Research on the Benefits of Paragon Fish Oil

The following research shows some of the benefits associated with the ingredients and nutrients of Paragon Fish Oil, as found in association with CRI Naturals, LLC. CRI Naturals, LLC believes the following excerpts and citations from respected scientific sources, substantiate the claims being made on CRI Naturals, LLC marketing mediums.

The Paragon Fish Oil dietary supplement is purified from metals & toxins through molecular distillation, ultra-concentrated, and enterically coated to help prevent a fishy aftertaste.

Ingredients of Paragon Fish Oil

2,000 mg Fish Oil from 100% wild caught fish including herring, anchovy, sardine, salmon and mackerel:

1. 800 mg EPA (Eicosapentaenoic Acid)
2. 600 mg DHA (Docosahexaenoic Acid)

Other Ingredients

3. Gelatin (bovine)
4. Vegetable Glycerin
5. Purified Water
6. Enteric Coating
7. Natural Vitamin E

==========

Claim 1: Ultra concentrated omega 3 fish oil. Paragon Fish Oil provides 800 mg EPA and 600 mg DHA per serving. Most other fish oils range from 100 - 200 mg EPA per serving and 50 - 200 mg DHA per serving.

Excerpt:

Abstract

Omega-3 fatty acids have a long history of use as dietary supplements and more recently for therapeutic applications as prescription pharmaceuticals. Achieving a high concentration is critical for developing convenient, practical therapeutic formulations. The objective of the study was to explore the uptake and effects of different concentrations of omega-3 acid ethyl esters. Three different omega-3 concentrations were investigated in a clinical study with 101 subjects. All participants were dosed for 14 days with 5.1g per day of eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) ethyl esters provided in three concentrations: 62.5%, 80% and 85% of total fatty acids. Key endpoints of the study were serum phospholipids and standard fasting lipid panels at day 14. Although administered the same quantity of omega-3 fatty acids, the patients taking the more concentrated formulations had higher levels of EPA/DHA in serum phospholipids and greater reductions in serum triglyceride and VLDL cholesterol levels. Total and non-HDL cholesterol were significantly reduced from baseline with all three formulations. In conclusion the concentration of omega-3 fatty acids of the formulations studied had independent effects on the uptake and effect outcomes during short-term administration. Very high concentrations of omega-3 acid ethyl esters (80%) appear to have higher uptake and are more potent for reducing triglycerides (TGs) and VLDL-cholesterol than formulations with lower concentrations.

Source:

Bryhn M, Hansteen H, Schanche T, Aakre SE. The bioavailability and pharmacodynamics of different concentrations of omega-3 acid ethyl esters. Prostaglandins Leukot Essent Fatty Acids. 2006 Jul;75(1):19-24. doi: 10.1016/j.plefa.2006.04.003. Epub 2006 Jun 27. PMID: 16806871.

==========

Claim 2: Most health organizations recommend at least 500 mg of combined EPA + DHA / day to stay healthy. It can go up to 1 g or even more if you have a history of heart condition.

Excerpt

Adequate daily intake of fish oils, particularly EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid), is associated with a wealth of health benefits including decreased risk of heart disease, lower blood pressure, improvement in rheumatoid arthritis, prevention of macular degeneration, and reduced risk of type 2 diabetes. There is also evidence that fish oil consumption is beneficial for patients with depression, schizophrenia, and Parkinson's disease. Finally, several studies have confirmed that fish oils, especially DHA, are essential for optimum development of an infant's brain and visual acuity. The American Heart Association (AHA) also recommends that patients with heart disease consume at least 1000 mg of EPA + DHA every day. Thus, it is not surprising that health authorities promote the frequent consumption of fish: the AHA specifically recommends that healthy people eat fish at least twice a week (preferably oily). Considering that oily fish, such as sardines, mackerel, salmon and tuna contain anywhere between 800 and 1500 mg of EPA + DHA per 3-oz (85 grams) serving means that people eating two oily fish meals a week would obtain between 230 and 430 mg/day of EPA + DHA

Source:

Manni, A. & Guerriero, Ettore & A., Guarnieri & Cincinelli, Alessandra & Rotatori, Mauro & Mosca, Silvia. (2010). POLYCHLORINATED BIPHENYLS (PCBs) IN FISH OIL DIETARY SUPPLEMENTS BY GPC AUTOMATED CLEAN-UP METHOD.

Excerpt:

Mainstream health organizations like the World Health Organization (WHO) and European Food Safety Authority (EFSA) recommend a minimum of 250–500 mg combined EPA and DHA each day for healthy adults (46)

Source(s):

https://www.healthline.com/nutrition/omega-3-guide#dosage

(46) https://health.gov/sites/default/files/2020-01/DietaryGuidelines2010.pdf

Excerpt:

One study followed 11,000 people who took an 850-mg dose of combined EPA and DHA every day for 3.5 years. They experienced a 25% reduction in heart attacks and a 45% reduction in sudden death

Source(s):

https://www.healthline.com/nutrition/how-much-omega-3#general-guidelines

https://pubmed.ncbi.nlm.nih.gov/10465168/

Excerpt:

Although the ideal amount to take is not firmly established, evidence from prospective secondary prevention studies suggests that intakes of EPA+DHA ranging from 0.5 to 1.8 grams per day (either as fatty fish or supplements) significantly reduce the number of deaths from heart disease and all causes.

Source:

https://www.ahajournals.org/doi/10.1161/01.ATV.0000057393.97337.AE

Excerpt:

Studies suggest that high doses of omega-3, ranging from 200–2,200 mg per day, can reduce symptoms of depression and anxiety (12, 14, 15).

In cases of mood and mental disorders, a supplement with higher amounts of EPA than DHA may be optimal.

Sources:

https://www.healthline.com/nutrition/how-much-omega-3#health-conditions

(12) https://pubmed.ncbi.nlm.nih.gov/21939614/

(14) https://pubmed.ncbi.nlm.nih.gov/19499625/

(15) https://pubmed.ncbi.nlm.nih.gov/21784145/

==========

Claim 3: Enterically Coated To Help Prevent Fish Aftertaste - if you have ever taken fish oil in the past, you may have experienced the occasional burps, this can cause substantial problems when in a social setting such as work. This is the reason that Paragon fish oil is sent through an Enteric Coating Process which allows the capsules to pass undissolved through the stomach into the intestinal tract where they break down. This eliminates the fishy aftertaste that is sometimes an issue with uncoated capsules.

Excerpt:

Enteric coating is a special coating used on oral medications and supplements that helps a substance maintain a certain makeup or quality even when exposed to harsh acids inside the stomach.

After you swallow a pill or capsule, it sits and churns in the stomach for up to two hours, exposing it to a highly acidic environment (somewhere between pH 1-4) that can compromise the makeup of the supplement. Enteric coating powder like MAAC prevents the stomach from dissolving the enzymes too early and from losing their effectiveness. Studies show that enzymes may lose activity in the low pH environment of the stomach, which is why enteric coatings are so important when dealing with enzymes and other particularly fragile supplements.

Gentler on the Stomach — Enteric coated medications are said to be gentler on the stomach, since they move past the stomach and absorb in the intestinal tract. This is especially favorable when taking medications, such as aspirin, that tend to cause upset stomach or nausea.

Easier to Digest — In the case of fatty acid or fish oil supplements, an enteric coating may help prevent gross fish-tasting burps and aftertaste while also allowing the body to better absorb the Omega-3 oils and other nutritional components that are beneficial to the body when properly absorbed.

Source:

https://astenzymes.com/the-complete-guide-to-enteric-coating/

==========

Claim 4: Processed using one of the best purification methods available, Molecular Distillation, which is the only current method that can remove heavy metals, PCBs, and other toxins to below detectable limits for human consumption. Compared to most other processing methods that heat the oil to temperatures of up to 250 degrees Celsius for 6 hours, Molecular Distillation takes only 45 seconds at the same temperature helping to preserve the quality of the fish oil and guarantees that no Trans Fats are created.

Excerpt:

'Omega-3 fatty acids concentration can be performed using different technologies, including molecular distillation (MD), urea precipitation, enzymatic enrichment, and supercritical fluid techniques. A combination of two or more of them is often needed because the raw material is extremely heterogeneous and contains different undesirable compounds. The most suitable method depends on raw material composition, target purity, selectivity, stability, and environmental considerations.'

