

Scientific Support

CRITICAL: Fish oil / krill / marine oil SPONTANEOUSLY OXIDIZES (becomes rancid)...

A.J. Hulbert, PhD: DHA from fish oil / krill / marine oils with its 6 double bonds, contains 5 bis-allylic bonds and is therefore **320 times more susceptible to oxidative attack, that is, becoming rancid, than monounsaturated oleic acid (18:1) as found in olive oil, which has no bis-allylic hydrogens in its chain.** The oxidation rate is nonlinear.

A saturated fat membrane containing just 5% DHA (fish oil) is 16 times more susceptible to peroxidative damage. [Hulbert AJ, et al., "Life and death: metabolic rate, membrane composition, and life span of animals." *Physiological Reviews*. 2007;87(4):1175–1213; Hulbert AJ. Metabolism and longevity: is there a role for membrane fatty acids? *Integrative and Comparative Biology*. 2010;50(5):808–817.]

Fish oil's DHA is 7 times more susceptible to peroxidative damage than LA (Parent omega-6). Parent omega-6 is the most significant fatty acid by both weight and functionality in the cell's bilipid membrane. *The shifting of the body's antioxidants required to combat this physiologic insult causes a shortage elsewhere.* Could this be a cause of the extreme rise in Alzheimer's? YES. The brain is loaded with DHA, and you aren't told that the required antioxidants for the brain are being re-directed! Even more shocking is the small amount of **DHA needed daily is a mere 3.8 mg/ day** [Umhau, J., et al. (National Institutes of Health), "Imaging incorporation of circulating docosahexaenoic acid into the human brain using positron emission tomography," *J Lipids Research*, Vol. 50, 2009, pages 1259-1268] You aren't told this fact, either. This fact should cause the medical community great concern. Keeping tissue fluid in frigid waters like is required for cold water fish is not a physiologic concern of humans with a body temperature of 98°F).

[Hulbert AJ, et al., "Life and death: metabolic rate, membrane composition, and life span of animals." *Physiological Reviews*. 2007;87(4):1175–1213.]

SCIENCE: Lipid physiology makes the following clear: (a) Marine oil's **EPA/DHA spontaneously oxidizes at room temperature and more rapidly at normal body temperature—no level of antioxidants can stop this deleterious effect.** (b) Fish oil blunts the insulin response and raises resting blood glucose levels. (c) Fish oil decreases critical prostacyclin (PGI₂) in patients with atherosclerosis—a very bad outcome. (d) Fish oil rapidly decreases arterial compliance—increasing “hardening of the arteries.” (e) In contrast to researcher's expectations, fish oil accelerates CANCER metastases (spreading) in animals. (g) Fish oil's EPA/DHA do nothing to increase cellular and tissue oxygenation; to the contrary, marine oils increase inflammation. (h) Marine oil consumption impairs mitochondrial functionality, making it an *anti-*antiaging substance.

Many in the medical profession are unaware of or are not acknowledging **the lipid science unequivocally showing the great harm that marine/fish oils often recommended supraphysiologic amounts of EPA/DHA cause.**

There is a lot about **plant-seed oils** in the news. Most of it negative, demonstrating **a naïve understanding of biochemistry—this was all known in 2009. (See below)**

1. #1 is the vast difference between UNPROCESSED (organic) and PROCESSED (adulterated) plant seed oils. Also, you MUST understand the difference between “PARENTs” and DERIVATIVES.” This was published in 2013. [Anton SD, et al., “Differential effects of **adulterated versus unadulterated forms of linoleic acid** on **cardiovascular health**,” *J Integr Med*, **2013**; 11(1): 2–10.]

It is important to separately address the erroneous assertion that PolyUnsaturated Fatty Acids (PUFAs) are harmful to your health. Those that attack PUFAs wholesale—with no differentiation between the heart-disease / cancer-causing PROCESSED cooking oils and ORGANIC UNPROCESSED cooking oils—need to revisit foundational works by Professor Spiteller and others that scientifically show the opposite conclusion. From Professor Spiteller:

Heating produces toxic products such as cholesterol oxides. If they are consumed—not produced in the body—they cause deleterious effects.

Professor Gerhard Spiteller, former Chairholder of Biochemistry, Institute of Organic Chemistry at the University of Bayreuth, Germany,

has investigated EFAs and their degradation products—

specifically, the influence of these substances on the physiology of

mammals. He, too, concluded that ***consumption of oxidized PUFA-***

cholesterol esters [from consumption / eating of PROCESSED /

adulterated cooking oils] is responsible for the initial damage to

endothelial cells and that cholesterol oxidation products are

incorporated into LDL cholesterol in the liver (Spiteller G. Is

atherosclerosis a multifactorial disease or is it induced by a sequence of

lipid peroxidation reactions? *Annals of the New York Academy of*

Sciences. 2005;1043:355–366)

Newsflash 2008: “PARENT” omega-3 is very good for the heart REGARDLESS of the amount of fish / marine (including krill oil). A superb medical journal article from Harvard’s esteemed Dr. Willet, et al.

