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Effect of technological processes on the betalain profile and antioxidant capacity of red beetroot

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Beetroot is one of the most common and frequently consumed vegetables in Poland. It is a rich source of a number of bioactive substances, including betalains exhibiting strong antioxidant, anti-virus and anti-bacterial activity. The aim of the research was to determine the betalain profile and antioxidant capacity in fresh, boiled and fermented red beetroot. Betalains were analyzed using micro-HPLC system (LC200, Eksigent) coupled with TripleTOF 5600+ mass spectrometer (SCIEX, Canada). The antioxidant capacity (AC) was measured by four methods: ACW PCL, ACL PCL, ABTS and DPPH. By means of HPLC-TOF-MS/MS analysis 22 betalains were identified, including 18 betacyanins and 4 betaxanthins. The dominant form of betalains in fresh red beetroot was betanin and isobetanin constituting 60% and 27% of the total betalains content, respectively. The content of betanin and other derivatives decreased in the boiled red beetroot. On the other hand the fermentation process did not cause significant changes in the betalains profile and content of red beetroot. The highest AC was observed for boiled red beetroot measured by ACW PCL, ACL PCL and DPPH. While the highest AC measured by ABTS was observed for fresh red beetroot. The lowest AC values were observed for the fermented red beetroot. The results of this study show that thermal treatment and fermentation affect the betalains profile and antioxidant activity of red beetroot.

Biography

Tomasz Sawicki is currently a PhD student of Doctoral studies at Institute of Animal Reproduction and Food Research of Polish Academy of Sciences in Olsztyn, Poland. He graduated in Food Technology and Nutrition in the Department of Food Science, University of Warmia and Mazury in Olsztyn. He has published 5 papers in reputed journals.

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