'Currently, the most utilized method to concentrate ω-3 FAs at an industrial scale is probably molecular distillation (MD), also known as short path distillation. Compounds are separated according to their vapor pressures under high vacuum conditions (10^{-3} bar), forcing the molecules to travel a pathway that is shorter than their mean free path. FAEEs have a lower boiling point than triglycerides (ca. 450 ◦C vs. >900 ◦C) and this allows an easier separation [64,81]. MD is widely used on an industrial scale, nonetheless, yield and selectivity are quite low (between 55 and 70%) if compared to the market demand for highly concentrated oils (≥85%) [3,63,64]. Moreover, despite the short time of operation, this tech- nique operates in the range of 140–170 ◦C, constituting a risk for thermolabile compounds.

To avoid problems related to PUFAs thermolability enzyme-catalyzed methods al- lowing mild operating conditions and chemicals have been developed [61]. Some lipases can discriminate against ω-3 fatty acids and this ability has been ascribed to the steric hindrance provided by the double bonds in the active site of the enzyme. Moreover, these methods can carry out the ω-3 FAs enrichment dealing directly with intact TAGs, skipping the transesterification step. Microbial lipases hydrolyze TAGs into fatty acids, acylglycerols, and glycerol. Free fatty acids are then esterified with simple alcohol or glycerol [67].'

Source(s):

3. Fiori, L.; Volpe, M.; Lucian, M.; Anesi, A.; Manfrini, M.; Guella, G. From Fish Waste to Omega-3 Concentrates in a Biorefinery Concept. Waste Biomass Valorization 2017, 8, 2609–2620.

61. Yves, H.; Korma, S.A.; Ali, A.H.; Tuyishime, M.A.; Habinshuti, I.; Abed, S.M. Extraction, Refining and Purification of ω-3 PUFA through Different Techniques—A Review. Am. J. Food Sci. Nutr. Res. 2016, 4, 18–26.

63. Melgosa, R.; Sanz, M.T.; Beltrán, S. Supercritical CO2 processing of omega-3 polyunsaturated fatty acids—Towards a biorefinery for fish waste valorization. J. Supercrit. Fluids 2020.

64. Ciriminna, R.; Meneguzzo, F.; Delisi, R.; Pagliaro, M. Enhancing and improving the extraction of omega-3 from fish oil. Sustain. Chem. Pharm. 2017, 5, 54–59. [

67. Ferraro, V.; Cruz, I.B.; Jorge, R.F.; Malcata, F.X.; Pintado, M.E.; Castro, P.M.L. Valorisation of natural extracts from marine source focused on marine by-products: A review. Food Res. Int. 2010, 43, 2221–2233.

81. Rossi, P.; Grosso, N.R.; Pramparo, M.D.C.; Nepote, V. Fractionation and concentration of omega-3 by molecular distillation. In Eicosapentaenoic Acid: Sources, Health Effects and Role in Disease Prevention; Nova Science Publishers: New York, NY, USA, 2012; pp. 177–203.

Excerpt:

Other PUFA concentration methods

Other methods for the concentration of PUFA include molecular or short-path distillation, filtration by membranes and the formation of complexes with urea.

Molecular distillation is a technology that can be used appropriately for the separation, purification or concentration of thermolabile substances, since it operates with high vacuum pressures (lower than an absolute pressure of 1,000-500 kPa) (Cerón, Cardona, & Toro, 2012; Pramparo, Prizzon, & Martinello, 2005).

Although in some cases this technology is used as an oil purification process for the removal of organic pollutants (Olli, Breivik, & Thorstad, 2013), it has also been applied in the concentration of PUFA, particularly of EPA and DHA in free form or as ethyl esters (Oliveira & Miller, 2014; Solaesa, Sanz, Falkeborg, Beltrán, & Guo, 2016; Wang et al., 2012). Likewise, in tuna oil, Wang et al. (2012) achieved a concentration increase of the total content of EPA and DHA from 32.11 % to 82.23 %, and similarly, Solaesa et al. (2016) reached an increase in the concentration of acylglycerols of omega-3 PUFA from 63 % to 91 % in sardine oil.

Membrane filtration is characterized by the application of hydraulic pressure as a driving force for mass transfer. The nature of the membrane controls which components will permeate, and which will be retained, according to their molar mass or particle size.

This technology has been used in degumming, recovery of solvents in extraction processes, pigment removal, acidity reduction, concentration of minor components, removal of waxes and separation of emulsions (De Morais-Coutinho et al., 2009), just as in PUFA (Ghasemian, Sahari, Barzegar, & Ahmadi, 2016; Ghasemian, Sahari, Barzegar, & Gavlighi, 2015; Linder et al., 2005; Linder, Matouba, Fanni, & Parmentier, 2002).

Thus, in salmon oil, the decrease in saturated fatty acids has been observed from 27.2 % to 20.2 %, while the PUFA content increased from 41.6 % to 46.5 %, with an increase of DHA from 9.9 % to 11.6 %, and EPA from 3.6 % to 5.6 % (Linder et al., 2005).

Nevertheless, Ghasemian et al. (2015) performed an optimization study for the concentration of omega-3 PUFA by polymeric membrane in fish oil, in which they evaluated the effect of temperature, pressure and agitation speed. These authors found that the optimal conditions were 36.19 °C, 4.82 bars and 43.01 r.p.m., respectively, which resulted in a maximum omega-3 PUFA value of 35.11 %.

On the other hand, the formation of complexes with urea is the simplest and most efficient technique to obtain omega-3 PUFA concentrates as free fatty acids or ethyl esters of triacylglycerols. Saturated and monounsaturated fatty acids are separated from polyunsaturated fatty acids starting from a saturated solution of urea, in which all the fatty acids are found.

By cooling and filtration, the compounds formed between the saturated and monounsaturated fatty acids can be removed during crystallization. PUFAs do not form inclusion complexes with urea, so they remain concentrated in the liquid fraction (Homayooni et al., 2014).

Studies on this technique mainly evaluate the relationship between urea and fatty acid, tempera-ture and crystallization time (Gámez et al., 2003; Homayooni et al., 2014; Liu, Zhang, Hong, & Ji, 2006; Suriani, Lawalata, & Komansilan, 2014; Tengku-Rozaina & Birch, 2013).

With this method, DHA and EPA contents higher than 85.02 % in tuna oil were obtained (Liu et al., 2006), with a ratio of urea: fatty acid of 15, a temperature of -5 °C and in a time period of 20 hours. In sardine oil, the highest amounts of DHA and EPA were found at -10 °C and 1 °C, respectively, where the DHA was enriched from 17.45 % to 29.61 % and the EPA from 15.39 % to 19.76 % (Homayooni et al., 2014).

Source(s):

http://www.scielo.org.co/scielo.php?script=sci_arttext&pid=S0122-87062018000300645#B11

Cerón, I. X., Cardona, C. A., & Toro, L. A. (2012). Simulación del proceso de concentración de aceite esencial de cidrón (*Lippia citriodora*) por destilación molecular de película descendente. *Ingeniería y Competitividad*, *14*(1), 107-120. Retrieved from http://hdl.handle.net/10893/5497.

Pramparo, M., Prizzon, S., & Martinello, M. A. (2005). Estudio de la purificación de ácidos grasos, tocoferoles y esteroles a partir del destilado de desodorización. *Grasas y Aceites*, *56*(3), 228-234.

Olli, J. J., Breivik, H., & Thorstad, O. (2013). Removal of persistent organic pollutants in fish oils using short-path distillation with a working fluid. *Chemosphere*, *92*(3), 273-278. doi:10.1016/j.chemosphere.2013.02.037.

Oliveira, A. C. M., & Miller, M. R. (2014). Purification of Alaskan walleye pollock (*Gadus chalcogrammus*) and New Zealand hoki (*Macruronus novaezelandiae*) liver oil using short path distillation. *Nutrients*, 6(5), 2059-2076. doi:10.3390/nu6052059.

