

# **Structural and Stability Investigations on *Salmo salar* Oil in Water Microemulsion Containing Marine Lecithin**

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For recent epidemiological, clinical and nutritional studies on animals and humans, it is accepted that fish oils containing high amount of  $\omega$ 3 polyunsaturated fatty acids (PUFA) such as eicosapentanoic EPA (20:5  $\omega$ 3) and docosahexaenoic DHA (22:6  $\omega$ 3) acids may be responsible for preventing atherosclerosis, cardiovascular disease, aging, and certain forms of cancer. However, humans cannot easily synthesize these fatty acids and must acquire them through the diet. In addition,  $\omega$ 3 fatty acids are not soluble in physiological conditions and are extremely sensitive to lipid oxidation resulting in potential alteration of their health benefits. To overcome these matters, oil in water microemulsion are well accepted as a delivery systems of  $\omega$ 3 fatty acids.

Hence, the aim of this study was to prepare oil in water microemulsion with different oil:water ratio. Lecithine extracted from *Salmo salar* used as a surfactant and  $\alpha$ -tocophérol used as an antioxidant were dissolved in the oil phase. Ascorbic acid acted as an antioxidant in the aqueous phase. The use of several antioxidants in combination was important because such formulations usually result in a synergistic effect. Both phases mixed by vortex were homogenized three times under 344,74 hPa in a microfluidizer (EmulsiFlex-C3 Sodexim S.A.). Immediately after homogenization aliquots of emulsions were analyzed using a Mastersizer Micro Particle Analyzer (Malvern Instruments Ltd.) and oil droplet size distribution was recorded. The oil phase composition was determined by GLC.

The stability and evolution of physico-chemical properties of the microemulsion during 32 days was monitored every 4 days as function of (1) the lecithin ratio (0,4; 0,8 and 1,2%), (2) the pH (5 and 7) of final emulsion and the (3) temperature of storage (4; 20 and 40°C) by measuring droplet size, oxidation rate (acid and peroxide index) and oil phase composition.