Should I be Eating More Fish

LIVING WELL – Show 109

7/20/2024

Benefits of Eating Fish

Rich in Omega-3 Fatty Acids: Fish, especially fatty fish-like salmon, tuna, sardines, and mackerel, are rich in omega-3 fatty acids.

Omega-3s are essential for heart health, brain function, and may help reduce inflammation.

High-Quality Protein: Fish is a good source of lean protein, which is important for building and maintaining muscle mass.

Vitamins and Minerals: Fish provides essential vitamins and minerals like vitamin D, vitamin B12, selenium, iodine, and phosphorus.

Healthy Molecules: Polyphenols and Flavonoids

https://ods.od.nih.gov/factsheets/Omega3FattyAcids-HealthProfessional/#:~:text=Cold%2Dwater%20fatty%20fish%2C%20such%20as%20salmon%2C%20mackerel%2C,composition%20of%20the%20food%20that%20the%20fish

Considerations of Eating Fish

Mercury Levels: Some fish, particularly larger predatory fish like king mackerel, swordfish, and tilefish, can contain higher levels of mercury.

Pregnant women, women who may become pregnant, and young children are restricted due to mercury intake in fish. They can choose low-mercury fish options (Lower on the Food Chain).

Sustainability: Overfishing can deplete fish populations and harm marine ecosystems. Choosing fish caught using sustainable practices is important for the environment.

Personal Preferences: Do you enjoy the taste and texture of fish? If not, there might be other ways to get the nutrients fish offer, such as through supplements or other protein sources.

https://www.fda.gov/food/environmental-contaminants-food/fdaepa-2004-advice-what-you-need-know-about-mercury-fish-and-shellfish

Fish and Omega-3 as a Health Food

Eating fish 2-3 times a week is generally recommended as part of a healthy diet.

Choose a variety of low-mercury fish options caught using sustainable practices. (Lower on the Food Chain)

If you don't enjoy fish or have concerns about mercury intake, leafy vegetables or Flax seeds Foods. Flaxseed, canola oil, walnuts, sunflower seeds and soybeans are all good sources of omega-3 fatty acids.

Fortified foods. Yogurt, milk and eggs can be fortified with omega-3 fatty acids.

Supplements. Supplements typically contain fish oil or omega-3 fatty acids from marine plant sources with toxins removed. Many prenatal vitamins also contain DHA an Omega-3 for Brain Health.

Talk to your health care professional before taking any supplement.

https://www.fda.gov/food/consumers/advice-about-eating-fish

Omega-3 As a Dietary Supplement

- According to a 2018 NCCIH survey, **7.8% of US adults and 1.1% of children ages 4–17** had taken a fish oil supplement in the previous 30 days.
- A 2019 AARP article states that 10% of Americans take fish oil supplements **to support their heart health.**
- A 2024 CNN article says that **20% of adults over 60 in the US frequently take fish oil** supplements for the same reason

https://www.nccih.nih.gov/health/omega3-supplements-in-depth

https://www.seafoodsource.com/news/foodservice-retail/americans-consumed-a-record-amount-of-seafood-in-2021

Typical Americans Seafood Consumption

Popular Seafood Choices in the US:

- In 2021, Americans ate a record **20.5 pounds (9.3 kg) of seafood per person**, which was a 1.5 pound increase from 2020.
- This includes finfish and shellfish.
- The most popular types of seafood in 2021 were:
  - Shrimp: 5.9 pounds per person
  - Salmon: 3.38 pounds per capita
  - Canned tuna: 1.90 pounds per capita
  - Other Options: Tilapia, Alaska pollock, cod, crab, catfish, pangasius, and scallops round out the top 10 list, collectively making up 4.4 pounds per person.

How Much Meat Americans Eat Annually

- According to estimates, Americans consume an average of **236 pounds of meat per person annually in 2024.**

- Here's a breakdown of the average consumption by category:

Meat Category	Average Consumption (lbs/person/year)
Beef	57
Pork	67
Chicken	112
Total Red Meat	124
Total Poultry	112
Total Meat	236

https://ourworldindata.org/grapher/per-capita-meat-consumption-by-type-kilograms-per-year?country=OWID_WRL~USA

It's important to note that this is an average and individual consumption may vary depending on factors like dietary preferences, age, and geographic location.