Solaesa, Á. G., Sanz, M. T., Falkeborg, M., Beltrán, S., & Guo, Z. (2016). Production and concentration of monoacylglycerols rich in omega-3 polyunsaturated fatty acids by enzymatic glycerolysis and molecular distillation. *Food Chemistry*, *190*, 960-967. doi:10.1016/j.foodchem.2015.06.061.

Vázquez, J. A., Nogueira, M., Durán, A., Prieto, M. A., Rodríguez-Amado, I., Rial, D., ... & Murado, M. A. (2011). Preparation of marine silage of swordfish, ray and shark visceral waste by lactic acid bacteria. *Journal of Food Engineering*, *103*(4), 442-448. doi:10.1016/j.jfoodeng.2010.11.014.

Ghasemian, S., Sahari, M. A., Barzegar, M., & Ahmadi, H. (2016). Omega-3 polyunsaturated fatty acids concentration using synthesized polyvinylidene fluoride (PVDF) asymmetric membranes. *Journal of the American Oil Chemists' Society*, *93*(9), 1201-1210. doi:10.1007/s11746-016-2876-8.

Linder, M., Fanni, J., & Parmentier, M. (2005). Proteolytic extraction of salmon oil and PUFA concentration by lipases. *Marine Biotechnology*, 7(1), 70-76. doi:10.1007/s10126-004-0149-2.

Ghasemian, S., Sahari, M. A., Barzegar, M., & Gavlighi, H. A. (2015). Concentration of Omega-3 polyunsaturated fatty acids by polymeric membrane. *International Journal of Food Science & Technology*, *50*(11), 2411-2418. doi:10.1111/ijfs.12907.

Homayooni, B., Sahari, M. A., & Barzegar, M. (2014). Concentrations of omega-3 fatty acids from rainbow sardine fish oil by various methods. *International Food Research Journal*, *21*(2), 743-748.

Gámez, N., Noriega, J. A., Medina, L. A., Ortega, J., Monroy, J., Toro, F. J., … & Angulo, O. (2003). Concentration of eicosapentaenoic acid and docosahexaenoic acid from fish oil by hydrolysis and urea complexation. *Food Research International*, *36*(7), 721-727. doi:10.1016/S0963-9969(03)00052-8.

Liu, S., Zhang, C., Hong, P., & Ji, H. (2006). Concentration of docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA) of tuna oil by urea complexation: Optimization of process parameters. *Journal of Food Engineering*, *73*(3), 203-209. doi:10.1016/j.jfoodeng.2005.01.020.

Suriani, N. W., Lawalata, H. J., & Komansilan, A. (2014). Urea crystallization on the concentrate making of omega-3 fatty acid from oil of tuna fish (*Thunnus* sp.) canning byproduct. *International Journal of PharmTech Research*, 6(7), 1981-1990.

==========

Claim 5: This product is PCB tested and guaranteed to be within Proposition 65 limits

Excerpt

What is Proposition 65?

Proposition 65, more formally known as the Safe Drinking Water and Toxic Enforcement Act of 1986, is a California law passed by citizen initiative with 63% of the popular vote. The statute reads:

"No person in the course of doing business shall knowingly discharge or release a chemical known to the state to cause cancer or reproductive toxicity into water or onto or into land where such chemical passes or probably will pass into any source of drinking water…" (CA Health and Safety Code, Section 25249.5)

"No person in the course of doing business shall knowingly and intentionally expose any individual to a chemical known to the state to cause cancer or reproductive toxicity without first giving a clear and reasonable warning…" (CA Health and Safety Code, Section 25249.6)

Proposition 65 provides that the Legislature may amend the law by a two-thirds vote and only "to further its purposes."

What does Proposition 65 require?

List of chemicals: Proposition 65 requires the Governor to publish a list of chemicals that are known to the state of California to cause cancer or reproductive toxicity, and to update this list at least once a year. The Office of Environmental Health Hazard Assessment (OEHHA) maintains the list of chemicals regulated under Proposition 65. (CA Code of Regulations, Title 27, Section 27001)

The most recent list can be found here: http://www.oehha.ca.gov/prop65/prop65_list/files/P65single062212.pdf.

Businesses that expose individuals to listed chemicals, or discharge listed chemicals, must comply with the following requirements:

Clear and reasonable warnings: A business is required to warn a person before "knowingly and intentionally" exposing that person to a listed chemical. A business must be aware that it is causing an exposure, and the exposure must result from a deliberate act, like the sale of a product. There is no requirement that a business is aware that the exposure violates the law, or intends to violate the law or cause harm. The warning given must be "clear and reasonable" and must effectively reach the person before exposure. Warning requirements take effect 12 months after the date that a chemical is added to the Proposition 65 list.

Source:

https://www.epa.gov/pcbs/learn-about-polychlorinated-biphenyls-pcbs

Excerpt:

To counteract low consumption of fish, many people use dietary supplements containing fish oils.

However, despite these health benefits, consumers have to ensure that the fish oil that they consume does not contain contaminants.

Many studies suggest that there are concerns that some fish oil supplements may contain polychlorinated

Biphenyls (PCB's)2,3,4,5,6,7. Polychorinated biphenyls are lipophilic which means that they have an affinity towards lipids or fats and are able to dissolve in them–this is one reason for the concern for these compounds being found in fish oil supplements.

To reduce the presence of these pollutants the supplements producers clean the fish oils before being packaged, using molecular distillation or solid sorbents as activated carbon.

Other producers to limit production costs do not make this clean-up. It is therefore important to perform control tests on the amount of PCBs present in these dietary supplements.

Source(s):

Manni, A. & Guerriero, Ettore & A., Guarnieri & Cincinelli, Alessandra & Rotatori, Mauro & Mosca, Silvia. (2010). POLYCHLORINATED BIPHENYLS (PCBs) IN FISH OIL DIETARY SUPPLEMENTS BY GPC AUTOMATED CLEAN-UP METHOD.

2. Martì M., Ortiz X., Gasser M., Martì R., Montaña M.J., Díaz-Ferrero J. (2010) Chemosphere 78: 1256– 1262

3. Rawn D.F., Breakell K., Verigin V., Nicolidakis H., Sit D., Feeley M. (2008); J Food Sci.74 (1):T14-19

4. Hasegawa, J., Guruge, K.S., Seike, N., Shirai, Y., Yamata, T., Nakamura, M., Handa, H.,

Yamanaka, N., Miyazaki, S. (2007) . Chemosphere 69:1188–1194

5. Tsutsumi, T., Amakura, Y., Tanno, K., Yanagi, T., Kono, Y., Sasaki, K., Maitani, T. (2007)

Organohalogen compounds. 69: 2371–2374

6. Zennegg, M., Schmid, P. (2006) Organohalogen compounds 68: 1967–1970.

7. Fernandes A. R., Rose M., White S., Mortimer D. N., Gem M. (2006) Food Addit. Contam. 23: 939–94

==========

Claim 6: *Paragon Fish Oil* uses a non-GMO formula.

Source:

https://www.nsf.org/blog/consumer/clearing-confusion-organic-non-gmo-labels

Excerpt:

What Does Non-GMO Mean?

Genetically modified organisms (GMOs) are created by deliberately changing the genetic makeup of a plant or animal in ways that could never occur naturally. The majority of GMO crops currently on the market have been genetically engineered to produce their own pesticides and/or withstand herbicides that normally would kill them. Farmers use the herbicides to control weeds. Non-GMO certified products have been verified to have been grown and processed without genetic modification.

Source:

https://www.nsf.org/blog/consumer/clearing-confusion-organic-non-gmo-labels

==========

Claim 7: When it comes to fish oil, you get what you pay for. Fish oil sitting on the shelf in the store can be there for months or years... And old fish oil not only has no health benefits, but it can even be dangerous. Rancid fish oil becomes peroxidized, meaning that free radicals damage and break up the cells. Taking rancid fish oil can poison you at a molecular level. That's why we bottle fresh, ethically caught and produced, high quality and concentrated fish oil and ship it directly to you.

Excerpt:

What is oxidation of fatty acids?