PEOs: Anti-CVD Newsflash 2008:¹ So Close, Yet So Far.

- "Greater alpha-linolenic acid [Parent omega-3] ... associated with lower risk of myocardial infarction.
- "Similarly, low intakes of alpha-linolenic acid can be found in developing countries where cardiovascular disease is on the rise.
- "Fish intake was similar in cases and controls, and the variation within each group was large...
- "Fish or eicosapentaenoic acid [EPA] and docosahexaenoic acid [DHA] intake at the levels found in this population did not modify the observed association.

Important Note: This result is independent of the level of fish consumption. Given all of fish oil's supposed miraculous claims, didn't these researchers wonder why this result occurred? At least, the researchers reported that the Parent Omega-3 did something the derivatives, like from fish oil, didn't do.

1. Hannia Campos, PhD, Ana Baylin, MD, Dec, Walter C. Willett, MD, DrPH, *Circulation*, 2008; 118:339-345.

In 2009, The American Heart Association stated that Omega-6 PUFA are NOT inflammatory.

Major Newsflash 2009: American Heart Association Champions Omega-6 PUFAs to Counter Popular Nutrition Advice

A great deal of discussion in the world of nutrition has given omega-6 fatty acids a bad reputation, which, according to the American Heart Association, is unfounded. The debate came about because one of the components of omega-6 fatty acids, called *arachidonic acid*, is a "building block" for some inflammation-related molecules. This had led to concern that omega-6 consumption would lead to a greater risk of heart disease. This has been completely disproven.

"That reflects a rather naive understanding of the biochemistry," says William S. Harris, Director of the Metabolism and Nutrition Research Center of the University of South Dakota Sanford School of Medicine and the nutritionist who led the science advisory committee that issued the report in *Circulation*.

"[O]mega-6 PUFAs [Derivatives] also have powerful anti-inflammatory properties that counteract any proinflammatory activity," say the advisory authors. "It's incorrect to view the omega-6 fatty acids as 'proinflammatory.'"

* AHA Heartwire 2009, © 2009 Medscape, January 28, 2009 (Dallas, Texas), based on *Journal of the American Heart Association*. Ref: AHA Science Advisory, Harris WS, et al., "Omega-6 fatty acids and risk for cardiovascular disease," a science advisory from the American Heart Association Nutrition Subcommittee of the Council on Nutrition, Physical Activity, and Metabolism; Council on Cardiovascular Nursing; and Council on Epidemiology and Prevention" downloaded from circ. ahajournals.org on January 29, 2009. Published in *Circulation*, 2009;119:902-907.

Reported in 2017: Parent omega-6 is NOT inflammatory; in fact, the greater the Parent omega-6 the LOWER the INFLAMMATION.

2017 Confirmation of Omega-6 Series: Serum Fatty Acid Analysis Gives the Truth
Parent and Derivative Omega-6 is Beneficial, NOT HARMFUL

This newly reported analysis CONFIRMS OTHER STUDIES showing that both Parent omega-6 (LA) and arachidonic acid (AA) are not inflammatory—as measured by C-reactive protein (CRP), a strong, key marker of inflammation.

"Conclusions: Serum n-6 PUFAs [AA, etc.] were not associated with increased inflammation in men. In contrast, the main n-6 PUFA linoleic acid [Parent omega-6] had a strong inverse association with the key inflammation marker CRP.

"Omega-6 fatty acids do not promote low-grade inflammation.

"The higher the serum linoleic acid [Parent omega-6] level, the lower the CRP."

* Virtanen, JK, et al., "The associations of serum n-6 polyunsaturated fatty acids with serum C-reactive protein in men: the Kuopio Ischaemic Heart Disease Risk Factor Study," *European Journal of Clinical Nutrition*, online accessed November 18, 2017, <https://doi.org/10.1038/s41430-017-0>.

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The New England Journal of Medicine (1986): Marine oils (like fish and krill) make existing heart disease WORSE

Fish Oil Makes EXISTING CVD WORSE! There is a defined metabolic pathway – fish oil suppresses PGI₂ synthesis!

- 1986: Fish Oil makes existing heart disease WORSE. (Knapp, H, et al., "In vivo indexes of platelet and vascular function during fish-oil administration in patients with atherosclerosis," *The New England Journal of Medicine*, Vol. 314, April 10, 1986, No. 15, pages 937-942.)

• "...In patients with atherosclerosis, prostacyclin bio-synthesis fell by a mean [average] of 42% during the fish-oil period."