Countries that Eat the Most Seafood

Coastal countries tend to have the highest consumption of fish and seafood, with some people eating more than 80 kilograms of aquatic foods per year.

As of 2020, the Maldives in South Asia had the highest per capita consumption of fish at 87.3 kilograms (191 lbs) per person.

Other countries with high per capita consumption include:

https://www.weforum.org/agenda/2022/11/chart-shows-countries-consume-fish-food-security/

Iceland: 84.3 kilograms per person in 2020

Macau: 70.26 kilograms per person in 2020

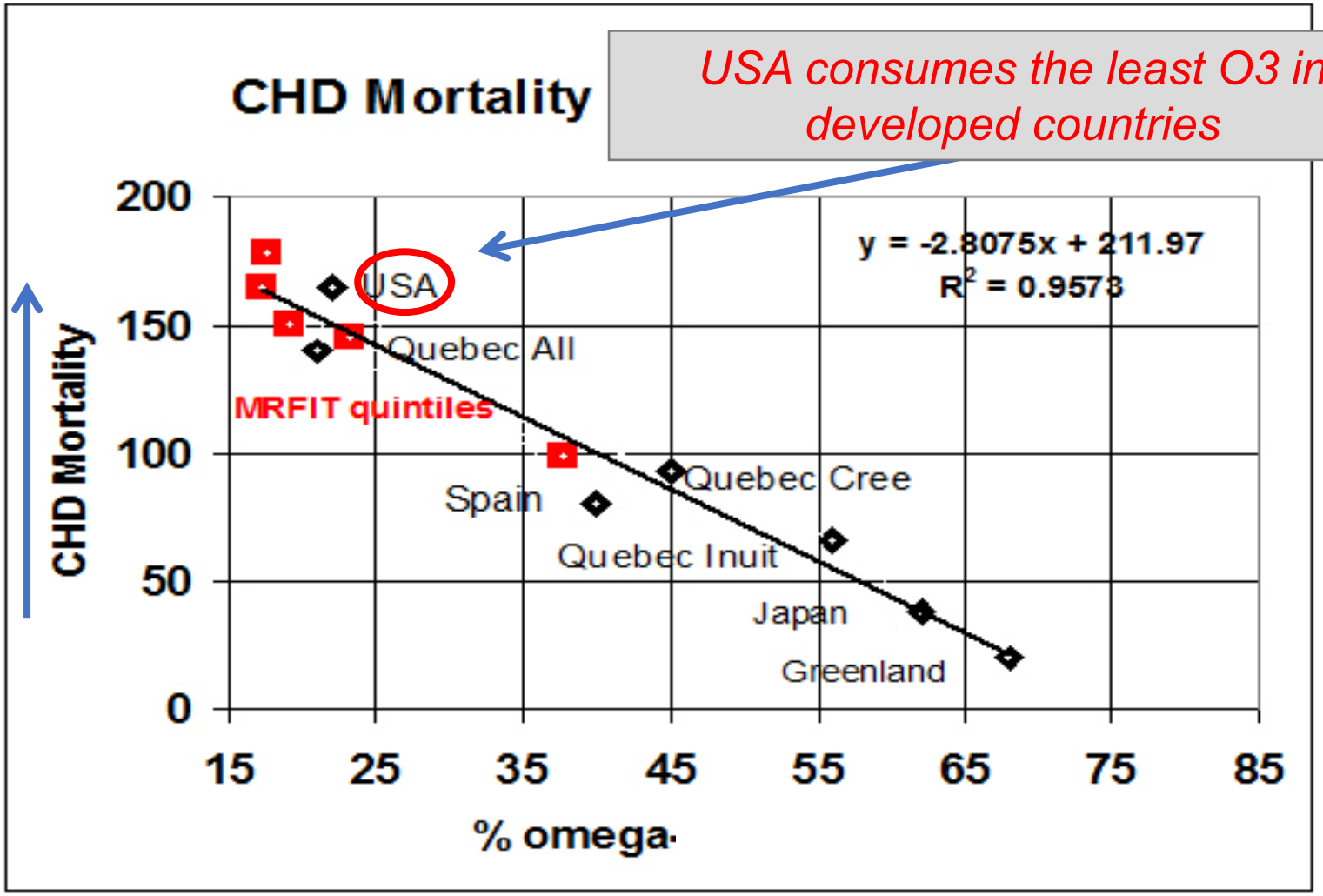
Kiribati: 69.22 kilograms per person in 2020

