickness — all relative to the placebo group.
- **These improvements matter in daily life** — Thigh strength plays a major role in your ability to climb stairs, stand from a chair, or walk with stability. Grip strength, as mentioned above, is directly tied to longevity and daily function. Meanwhile, a 3.5% boost in muscle size in this age group is a significant gain, not just maintenance.
- **The researchers also tracked changes in blood levels of EPA and DHA** — The krill oil group showed a 214% increase in EPA and a 36% increase in DHA in red blood cells. Their overall omega-3 index — the marker used to assess long-term omega-3 status — jumped by 61% as well. These numbers confirm that the body was not only absorbing the nutrients, but also incorporating them into cell membranes where they can actually change the way muscle functions.
- **Another interesting outcome was a 17% increase in what's known as the M-Wave** — This is a measurement that reflects how excitable muscle membranes are. To put it simply, it shows that the muscles were more responsive and better primed to contract, pointing to better neuromuscular communication and more effective movement.

So How Does Krill Oil Achieve These Results?

According to Gray and his team, there are several mechanisms by which krill oil imparts these impressive benefits on muscle health.

- **EPA and DHA play a direct role in muscle protein synthesis** — This is the process your body uses to build new muscle tissue. These omega-3s help activate pathways inside your cells that control muscle growth and repair. EPA and DHA also reduce

inflammation, which tends to increase with age and is known to accelerate muscle breakdown. By dialing down inflammation while promoting growth, krill oil supports a stronger, more resilient muscular system.

- **This supplement also contains choline** — A lesser-known yet essential nutrient also found in eggs, choline is vital for cell membrane integrity and muscle contraction. The researchers noted that choline supports skeletal muscle metabolism and helps your muscles communicate with your nervous system. It also supports the production of acetylcholine — a neurotransmitter essential for muscle control and coordination.
- **Krill oil has [astaxanthin](#), too** — Similar to choline, this potent antioxidant helps benefit your skeletal muscle metabolism. However, astaxanthin is found in krill oil, but not fish oil — highlighting the advantages of this supplement over other marine oils.

For anyone over 65, this study shows that krill oil offers a real, measurable way to fight the natural muscle loss that comes with aging. And it does so with the help of nutrients your body actually uses to support better performance from the inside out.

Krill Oil Boosts Your Energy and Optimizes Protein Building

As mentioned above, your muscles play an essential role in many areas of your health, including your energy utilization — and according to a 2024 study published in the journal *Frontiers in Nutrition*, daily krill oil supplementation helps enhance this function by helping your muscles burn fat, process sugars, and build protein.^{5,6}

- **Twenty adult participants were involved in this study** — They were given either 1 gram of krill oil per day, equivalent to roughly four servings of fatty fish or a placebo for seven weeks. Researchers collected thigh muscle samples from the participants before and after supplementation.

- **Remarkable changes emerged after supplementation** — They found that the muscle cells in people taking krill oil showed increased oxidation of oleic acid — a type of monounsaturated fat (MUF) — meaning their muscles burned fat more efficiently. And the more oleic acid the participants burned, the lower their low-density lipoprotein (LDL) cholesterol (also known as "bad" cholesterol) levels were.
- **The krill oil group also accumulated more leucine** — This is a key amino acid needed to build muscle tissue. These results show that krill oil increased protein synthesis inside your muscle cells.
- **The experiments showed no effect on glucose metabolism, but a closer look shows a different story** — When the researchers examined the genes inside the muscle cells, they found that krill oil had switched on genes that help bring sugar into the cells and turn it into energy. Simply put, while the muscles didn't appear to use more sugar right away, the cells were clearly getting ready to do so by boosting the tools they need to process sugar more efficiently.

These findings show that krill oil not only supports strength, but also leads to efficient energy production by burning fat and carbs, even helping cholesterol balance. The researchers conclude:

"[O]ur findings indicate that krill oil supplementation positively impacts lipid metabolism and cellular energy regulation in human skeletal muscle cells. The observed increase in fatty acid oxidation, upregulation of metabolic pathways, and changes in the proteomic profile suggest enhanced metabolic function and improved protein synthesis.

