FISH OIL:

Your Unbiased Guide to Choosing the Best Omega-3 Supplement

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The Argument for Fat

For the last several decades, we've been brainwashed into believing that a low-fat diet is the only way to avoid disease and maintain an ideal weight but this idea is not only wrong, it's unhealthy.

While it's true that some fats are bad for you, there are others that your body simply can't function without. Because we have been so conditioned to believe that all fats are bad for us, this may be tough for some people to accept but it's true.

Saturated fats and trans fats are what many people refer to as bad fats. They, especially trans fats, are cause a myriad of health problems such as strokes, heart disease and cancer. On the other hand, many unsaturated fats, like olive oil and fish oil, keep your heart healthy, help your body fight disease and even support healthy brain function.

Polyunsaturated fats include essential fatty acids, or EFA's for short, that vital to your health and your very survival. They are called "essential" because your body cannot produce them and must obtain through food.

You can really see the difference that a plentiful supply of EFA's can make to human health and longevity by comparing people who eat a traditional Mediterranean diet (and other coastal diets) to people who eat a modern Western diet.

Followers of the modern Western diet eat primarily processed, nutrient-poor foods, white flours, refined sugars and fatty red meats. Amongst this population, heart disease, obesity, cancer, Alzheimer's disease and other debilitating disorders are at near-epidemic proportions.

Traditionally, people who live on the Mediterranean Sea (and other coastal regions) eat a diet rich in fatty fish, vegetables and olive oil with a moderate intake of red meat. They get a plentiful supply of omega-3 (and monounsaturated fats) from the foods that they eat and have low instances of heart disease and significantly longer, healthier lifespans than their Western-eating counterparts.

A key difference is the dietary intake of essential fatty acids.

Though your body can produce many of the nutrients that it needs, EFA's aren't among them. We must get them from food sources such as fish, crustaceans, and certain nuts and seeds.

However, for various reasons, many of us don't eat those on a regular basis; to make up for the dietary deficiency, there are several different types of EFA supplements available.

Throughout this report, we're going to discuss the role of essential fatty acids – specifically fish oil - in your diet and talk about the different types of supplements available. There are toxicity issues that you need to know about as well as differences in the processing of various types of oils.

Finally, some types of supplements – as well as some EFA's – are more bioavailable than others, and we will discuss that as well.

By the end of this report, you'll know enough about essential fatty acids and the way that they're processed and used by your body to best choose which omega-3 supplement is right for you.

What Are EFA's Anyway?

Essential fatty acids are types of polyunsaturated fats, which means that they contain more than one double bond in their molecular chain. It's these double bonds that make these fats liquid at room temperature. There are two EFA's: Alpha linolenic acid (ALA) and linolenic acid (LA). You can consider these two fats as kind of the mirror images or counterbalances to each other.

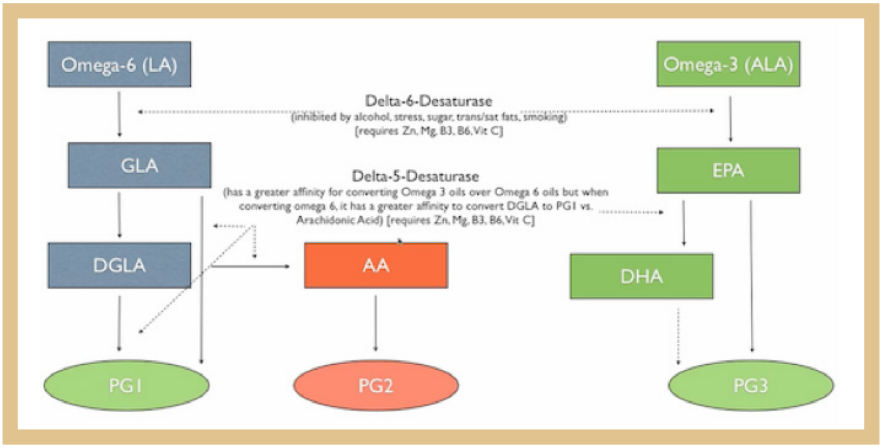
LA is an omega-6 fatty acid that you get from meats and the vegetable oils that are plentiful in processed foods. ALA is an omega-3 fatty acid found in foods that are less commonly eaten by Westerners such as:

- ✓ fish
- ✓ walnuts and walnut oil
- ✓ flaxseed and flaxseed oil
- ✓ chia seeds
- ✓ hemp seeds and hemp oil
- ✓ sea vegetables such as certain types of algae

The vast majority of people get more than enough LA from their diets; unfortunately the same can't be said for ALA, which is why supplementing may be a good idea. In fact, the ideal of ratio of omega-6 to omega-3 in our diet (and body) is about 1:1. However, our modern diet – full of its high amounts of processed vegetables oils (high in omega-6) – has shifted this balance to more than 10:1.

The problem with this is that omega-6 fats increase inflammation in your body, as the following flow chart demonstrates.

So the goal is to reduce your consumption of omega-6 fats (LA) and increase your consumption



of omega-3 fats (ALA) and specifically, your intake of DHA (docosahexanoic acid) and EPA (eicosapentanoic acid). These 2 long-chain fatty acids are very important considering that 30% of retina and brain tissue are comprised of them.

As the flow chart above shows, your body can convert omega-3s into DHA and EPA; however, it has a very tough time doing so.

Most studies have shown that the conversion of ALA to DHA is around 1% in infants and considerably lower in adults.

Very few studies in adults show that bloodstream or breast milk DHA concentrations increase following several weeks of increased dietary Omega-3 supply. Most studies show no improvement.

And surprisingly, omega-3 fats appear to contribute little to circulating DHA and EPA when added to a diet that already contains HIGH levels of omega-6 compared to omega-3.

Why is that?

Well, referring back to the earlier flow chart, you can see that omega-6 and omega-3 compete for the same enzyme, *delta six desaturase*, in their metabolism pathway. Thus, if there's more omega-6 in the diet, it tip the scale towards that side of the metabolism pathway and omega-3 conversion will be compromised.

