

## Description for the general public

Fruit powders may be successfully used as a natural source of biologically active compounds, regardless of the seasoning of fruits. Such products may be an alternative to artificial supplements. The preparation of powders from fruit juices is connected with evaporation of a significant amount of water (up to 90%). Drying of fruit juices is considered to be a complex process. The transformation of fruit juice into powdered form requires the application of carriers (mainly maltodextrins, Arabic gum, etc.) that enable the drying process. The drying methods do not allow to obtain powders of quality comparable to fresh products. 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 human health.

The project aims to identify critical drying parameters for preservation of bioactive compounds to improve the quality of fruit powders. Novel and functional carriers like inulin, trehalose and isomaltulose will be studied. Fruits juices from dog rose - *Rosa canina* (easy available and excellent source of ascorbic acid, polyphenols and carotenoids) and blue honeysuckle – *Lonicera caerulea* (high content of polyphenols, especially anthocyanins) will be prepared to provide knowledge of chemical changes that occur during drying of these fruit juices. The study will also explore the effect of carriers on the formation of Maillard reaction (caramelisation) products, a pertinent quality aspect of powders production that must be evaluated due to the health-related impacts. The interactions of polyphenolic fruit compounds and selected carriers on the formation of Maillard reaction products will be complemented with studies on model systems, to give a more detailed insight into this complex system. An addition of herb (*Morus alba*) and edible flower (*Crataegi inflorescentia*) extracts rich in antioxidants and polyphenols in preparation of fruit powders will be for the first time studied. The objective is to improve the physical, chemical, sensorial and biological properties and to inhibit the formation of Maillard reaction and caramelisation products. Such approach will provide new knowledge of the interactions between bioactive components originating from different natural sources that occur during drying. Finally, the consumer acceptance of the novel type of fruit powders in Switzerland, Poland and Spain will be compared to gain information about national preferences. Research carried out in the project will be of an interdisciplinary nature, investigating the issues of food technology, analytical chemistry, physics, bioactivity and sensorial evaluation.