

Abstract

The Effects of Various Thermal Processes on the Antioxidant Status of Sprats and Sardines [†]

Aneta Kopec ^{1,*}, Joanna Skoczylas ¹, Ewa Piątkowska ¹, Teresa Leszczyńska ¹ and Ivo Dorskocil ²

¹ Department of Human Nutrition and Dietetics, Faculty of Food Technology, University of Agriculture in Krakow, 31-120 Kraków, Poland; joannaskoczylas7@gmail.com (J.S.); ewa.piatkowska@urk.edu.pl (E.P.); teresa.leszczynska@urk.edu.pl (T.L.)

² Department of Microbiology, Nutrition and Dietetics, Faculty of Agrobiological Sciences, Food and Natural Resources, Czech University of Life Sciences Prague, 165 00 Prague, Czech Republic; dorskocil@af.czu.cz

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

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Abstract: Background and objectives: Fish should be an important part of a properly balanced diet because of their nutritional value. Sprats and sardines are rich sources of protein, polyunsaturated fatty acids, especially n-3, and other nutrients. Unfortunately, fish consumption is too low among almost all European countries. The aim of this study was to evaluate the antioxidant activity of sprats and sardines subjected to thermal treatment: boiling, steaming, baking, and frying. Materials and methods: Samples of sprats and sardines were purchased from markets selling sea food. Based on the distributor information, the sprats were caught in the Baltic Sea and the sardines were caught in the Mediterranean Sea. After removing the inedible parts and washing the fish, the fish were cooked, steamed, baked, or fried. Thus, the prepared samples were freeze-dried. Next, a methanolic extract was prepared for an antioxidant activity analysis. The antioxidant activity was measured using the ABTS•⁺, DPPH as well as FRAP methods. Data were statistically evaluated using a two-way factorial analysis of variance (MNOVA), and Scheffe's post hoc analyses with a significance level of $\alpha = 0.05$. Results: The higher antioxidant activity measured with the ABTS method was determined in raw sprats as compared to thermally treated both types of fish. The highest antioxidant activity measured with the ABTS method was found in the steamed and baked sprats as compared to other samples of fish. The fried and baked sardines had the highest antioxidant activity measured via the FRAP method. The raw sprats and the raw and fried sardines had the highest antioxidant activity measured with the DPPH method. Discussion: Based on these obtained results, it can be suggested that generally, sprats have better antioxidant activity than sardines. This can be explained by the different living conditions that affect the content of various antioxidant compounds. Furthermore, the type of thermal treatment used for the sprats and sardines can strongly affect their antioxidant activity. Using traditional cooking methods that cause compounds soluble in water to be removed from food products can also affect the antioxidant activity of fish. Steaming and baking are processes in which the antioxidant activity became higher.

Keywords: fish; antioxidant activity; thermal processes



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