Since the ultimate goal of ingesting omega-3 fats is the EPA and DHA than can arise from their metabolism, which then stimulate the production of anti-inflammatory prostaglandins (short lived hormone-like molecules), it's probably best to go right to the source and…

Supplement directly with preformed EPA and DHA.

So even though plant sources of ALA like flax, chia, and hemp all contain good amounts of omega-3s, they simply are NOT converted to EPA and DHA in any sizable manner.

Fish and fish oil, on the other hand, contain preformed EPA and DHA and are a much better source.

DHA and EPA are readily available in seafood and fatty, cold-water fish such as salmon, tuna, mackerel, anchovies, and sardines. However, these may not be the best options for some people, especially if:

- ✓ You are a vegetarian
- ✓ You don't like fish
- ✓ You are worried about high levels of mercury contained in carnivorous ocean fish

If any of these reasons apply to you, then you have several supplementation options available to you. We will talk about those in detail in a bit. First, you need to know what omega-3's do for your health.

The Health Benefits of Fish Oil

Before we delve into the differences between different fish oils and plant sources of essential fatty acids, you need to fully grasp how important omega-3's are to your overall good health.

We have already touched briefly on some of the benefits of omega-3 fatty acids but in this chapter we are going to really dig deeper so that you understand why they aren't just good for you; they're necessary for your body to function properly.

Just a few of the benefits that we are going to discuss include:

- ✓ Brain health and cognitive function
- ✓ Depression and mental health
- ✓ Age-related cognitive decline
- ✓ Cell health
- ✓ Weight loss and obesity prevention
- ✓ Heart health
- ✓ Inflammation-related disease prevention
- ✓ Healthy skin, shiny hair and strong nails – protection from oxidative stress and photodamage
- ✓ Fetal Development
- ✓ Eye Health

As you can see, fish oil plays no small part in keeping you whole and healthy. But how does it play such a huge role in so many different bodily functions? Excellent question: to answer it, we will need to take a closer look at each health benefit separately.

Brain Health and Cognitive Function

If we were to discuss every single role that omega-3 fatty acids play in your brain, we would have enough to write a thesis! More than half of your brain is made up of fats and about 30% of that is EPA and DHA.

That's right – a large portion of your brain is actually made out of omega-3 fatty acids. That should give you some idea of how important fish oil is to brain health. Every function that your brain performs is somehow affected by omega-3 fatty acids.

Neurons are the cells in your brain responsible for sending signals and information back and forth to each other and other parts of the body. The outer membrane of neurons, called the myelin,

is made up of fatty acids so the cells require omega-3's in order to effectively absorb oxygen, glucose for energy and other nutrients that the neuron needs in order to function.

There are two kinds of neurons: motor and sensory. As the names imply, motor neurons send signals to the muscles (including your heart) to move and sensory neurons are responsible for translating touch, smell, sound, vision etc. into sensory experiences. Since omega-3's help make it possible for neurotransmitters to cross the cell barriers and relay this information, you can see how important they are to brain health, memory and cognitive function.

Other interesting ways that fish oil is beneficial to your brain include:

- ✓ Improving cerebral blood flow
- ✓ Preventing cell death
- ✓ Helps keep the walls of your brain cells strong, intact and pliable
- ✓ Playing a role in cell creation

Depression and Mental Health

As we've already discussed, the cells in your brain need omega-3s in order to perform such tasks as movement, memory storing and recall and sensory interpretation. Other cells in the brain that are responsible for releasing the "feel good" chemicals serotonin and dopamine, also rely on omega-3s for proper function.

Studies have shown that populations that have a low intake of fish oil have higher-than-average rates of depression, schizophrenia, bipolar disorder and other anxiety-related mental illnesses.

Age-Related Cognitive Decline

After learning about how vital fish oil is to other parts of your brain, it's not that much of a stretch to imagine that it can help prevent your brain from falling into cognitive decline as you age.

Your risk of developing such disorders as Parkinson's, Alzheimer's disease, dementia and other inflammation-related conditions may be reduced by adequate omega-3 consumption. In populations where consumption of fatty fish is low, instances of these disorders are significantly higher than in areas where omega-3-rich foods are a dietary staple.

And this makes sense since omega-3 fats (especially DHA and EPA) are anti-inflammatory once metabolized. Since most diseases of cognition (like dementia) have been linked to chronically high levels of inflammation in the body, supplementing with a good quality fish oil could be a very smart and easy thing to do to ensure life-long brain function.

Cell Health

In addition to the fact that omega-3's are an integral part of the outer membrane of every cell in your body, there is now some fascinating research that shows that fatty acids may actually extend the life of your cells.

Telomeres are the little packets of DNA information that are found on the ends of your chromosomes. As the cell splits, a piece of the telomere accompanies the new cell. As the cell ages, the telomere shortens and when it is gone, the cell dies.

An article published in the February, 2013 volume of *Brain, Behavior,* and *Immunity* discusses a study conducted by scientists at Ohio State University. The study shows compelling evidence that link increased omega-3 levels via supplements with telomere support. Thus, an increase of omega-3's may help prevent the physical and cognitive signs of aging. That's pretty significant!

Weight Loss and Obesity Prevention

Both DHA and EPA increase levels of certain enzymes in your body that boost your metabolism and help your body burn calories faster.

There was also a study by Hill, et al in 2007 that showed that fish oil worked in synergy with exercise in order to support fat loss. In addition, this study also compared different types of fatty acids and fish oil worked best to reduce body fat.

In a few other studies, fish oil was shown to increase the diameter of your brachial artery during exercise, enabling better blood flow throughout your body so that you get more from your workout.

Finally, fish oil actually works directly with other body functions to promote the breakdown of fats, increase the rate of fat metabolism and increase insulin sensitivity. The bottom line is that fish oil promotes healthy weight loss and maintenance.

