5th International Scientific and Professional Conference /
5. međunarodni znanstveno-stručni skup

FOOD INDUSTRY BY-PRODUCTS

BOOK OF ABSTRACTS / KNJIGA SAŽETAKA

10th and 11th June 2026
Osijek, Croatia

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***Published by* / Izdavač**	*Josip Juraj Strossmayer University of Osijek, Faculty of Food Technology Osijek* / Sveučilište Josipa Jurja Strossmayera u Osijeku, Prehrambeno-tehnološki fakultet Osijek
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ISBN: 978-953-8543-14-2
EAN: 9789538543142
Osijek, 2026.

VALORIZATION OF BLACK ELDERBERRY POMACE AND FLOWER USING GREEN HIGH-PRESSURE TECHNOLOGIES

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invited lecture

Current approaches to managing fruit waste and by-products do not fully capitalize on their potential, as these materials often contain valuable compounds that can be recovered and utilized across various industries. Black elderberry (*Sambucus nigra* L.) press cake, a by-product of black elderberry juice production, is particularly rich in anthocyanins that can reduce neurological diseases and heart-disease risks, and exert an anti-inflammatory role related to obesity and diabetes. Elderberry flowers are edible and can be used in various culinary applications, yet they are mostly underused. Therefore, green high-pressure technologies are employed to valorize these feedstocks and underline their potential to be applied in various food matrices. Supercritical Fluid Extraction (SFE) and Particles from Gas-Saturated Solutions (PGSS) are both based on the use of supercritical fluids, most commonly carbon dioxide, and share several important features, including operation under high pressure, environmentally friendly processing without toxic organic solvents, and the ability to tune process conditions such as temperature and pressure to control product characteristics. Both techniques are widely applied in high-value industries such as food, pharmaceuticals, and cosmetics. However, they differ fundamentally in their purpose and mechanism, SFE is primarily used for the extraction of valuable compounds from solid or liquid matrices, where CO_2 acts as a solvent, while PGSS is used for the production of micro- and nanoparticles, where CO_2 is dissolved into the material and acts as an expansion agent during rapid depressurization. Consequently, SFE yields concentrated extracts, whereas PGSS produces solid particles with controlled size and morphology.

Keywords: elderberry pomace, elderberry flower, supercritical extraction, PGSS

Acknowledgement: *This study was supported by the Ministry of Education, Science, and Technological Development of the Republic of Serbia (Project no.: 451-03-33/2026-03/ 200134).*