



SOCIEDADE
PORTUGUESA
DE QUÍMICA

ANALÍTICA 2018

9th Meeting of Division of Analytical Chemistry

26-27 MARCH, PORTO-PORTUGAL

FFUP/ICBAS – UNIVERSITY OF PORTO

www.analitica2018.eventos.chemistry.pt

**BOOK OF
ABSTRACTS**

PE 2

COMPARATIVE ANALYSIS OF FATTY ACID COMPOSITION OF WILD VS. FARMED SALMON

Liliana Grazina¹, Maria A. Nunes¹, Isabel Mafra¹, M. Beatriz P. P. Oliveira¹,
Joana S. Amaral^{1,2}

¹REQUIMTE-LAQV, Faculdade de Farmácia, Universidade do Porto, Rua Jorge Viterbo
Ferreira, 228, 4050-313 Porto, Portugal

²CIMO, Instituto Politécnico de Bragança, Campus de Sta. Apolónia, 5300-253, Bragança,
Portugal. jamaral@ipb.pt; isabel.mafra@ff.up.pt

To respond to the increasing global demand for fish, nowadays, almost 50% of the global fish market comes from aquaculture production [1]. Thus, there is the need to assure a correct information, not only about the species, but also about the production method (farmed vs. wild) and the catch origin of fish. Salmon, a high-trophic-level carnivorous species with high economic value due to its popularity, is among the fish species that is frequently produced in aquaculture. Although the feed given to farm-raised salmon is designed to meet its nutritional requirements, it can present differences compared to the diet of wild salmon that can be reflected on the muscle composition of farmed *versus* wild salmons. Therefore, this work aims at comparing the fatty acid composition of salmon from aquaculture and caught in the wild.

Salmon specimens caught in the wild (n = 25) and farm-raised (n = 25) were obtained from West of Vancouver Island and Campbell River (Canada), respectively. Two lipid extraction methods (Soxhlet extraction with *n*-hexane and an adaptation of the Bligh and Dyer extraction method) and two derivatization procedures (alkaline transmethylation using KOH and acid-catalyzed transmethylation using BF₃/MEOH solution) were tested. Fatty acid methyl esters (FAME) were analyzed in a Shimadzu GC-2010 Plus gas chromatograph equipped with a Shimadzu AOC-20i auto-injector, a flame ionization detector and a CP-Sil 88 silica capillary column (50 x 0.25 mm i.d., 0.20 µm). The injector and detector temperatures were 250 and 270 °C, respectively. The compounds were identified by comparison with standards (FAME 37, Supelco). Based on the obtained results, the modified Bligh and Dyer method was chosen for lipid extraction since it allowed obtaining higher amounts of long chain unsaturated fatty acids, particularly of docosahexaenoic acid (DHA). Similar results were obtained for both tested derivatization methodologies. In general, the two groups of salmon samples showed different profiles, with wild samples presenting significantly higher contents of omega-3 fatty acids, in particular docosahexaenoic and eicosapentaenoic acids, while farmed salmon had higher amounts of oleic and linoleic acids.

Acknowledgements: To the European project FOODINTEGRITY (FP7-KBBE-2013-single-stage, No 613688), the project UID/QUI/50006/2013 – POCI/01/0145/FEDER/007265 with financial support from FCT/MEC through national funds and co-financed by FEDER, under the Partnership Agreement PT2020 and by the project NORTE-01-0145-FEDER-000011. L. Grazina and M.A. Nunes acknowledge the PhD fellowship (SFRH/BD/132462/2017 and SFRH/BD/130131/2017) funded by FCT.

[1] Food and Agricultural Organisation (FAO). The State of World Fisheries and Aquaculture 2012. Rome: FAO.