Heart Health

Fish oil contributes to heart health in several different ways. As a potent anti-inflammatory, it reduces inflammation cause by free radicals that can weaken the integrity of the cells of your cardiovascular system.

It lowers triglycerides that are known to cause cardiovascular disease if they aren't controlled. Omega-3s in fish oil also helps lower heart-damaging cholesterol and the high blood pressure that can put you at risk for strokes and heart attacks.

If you've already suffered one heart attack, fish oil has been shown in numerous studies to help protect you from another one. If you're fortunate enough to have a healthy cardiovascular system, fish oil helps keep plaque from building up inside your arteries and causing atherosclerosis, also known as hardened arteries.

From an aesthetic perspective, fish oil can help you avoid varicose veins because it plays a part in increased circulation. Omega 3's keep you looking good as well as healthy!

NOTE: Because fish oil is a pretty potent blood thinner you'll want to check with your doctor about supplementation if you're currently on any type of blood thinning medication.

Inflammation-Related Disease Prevention

There are numerous links between chronic inflammation and many types of diseases where fish oil has been shown to reduce inflammation when taken regularly. Inflammation wreaks havoc on your body in a variety of ways and the link between it and some of our most deadly diseases is strong. Some of these include:

- ✓ Cancer
- ✓ Alzheimer's disease
- ✓ Heart disease
- ✓ Inflammatory bowel disease
- ✓ Rheumatoid arthritis
- ✓ Chronic joint pain
- ✓ Hepatitis
- ✓ Pancreatitis

The relationship between chronic inflammation and many different illnesses has been researched to the point that it's undeniable. Equally unshakable is the research that shows that omega-3 fatty acids help reduce inflammation. It works to do this in at least two ways:

- ✓ Omega-3s are powerful antioxidants that fight the oxidative stressors that cause inflammation.
- ✓ Omega-3s prevent pro-inflammatory prostaglandins from activating, thereby preventing inflammation to begin with.

An added bonus of the anti-inflammatory effects of EPA and DHA supplements is that they can help reduce that stiffness that often makes mornings difficult to navigate and even helps fight cartilage deterioration.

Healthy Skin

If you have problem skin, fish oil may be just what you need to get your beautiful glow back. It protects you from various skin disorders as well as from chronological and environmental signs of aging including sun damage, also known as photoaging.

EPA protects your skin from photodamage caused by the sun by fighting wrinkles and the oxidation process stimulated by UV rays that activates proteins that make your skin thin and yellow.

If you have chronically low levels of EPA, studies show that you will be more likely to experience many different skin conditions including:

- ✓ Acne
- ✓ Psoriasis
- ✓ Eczema
- ✓ Dermatitis
- ✓ Wrinkles
- ✓ Age spots

Not only does EPA protect your skin from further damage, it has also been shown to have rejuvenating effects.

We already know that it helps promote new cell growth throughout your body but here's another interesting trick: EPA also helps stimulate the production of the matrix proteins in your skin that help keep your face looking young and firm. These include precollagen and tropoelastin.

Not only can EPA stop time; it can turn it back!

As an added bonus, EPA helps make your hair lustrous and your nails strong and healthy, too.

Healthy Pregnancy and Fetal Development

Because of fish oil's effect on cellular generation and nourishment and its role in proper insulin sensitivity, omega-3s are essential for a healthy pregnancy and proper fetal development. For that matter, kids need it during their formative years in order to grow properly and develop well cognitively and psychologically.

A large percentage of the brain is, after all, EPA and DHA, so if you're not getting enough of it while you are pregnant, your body is going to suffer and your baby may not develop properly either. Several studies show that fish oil is necessary for proper eye development and health both during your pregnancy and throughout your child's life.

In addition to helping your baby grow well, fish oil can also help you throughout your pregnancy and beyond. Here are just a few ways that omega-3's promote women's health:

- ✓ Less painful menstrual periods
- ✓ Reduced risk of postpartum depression
- ✓ Lower chance of developing pre-eclampsia
- ✓ Reduced risk of developing gestational hypertension

- ✓ Increased fertility
- ✓ Less traumatic menopause

Adding fish oil supplements during pregnancy is something that may be extremely beneficial if you aren't getting enough from dietary sources but be sure that you talk to your doctor about it first.

Eye Health and Development

We have already discussed how fish oil helps promote cellular health and growth, and you know that omega-3s are an integral part of many bodily structures, such as your brain and your skin. Well now you can add your eyes to that list.

That's right – your eyes contain a tremendous amount of omega 3s and if you don't get enough of them, you can experience several issues with your eyes including:

- ✓ Macular degeneration
- ✓ Chronic dry eye
- ✓ Retinopathy
- ✓ Age-related vision loss
- ✓ Glaucoma
- ✓ Vision loss for people suffering from retinitis pigmentosa

Vitamin A in the form of retinyl palmitate is essential to preserving your vision and keeping your eyes healthy but in order to work, it has to be released from a certain binding protein. DHA is a necessary part of the unlocking process.

There aren't really any major eye diseases that fish oil ***doesn't*** help prevent because it's such an important part of the structure and function of your eye.

Not only does it act too keep your cells healthy, omega-3s decrease inflammatory messaging and keep the blood vessels in your eyes healthy.

A final note: remember how we discussed the fact that fish oil helps prevent insulin resistance? Diabetics are more prone to experience pressure in the eyes that can cause retinopathy or macular degeneration, so by helping your body to avoid diabetes, fish oil is also protecting your vision!

Overall Good Health

By now you have a fairly good idea about why omega-3s are good for you. They're rich in the fat-soluble antioxidant vitamins E and D, they fight inflammation, and they play a tremendous part in cell health and function. Quite simply, you can't live without them!

So you get it: you need omega 3's, but you might not like fish. That's OK because you can always supplement. Be careful though because not all omega-3 supplements are the same, nor do they provide you with the same benefits.

There are definitely omega-3 supplements that are superior to others and that's what we're going to talk about next. Throughout the following pages, you are going to learn the difference between fish oil and vegetable sources of omega-3s.