Portugal: 59.9 kilograms per person per year in the EU

China: 34.27 kilograms per person per year in 2022

Mexico: An estimated 14 kilograms per person per year in 2019

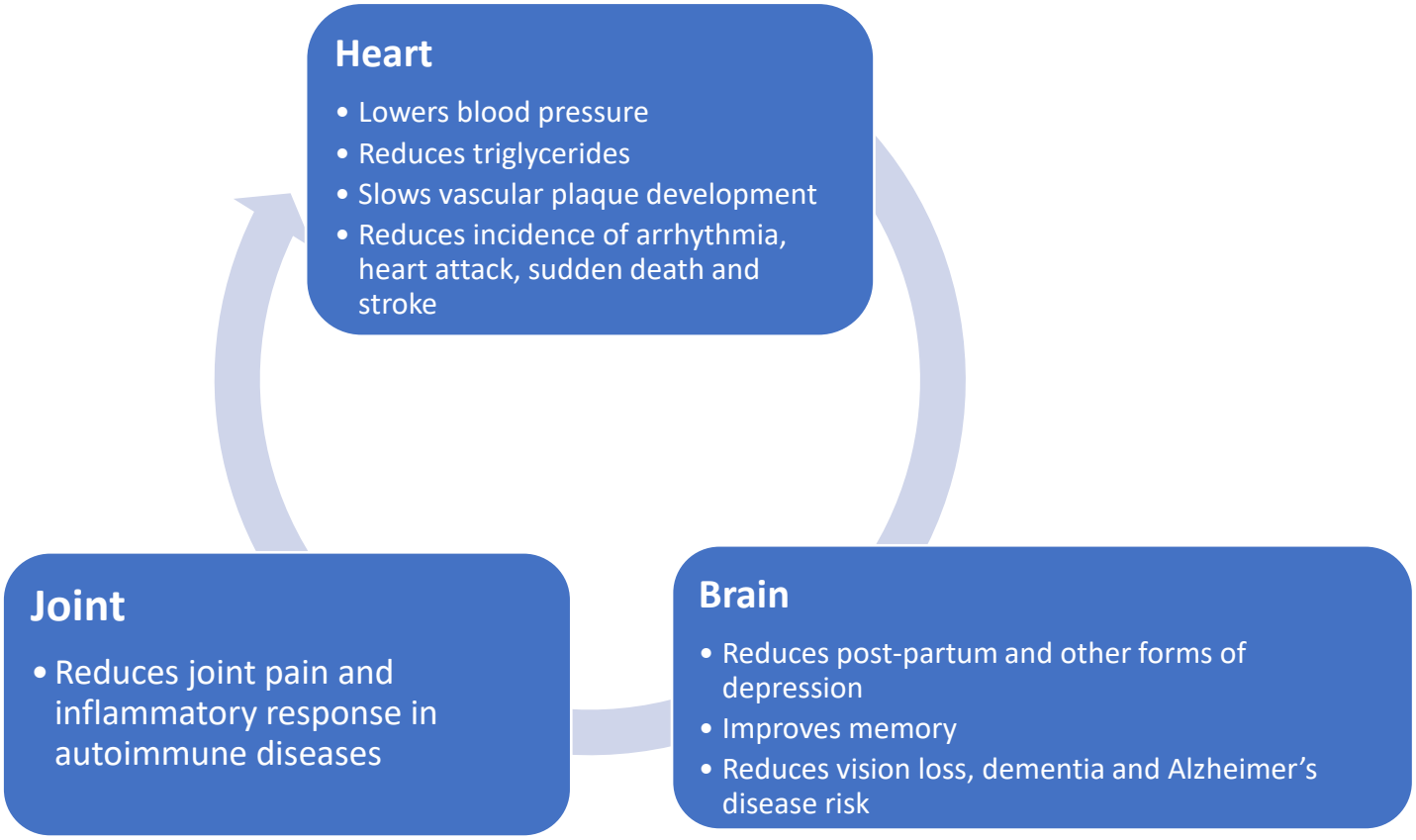
Omega-3 – Cardiovascular Disease



60% of Americans are deficient in Omega-3

Lands, Lipids 2003 (Apr.); 38: 317–321

Amazing Benefits of Omega-3 EFA



https://my.clevelandclinic.org/health/articles/17290-omega-3-fatty-acids

AHA Fish Oil Recommendation

Summary of AHA Recommendations for Omega-3 Fatty Acid Intake

Patient population	Recommendation
No documented history of CHD	**Eat a variety of fish (preferably oily) at least twice per week. Include oils and foods rich in alpha-linolenic acid (flaxseed, canola, and soybean oils; flaxseeds and walnuts).**
Documented history of CHD	Consume approximately 1 g of EPA plus DHA daily, preferably from oily fish. EPA plus DHA capsule supplements may be used in consultation with a physician.
Needs to lower triglyceride level	Consume 2 to 4 g of EPA plus DHA daily in capsules in consultation with a physician.

AHA = American Heart Association; CHD = coronary heart disease; EPA = eicosapentaenoic acid; DHA = docosahexaenoic acid.
Adapted with permission from Kris-Etherton PM, Harris WS, Appel LJ; American Heart Association. Nutrition Committee. Fish consumption, fish oil, omega-3 fatty acids, and cardiovascular disease. Circulation 2002;106:2755.

Background: Fish Oil Discovery

Why do Greenland's Inuit rarely get heart disease in spite of a high-fat diet consisting mostly of whale blubber and seal meat?

PLASMA LIPID AND LIPOPROTEIN PATTERN IN GREENLANDIC WEST-COAST ESKIMOS

H.O. Bang , J. Dyerberg , AaseBro¤ndum Nielsen

The Lancet, Volume 297, Issue 7710, Pages 1143 - 1146, 5 June 1971

The plasma-lipid pattern, including quantitative lipoprotein electrophoresis, was examined in 130 Eskimos (69 females, 61 males) — hunters and/or fishermen, and their wives — in the northern part of the west coast of Greenland, and consuming a predominantly meat diet rich in polyunsaturated fatty acids. Most types of lipid were decreased, compared with Danish controls and Eskimos living in Denmark. The most remarkable finding was a much lower level of pre-β-lipoprotein and consequently of plasma-triglycerides in Greenlandic Eskimos than in Danish controls. These findings may explain the very low incidence of ischæmic heart-disease and the complete absence of diabetes mellitus in Greenlandic Eskimos.