Oxidation is what happens to the unsaturated fatty acids found in fats and oils when they are exposed to oxygen. Reaction of unsaturated fatty acids containing pentadiene structures with oxygen is possible due to the presence of easily abstractable hydrogen atoms, permitting the insertion of molecular oxygen. Upon reaction with oxygen from the air that surrounds us, some of the chemical bonds in the fatty acid molecules rearrange and further reactions take place to form new molecules. All lipids containing unsaturated fatty acids oxidize over time, whether in cooking oils or fish oil capsules, and this can ultimately lead to the oil becoming rancid. In EPA- and DHA-rich oils, this degradation is most often linked to a fishy taste or odor, which is why omega-3 companies try to manage the oxidation process.

When unsaturated fatty acids oxidize, they form a variety of oxidative products like fatty acid peroxides, alcohols and aldehydes. Some specific oxidation products resulting from the lipid peroxidation of highly unsaturated fatty

acids include 4-hydroxy-2-hexenal (4-HHE), 4-hydroxy-2-nonenal (4-HNE), and a wide variety of isoprostanes, whose presence are often monitored as signs of oxidative stress in clinical trials.

Exposure to oxygen, light, heat and the degree of unsaturation of the fatty acids all contribute to oxidation rates 1. Highly unsaturated lipids, like EPA and DHA, are especially prone to oxidation and require special handling to prevent off-flavors from developing. Some of these measures include the use of antioxidants to slow the rate of oxidation, limiting exposure to oxygen during manufacturing, refining oils in a vacuum, and blanketing storage containers with inert gases (i.e. nitrogen) that displace air. These strategies appear to be effective and are widely used in the manufacturing of omega-3 products.

It is important to understand that the oxidation of unsaturated fatty acids can occur in our own bodies, but this process is tightly controlled by our antioxidant defenses, effectively allowing us to remain healthy in an oxygen-rich atmosphere. This same strategy, defending against the oxidation process employing antioxidants, is used in omega-3 products to keep oils from going rancid. For example, Kolanowski et al. tested 19 commercially available brands of fish oils and noted that oxidation was stable in products stored at room temperature for 22 days with no noticeable changes in oxidation 2. Consumers should expect the products they purchase to be below oxidation limits through the end of the products' shelf lives when these strategies are effectively utilized by manufacturers.

Source(s):

https://onlinelibrary.wiley.com/doi/full/10.1002/lite.201600013

1 Shahidi, F. and Y. Zhongin, Bailey's Industrial Oil and Fat Products. Newfoundland: John Wiley & Sons, 2005, pp. 357– 385.

2 Kolanowski, W., International Journal of Food Properties 2010, 13, 498– 511.

==========

Claim 8: Fish Oil is full of Omega 3 Fatty Acids and is known to lower blood triglyceride levels, the free-floating fat in your bloodstream. Anyone who wants to experience superior long term circulatory and cardiac health will benefit from a health investment in Paragon Fish Oil.

Excerpt:

Omega-3 fatty acids appear to confer CV benefits largely through DHA and EPA enrichment of membrane phospholipids.9 Via this mechanism, omega-3 fatty acids can ultimately increase arrhythmic thresholds,10 reduce blood pressure,11, 12 improve arterial and endothelial function,13 reduce platelet aggregation,14 and favorably affect autonomic tone 11, 15 (Table 2). In a meta-regression analysis of 22 double-blind studies, Geleijnse et al16 reported that consumption of approximately 4.0 g/d of omega-3 fatty acid was associated with a significant 1.7- and 1.5-mm Hg reduction in systolic and diastolic blood pressures, respectively; these reductions were more pronounced in older patients and in those with higher blood pressures. Evidence suggests that lowering systolic blood pressure by as little as 2 mm Hg can yield reductions of 4% in mortality due to CAD. 17

Source(s):

https://www.mayoclinicproceedings.org/article/S0025-6196(11)60866-5/fulltext

Harris WS

Omega-3 fatty acids and cardiovascular disease: a case for omega-3 index as a new risk factor. Pharmacol Res. 2007 Mar; 55 (Epub 2007 Jan 25.): 217-223 (9)

Anand RG, Alkadri M, Lavie CJ, Milani RV

The role of fish oil in arrhythmia prevention.

J Cardiopulm Rehabil Prev. 2008; 28: 2-8 (10)

O'Keefe Jr, JH, Abuissa H, Sastre A, Steinhaus DM, Harris WS

Effects of omega-3 fatty acids on resting heart rate, heart rate recovery after exercise, and heart rate variability in men with healed myocardial infarctions and depressed ejection fractions. (Epub 2006 Mar 3.): 1127-1130 (11)

Ventura HO, Milani RV, Lavie CJ, et al.

Cyclosporine-induced hypertension: efficacy of omega-3 fatty acids in patients after cardiac transplantation. Circulation. 1993; 88: II281-II285 (12)

Thies F, Garry JM, Yaqoob P, et al.

Association of n-3 polyunsaturated fatty acids with stability of atherosclerotic plaques: a randomised controlled trial. Lancet. 2003; 361: 477-485 (13)

Din JN, Harding SA, Valerio CJ, et al. Dietary intervention with oil rich fish reduces platelet-monocyte aggregation in man [published online ahead of print April 27, 2007]. Atherosclerosis, doi:10.1016/j.atherosclerosis.2007.04 .047. (14)

Abuissa A, O'Keefe Jr, JH, Harris WS, Lavie CJ

Autonomic function, omega-3, and cardiovascular risk [editorial]. (15)

Geleijnse JM, Giltay EJ, Grobbee DE, Donders AR, Kok FJ

Blood pressure response to fish oil supplementation: metaregression analysis of randomized trials. J Hypertens. 2002; 20: 1493-1499 (16)

Ueshima H, Stamler J, Elliott P, INTERMAP Research Group et al.

Food omega-3 fatty acid intake of individuals (total, linolenic acid, long-chain) and their blood pressure: INTERMAP study. Hypertension. 2007 Aug; 50 (Epub 2007 Jun 4.): 313-319 (17)

Excerpt:

Fish oil is a dietary source of omega-3 fatty acids. Your body needs omega-3 fatty acids for many functions, from muscle activity to cell growth.

Evidence

Research on the use of fish oil for specific conditions shows:

Heart disease. While research shows that people who eat dietary sources of fish oil at least twice a week have a lower risk of dying of heart disease, taking fish oil supplements seems to have little to no benefits to heart health.

High blood pressure. Multiple studies report modest reductions in blood pressure in people who take fish oil supplements. There's some evidence that the beneficial effects of fish oil might be greater for people with moderate to severe high blood pressure than for those with mild blood pressure elevation.

High triglycerides and cholesterol. There's strong evidence that omega-3 fatty acids can significantly reduce blood triglyceride levels. There also appears to be a slight improvement in high-density lipoprotein (HDL, or "good") cholesterol, although an increase in levels of low-density lipoprotein (LDL, or "bad") cholesterol also was observed.

Rheumatoid arthritis. Studies suggest fish oil supplements might help reduce pain, improve morning stiffness and relieve joint tenderness in people with rheumatoid arthritis. While relief is often modest, it might be enough to reduce the need for anti-inflammatory medications.

Source:

https://www.mayoclinic.org/drugs-supplements-fish-oil/art-20364810

==========

Claim 9: Paragon Fish Oil is rich in two Omega-3 Fatty Acids, EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid), which are recognized for their benefits in supporting cardiovascular health and supporting normal blood pressure levels. Each serving typically provides 800 milligrams of EPA and 600 milligrams of DHA, more than double that of most fish oil products on the market!

Excerpt:

Consistent data from animal models, epidemiologic studies, and randomized controlled trials have suggested that increased -3 fatty acids intakes from fish or supplements decrease risks of fatal coronary heart disease 1,2 and sudden cardiac death.3 There are several possible mechanisms by which fatty acids may operate, including decreases in blood pressure,4 lipids,5 and platelet aggregation and inflammation.6 Because these effects have been documented only in studies using higher doses (3 to 5 g/day) than can be practically achieved by diet, they may not account for the decreased risk seen with lower doses (1 g/day)1 that are

currently recommended by the American Heart Association.2 Observational studies have linked diets high in fish to increased heart rate (HR) variability,7 decreased HR,8 and improved endothelial function.9 However, these end points have not been studied in the most clinically relevant setting, namely, patients with coronary heart disease who take low

doses of docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA).