We are also going to talk for a bit about the different processing methods and why some are better than others. Finally, there are some toxicity issues that you need to be aware of, so we will explain those, too. Let's get to it.

The Problem with Plant-Based Omega-3's

The great omega-3 debate continues to rage about whether or not plant-based omega-3's offer the same health benefits that their fishy cousins do but research just isn't stacking up to support the idea.

The problem is that plant-based sources of omega-3 fatty acids only supply ALA, the essential fatty acid. Research has been trying to determine if ALA offers the same incredible health benefits as EPA and DHA and the findings so far aren't favorable.

It would appear that ALA does offer a watered-down version of some of the benefits of other omega-3's such as helping with cardiovascular health but the mega-power simply isn't there. For instance, it doesn't appear as if ALA helps reduce cholesterol levels like EPA and DHA do.

Since this is one of the major functions of omega-3's, the viability of ALA as a stand-alone supplement isn't looking that great. It does have one thing going for it, though: the power of conversion.

For reasons stated earlier, your body, being the amazing machine that it is, still has trouble converting ALA into its big brothers, EPA and DHA. These are the two magnificent fatty acids that are mainly responsible for all of the incredible benefits that we discussed above.

Since we've already discussed why DHA and EPA are so important, it doesn't seem logical to make your body perform parlor tricks just to access the nutrients that it needs to function properly when there are readily available sources of preformed EPA and DHA at your fingertips.

That's not to say that ALA is useless, it's just not the ideal source if you have the option of using preformed sources of DHA and EPA such as fish oil. There are, however, certain circumstances that may prevent you from taking fish oil. In that case, it's a sure bet that ALA is better than no supplement at all.

There are several reasons why you may not wish to take fish oil supplements, including:

- ✓ Vegetarianism or veganism
- ✓ Allergies to fish
- ✓ Fear of heavy metal poisoning
- ✓ Concern regarding the purification process

These are all valid reasons, but we may be able to help you out a bit if your reasons for being cautious about taking a fish oil supplement fall into the last 2 categories. If you must take a plant-based source of omega 3's, we'll discuss your options there, too. Before we delve into the world of supplements though, let's talk about the benefits of eating your fish versus taking a supplement. We'll approach the topic from a nutritional standpoint instead of from a taste or convenience perspective.

Fish versus Fish Oil

If you compare people who eat diets rich in fish and other sources of omega-3s you're going to find that they are healthier and live longer than people who follow a Western diet based on processed foods, copious amounts of low quality animal products, and refined sugar.

It's almost always a given that it's better to eat your nutrients than to get them in pill form, but we're going to do a fish-to-oil comparison so that you'll know for yourself whether or not you'd like to dedicate yourself to eating fish at least 3 times per week or simply add a daily supplement.

Omega-rich fish, which include: sardines, wild sockeye salmon, atlantic salmon, herring, anchovies, and other cold water fish – contain EPA and DHA as well as vitamins and nutrients such as protein, selenium and vitamin D. As a powerful antioxidant, selenium is important especially when we're talking about fish because it helps protect your body against the deleterious effects of mercury.

Fish oil, with very few exceptions only has EPA and DHA.

Like many supplements, the omega-3s in fish oil aren't as effectively absorbed as the nutrients from fish. This could be because other fats and nutrients in the fish work together to increase absorption.

But you can't forget about the toxicity issue when you're comparing fish oil to fish. Fish oil is purified, so the vast majority of fish oils on the market are free of toxins and heavy metals. Fish, however, can't be purified. That's why eating smaller fish (ie. sardines, anchovies) is usually better since they haven't bio-accumulated as many toxins as the larger fish (ie. tuna).

One final point, again in favor of fish oil, is that molecularly distilled and purified fish oil can provide up to 1.6 grams of DHA and EPA in just a few pills or spoonfuls. A single 6 oz. portion of salmon only offers about 1,111 mg of DHA and 883 mg of EPA.

From a purely nutritional standpoint, it's much more beneficial to eat your fish than to take a supplement. However, taking a fish oil supplement is more convenient, less expensive and more appealing to those of you who may not like fish.

The bottom line is that eating your fish is the best way to get your omega-3 fatty acids but if you aren't eating them (and most people aren't!) then you should seriously consider supplementing.

Toxins and Poisons Lurking in Fish

One of the biggest concerns you may have about taking fish oil is that same concern that health officials appeal to when they tell you not to eat fatty fish more than a few times per week: heavy metal consumption.

Fatty, cold-water fish are the best sources for omega-3 fish oils. The following fish contain some of the highest concentrations of omega-3 fatty acids:

- ✓ Salmon
- ✓ Tuna
- ✓ Mackerel
- ✓ Herring
- ✓ Sardines
- ✓ Anchovies

As you can see, all of these fish eat other fish, which means there is a greater heavy metal concentration as well as much higher levels of omega-3's. If you choose to eat your omega-3's instead of taking a fish oil supplement, go for smaller fish that are lower on the food chain because they have lower concentrations of heavy metals.

Just as with many other issues, heavy metals and toxins in our fish are a direct result of pollution by people. In the case of mercury, our manufacturing plants belch out gases that contain it. When it's released into the atmosphere in the form of gas, it enters the air and is deposited into our water sources when it rains.

Fish, bugs, and other creatures absorb the mercury, then the fish eat the bugs. Bigger fish eat the smaller fish, and up you go until you reach the top of the food chain: humans. By the time you get to the larger predator fish such as tuna and salmon, you have a pretty significant concentration of mercury going on.

Other forms of toxins and heavy metals work the same way, though there are different means of introducing them into the water supply. Pesticides, herbicides and chemicals are either illegally dumped into the water or rain washes it off of land and into the water.

