

DESCRIPTION FOR THE GENERAL PUBLIC (IN ENGLISH)

In recent years, an alarming increase in the incidence of diet-related diseases, including gluten-related disorders is observed. The classification of gluten-related disorders include wheat allergies, gluten sensitivity and coeliac disease. Coeliac disease is an autoimmune disorder triggered by the ingestion of gluten in genetically susceptible individuals. Chronic inflammation leading to cachexia of the body is a consequence of gluten consumption by sick individuals. The only treatment of coeliac disease is a lifelong elimination of gluten from the diet. However, gluten-free diet has very low nutritional value, therefore its supplementation seems to be necessary. Currently, natural supplements, having additional nutritional/health benefit value become more and more popular for the consumers, producers and researchers. We chose inulin-type fructans as an additive to gluten-free diet because their health-benefit attributes. These compounds are present in large amounts in chicory and Jerusalem artichoke as well as in onions, garlic and leeks. They belong to group of prebiotics, means non-digestible food constituent that shifts to the colon and selective stimulate the growth and activity of host beneficial bacteria. Numerous studies indicated the health-benefit effect of inulin-type fructans, including improvement of minerals absorption and alleviation of the inflammation symptoms. **Therefore, the aim of this project is to evaluate the influence of inulin-type fructans, as supplements of gluten-free diet, on volatile organic compounds in urine of children with coeliac disease.** The main reason for undertaking research presented in this project, is the lack of scientific information regarding the influence of inulin-type fructans on the health of people with coeliac disease.

The project assumes the analysis of profile of volatile organic compound in urine of coeliac children following the gluten-free diet supplemented with inulin-type fructans. As a result of metabolic processes, cells of human body emit hundreds of volatile compounds, the composition and amount of which may vary in the course of pathological conditions. Therefore, the analysis of these compounds can help to determine the metabolic state of the body. Urine contains many metabolic products, which entered the bloodstream and have been excreted by the kidneys. Additional, analysis of urine is non-invasive and unstressful method for children. The project involves the providing of information on the influence of food and its components on the human body. A study on the application of inulin-type fructans in the diet of people with coeliac disease, using modern extraction and sophisticated chromatographic methods allow to undertake further research to explain the potentially beneficial effects of these compounds on the human, especially children, body. The knowledge obtained can contribute to the development of new nutritional strategies, improving the effectiveness of a gluten-free diet. Furthermore, the results obtained can play a role in raising public awareness about the effects of consumption of prebiotics and following the gluten-free diet.