Department of Clinical Chemistry, Aalborg Hospital North, , Denmark

Omega-3 EFAs: SCIENCE FACTS

- **Polyunsaturated fatty acid –** concentrated in cold-water fish and seafood in various amounts.

  Note- High heat like cooking lowers O3 levels

- **Essential Fatty Acid** – Human's cannot make Omega-3's must be obtained from food

  Note – 2021 research has found that over 68% of adults and 95% of children in the United States do not consume enough omega-3s to meet nutritional needs based on the US Dietary Guidelines

- **Key ingredients in Fish oil-** eicosapentaenoic acid (EPA) and docosahexanoic acid (DHA).

https://www.nutraceuticalsworld.com/contents/view_breaking-news/2021-05-27/study-finds-most-us-adults-have-low-blood-serum-levels-of-omega-3s/#:~:text=A%20study%20published%20in%20the,the%20high%20cardiovascular%20risk%20category.

Omega-3 Effects Every Cell in the Body

Structural

- In every cell & mitochondria membranes Omega -3 counters overwhelming amounts of arachidonic acid (Omega-6).
- Omega-3 Enhances membrane fluidity, improves protein/enzyme function and ion channel conduction

Hormonal

- Omega-3 used to make anti-inflammatory hormones –eicosanoids to counter inflammatory prostaglandins from arachidonic acid (Corn oils) Omega-6

Genetic

- Omega-3 binds to transcription factors (i.e. PPARs and Nrf2) - down regulate gene expression of inflammation

Omega-3 supplementation alters mitochondrial membrane composition and respiration kinetics in human skeletal muscle
J Physiol. 2014 Mar 15; 592(Pt 6): 1341–1352.
Published online 2014 Feb 13. doi: 10.1113/jphysiol.2013.267336
PMCID: PMC3961091 PMID: 24396061

Comparing Omega-3 and Omega-6
(American have TOO MUCH O-6 Due to The Western Diet)

Omega-3- "Good" Prostaglandins	Omega-6- "Bad" Prostaglandins
Prevents blood clots caused by platelet aggregation	Promotes blood clots caused by platelet aggregation
Cause vasodilatation of blood vessels	Cause vasoconstriction of blood vessels
Reduce pain	Promote pain
Decrease cell division	Promote cell division
Enhance the immune system	Depress the immune system
Improve brain function	Depress brain function

