

Methods to Evaluate Lipid Oxidation: Strengths and Weaknesses

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Oxidation is an important cause of quality deterioration in marine oils. Due to the high amount of unsaturated double bonds a large variety of different peroxides and secondary oxidation products can be formed during oxidation of marine oils. To measure all the oxidation products and their concentration in the oil can therefore be time and resource consuming. Therefore, in industry per today the standard oxidative quality parameters are: the level of primary oxidation products measured by peroxide value and the level of secondary oxidation products – aldehydes - measured as anisidine value. Other methods that evaluate the amount of peroxides and aldehydes in the oils can also be employed. However, each method has its strengths and weaknesses.

This work discusses the principle of several methods that are used for evaluation of the oxidation status of oils. The methods that were tested were traditional iodometric titration methods, and modified IDF (International Dairy Federation) methods (also called ferro method) – for peroxide value test, and anisidine and TBARS values – for determination of the level of secondary oxidation products. The sources of possible misinterpretation of the results such as reaction time, presence of oxygen in the measuring system, the intensity of the mixing of the reactants and others were studied and discussed. Some of the fish oil products that are on the market contain flavors, color compounds and vitamins. Studying the effect of different additives (antioxidants, flavor compounds) on the measurement of the oxidative quality parameters showed that addition of some additives (like lemon taste) complicates the determination of the oxidation status of the product.