

The potential of by-products from chokeberry processing - development of a sustainable method of upcycling fruit processing waste

A. Piekara¹, M. Krzywonos², A. Błaszczuk³, S. Sady³, B. Pacholek⁴, S. Popek⁵, S. Syguła-Cholewińska⁵, T. Sawoszczuk⁵, A. Kaczmarek⁶

¹Department of Bioprocess Engineering, Wrocław University of Economics and Business, Wrocław, 53-345 Poland

²Department of Process Management, Wrocław University of Economics and Business, Wrocław, 53-345 Poland

³Department of Natural Science and Quality Assurance, Poznań University of Economics and Business, Poznań 61-875 Poland

⁴Department of Product Marketing, Institute of Marketing, Poznań University of Economics and Business, Poznań 61-875 Poland

⁵Institute of Quality and Product Management Sciences, Kraków University of Economics, Cracow, 31-510 Poland

⁶Student Scientific Association NEXUS, Department of Natural Science and Quality Assurance, Institute of Quality Science, Poznań University of Economics and Business, Poznań 61-875, Poland

Keywords: chokeberry processing, chokeberry by-products, chokeberry pomace, aronia, upcycling, new products
Presenting author email: agnieszka.piekara@ue.worc.pl

Poland is the undisputed leader in chokeberry (*Aronia nigra*) production and an exporter of its semi-finished products worldwide. In 2019, approximately 70% of the world's chokeberry production came from Poland. The chokeberry cultivation area in Poland has increased from 4.0 to 14.8 thousand hectares since 2017. At the same time, fruit production increased from 48.6 to 66 thousand tonnes. However, the prices paid to producers for fruit remained relatively high. The average price of chokeberry intended for processing in 2021 amounted to 0.25euros/kg and was 40% lower than in 2020. Much research was devoted to assessing the potential of chokeberry and quality of their juices. It has been proven that by-products of chokeberry fruit processing are valuable secondary raw materials in shaping the health-promoting properties of food.

The analysis of Poland's volume of chokeberry juice production was made to estimate the raw material market, which is a part of the product management process. The study aimed to assess of the potential and possibility of using pomace for producing innovative food products and the degree of consumer acceptance of innovative products with functional properties based on chokeberry. A group of 24 adult consumers was asked to rank 10 products (hypothetical products) that may contain chokeberry by-products as one of the ingredients.

Knowing the size of the market can be crucial when considering using waste as a raw material as the base for developing an innovative food product. In Poland, the production of chokeberry juice concentrate increased from 6 to 7.8 thousand tonnes, generating a correspondingly more significant amount of pomace. It is necessary to know the pomace parameters in order to be able to prepare them for further processing. Moreover, the pomace during production cannot be classified as waste because then it cannot be used as a raw material for food production. Consumers indicated that bars, yoghurts and bread are the most familiar products where chokeberry pomace can be used. It can be seen as a direction for further research. Now, the challenge is to develop valuable products of satisfactory quality. It is necessary to take specific horizontal measures to minimise waste by reusing and implementing full recovery of by-products, particularly by treating them as a potential source of secondary raw materials.

Funding:

The project was financed under the 1st EDITION OF INTER-UNIVERSITY RESEARCH GRANTS 2022(PL)

The project is financed by the Ministry of Education and Science in Poland under the programme "Regional Initiative of Excellence" 2019 - 2023 project number 015/RID/2018/19 total funding amount 10 721 040,00 PLN"