A P Simopoulos. Omega-3 fatty acids in health and disease and in growth and development. Am J Clin Nutr **September 1991** vol. 54 no. 3 **438-463**

Latest Research on Omega-3 as a Dietary Supplement

Lung Benefits

- In 2023 a study showed that higher levels of omega-3 fatty acids in a person's blood were associated with a **reduced rate of lung function decline**. N = 15,000

Cardiovascular Disease Protection (Recent Studies)

- In the Vitamin D and Omega-3 Trial (VITAL), 840 mg/d of eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) resulted in a **28% reduced risk for heart attacks, 50% reduced risk for fatal heart attacks, and 17% reduced risk for total coronary heart disease events.**
- In the ASCEND trial (A Study of Cardiovascular Events in Diabetes), **cardiovascular disease death was significantly reduced by 19% with 840 mg/d of EPA and DHA.**
- In REDUCE-IT (the Reduction of Cardiovascular Events with EPA) there was a **25% decrease in the primary end point of major cardiovascular events with 4 g/d EPA in patients with elevated triglycerides (135–499 mg/dL)** who already were taking a statin drug.

Investigating associations of omega-3 fatty acids, lung function decline, and airway obstruction. Am J Respir Crit Care Med. 2023; doi: 10.1164/rccm.202301-0074OC

Methodist Debakey Cardiovasc J. 2019 Jul-Sep; 15(3): 171–178.
doi: 10.14797/mdcj-15-3-171
PMCID: PMC6822654
PMID: 31687095
Recent Clinical Trials Shed New Light on the Cardiovascular Benefits of Omega-3 Fatty Acids

Latest Research on Omega-3 as a Dietary Supplement

University of Gothenburg. "Preterm babies given certain fatty acids have better vision." ScienceDaily. ScienceDaily, 24 August 2023. <www.sciencedaily.com/releases/2023/08/230824111854.htm>.
McBurney, a Fellow of the American Society for Nutrition and the Canadian Nutrition Society, will present the findings at NUTRITION 2023, the flagship annual meeting of the American Society for Nutrition held July 22–25 in Boston.

Aug 2023 -Preterm babies given a supplement with a combination of omega-3 and omega-6 fatty acids have **better visual function by the age of two and a half.**

Aug 2023 - omega-3 fatty acid docosahexaenoic acid (DHA) were inversely correlated with hearing difficulty in a new population-based cross-sectional study.

Middle-aged and older adults with higher DHA levels were **8-20% less likely to report age-related hearing issues than those with lower DHA levels.**

Latest Research on Omega-3 as a Dietary Supplement

J Orthop Surg Res. 2023; 18: 381.
Published online 2023 May 24. doi: 10.1186/s13018-023-03855-w
PMCID: PMC10210278
PMID: 37226250
Effect of omega-3 polyunsaturated fatty acids supplementation for patients with osteoarthritis: a meta-analysis

May 2023 –Meta-Study

- 2070 patients with OA and pain of the knee supplementation with n-3 **showed 27% improvement in pain.**
- **Conclusions** - Supplementation of n-3 PUFAs is effective to relieve pain and improve joint function in patients with OA.

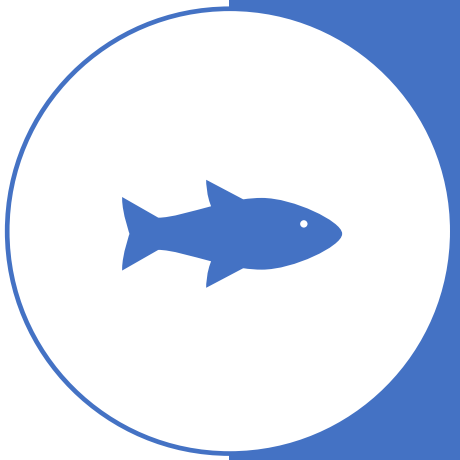
Could the Benefits of Omega-3's Be Improved With-

Eating More Seafood?
More Traditional EPA/DHA Supplements?
Or Better Omega (Whole Fish) Supplements?

