



VI. Symposium of Young Researchers on Pharmaceutical Technology, Biotechnology and Regulatory Science

January 24-26 2024 - Szeged, Hungary

OP-08

DOI: [10.14232/syrptbrs.2024.26](https://doi.org/10.14232/syrptbrs.2024.26)

Characterization of grape pomace extract microcapsules - the influence of carbohydrate co-coating on the stabilization of goat whey as primary coating

Gabriela Perković¹, Mirela Planinić¹, Rita Ambrus², Daliborka Koceva Komlenić¹, Ana Bucić-Kojić¹



¹ Faculty of Food Technology Osijek, Josip Juraj Strossmayer University of Osijek, Osijek, Croatia

² Institute of Pharmaceutical Technology and Regulatory Affairs, University of Szeged, Szeged, Hungary

Due to the increasing global demand for food caused by population growth, changes in diet and lifestyle and the emergence of various food-borne diseases, food production is continuously intensifying. All this has led to an increased production of "waste" from various food industries. At the same time, upcycling has become increasingly important in recent decades due to growing environmental demands and more and more research is looking into the possibility of recycling by-products from the food industry to produce new goods for human consumption. Goat whey (GW) and grape pomace (GP), by-products of the dairy and wine industries, are two examples of such by-products that have significant processing potential. Both are rich in various bioactive compounds, which is why they have the potential to be processed into various pharmaceutical, food or nutraceutical products. In this study, GP was used as a source of bioactive phenolic compounds isolated by extraction. Encapsulation of the liquid GP extract was performed by spray drying with powdered GW (2.5%, w/v), which served as the primary coating material. It was investigated how GW alone or in combination with additional coating material influences the properties of the obtained microcapsules (powder). To stabilize the GW, trehalose, sucrose, xylose and maltodextrin (DE 4-7) were used as additional coating materials, which were added to replace a certain proportion of the GW (2.5 – 30 %). The analyses showed that all microcapsules are hydrophilic and almost all have an amorphous structure, which was confirmed by X-ray powder diffraction and differential scanning calorimetry analyses. The microcapsules containing 10 % sucrose, trehalose or xylose and 5 % maltodextrin have a semi-crystalline structure. The average particle size varied between 3.31 μm and 4.61 μm . The scanning electron microscope (SEM) images show that the microcapsules are shriveled with irregular shape and size. The development of a "skin" on the surface of the microcapsules is another feature seen in the SEM images, indicating the presence of a protein coatings.

Acknowledgement: This work was supported by the Croatian Science Foundation under the project (IP-2018-01-1227) „Development of a sustainable integrated process for the production of bioactive isolates from food industry residues” (POPI-WinCEco) and Bilateral project Croatia-Hungary „Encapsulation of polyphenol-rich extracts from food industry residues and characterization of encapsulated particles” (grant number: HRHUN_2020_011).