



Abstract

The Concentration of Iodine and Selenium in Fish Depends on the Type of Thermal Process [†]

Aneta Kopeć ^{1,*}, Joanna Skoczylas ¹, Ewa Piątkowska ¹, Teresa Leszczyńska ¹, Sylwester Smoleń ²,
Joanna Pitala ² and Ivo Dosekocil ³

¹ Department of Human Nutrition and Dietetics, Faculty of Food Technology, University of Agriculture in Krakow, Balicka 122, 30-149 Krakow, Poland; teresa.leszczynska@urk.edu.pl (T.L.)

² Department of Plant Biology and Biotechnology, Faculty of Biotechnology and Horticulture, University of Agriculture in Krakow, al. 29 listopada 46, 31-425 Krakow, Poland

³ Department of Microbiology, Nutrition and Dietetics, Faculty of Agrobiological, Food and Natural Resources, Czech University of Life Sciences Prague, Kamýcká 129, 165 00 Prague, Czech Republic

* Correspondence: aneta.kopec@urk.edu.pl

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Abstract: Background and Objectives: Iodine and selenium are trace elements essential for health. In many countries, a deficiency of both minerals is common. Sea fish can be a good source of these minerals and their consumption should be increased. The objective of this research was to evaluate the effect of various thermal treatments of sprats and sardines on the concentration of total iodine, its iodide form (I⁻) and selenium. Material and Methods: Sprats and sardines were purchased from markets selling sea food. Sprats were caught in the Baltic Sea and sardines in the Mediterranean Sea. After removing inedible parts and washing, fish were thermally treated using the following processes: cooking, steaming, baking or frying. In freeze-dried samples, the concentrations of selenium and iodine were measured using the ICP-MS/MS method. For an analysis of iodide the form HPLC-ICP-MS/MS method was used. Data were statistically evaluated using two-way factorial analysis of variance (MNOVA), and Scheffe's test at significance level $p < 0.05$. Results: Iodine concentration was not affected by the type of fish. The lower losses of iodine were measured in samples of baked fish. The iodide form of iodine concentration was statistically different between sardines and sprats. In both cases, the best thermal processes to protect from iodide (I⁻) losses were cooking, steaming and baking. The highest concentration of selenium was measured in raw sardines and thermally treated ones, as compared to the raw and thermally treated sprats. Cooking, baking and steaming were the best processes for the protection of the concentration of selenium in both types of fish. Discussion: Sardines and sprats can be source of iodine in the diet, and especially a portion of 200 g of baked sardines or sprats can provide, respectively, 55 µg or 32 µg of iodine (39% or 20% of the recommended daily allowances [RDA] for adults); 100 g of baked or steamed sardines covers about 78% (48 µg/100 g f.m.) of the RDA for selenium. Steamed or baked sprats can cover the daily requirements to 54%. It can be suggested that the frequent consumption sprats and sardines can improve the intake of iodine and selenium.

Keywords: fish; thermal processes; iodine; selenium



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