

Essential Fatty Acids (EFA), Fish Oils and Total Oxidation: TOTOX

EFA's are called essential because they can only be obtained from the diet. The body is unable to manufacture them even though they are required for critical chemical reactions in the body. The average American diet is often too high in harmful fats, and therefore, generally also deficient in EFA's. Essential fatty acids can be broadly classified into Omega 6 and Omega 3 fats. EPA & DHA are the most important omega-3s in your diet — and you can get them from a variety of sources, including seafood, fortified foods, and dietary supplements.

Omega-3 EFA's (including EPA and DHA) are required for cell membranes to achieve optimum fluidity as well as to have a correct balance between inflammatory and counter inflammatory hormones in the body. EFA's are the source of the body's potent prostaglandins, which are hormone-like substances that regulate many cardiovascular, reproductive, immune, hormonal, and nerve functions.

Scientific studies have associated an insufficient intake of Omega-3 EFA's with the following health concerns: cardiovascular disease, inflammatory/autoimmune diseases, premenstrual syndrome (PMS), attention deficit disorder (ADD)/attention deficit hyperactivity disorder (ADHD), mood disorders, memory problems, cognitive disorders, dyslexia, vision concerns, addictive behaviors, and several degenerative neurologic diseases.

EPA: increases membrane fluidity and has also shown significant benefits for neurologic function.

DHA: Is similar to EPA. DHA, a member of the Omega-3 family, converts to anti-inflammatory prostaglandins. Studies indicate that DHA is especially vital to growing or repairing brain and nerve cell function by restoring Omega-3 prostaglandins that repair (PGF2alpha and PGI). By far the most powerful EFA for enhancing membrane fluidity, it is the primary Omega-3 EFA for the brain. It confers the highest degree of membrane fluidity of all the Omega-3 EFA's. It is so important for optimum brain function that in a healthy brain, 50% of the lipid content is in the form of DHA. DHA may have a positive effect on diseases such as hypertension, arthritis, atherosclerosis, depression, adult-onset diabetes mellitus, myocardial infarction, thrombosis, and some cancers.

Oxidation of Fish Oils

Fish oils are the best way to provide Omega-3 EFA supplementation, but many commercial fish oils lack the purity and potency required. Plus, many are susceptible to oxidation and rancidity that can in fact make the fish oils harmful instead of being helpful. Let's look at some oxidation markers that can tell us more about the degree of rancidity and oxidation of fish oils.

Anisidine value, Peroxide value, and TOTOX value

Anisidine value (AV) is a measurement of past oxidation of the oil. More specifically, it is the measure of aldehyde and ketone production during oxidation of fats. AV essentially reflects how an oil has been handled and stored over time. Thus, the Anisidine value indicates the "oxidative history" of an oil or fat. Anisidine value is used to assess the secondary oxidation of fatty substances and correlates with the presence of aldehydes and ketones, which are responsible for rancid smell and taste. This is more indicative of the overall quality state of the oil.

Peroxide value (PV) measures current oxidation of the oil. The peroxide value of an edible fat indicates its primary oxidation state and thus its tendency to go rancid.

The Total Oxidation Value (TOTOX) is a measure of the overall oxidation profile of a sample and is calculated from the PV and AV data which considers how the PV and AV results will potentially change over time. For both AV and PV, a lower number is better. TOTOX (total oxidation value) is used to describe total oxidation to which the oil has been exposed and refers to the Total Oxidation Value of the fish oil.

TOTOX Ranges: The established upper limits, as set by the current Voluntary Standards for Omega-3s in the United States, are as follows:

Peroxide value: Maximum is 5 mEq/kg

Anisidine value: Maximum is 20 mEq/kg

TOTOX: Maximum is 26 mEq/kg .

Values are typically expressed in milliequivalents (mEq) of active oxygen per kilogram (kg) of oil. (2)

Other leading brand name fish oils in the marketplace: While the acceptable higher limit is 26 mEq/kg , most reputable leading brand name companies fall in the range of 5-14 mEq/kg . Recent tests of a leading brand name raw fish oils report TOTOX values of 7.0 with their varying products ranging from 6.6-16.5 mEq/kg.

PERQUE EPA/DHA Guard™

Due to **PERQUE's** proprietary nitrogen blanket distillation process, we are able to provide a **TOTOX value for PERQUE EPA DHA Guard just below 3 mEq/kg.**

PERQUE EPA/DHA Guard is a blend of pure marine lipids derived from cold-water deep-sea fish yielding a high level of Omega-3 EFAs (Essential Fatty Acids): EPA (Eicosapentanoic acid) and DHA (Docosahexaenoic acid). These brain and body building "good for you" lipids meet **PERQUE's** high standards and bring the complicated issues of fat supplementation into one easy-to-use source.

Third-Party Test Results: Every batch of fish oil used in **PERQUE** products is third-party tested to verify our leading purity and freshness levels.

References

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These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.