Boats and other water craft pollute the waters as well. All of these sources of toxins are absorbed by the plants and creatures that live in the water, then we eat them and absorb the toxins. Other than mercury, you may be eating the following:

- ✓ Nickel
- ✓ Lead
- ✓ Cadmium
- ✓ Arsenic
- ✓ Polychlorinated biphenyls (chemical toxins banned in 1979 but still present in our waters)
- ✓ Dioxins
- ✓ Furans

The amount of these toxins found in fish has risen to the point that the government has suggested that you restrict your consumption of fatty fish to no more than three times per week. You can imagine the level of toxicity that would be found in concentrated fish oil if protective measures aren't taken.

For that reason, fish oil is processed and purified so that it's safe for you to consume. There are a few different ways that this can be done, and we're going to explore which one is best for you.

But before we do, keep in mind that only about a third of the oil from fish is EPA and DHA, although this may be higher (up to about 85% as EPA and DHA) in a fish oil supplement.

Supplements from small fish tend to have a ratio of EPA to DHA of 1.5:1 so that a capsule claiming 1 gram (1,000 mg) of fish oil, of which 30% is EPA and DHA, provides 180 mg of EPA and 120 mg of DHA. Later on, this will make sense once you learn how much of each you need on a daily.

Cleaning Up Your Fish Oil

Because of the extraordinary amounts of environmental toxins in cold-water fish, you wouldn't be able to safely take any kind of fish oil concentrate if it weren't purified first. There are a few different purification methods that can be used as well as a ton of misinformation floating around out there that is intended to sway you toward one product or another.

That's OK, though. By the end of this report, you will have the knowledge to see through the hype and choose a quality fish oil that meets your needs. Let's talk about different purification methods now.

Oil Refining

This is one of the more crude methods of purifying fish oil and involves heating it in order to destroy contaminants. The process isn't very efficient and doesn't remove nearly as many toxins as other methods, though it does remove enough to make the oil safe enough to pass federal standards.

The risk of oxidation and damage to the nutritive value of the oil is higher because of the increased temperatures used to process it. Unlike with other methods, oil refining doesn't alter the amount of omega-3s in the oil, but it does significantly degrade their quality.

However, one advantage to this process is that the oil maintains its original triglyceride form instead of being altered into ethyl esters. This makes it more bioavailable but also allows for the creation of trans fats because of the heating process. Will cover this topic in more detail in a moment.

Steam Distillation

This purification process uses steam and a vacuum environment in order to purify the fish oil at lower temperatures than are used in the refining. Because steam is used, heat is still involved and the possibility of damaging the delicate fatty acids is still present. The oil can't be concentrated using this method, either.

Molecular Distillation

This purification method is the most thorough way to extract toxins and heavy metals from the oil. It involves low temperatures and vacuum pressing so that no trans fats are created but it also chemically alters the molecular composite of the oil.

Originally, the fish oil is a triglyceride compound but the molecular distillation process alters it to an ethyl ester. This has a couple of implications. First, fish oil is more bioavailable in its triglyceride form. Also, it's less stable and more prone to oxidize as an ethyl ester.

However, realizing this fact, some manufacturers are able to “reform” the fish oil into its ideal triglyceride after being molecularly distilled. Ideally, that’s something you would want as it ensures optimal purity and absorption.

This is such a key point in the search for the best fish oil that we need to discuss it in greater depth. Over the next few paragraphs, you will learn the functional differences between the triglyceride (TG) form of fish oil and the ethyl ester (EE) form.

The Great EE vs. TG Fish Oil Debate

OK, so it isn't actually a debate yet, but it should be. The reason that you don't hear much about the differences between triglyceride forms of fish oil and ethyl ester forms is because quite frankly, most people probably don't realize that there IS a difference.

If you are the average person, you go to the health food store or your favorite trusted online retailer and buy fish oil. If you have a preference between krill oil, fish oil and cod liver oil, you may make that differentiation but nobody really pays much attention to the distillation process. That's all about to change!

The EE transformation

Because of the tremendous amount of toxins found in concentrated fish oil, ethanol has to be added during the decontamination process. The oil and ethanol mixture is added to a vacuum and the oil is molecularly altered.

In its natural state, fish oil's "backbone" is an extremely bioavailable triglyceride; however, during the molecular distillation, that backbone is changed to an ethyl ester. The result is an extremely pure fish oil concentrate.

Unfortunately, the EE form isn't nearly as bioavailable as the TG form. If you are wondering if your fish oil is EE or TG, chances are pretty good that if it's concentrated, it's EE – unless the manufacturer has stated otherwise (usually on their website). The sad part is that the oil can be changed back into a triglyceride form but it adds a substantial amount to production costs.

This third form of fish oil is known as re-esterified triglycerides: It is made by chemically converting ethyl esters back to triglycerides, so that most of the omega-3 fatty acids are, once again, triglycerides.

A 2010 study found that people absorb about 37% more omega-3 fatty acids from natural fish oil (TG form) than from the ethyl ester form. Interestingly, re-esterified triglyceride fish oil is absorbed even better than natural fish oil (24% more fatty acids are absorbed). Regardless of these differences in absorption, any of these forms can significantly raise the levels of DHA and EPA in your blood.

If you'd like to know for sure which fish oil you've got, there is a simple test that you can perform on your oil. Simply squeeze 3 or 4 capsules into a Styrofoam cup and let is set for 10 minutes or so. If your oil starts to melt the cup, it is an EE form of fish oil.

Don't let that worry you though because it isn't dangerous regardless of how curious it may seem: your stomach acid is much more powerful than a little bit of ethyl ester. But at least you will know what kind of fish oil you're taking!

Absorption Comparison

Your body naturally breaks down fish oil in your small intestine using bile salts and pancreatic lipase. What essentially happens is the salts and the lipase work together to tear the molecules into their different parts. The glycerol "backbone" that we talked about earlier separates easily from the fatty acids and all is absorbed quickly and easily.

The ether/fatty acid bond is up to 50 times more resistant to the pancreatic lipase than the glyceride bond, so it doesn't break down as easily as the TG oil does. There is also an issue with availability after the initial breakdown.

The fatty acids have to be converted back to a triglyceride in order to be transported and further synthesized. TG forms of the oil already have the monoglyceride substrate necessary for this conversion but EE forms do not. Your body then has to call for a glycerol substrate from somewhere else, slowing the absorption process even more.