* Prostacyclin (PGI₂) is the body's natural blood thinner and keeps platelets apart naturally. The last thing a CVD patient needs is a reduction in this critical substance. CVD patients require more, NOT less PGI₂. Decreased PGI₂ significantly increases - not decreases - the risk and severity of any heart attack.

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An insignificant amount of EPA/DHA is required by the brain. Compare what is needed to the overdose you are likely being told is needed...

Supra-Physiologic Pharmaceutical Overdose of Fish Oil:

New 21st Century Analysis: NIH researchers determined the amount of DHA utilized in human brain tissue to be *a mere 3.8 mg ± 1.7 mg / day [1.1 mg/day - 8.9 mg/day for 99% of the world's patients].**

•• COMPARE this amount with the doses of fish oil recommended and prescribed. ••

Aside from reading my writings, has anyone seen this medical fact? Knowing this fact is fundamental to prescribing a proper – instead of – a harmful supra-physiologic dose.

* J. C. Umhau, W. Zhou, R. E. Carson, S. I. Rapoport, A. Polozova, J. Demar, et al., "Imaging Incorporation of Circulating Docosahexaenoic Acid [DHA] into the Human Brain Using Positron Emission Tomography," *Journal of Lipid Research*, Vol. 50, No. 7, 2009, pp. 1259–1268.

DHA from fish / krill / marine oils DAMAGES the Heart's mitochondria (energy producers). This will lead to congestive heart failure. Read the last quote from the superb *Journal of Biological Chemistry*.

The article clearly states that the marine oils CAUSE the critical Parent omega-6 to get displaced. **ADDING back the critical Parent omega-6 RESCUES the marine-oil-causing (fish / krill, etc.) damage.**

***2018: DHA [Omega-3 DERIVATIVE] Ruins Cardiac Mitochondria – [Causing Congestive Heart FAILURE]:²**

- "(18:2) CL₄ [Parent omega-6] rescues [fixes the damage] the major remodeling in the cardiolipin lipidome induced by long-term intake of DHA.
- "...[I]t is not the loss of linoleic acid alone that drives the impairment in enzyme function since the Western diet alone did not impair enzyme activities. Instead, it was the replacement of linoleic acid with DHA that promoted the reduction in activities."
- **Diabetic Patients:** "Analyses of the major n-3 PUFAs showed that DHA levels were increased by 1.7 fold for the diabetic [HUMAN] subjects compared to non-diabetic controls.

1. Hannia Campos, PhD; Ana Baylin, MD, Dsc; Walter C. Willett, MD, Dr Ph., *Circulation*, 2008; 118:339-345.
2. Sullivan, E. Madison, et al. "Docosahexaenoic acid lowers cardiac mitochondrial enzyme activity by replacing linoleic acid in the phospholipidome." *Journal of Biological Chemistry*, 2018, 293: 466-2018 Jan 12;293(2):466-483.

People speak a lot about the mitochondria. Cardiolipin is all Parent omega-6, NOT omega-3. In the area of EFAs, Rodent physiology is the same as humans. You will PERMANENTLY DESTROY your mitochondria by listening to the wrong advice.

CANCER: In The News: 2009 Cellular ENERGY-PRODUCING Mitochondria

- "Major abnormalities in CL [cardiolipin] content or composition were found in all (cancer) tumors. Hence, our findings in mouse brain tumors provide evidence linking abnormal CL to irreversible respiratory injury. [from chronic inflammation due to decreased CELLULAR oxygen [Warburg]]"¹

L.S.E. Analysis: What is cardiolipin (CL)? It is a fat-based complex phospholipid found in all mitochondrial membranes – intimately involved in maintaining mitochondrial functionality and membrane integrity. It is used for ATP synthesis and consists roughly of 20% lipids.² In mammals, the main substrate in CL is Parent omega-6 with virtually no Parent omega-3 or its derivatives.³ [Note: A recent post (2023) by a top internet "health site," falsely claimed cardiolipin is omega-3 based....WRONG.]

1. Science Daily (January 14, 2009) and Kiebish MA, Han X, Cheng H, Chuang JH, Seyfried TN. Cardiolipin and electron transport chain abnormalities in mouse brain tumor mitochondria: lipidomic evidence supporting the Warburg theory of cancer. *J Lipid Res* 2008;49:2545-66.
2. Krebs JJ, Hauser H, Carafoli E. Asymmetric distribution of phospholipids in the inner membrane of beef heart mitochondria. *J Biol Chem* 1979;254:5308-16.
3. Scottish Crop Research Institute (MRS Lipid Analysis Unit, Invergowrie, Dundee DD2 5DA, Scotland). Cardiolipin (diphosphatidylglycerol). Structure, occurrence, biology and analysis. Retrieved January 20, 2009 from: <http://www.lipidlibrary.co.uk/Lipids/dpg/index.htm>.