Source(s):

1. He K, Song Y, Daviglus ML, Liu K, Van Horn L, Dyer AR, Greenland

P. Accumulated evidence on fish consumption and coronary heart

disease mortality: a meta-analysis of cohort studies. Circulation 2004;

109:2705–2711.

2. Kris-Etherton PM, Harris WS, Appel LJ. Fish consumption, fish oil,

omega-3 fatty acids, and cardiovascular disease. Circulation 2002;

106:2747–2757.

3. GISSI-Prevenzione Investigators. Dietary supplementation with n-3

polyunsaturated fatty acids and vitamin E in 11,324 patients with

myocardial infarction: results of the GISSI-Prevenzione trial. Lancet

1999;354:447–455.

4. Morris MC, Sacks FM, Rosner B. Does fish oil lower blood pressure?

A meta-analysis of controlled trials. Circulation 1993;88:523–533.

5. Harris WS. N-3 fatty acids and serum lipoproteins: human studies.

Am J Clin Nutr 1997;65(suppl):1645S–1654S.

6. Calder PC. Dietary fatty acids and the immune system. Nutr Rev

1998;56(suppl):S70–S83.

7. Christensen JH, Korup E, Aarøe J, Toft E, Moller J, Rasmussen K,

Dyerberg J, Schmidt EB. Fish consumption, n-3 fatty acids in cell membranes, and heart rate variability in survivors of myocardial infarction with

left ventricular dysfunction. Am J Cardiol 1997;79:1670–1673.

8. Mozaffarian D, Geelen A, Brouwer IA, Geleijnse JM, Zock PL, Katan

MB. Effect of fish oil on heart rate in humans: a meta-analysis of

randomized controlled trials. Circulation 2005;112:1945–1952.

9. Nestel P, Shige H, Pomeroy S, Cehun M, Abbey M, Raederstorff D.

The n-3 fatty acids eicosapentaenoic acid and docosahexaenoic acid

increase systemic arterial compliance in humans. Am J Clin Nutr

2002;76:326–330.

https://www.ajconline.org/article/S0002-9149(06)00029-4/pdf

==========

Claim 10: The use of Paragon Fish Oil supports heart health.

Excerpt:

Whether marine omega-3 supplementation is associated with reduction in risk of cardiovascular disease (CVD) remains controversial. Methods and Results This meta-analysis included study-level data from 13 trials. The outcomes of interest included myocardial infarction, coronary heart disease (CHD) death, total CHD, total stroke, CVD death, total CVD, and major vascular events. The unadjusted rate ratios were calculated using a fixed-effect meta-analysis. A meta-regression was conducted to estimate the dose-response relationship between marine omega-3 dosage and risk of each prespecified outcome. During a mean treatment duration of 5.0 years, 3838 myocardial infarctions, 3008 CHD deaths, 8435 total CHD events, 2683 strokes, 5017 CVD deaths, 15 759 total CVD events, and 16 478 major vascular events were documented. In the analysis excluding REDUCE-IT (Reduction of Cardiovascular Events with Icosapent Ethyl-Intervention Trial), marine omega-3 supplementation was associated with significantly lower risk of myocardial infarction (rate ratio [RR] [95% CI]: 0.92 [0.86, 0.99]; P=0.020), CHD death (RR [95% CI]: 0.92 [0.86, 0.98]; P=0.014), total CHD (RR [95% CI]: 0.95 [0.91, 0.99]; P=0.008), CVD death (RR [95% CI]: 0.93 [0.88, 0.99]; P=0.013), and total CVD (RR [95% CI]: 0.97 [0.94, 0.99]; P=0.015). Inverse associations for all outcomes were strengthened after including REDUCE-IT while introducing statistically significant heterogeneity. Statistically significant linear dose-response relationships were found for total CVD and major vascular events in the analyses with and without including REDUCE-IT. Conclusions Marine omega-3 supplementation lowers risk for myocardial infarction, CHD death, total CHD, CVD death, and total CVD, even after exclusion of REDUCE-IT. Risk reductions appeared to be linearly related to marine omega-3 dose.

Source:

Hu Y, Hu FB, Manson JE. Marine Omega-3 Supplementation and Cardiovascular Disease: An Updated Meta-Analysis of 13 Randomized Controlled Trials Involving 127 477 Participants. J Am Heart Assoc. 2019 Oct;8(19):e013543. doi: 10.1161/JAHA.119.013543. Epub 2019 Sep 30. PMID: 31567003; PMCID: PMC6806028.

==========

Claim 12: The use of Paragon Fish Oil supports normal cholesterol levels.

Excerpt(s):

Abstract:

The beneficial effects of omega-3 polyunsaturated fatty acids (n-3 PUFAs) on cardiovascular disease have been studied extensively. However, it remains unclear to what extent n-3 PUFAs may impact Reverse Cholesterol Transport (RCT). RCT describes a mechanism by which excess cholesterol from peripheral tissues is transported to the liver for hepatobiliary excretion, thereby inhibiting foam cell formation and the development of atherosclerosis. The aim of this review is to summarize the literature and to provide an updated overview of the effects of n-3

PUFAs on key players in RCT, including apoliprotein AI (apoA-I), ATP-binding cassette transporter A1 (ABCA1), ABCG1, apoE, scavenger receptor class B type I (SR-BI), cholesteryl ester transfer protein (CETP), low-density lipoprotein receptor (LDLr), cholesterol 7 alpha-hydroxylase (CYP7A1) and ABCG5/G8. Based on current knowledge, we conclude that n-3 PUFAs may beneficially affect RCT, mainly by influencing high-density lipoprotein (HDL) remodeling and by promoting hepatobiliary sterol excretion.

Conclusions:

n-3 PUFAs have a positive impact on atherosclerosis and CVD, a major concern of today's health care systems. It is important to emphasize that the positive effects of n-3 PUFAs on CVD are thought to be mediated by diverse mechanisms, including the alteration of physical and chemical properties of cellular membranes, direct interaction with, and modulation of, membrane channels and proteins, regulation of gene expression via nuclear receptors and transcription factors, changes in eicosanoid profiles, and conversion of n-3 PUFAs to bioactive metabolites, which may promote ischemia-induced myocyte healing.

The aim of this article was to review possible beneficial effects of n-3 PUFAs on RCT. After evaluating available literature, it appears likely that this effect is, to a certain degree, mediated by positively influencing RCT on different levels, as illustrated by the stimulation of macrophage-to-feces RCT. However, these studies may not adequately illustrate the complexity of involved mechanisms and steps. Taking a closer look at the pivotal steps of RCT, the available literature suggests that n-3 PUFAs might affect several, but not all, involved processes. Interpretation of available studies is difficult and hampered by heterogenous study designs, sample sizes, different PUFA formulations used (n-3/n-6 PUFAs, phytosterols and/or single formulations of EPA or DHA etc.), and varying experimental approaches (in vivo versus in vitro). The application of results derived from mouse studies is limited by striking differences between murine and human lipoprotein metabolism, the mouse being an 'HDL' animal without CETP in plasma. Available studies in hamsters, which naturally express CETP, may help to better extrapolate observed physiological effects of n-3 PUFAs on RCT to the human setting. However, the number of studies in this animal model is limited, warranting further experiments in CETP-expressing, potentially dyslipidemic animal models to verify existing hypotheses on n-3 PUFAs and RCT. In summary, n-3 PUFAs may not significantly affect the first step of RCT—i.e., ATP-dependent cholesterol efflux mechanisms within atherosclerotic plaque macrophages—rather, they appear to beneficially affect HDL remodeling through LCAT and CETP, facilitating SR-BI and LDLr mediated hepatic uptake of plaque-derived excess cholesterol. In addition, n-3 PUFAs were clearly shown to promote hepatobiliary excretion of neutral and of acidic sterols, which is a pivotal final step in RCT.

Gaining further insight into the functionality of RCT may help to determine key populations who may substantially benefit from n-3 PUFA supplementation, an easy-to-obtain and interesting dietary supplement, with potentially promising effects in CVD.