*These and other findings highlight the potential treatment of metabolic disorders and enhancement of skeletal muscle performance by krill oil supplementation."*⁷

How to Maintain Your Muscle Health and Energy While Losing Weight or During Aging

If you're fasting, cutting calories, or simply getting older, your body naturally starts to lose muscle, which drains your energy, slows your metabolism, and raises your risk of weight regain and frailty. Thankfully, you don't have to just accept that decline. Here are some steps to protect your strength, energy, and overall function.

- 1. Add krill oil to your daily routine** — As these studies show, krill oil gives your muscles the raw materials — like omega-3s, astaxanthin, and choline — to preserve energy, reduce breakdown, and trigger protein-building activity. However, make sure to choose reputable brands that prioritize quality and purity and pay attention to dosage.

There is what's called the **Omega-3 Paradox**, wherein too much omega-3s also leads to negative health effects. Specifically, daily omega-3 supplementation exceeding 1 gram has been linked to increased AFib risk, especially in those with pre-existing heart conditions. Lower doses and whole food sources appear safer. So, start with lower doses and increase them only under medical guidance.

- 2. Eliminate vegetable oils and ultraprocessed foods from your diet** — I recommend replacing them with real, whole foods. Processed foods contain **linoleic acid** (LA)-rich vegetable oils that disrupt your metabolic pathways and alter how your body stores fat. Instead, cook your meals using tallow, grass fed butter, ghee, or coconut oil.
- 3. Consider your protein and collagen intake** — I suggest aiming for 0.8 grams of protein per pound of your ideal body weight and balancing that amount so that about one-third comes from collagen. This will help support muscle maintenance. If you exercise frequently, you might need to slightly increase your intake.
- 4. Consume healthy whole carb sources** — Carbohydrates from healthy food sources are the ideal fuel for your body. Aim for 200 to 250 grams of carbs per day from white rice, whole fruits, and vegetables. If you have severe gut issues, sip dextrose water to provide your cells with a steady source of easy-to-digest, healthy carbohydrates for energy.

- 5. Stay physically active** — The study participants who gained strength were inactive at the start, so even light movement will help your body use the nutrients in krill oil better. Daily walks, standing more often, or light resistance training will keep your muscles engaged and responsive.
- 6. Use chair-stand or grip tests to track your progress** — Grip strength and how fast you can stand up from a chair are powerful indicators of muscle health. Try doing these weekly. Watching your time improve or your grip become stronger will give you confidence and show that what you're doing is working.

Frequently Asked Questions (FAQs) About Krill Oil

Q: How does krill oil help protect muscle during weight loss?

A: Krill oil supplies your body with omega-3 fatty acids, astaxanthin, and choline—nutrients that help reduce muscle breakdown and support muscle repair. Studies show that people who took krill oil during intermittent fasting kept more muscle mass and strength compared to those who didn't.

Q: Does krill oil improve strength and mobility in older adults?

A: Yes. Research involving adults over 65 found that taking 4 grams of krill oil daily for six months led to stronger grip strength, thicker thigh muscles, and better performance in mobility tests, even without added exercise.

Q: What makes krill oil different from fish oil?

A: Krill oil contains omega-3s bound to phospholipids, which are more easily absorbed by your body. It also contains astaxanthin (a powerful antioxidant) and choline, both of which support muscle energy, coordination, and performance.

Q: Does krill oil boost energy levels in muscles?

A: Yes. In muscle samples, krill oil increased fat burning and helped muscles store more leucine, an amino acid used to build new muscle. It also activated genes that improve the use of sugar for energy – key for staying energized and strong.

Q: Who benefits most from taking krill oil?

A: If you're trying to lose weight, fasting, or are in your senior years, krill oil can help protect your muscle, keep your energy steady, and support your metabolism. It's especially valuable for older adults or anyone at risk of muscle loss.

Sources and References

- ¹ [Obesity, July 16, 2025](#)
- ^{2, 3} [Nutraceuticals World, July 17, 2025](#)
- ⁴ [Clinical Nutrition, June 2022, Volume 41, Issue 6, Pages 1228-1235](#)
- ^{5, 7} [Frontiers in Nutrition, Sec. Nutrition and Metabolism, Volume 11 – 2024](#)
- ⁶ [Nutraingredients, November 19, 2024](#)