

## Quantitative on Fatty Acid Profiles, Lipid Contents and Fat-Soluble Vitamin A of Freshwater Fish Species in Tonle Sap Lake, Cambodia

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**Abstract :** In Cambodia, fish plays an important role for local community in term of food habits, preference and contribution to several nutritional intakes. Consumed on a daily basis, fishes and their derivatives products are good sources of proteins, essential fatty acids and fat-soluble vitamins. They mainly obtain from the Tonle Sap Lake but, during the last decade, the fish population decreased drastically due to climate change and human activities as well. Contamination by agricultural residues and heavy metals were identified. However, fishes are currently used in several nutrition programs for children and pregnant women to improve their nutritional status. The aim of our work was to characterize the nutritional profile and contamination of 10 fish species consumed near the Tonle Sap Lake with a special attention to fatty acid and fat-soluble vitamin profiles. Fish samples were analyzed for their nutritional profiles (AOAC methods for macronutrients and micronutrients), their lipid content (Folch modified method), their Fatty acid (FAME method), their vitamin A (HPLC) and their heavy metals (ICP-MS). The total lipid contents ranged from 1.43 to 10.00% according to fish species. Lipid profile was mainly dominated by saturated fat (from 47.95 to 57.32%) but some fish species were particularly rich in  $\omega$ -3 and  $\omega$ -6 especially eicosapentaenoic acid EPA (3.05%) and docosahexaenoic acid DHA (2.82%). The more the fishes were fats, the more they contained vitamin A, DHA and EPA. Vitamin A is particularly abundant in small fishes (250.10  $\mu$ g RE/100 g) compare to big ones (13.77  $\mu$ g RE/100 g) because they are consumed as a whole with their organs (liver) and head. However, the contents of heavy metal in some species are higher than the maximum permitted level (MPL) from codex alimentarius, especially Mn. The results obtained provided important information on the most interesting fish in term of human nutrition and the potential risk of contaminants. The fatty acids are important for child development and pregnant women. These data are useful for supply chain stakeholders and the people in charge of nutrition program.

**Keywords :** fat-soluble vitamin, fatty acid, freshwater fish, lipid content, Tonle Sap Lake

**Conference Title :** ICLN 2020 : International Conference on Lipids in Nutrition

**Conference Location :** Paris, France

**Conference Dates :** November 19-20, 2020