Source:

Pizzini A, Lunger L, Demetz E, et al. The Role of Omega-3 Fatty Acids in Reverse Cholesterol Transport: A Review. Nutrients. 2017;9(10):1099. Published 2017 Oct 6. doi:10.3390/nu9101099

==========

Claim 13: Paragon Fish Oil promotes skin health.

Excerpt:

Fish oil and the related actives, such as omega-3 and omega-6 PUFAs, have been proved helpful for maintaining skin homeostasis and ameliorating cutaneous abnormalities. The fatty acids in fish oil can improve skin barrier function, inhibit UV-induced inflammation and hyperpigmentation, attenuate dry skin and pruritus elicited by dermatitis, accelerate skin wound healing, and prevent skin cancer development.

Source:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6117694/

Huang TH, Wang PW, Yang SC, Chou WL, Fang JY. Cosmetic and Therapeutic Applications of Fish Oil's Fatty Acids on the Skin. Mar Drugs. 2018;16(8):256. Published 2018 Jul 30. doi:10.3390/md16080256

Excerpt:

Omega-3 fatty acids, particularly EPA and DHA, have anti-inflammatory effects. So, it's speculated that they may indirectly fight acne by targeting inflammation (5).

In one small study, participants with acne had lower blood levels of EPA and higher blood levels of certain inflammatory markers than participants without acne (6).

Yet, it's not clear if supplementing with EPA or other omega-3s can prevent or treat acne.

A randomized, controlled trial in 45 people with mild to moderate acne found that taking 2,000 mg of EPA and DHA supplements daily for 10 weeks significantly decreased both inflammatory and noninflammatory acne lesions (7).

On the other hand, a study in 13 people with inflammatory acne observed no significant changes in acne severity or the number of inflammatory lesions after the participants took a daily fish oil supplement with 930 mg EPA for 12 weeks (5).

Source(s):

https://www.healthline.com/nutrition/omega-3-for-acne#benefits

(5) https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3543297/

(6) https://pubmed.ncbi.nlm.nih.gov/28025036/

(7) https://pubmed.ncbi.nlm.nih.gov/24553997/

==========

Claim 14: The regular use of Paragon Fish Oil supports proper inflammation response.

Excerpt:

The influence of marine n-3 PUFAs on the functional responses of the various cell types involved in inflammation and on the production of the range of chemical mediators produced has been studied for many years and a number of effects have been reported. Typically the effects observed are highly suggestive that marine n-3 PUFAs act in an anti-inflammatory manner, with more recent studies suggesting that they may be involved in the resolution of inflammation. The anti-inflammatory effects of marine n-3 fatty acids are widely reviewed

Source(s):

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3575932/#b9

Calder PC. N-3 polyunsaturated fatty acids, inflammation, and inflammatory diseases. Am J Clin Nutr. 2006;83:1505S–1519.

Calder PC. Fatty acids and inflammation: the cutting edge between food and pharma. Eur J Pharmacol. 2011;668:S50–58.

Excerpt

Cardiovascular disease is the cause of 38% of all deaths in the United States, many of which are preventable (28).

Chronic inflammation is thought to be the cause of many chronic diseases, including cardiovascular disease (29). EPA and DHA are thought to have anti-inflammatory effects and a role in oxidative stress (30) and to improve cellular function through changes in gene expression (31). In a study that used human blood samples, EPA+DHA intake changed the expression of 1040 genes and resulted in a decreased expression of genes involved in inflammatory and atherogenesis-related pathways, such as nuclear transcription factor κB signaling, eicosanoid synthesis, scavenger receptor activity, adipogenesis, and hypoxia signaling (31). Circulating markers of inflammation, such as C-reactive protein (CRP), TNF α, and some ILs (IL-6, IL-1), correlate with an increased probability of experiencing a cardiovascular event (32). Inflammatory markers such as IL-6 trigger CRP to be synthesized by the liver, and elevated levels of CRP are associated with an increased risk of the development of cardiovascular disease (33). A study of 89 patients showed that those treated with EPA+DHA had a significant reduction in high-sensitivity CRP (66.7%, $P < 0.01$) (33). The same study also showed a significant reduction in heat shock protein 27 antibody titers (57.69%, $P < 0.05$), which have been shown to be overexpressed in heart muscle cells after a return of blood flow after a period of ischemia (ischemia-reperfusion injury) and may potentially have a cardio-protective effect (33).

Source(s)

28. Kelley DS, Siegel D, Fedor DM, Adkins Y, Mackey BE. DHA supplementation decreases serum C-reactive protein and other markers of inflammation in hypertriglyceridemic men. J Nutr. 2009;139:495–501.

29. Schubert R, Kitz R, Beermann C, Rose MA, Baer PC, Zielen S, Boehles H. Influence of low-dose polyunsaturated fatty acids supplementation on the inflammatory response of healthy adults. Nutrition. 2007;23:724–30.

30. Bloomer RJ, Larson DE, Fisher-Wellman KH, Galpin AJ, Schilling BK. Effect of eicosapentaenoic and docosahexaenoic acid on resting and exercise-induced inflammatory and oxidative stress biomarkers: a randomized, placebo controlled, cross-over study. Lipids Health Dis. 2009;8:36.

31. Bouwens M, van de Rest O, Dellschaft N, Bromhaar MG, de Groot LC, Geleijnse JM, Muller M, Afman LA. Fish-oil supplementation induces antiinflammatory gene expression profiles in human blood mononuclear cells. Am J Clin Nutr. 2009;90:415–24.

32. Micallef MA, Garg ML. Anti-inflammatory and cardioprotective effects of n-3 polyunsaturated fatty acids and plant sterols in hyperlipidemic individuals. Atherosclerosis. 2009;204:476–82.

33. Ebrahimi M, Ghayour-Mobarhan M, Rezaiean S, Hoseini M, Parizade SM, Farhoudi F, Hosseininezhad SJ, Tavallaei S, Vejdani A, Azimi-Nezhad M, et al.. Omega-3 fatty acid supplements improve the cardiovascular risk profile of subjects with metabolic syndrome, including markers of inflammation and auto-immunity. Acta Cardiol. 2009;64:321–7.

Excerpt:

Abstract

Objective: To determine the following: 1) whether dietary supplementation with fish oil will allow the discontinuation of nonsteroidal antiinflammatory drugs (NSAIDs) in patients with rheumatoid arthritis (RA); 2) the clinical efficacy of high-dose dietary omega 3 fatty acid fish oil supplementation in RA patients; and 3) the effect of fish oil supplements on the production of multiple cytokines in this population.

Methods: Sixty-six RA patients entered a double-blind, placebo-controlled, prospective study of fish oil supplementation while taking diclofenac (75 mg twice a day). Patients took either 130 mg/kg/day of omega 3 fatty acids or 9 capsules/day of corn oil. Placebo diclofenac was substituted at week 18 or 22, and fish oil supplements

were continued for 8 weeks (to week 26 or 30). Serum levels of interleukin-1 beta (IL-1 beta), IL-2, IL-6, and IL-8 and tumor necrosis factor alpha were measured by enzyme-linked immunosorbent assay at baseline and during the study.

Results: In the group taking fish oil, there were significant decreases from baseline in the mean (+/- SEM) number of tender joints (5.3 +/- 0.835; P < 0.0001), duration of morning stiffness (-67.7 +/- 23.3 minutes; P = 0.008), physician's and patient's evaluation of global arthritis activity (-0.33 +/- 0.13; P = 0.017 and -0.38 +/- 0.17; P = 0.036, respectively), and physician's evaluation of pain (-0.38 +/- 0.12; P = 0.004). In patients taking corn oil, no clinical parameters improved from baseline. The decrease in the number of tender joints remained significant 8 weeks after discontinuing diclofenac in patients taking fish oil (-7.8 +/- 2.6; P = 0.011) and the decrease in the number of tender joints at this time was significant compared with that in patients receiving corn oil (P = 0.043). IL-1 beta decreased significantly from baseline through weeks 18 and 22 in patients consuming fish oil (-7.7 +/- 3.1; P = 0.026).

Conclusion: Patients taking dietary supplements of fish oil exhibit improvements in clinical parameters of disease activity from baseline, including the number of tender joints, and these improvements are associated with significant decreases in levels of IL-1 beta from baseline. Some patients who take fish oil are able to discontinue NSAIDs without experiencing a disease flare.