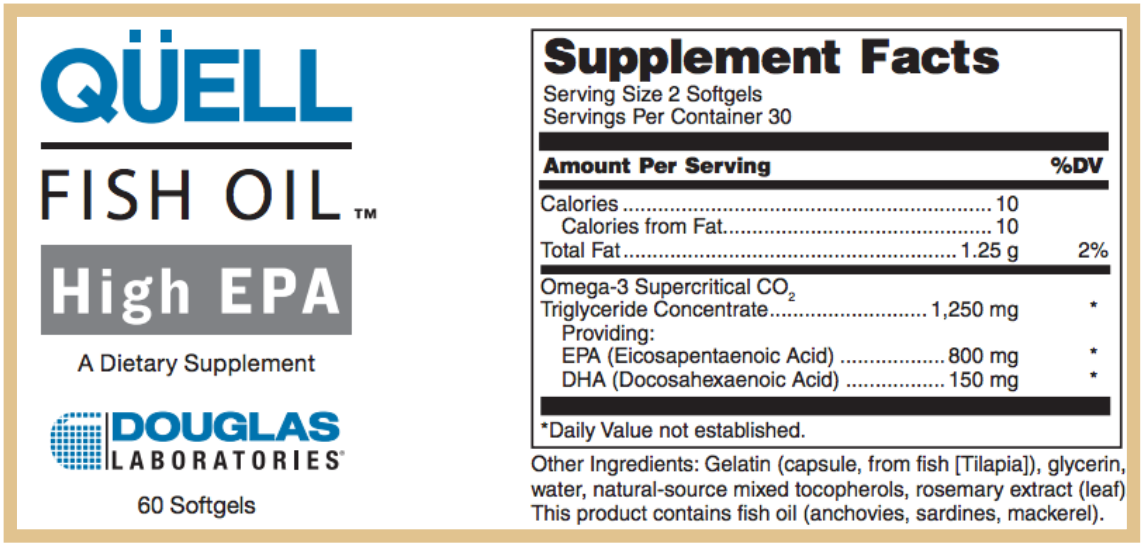
This all sounds extremely scientific but the bottom line is that research is showing that EE forms of fish oil aren't utilized as efficiently by your body as TG forms.

A final blow is that fish oil in EE form isn't as stable as TG forms and is more likely to oxidize, which ultimately defeats the purpose of taking a fish oil in the first place.

Now that you know the difference in processing styles, let's take a look at a relatively new form of fish oil that's hitting the market. It's called krill oil and manufacturers claim that it's better for you than standard fish oil. Let's take a look at why they say that and what facts they may have to back it up.

In summary, each of the three forms of fish oil, after being digested, will end up in the same form in your blood. However, due to their better absorption, it may be fair to pay some premium for fish oil in the natural or re-esterified triglyceride forms.

If you choose to use either of these two forms, look for fish oil supplements that list EPA and DHA as "triglycerides." Here's an example from *Douglas Labs Quell Fish Oil…*



However, some companies do not state “triglycerides” on their ingredient label and thus require a little more investigation to find out for sure. For example, one of my favourite fish oils is NutraSea from Ascenta Health. However, only by digging around on their website can you uncover the fact that they use the actual TG form of fish oil.

My goal with this report is to simply give you the best fish oil recommendations I can so that you don’t have to spend hours figuring this stuff out on your own. Near the end of this report, I’ll share with you a number of my favourite fish oil supplements that are of the utmost quality.

Krill Oil: Better, Worse or Just Another Option?

A krill is a small, shrimp-like crustacean that contains rich amounts of EPA and DHA omega-3s. Manufacturers are claiming that it's more bioavailable than fish oil, so let's take a look at what the research says.

One of the first advantages that krill oil people claim is that krill doesn't have the fishy aftertaste that fish oil does. Though this may have been an issue several years ago, most capsules are now enterically coated to make it to your small intestine before the oil is released, thus reducing or eliminating the fishy aftertaste or burping.

Another point for the krill oil argument is that the oil is based on phospholipids instead of the triglycerides that forms fish oil molecules. Because our cells walls are also made of phospholipids, proponents claim that our bodies can use krill oil more effectively than it can use fish oil.

There have been very few actual independent studies so this is hard to determine. What we do know is that the TG form of fish oil is extremely bioavailable. One study, conducted by the Institute of Food Science and Human Nutrition at Leibniz University does suggest that levels of free EPA were higher after breakdown of krill oil than they were after breakdown of fish oil but further research is needed to see if the results will repeat.

What clinical tests available actually show is that though krill oil has the same incredible healthy benefits that fish oil does, it's not necessarily any better.

However, one area where krill oil is superior than fish is in its level of antioxidants, especially one called astaxanthin.

Research shows that, due to astaxanthin's potent antioxidant activity, it may be beneficial in cardiovascular, immune, inflammatory and neurodegenerative diseases. Some research supports the assumption that it may protect body tissues from oxidative and ultraviolet damage as well.

Whichever you choose, krill or fish oil will be of tremendous benefit to you.

Throughout the pages of this report, we've talked about the benefits of fish oil, but what if you don't want to eat fish or even fish oil? Is there an alternative that allows you to get the same great benefits of preformed EPA and DHA without relying on fish?

The answer is maybe. Algae supplements may be exactly what you need to meet your non-fishy omega-3 needs. Let's take a look and see.

What's the Big Deal about Algae Supplements?

The big deal is that algae is amazingly good for you. The main reason that fish oil is so much better for you than most plant-based omega-3 supplements is because it contains preformed EPA and DHA, while plant forms contain only ALA, the primary essential fatty acid that your body can convert into the other two, albeit inefficiently.

Don't Kill the Krill

With the addition of krill oil to the market, and the subsequent banning of fishing for the little guys, the search was on to figure out how to get the same brain-healthy, disease-fighting benefits of them without actually eating ***them***.

