

Analysis of Omega-3 Polyunsaturated Fatty Acid Oxidation

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Omega-3 fatty acids are essential polyunsaturated fatty acids that help prevent diseases such as coronary heart disease, osteoporosis, cancers, asthma, and depression. Omega-3 can be obtained from eating fresh marine fish but the potency of Omega-3 from the diet is difficult to maintain because Omega-3 is subject to rapid oxidation. Omega-3 fatty acids are available in either capsulated or bottled preparation. The liquid contains antioxidants but most Omega-3 in capsules does not. The capsule is more convenient to take than bottled fish oil but the capsule is not completely impervious to air. Exposure of Omega-3 to air will cause oxidation. The aim of this study is to evaluate the integrity of commercial capsulated Omega-3 and commercial bottled fish oil after it was opened. We hypothesize that extended exposure to air will oxidize Omega-3 fatty acids in capsule form faster than the bottled Omega-3. We tested fatty acid oxidation by analyzing the Peroxide value of freshly opened and Omega-3 already exposed to air for 2, 4, 8 and 16 weeks. Our results show that Omega-3 fatty acids is oxidized, whether in capsules or in liquid form, upon extended exposure to air. After eight weeks of air exposure, Omega 3 in capsules has a peroxide value 20 fold higher than fresh omega 3 and the liquid form has a peroxide value nine fold higher than freshly opened fish oil. Although, both the capsule form and the liquid for oxidized, our results supported our hypothesis that bottled fish oil will oxidize slower due to the presence of antioxidant.

We then further analyze the effect of temperature on the integrity of Omega 3 capsules stored at 25°C or 4°C after opening using the previous method. We hypothesize that Omega-3 capsules stored at 4°C will oxidize slower than Omega-3 capsules stored at 25°C.