Source:

Kremer JM, Lawrence DA, Petrillo GF, Litts LL, Mullaly PM, Rynes RI, Stocker RP, Parhami N, Greenstein NS, Fuchs BR, et al. Effects of high-dose fish oil on rheumatoid arthritis after stopping nonsteroidal antiinflammatory drugs. Clinical and immune correlates. Arthritis Rheum. 1995 Aug;38(8):1107-14. doi: 10.1002/art.1780380813. PMID: 7639807.

Excerpt:

Abstract

Among the fatty acids, it is the omega-3 polyunsaturated fatty acids (PUFA) which possess the most potent immunomodulatory activities, and among the omega-3 PUFA, those from fish oil-eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA)--are more biologically potent than alpha-linolenic acid (ALA). Some of the effects of omega-3 PUFA are brought about by modulation of the amount and types of eicosanoids made, and other effects are elicited by eicosanoid-independent mechanisms, including actions upon intracellular signaling pathways, transcription factor activity and gene expression. Animal experiments and clinical intervention studies indicate that omega-3 fatty acids have anti-inflammatory properties and, therefore, might be useful in the management of inflammatory and autoimmune diseases. Coronary heart disease, major depression, aging and cancer are characterized by an increased level of interleukin 1 (IL-1), a proinflammatory cytokine. Similarly, arthritis, Crohn's disease, ulcerative colitis and lupus erythematosis are autoimmune diseases characterized by a high level of IL-1 and the proinflammatory leukotriene LTB(4) produced by omega-6 fatty acids. There have been a number of clinical

trials assessing the benefits of dietary supplementation with fish oils in several inflammatory and autoimmune diseases in humans, including rheumatoid arthritis, Crohn's disease, ulcerative colitis, psoriasis, lupus erythematosus, multiple sclerosis and migraine headaches. Many of the placebo-controlled trials of fish oil in chronic inflammatory diseases reveal significant benefit, including decreased disease activity and a lowered use of anti-inflammatory drugs.

Source:

Bloch MH, Qawasmi A. Omega-3 fatty acid supplementation for the treatment of children with attention-deficit/hyperactivity disorder symptomatology: systematic review and meta-analysis. J Am Acad Child Adolesc Psychiatry. 2011 Oct;50(10):991-1000. doi: 10.1016/j.jaac.2011.06.008. Epub 2011 Aug 12. PMID: 21961774; PMCID: PMC3625948.

https://pubmed.ncbi.nlm.nih.gov/21961774/

==========

Claim 15: The regular use of Paragon Fish Oil support the stimulation of joint mobility.

Excerpt:

Abstract

Background: This study aimed to investigate the effect of supplementation of fish oil rich in eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) on the damage of the biceps brachii after eccentric contractions (ECCs) of the elbow flexors, particularly focusing on muscle stiffness.

Methods: Sixteen men were included in this double-blind, placebo-controlled, parallel design study and the participants were randomly assigned to the EPA and DHA supplement group (EPA, n = 8) and placebo group (PL, n = 8). They consumed either EPA 600 mg and DHA 260 mg per day or placebo supplement for 8 weeks prior to exercise. Moreover, they performed six sets of 10 ECCs at 100% maximal voluntary contraction (MVC) using a dumbbell. Changes in MVC torque, range of motion (ROM), upper arm circumference, muscle soreness, muscle echo intensity, and muscle stiffness were assessed before exercise; immediately after exercise; and 1, 2, and 5 days after exercise.

Results: MVC torque and ROM were significantly higher in the EPA group than in the PL group after ECCs ($p < 0.05$). Muscle soreness, upper arm circumference, and muscle echo intensity were significantly higher in the PL group than in the EPA group after ECCs ($p < 0.05$). In addition, muscle stiffness at 150° was significantly higher in the PL group than in the EPA group immediately after ECCs ($p < 0.05$).

Conclusion: The present study showed that EPA and DHA supplementation has a positive role in inhibiting muscle stiffness after ECCs.

Source:

Tsuchiya Y, Yanagimoto K, Ueda H, Ochi E. Supplementation of eicosapentaenoic acid-rich fish oil attenuates muscle stiffness after eccentric contractions of human elbow flexors. J Int Soc Sports Nutr. 2019 Apr 15;16(1):19. doi: 10.1186/s12970-019-0283-x. PMID: 30987668; PMCID: PMC6466674.

Excerpt:

Between 40% and 60% of Americans use complementary and alternative medicine to manage medical conditions, prevent disease, and promote health and well-being. Omega-3 polyunsaturated fatty acids (omega-3 PUFAs) have been used to treat joint pain associated with several inflammatory conditions. We conducted a meta-analysis of 17 randomized, controlled trials assessing the pain relieving effects of omega-3 PUFAs in patients with rheumatoid arthritis or joint pain secondary to inflammatory bowel disease and dysmenorrhea.

The results suggest that omega-3 PUFAs are an attractive adjunctive treatment for joint pain associated with rheumatoid arthritis, inflammatory bowel disease, and dysmenorrhea.

Source(s):

Goldberg RJ, Katz J. A meta-analysis of the analgesic effects of omega-3 polyunsaturated fatty acid supplementation for inflammatory joint pain. Pain. 2007 May;129(1-2):210-23. doi: 10.1016/j.pain.2007.01.020. Epub 2007 Mar 1. PMID: 17335973.

https://pubmed.ncbi.nlm.nih.gov/17335973/

- **Research suggests that fish oil from supplements and food sources can reduce triglyceride levels. The effects of fish oil appear to be the greatest in people who have very high triglyceride levels. It could also be effective on heart disease, preventing re-blockage of blood vessels after angioplasty, attention deficit-hyperactivity disorder (ADHD) in children, bipolar disorder, etc.**

Excerpt(s):

Abstract

Objective: Several studies have demonstrated differences in omega-3 fatty acid composition in plasma and in erythrocyte membranes in patients with attention-deficit/hyperactivity disorder (ADHD) compared with unaffected controls. Omega-3 fatty acids have anti-inflammatory properties and can alter central nervous system cell membrane fluidity and phospholipid composition. Cell membrane fluidity can alter serotonin and dopamine neurotransmission. The goal of this meta-analysis was to examine the efficacy of omega-3 fatty acid supplementation in children with ADHD.

Method: PubMed was searched for randomized placebo-controlled trials examining omega-3 fatty acid supplementation in children with ADHD symptomatology. The primary outcome measurement was standardized mean difference in rating scales of ADHD severity. Secondary analyses were conducted to determine the effects of dosing of different omega-3 fatty acids in supplements.

Results: Ten trials involving 699 children were included in this meta-analysis. Omega-3 fatty acid supplementation demonstrated a small but significant effect in improving ADHD symptoms. Eicosapentaenoic acid dose within supplements was significantly correlated with supplement efficacy. No evidence of publication bias or heterogeneity between trials was found.

Conclusion: Omega-3 fatty acid supplementation, particularly with higher doses of eicosapentaenoic acid, was modestly effective in the treatment of ADHD. The relative efficacy of omega-3 fatty acid supplementation was modest compared with currently available pharmacotherapies for ADHD such as psychostimulants, atomoxetine, or α(2) agonists. However, given its relatively benign side-effect profile and evidence of modest efficacy, it may be reasonable to use omega-3 fatty supplementation to augment traditional pharmacologic interventions or for families who decline other psychopharmacologic options.