The answer was to eliminate the middle man, so to speak, and go directly to the source that provided krill (and eventually fish) with their awesome omega-3s: the algae that it regularly dines on! Sea algae is especially rich in the brain-supporting DHA and also has several other healthy nutrients including chlorophyll and other incredible phytonutrients and minerals.

What Can Algae Do for You?

Though the other health benefits are outside the scope of this report, they truly are something that you should take into consideration when you are choosing your omega-3 supplement. Some of the biggest benefits that the omega 3s in algae offer are the same ones that you get from fish oil, except algae is vegan. They include:

- ✓ Improved heart health
- ✓ Healthy brain function
- ✓ Memory improvement
- ✓ Mood stability and improvement
- ✓ Insulin stability
- ✓ A healthy nervous system
- ✓ A healthy immune system
- ✓ Healthy cholesterol levels
- ✓ Lower triglycerides

That's all well and good, but do they work as well as fish oil? The answer so far is yes. The recommended dosage for many algae supplements tends to be lower than the recommended 1-3 grams of fish oil per day. Typically, most of the algae manufacturers recommend 1-2 grams daily.

While algae supplements are still fairly new, they show promise as a great option to fish oil. It's biocompatible and also offers other health benefits in addition to just the omega-3s. They're worth checking out. One final source of omega-3s is cod liver oil. Before we wrap things up, let's take a look at what it has to offer.

Cod Liver Oil or Fish Oil?

If you happen to be a baby boomer, just hearing the words “cod liver oil” may cause a reflexive shudder, accompanied by memories of the ever-present bottle of the stuff that was always available to cure what ails you. For centuries, cod liver oil has been used to battle rickets, tooth decay, joint stiffness, arthritis and various other ailments.

Now we know exactly why people put so much faith into this not-so-pleasant tasting liquid: it’s rich in a couple of different vitamins as well as omega-3 fatty acids that your body needs to survive. The main difference between standard fish oil and cod liver is that the latter is derived from the liver of cod (hence the name). And since the liver is a storage basin for fat soluble vitamins (among other things), cod liver oil brings with it higher amounts of vitamin D and vitamin A.

Vitamin D

Many children today are deficient in this vitamin that most people get just from being out in the sunshine. Vitamin D plays important roles in numerous bodily functions including:

- ✓ Bone heath
- ✓ Immune health
- ✓ Nervous system function
- ✓ Kidney health
- ✓ Cancer prevention

One serving of cod liver oil provides up to 1000 IU, a dose that many professionals recommend as a full daily serving. Fish oil typically doesn’t supply any vitamin D at all.

Vitamin A

This is another antioxidant vitamin that’s critical to many different bodily functions including:

- ✓ Eye health
- ✓ Skin health
- ✓ Bone health

Vitamin A is stored in your skin and is also readily available in many of the foods that you eat. One serving of cod liver oil provides more than your recommended daily allowance of vitamin A so be cautious because, as a fat-soluble vitamin, you can get toxic from high doses of vitamin A (NOTE: This also applies to vitamin D). Again, fish oil doesn’t provide vitamin A.

Omega 3's

Both cod liver oil and fish oil provide an abundance of omega-3 fatty acids. In this category, one really isn't any better than the other with the exception that fish oil is free of contaminants. Since cod liver oil is often offered in its pure form, it may not be purified.

This means that it may contain the toxins and heavy metals that we've discussed in previous chapters in levels high enough to be harmful. Cod liver oil also putrefies much faster and easier than fish oil does.

All things considered, unless you have an extremely poor diet and never go out in the sun, you are probably much better off taking a daily fish oil supplement.

Personally, I haven't used cod liver oil since I was a kid. Now, I supplement with my diet with either of fish oil supplements I'll be mentioning in just a moment. However, before I show you the good, let's look at some of the bad.

Consumer Lab Testing

Recently ConsumerLab.com – an organization that independently evaluates products that affect health and nutrition - tested 35 different fish oil supplements.

Among these 35 products, only 24 passed quality testing, meeting requirements for freshness and purity, and containing their claimed amounts omega-3 fatty acids. Eleven products failed to pass testing for several reasons, including:

Containing FEWER ingredients than claimed

These included:

- ✓ *Astamega-3 Omega-3 Krill Oil Cardio Support* contained only 74.7% of claimed EPA, 71.3% of claimed DHA, and 67.3% of claimed total omega-3s.
- ✓ *PharmaNutrients* Learn contained only 80.3% of its listed amount of total omega-3s.
- ✓ *Xtendlife Omega3/DHA Fish Oil Premium* contained only 82.7% of claimed EPA and 86.2% of claimed total omega-3s and also failed for contamination.

It was also noted that some supplements use terms which, in actuality, are meaningless and misleading (at least in the world of fish oil):

Pharmaceutical grade

With respect to fish oil this term means nothing, as the FDA has not defined what would constitute a pharmaceutical grade fish oil product.

Tested in FDA approved laboratories

The FDA does not approve analytical laboratories so these claims are not correct, although laboratories may be FDA registered and inspected.

Krill Oil

Be aware that the term "krill oil" in the name of a product does not necessarily mean it's all krill oil as was found in the case of Source Natural Arctic Pure Krill Oil. A trade name doesn't necessarily imply that's what's in the ingredients. In this case, fish oil (not krill) was the first ingredient listed.

How Much Do You Need?

Before I share my top fish oil and omega-3 recommendations with you, it's probably helpful to know how much omega-3 you need on a daily basis.

And the fact that many people don't know this information could be part of the reason why some people don't experience the full benefits that fish oil has to offer.

For example, many of the fish oil products on the market contain just 300-500 mg of actual Omega-3s per day.

The American Heart Association (AHA), on the other hand, notes that significant therapeutic benefits from Omega-3s (such as lowering triglycerides) don't come until at least 2000 mg in the form of EPA and DHA are consumed on a daily basis.

