Description for the general public

Fruit powders may be successfully used as a natural source of biologically active compounds. The preparation of powders from fruit juices or pomace is connected with evaporation of a significant amount of water (juices contain up to 90%, whereas pomace up to 60% of H_2O). Drying of fruit juices or pomace is considered to be a complex process. The conventional drying methods applied for fruits dehydration neither guarantee nor allow to obtain powders of desired qualities and properties typical for this kind of dried products. Obtaining powders from fruit juices or pomace requires a broad scope of knowledge regarding drying processes and parameters. Inappropriate performance of drying may result in a degradation of natural bioactive compounds present in fruits. What is more, due to the specific chemical composition of fruits, new compounds may be formed, which are not present in a raw material and which may be harmful to a human health.

The research under the project aim to select appropriate methods and parameters of drying, as well as to evaluate their influence on the content of biologically active compounds present in powders obtained from juices and pomace of popular fruits (blueberry, cranberry, chokeberry and blackcurrant). Obtaining powders from juices usually involves the application of different carriers such as maltodextrin, arabic gum or starch, as their absence is considered to make the drying process impossible to take place. In the project in question these carries will be replaced with inulin, which has been proved to have a number of pro-health properties and, due to its chemical composition, may have a beneficial impact on human health. When it comes to obtaining powders from fruit pomace, the combination of conventional drying methods will be performed to achieve dried products of a relatively low moisture content. This will contribute to obtaining powders of desired physico-chemical properties. The powders obtained will be subject to the quantification of both the compounds with a positive impact on human health and the compounds that might exert some harmful effects. On the basis of the physico-chemical properties of the powders, the relationship between the methods and parameters applied will be determined. This will allow to select the process parameter that influenced a high quality of the powders. The powders obtained from juices and pomace will be used in *in vivo* studies on an animal model (rat) in order to evaluate the influence of bioactive compounds present in the powders on the response of the immune system (determination of the concentration of biochemical markers of Il-1, IL-6, and IL-10 and TNFα and TGFβ in the serum of rats). Powders will also be investigated in terms of the influence of their storage at different conditions on their physico-chemical properties. Research carried out in the project will be of an interdisciplinary nature, investigating the issues of food technology, analytical chemistry and medicine.