Purification of fish oil to make Supplements removes healthy polyphenols and other types of Omega-3 which likely contribute to the health benefits of oily fish

The Loss of polyphenols and other antioxidants may cause fish oil to break down faster and become rancid

Studies of large populations that consume more seafood are generally healthier that those that don't, even if they take fish oil supplements



From alga to omega; have we reached peak (fish) oil?, Paul R Clayton corresponding author1 and Szabolcs Ladi 2
J R Soc Med. 2015 Sep; 108(9): 351–357.
doi: 10.1177/0141076815599673 PMCID: PMC4582263 PMID: 26359136

Marine Polyphenols (MP) Provide Essential Benefits

- The case for Marine polyphenols (MP) which are a group of bioactive compounds that are found in a wide variety of marine organisms, including algae, fish and crustaceans.
- These compounds are characterized by the presence of multiple hydroxyl groups (-OH) in their molecular structures, which give them antioxidant and anti-inflammatory properties
- MP also include - flavonoids, phenolic acids, tannins, lignans and stilbenes

From alga to omega; have we reached peak (fish) oil?, Paul R Clayton corresponding author1 and Szabolcs Ladi 2
J R Soc Med. 2015 Sep; 108(9): 351–357.
doi: 10.1177/0141076815599673 PMCID: PMC4582263 PMID: 26359136

REFERENCES:

1. From alga to omega; have we reached peak (fish) oil?Paul R Clayton corresponding author1 and Szabolcs Ladi 2J R Soc Med. 2015 Sep; 108(9): 351–357.doi: 10.1177/0141076815599673PMCID: PMC4582263PMID: 26359136
2. Effect of omega-3 polyunsaturated fatty acids supplementation for patients with osteoarthritis: a meta-analysis J Orthop Surg Res. 2023; 18: 381. Published online 2023 May 24. doi: 10.1186/s13018-023-03855-w PMCID: PMC10210278PMID: 37226250
3. University of Gothenburg. "Preterm babies given certain fatty acids have better vision." ScienceDaily. ScienceDaily, 24 August 2023. <www.sciencedaily.com/releases/2023/08/230824111854.htm>.
4. McBurney, a Fellow of the American Society for Nutrition and the Canadian Nutrition Society, will present the findings at NUTRITION 2023, the flagship annual meeting of the American Society for Nutrition held July 22–25 in Boston.
5. Investigating associations of omega-3 fatty acids, lung function decline, and airway obstruction. Am J Respir Crit Care Med. 2023; doi: 10.1164/rccm.202301-0074OC
6. Recent Clinical Trials Shed New Light on the Cardiovascular Benefits of Omega-3 Fatty Acids Methodist Debakey Cardiovasc J. 2019 Jul-Sep; 15(3): 171–178. doi: 10.14797/mdcj-15-3-171 PMCID: PMC6822654 PMID: 31687095
7. Omega-3 supplementation alters mitochondrial membrane composition and respiration kinetics in human skeletal muscle J Physiol. 2014 Mar 15; 592(Pt 6): 1341–1352. Published online 2014 Feb 13. doi: 10.1113/jphysiol.2013.267336 PMCID: PMC3961091
PMID: 24396061
8. https://www.nutraceuticalsworld.com/contents/view_breaking-news/2021-05-27/study-finds-most-us-adults-have-low-blood-serum-levels-of-omega-3s/#:~:text=A%20study%20published%20in%20the,the%20high%20cardiovascular%20risk%20category.
9. https://my.clevelandclinic.org/health/articles/17290-omega-3-fatty-acids
10. https://www.weforum.org/agenda/2022/11/chart-shows-countries-consume-fish-food-security/
11. https://ourworldindata.org/grapher/per-capita-meat-consumption-by-type-kilograms-per-year?country=OWID_WRL~USA
12. https://www.seafoodsource.com/news/foodservice-retail/americans-consumed-a-record-amount-of-seafood-in-2021
13. https://www.nccih.nih.gov/health/omega3-supplements-in-depth
14. https://www.fda.gov/food/consumers/advice-about-eating-fish
15. https://www.fda.gov/food/environmental-contaminants-food/fdaepa-2004-advice-what-you-need-know-about-mercury-fish-and-shellfish
16. https://ods.od.nih.gov/factsheets/Omega3FattyAcids-HealthProfessional/#:~:text=Cold%2Dwater%20fatty%20fish%2C%20such%20as%20salmon%2C%20mackerel%2C,composition%20of%20the%20food%20that%20the%20fish