Furthermore, other studies suggest the optimum benefit occurs at 2.4 grams daily of Omega-3s. To be clear, this is not just 2.4 grams of fish oil, it is 2.4 grams of Omega-3's per day.

With these numbers in mind, the following fish oils recommendations can easily meet these requirements with 1-2 servings per day.

My Top Recommendations

Now that we've covered pretty much everything you need to know about fish oil and it's alternatives, I'd like to leave you with a select few that I've personally used and highly recommend.

These fish oils meet the highest standards and are guaranteed to provide what they claim.

I should also mention that there's probably numerous other fish oils on the market that are very good as well and hopefully you'll be able to determine which they are based on what you've learned so far.

The following 2 recommendations are commercially available to anyone. I've excluded "professional brands" that are only available to clinicians, naturopaths, and nutritionists since they are tougher to come by. But, in case you're interested, QUELL Fish Oil from Douglas Laboratories is a terrific fish oil, however, it's very hard to get a hold of.

In the meantime, these are my 2 favourite fish oils that you CAN enjoy immediately.

NutraSea

The standard fish oil that they provide packs in a whopping 750mg of EPA and 500 mg of DHA per teaspoon. I take about 2 tablespoons of this stuff each day!

They also have lemon-flavoured, vitamin D-fortified, and soft gel options as well. For a 500-ml bottle you're looking at about $50, which should last you about 6-8 weeks. Unfortunately, they do not ship outside of North America so if that excludes you, you're probably better off with the next option.

All in all, this is one of the best fish oils I've ever come across. Here's a look at the ingredient label…

Click here to learn more about NutraSea

Supplement facts
Serving size 1 tsp. (5 ml) / Servings per container 100

Amount per serving	% Daily value
Calories 40	
Calories from fat 40	
Fat 4.5 g	7%*
Saturated 1.5 g	8%*
+ Trans 0 g	
Polyunsaturates 2 g	
Monounsaturates 1 g	
Cholesterol 20 mg	7%*
Total omega-3 fatty acids	1500 mg†
EPA (eicosapentaenoic acid)	750 mg†˘
DHA (docosahexaenoic acid)	500 mg†˘

* Percent daily value is based on a 2000 calorie diet.
† Daily value not established.

˘ Guaranteed analysis EPA+DHA – 1250 mg

Real Dose Omega-3 TG

Not to be out-done, Real Dose has put together a great fish oil supplement as well.

This one is slightly less expensive and has the convenience of worldwide shipping.

As with NutraSea, it packs a huge amount of TG-formed omega-3s with 620 mg of EPA and 460 mg of DHA. And for those who don't enjoy fish oil in liquid form, Real Dose's soft gel capsules might be a bit easier on the palette.

Here's the ingredient label:

Supplement Facts

Serving Size: 2 Soft Gels
Servings Per Container: 60

Two Soft Gels Contain		% Daily Value
Calories (energy)	**20**	
Calories from Fat	20	
Total Fat	**2 g**	**3%***
Polyunsaturated Fat	1.5 g	†
Cholesterol	**<5 mg**	**<2%***
Omega-3 Fatty Acids as TG**	**1200 mg**	†
EPA (Eicosapentaenoic Acid) as TG**	620 mg	†
DHA (Docosahexaenoic Acid) as TG**	460 mg	†
Additional Omega-3 Fatty Acids as TG**	120 mg	†

* Percent Daily Values are based on a 2,000 calorie diet.
† Daily Value not established.
** Superior Triglyceride Form

Ingredients: Highly Refined and Concentrated Omega-3 Fish Oil (anchovy, sardine, mackerel), Capsule Shell (gelatin, glycerin, purified water), Natural Lemon/Lime Flavor, Proprietary Antioxidant Blend (consisting of natural tocopherols (soy), rosemary extract, and ascorbyl palmitate).

Click here to learn more about NutraSea

Wrapping Up

For the majority of your life, you've probably been told that fats were categorically bad for you and that the only way to be lean and healthy was to avoid them completely if at all possible. Even diets that allow fat don't encourage the consumption of good fats; instead, they just give you a number and tell you not to eat more of ANY fat than that.

Hopefully, we've managed to enlighten you to the healthy delights of good fats as well as the differences between all of the supplements out there.

Now that we've reached the end of this report, you know that not only are some fats OK to eat, you actually need them to survive! Omega 3's are a vital part of your survival and there really is no better source for them than fresh-caught cold-water fish. Of course, given the level of toxins now found in them along with our propensity to NOT eat the foods that are good for us, perhaps a fish oil supplement is a better fit for you.

If so, that's OK, too. Now you know which kinds of fish oil are best for you, how they are processed and how your body responds to each kind. In short, you have enough information to make an educated decision about what kind of omega-3 fatty acid supplement is right for you.

In my humble opinion, fish oil is best if you have no aversion or allergy to fish. If you do, then perhaps you should consider algae supplements because they offer the same wonderful preformed variety of omega-3 fatty acids that fish oil does.

Regardless of which one you choose, do so in the best of health!

About Yuri Elkaim BPHE, CK, RHN

Coined a “rogue” nutritionist and inspiring fitness expert, Yuri has helped more than 65,000 people worldwide lose weight, get in great shape, eat healthier, and have a much better understanding of their health.

He’s a Registered Holistic Nutritionist, Certified Kinesiologist, a High Honours graduate in Physical Education and Health, and a former professional soccer player.

He is the owner of Total Wellness Consulting, the professor of Super Nutrition Academy, the author of Eating for Energy and the Total Wellness Cleanse, and the creator of more than 130 workout programs, including Fitter U and Treadmill Trainer.

For the 7 seasons, Yuri’s also acted as the head strength & conditioning and nutrition coach for the men’s soccer program at the University of Toronto.

Yuri and his programs been featured across the nation’s media including Breakfast Television, Perfect Fit, A-Channel Morning, CTV news, e-Talk Daily, Global News. He’s also a frequent contributor to numerous magazines including Maximum Fitness, VIVA, Impact magazine, Wish, and Fitness Business Canada - just to name a few.

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