Source(s):

Bloch MH, Qawasmi A. Omega-3 fatty acid supplementation for the treatment of children with attention-deficit/hyperactivity disorder symptomatology: systematic review and meta-analysis. J Am Acad Child Adolesc Psychiatry. 2011 Oct;50(10):991-1000. doi: 10.1016/j.jaac.2011.06.008. Epub 2011 Aug 12. PMID: 21961774; PMCID: PMC3625948.

https://pubmed.ncbi.nlm.nih.gov/21961774/

Excerpt:

Abstract

Attention-deficit/hyperactivity disorder (ADHD) is a common neurodevelopmental disorder. The classical treatment of ADHD where stimulant medication is used has revealed severe side effects and intolerance. Consequently, the demand to search for alternative treatment has increased rapidly. When comparing levels of omega-3 polyunsaturated fatty acids (ω-3 PUFAs) in ADHD patients with those in age-matching controls, lower levels are found in ADHD patients' blood. ω-3 PUFAs are essential nutrients and necessary for a proper brain function and development. Additionally, there are strong indications that ω-3 PUFA supplements could have beneficial effects on ADHD. However, the results of ω-3 PUFA supplementation studies show a high variability. Therefore, we reviewed recent studies published between 2000 and 2015 to identify effective treatment combinations, the quality of design, and safety and tolerability of ω-3-containing food supplements. We searched the databases MEDLINE, PubMed, and Web of Science with keywords such as "ADHD" and "ω-3/6 PUFA" and identified 25 studies that met the inclusion and exclusion criteria. The results of these ω-3 PUFA studies are contradictory but, overall, show evidence for a successful treatment of ADHD symptoms. Tolerability of the given supplements was high, and only mild side effects were reported. In conclusion, there is evidence that a ω-3 PUFA treatment has a positive effect on ADHD. It should be added that treatment could be more effective in patients with mild forms of ADHD. Moreover, the dosage of stimulant medication could be reduced when used in combination with ω-3 PUFA supplements. Further studies are necessary to investigate underlying mechanisms that can lead to a reduction of ADHD symptoms due to ω-3 PUFA treatments and also to determine the optimal concentrations of ω-3 PUFAs, whether used as single treatment or in combination with other medication.

Source:

Königs A, Kiliaan AJ. Critical appraisal of omega-3 fatty acids in attention-deficit/hyperactivity disorder treatment. Neuropsychiatr Dis Treat. 2016;12:1869-1882. Published 2016 Jul 26. doi:10.2147/NDT.S68652

Excerpt:

Abstract

Objective: To evaluate the effects of fish oil (FO), a source of the omega-3 polyunsaturated fatty acids (n-3 PUFA), eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), on emotion-generated corticolimbic functional connectivity in depressed youth at high risk for developing bipolar I disorder.

Methods: Thirty-nine antidepressant-free youth with a current depressive disorder diagnosis and a biological parent with bipolar I disorder were randomized to 12-week double-blind treatment with FO or placebo. At baseline and endpoint, fMRI (4 Tesla) scans were obtained while performing a continuous performance task with emotional and neutral distractors (CPT-END). Seed-to-voxel functional connectivity analyses were performed using bilateral orbitofrontal cortex (OFC) and amygdala (AMY) seeds. Measures of depression, mania, global symptom severity, and erythrocyte fatty acids were obtained.

Results: Erythrocyte EPA+DHA composition increased significantly in the FO group (+47%, $p \leq 0.0001$) but not in the placebo group (-10%, $p = 0.11$). Significant group by time interactions were found for functional connectivity between the left OFC and the left superior temporal gyrus (STG) and between the right AMY and right inferior temporal gyrus (ITG). OFC-STG connectivity increased in the FO group ($p = 0.0001$) and decreased in the placebo group ($p = 0.0019$), and AMY-ITG connectivity decreased in the FO group ($p = 0.0014$) and increased in the placebo group ($p < 0.0001$). In the FO group, but not placebo group, the decrease in AMY-ITG functional connectivity correlated with decreases in Childhood Depression Rating Scale-Revised and Clinical Global Impression-Severity Scale scores.

Conclusions: In depressed high-risk youth FO supplementation alters emotion-generated corticolimbic functional connectivity which correlates with changes in symptom severity ratings.

Source:

McNamara RK, Li W, Lei D, Tallman MJ, Welge JA, Strawn JR, Patino LR, DelBello MP. Fish oil supplementation alters emotion-generated corticolimbic functional connectivity in depressed adolescents at high-risk for bipolar I disorder: A 12-week placebo-controlled fMRI trial. Bipolar Disord. 2022 Mar;24(2):161-170. doi: 10.1111/bdi.13110. Epub 2021 Jul 23. PMID: 34214231; PMCID: PMC8720319.

Excerpt:

Omega-3 fatty acids play an important role to regulate genes that are critical for controlling lipid homeostasis. Omega-3 fatty acids decrease VLDL assembly and secretion, resulting in diminished triacylglycerol production, through a decreased activity of sterol receptor element-binding protein-1c, which is the key switch in controlling lipogenesis.21 In addition, omega-3 fatty acids could promote β-oxidation simultaneously in mitochondria and/or peroxisomes, possibly through the activation of peroxisome PPAR-α, leading to the reduction of fatty acids substrate for triglyceride synthesis.21,22 The remnant lipoprotein (RLP), produced from the triacylglycerol-rich chylomicrons and VLDL, exerts potent pro-atherogenic effects and is thus regarded as an important risk factor of CVD.22,23 The involvement of RLP has been suggested in the pathogenesis of sudden cardiac death22 and restenosis after coronary angioplasty.23 Although omega-3 fatty acids do not have a major effect on fasting total cholesterol and LDL cholesterol levels, EPA effectively reduces RLP in hyperlipidaemic patients.24

Source(s):

21. Sampath H, Ntambi JM. Polyunsaturated fatty acid regulation of genes of lipid metabolism. Annu Rev Nutr. 2005;25:317–340. doi:10.1146/annurev.nutr.25.051804.101917.

22. Oi K, Shimokawa H, Hiroki J, Uwatoku T, Abe K, Matsumoto Y, Nakajima Y, Nakajima K, Takeichi S, Takeshita A. Remnant lipoproteins from patients with sudden cardiac death enhance coronary vasospastic activity through upregulation of Rho-kinase. Arterioscler Thromb Vasc Biol. 2004;24:918–922. doi:10.1161/01.ATV.0000126678.93747.80.

23. Oi K, Shimokawa H, Hirakawa Y, Tashiro H, Nakaike R, Kozai T, Ohzono K, Yamamoto K, Koyanagi S, Okamatsu S, Tajimi T, Kikuchi Y, Takeshita A. Postprandial increase in plasma concentrations of remnant-like particles: an independent risk factor for restenosis after percutaneous coronary intervention. J Cardiovasc Pharmacol. 2004;44:66–73. doi:10.1097/00005344-200407000-00009.

24. Nakamura N, Hamazaki T, Ohta M, Okuda K, Urakaze M, Sawazaki S, Yamazaki K, Satoh A, Temaru R, Ishikura Y, Takata M, Kishida M, Kobayashi M. Joint effects of HMG-CoA reductase inhibitors and eicosapentaenoic acids on serum lipid profile and plasma fatty acid concentrations in patients with hyperlipidemia. Int J Clin Lab Res. 1999;29:22–25. doi:10.1007/s005990050057.

ncbi.nlm.nih.gov/pmc/articles/PMC3279313/#EHR362C21

==========

Claim 16: Anyone who wants to experience superior long term circulatory and cardiac health will benefit from a health investment in Paragon Fish Oil.

Excerpt(s):

Omega-3 fatty acids are also used to treat hyperlipidemia and hypertension.

The American Heart Association recommends consumption of two servings of fish per week for persons with no history of coronary heart disease and at least one serving of fish daily for those with known coronary heart disease. Approximately 1 g/day of eicosapentaenoic acid plus docosahexaenoic acid is recommended for cardio protection. Higher dosages of omega-3 fatty acids are required to reduce elevated triglyceride levels (2-4 g/day). Modest decreases in blood pressure occur with significantly higher dosages of omega-3 fatty acids.

Source(s):

Jain AP, Aggarwal KK, Zhang PY. Omega-3 fatty acids and cardiovascular disease. Eur Rev Med Pharmacol Sci. 2015;19(3):441-5. PMID: 25720716.

The above research was collected and compiled by Kiah Traendly, Registered Dietitian Nutritionist (RDN). Kiah obtained her credentials in Dietetics and Nutrition in 2015 at Keiser University in South Florida. Throughout the past seven years she has gained a wide variety of experience in healthcare, community, education, research and private practice. Currently, Kiah has been providing the medical nutrition therapy that has been valuable in settings such as hospitals and long- term care facilities focusing on acute and chronic illnesses in the San Diego area.