

Osteoporosis is a serious disease in which loss of bone tissue occurs, leading to an increase in the frequency of fractures, and consequently, a loss of the ability to walk independently. Throughout the world suffer from it more than 200 million people, and especially vulnerable to the development of osteoporosis are postmenopausal women. Research results indicate that a properly balanced diet can significantly reduce the risk of osteoporosis. Of particular importance is the consumption of adequate amounts of nutrients such as calcium, carotenoids or vitamin D. In the diet therapy of osteoporosis an important part of prevention, providing additional health benefits, is the simultaneous consumption of ingredients which aid the absorption of calcium, being the ingredients of traditionally consumed food. Therefore, the **main aim of the studies** is the enrichment of the pumpkin pulp (*Cucurbita* L.) with calcium compounds, evaluation of its antioxidant capacity and the effect of its consumption on bone, and thus the occurrence of osteoporotic changes in the animal model of postmenopausal osteoporosis.

The planned study will analyze the chemical composition of different varieties of pumpkin (*Cucurbita* L.). Evaluations include the content analysis of protein, fat, carbohydrates, fiber, minerals and other components of high biological activity (e.g. the phenolic profile, carotenoids). Antioxidant properties of pumpkin pulp will also be examined. Based on these results, there will be selected a variety of pumpkin, characterized with the most beneficial chemical composition and the highest antioxidant activity. In a further step selected pumpkin pulp will be subjected to the process of osmotic dehydration during which it will be enriched with selected calcium compounds. Obtained by this process pumpkin pulp will be subjected to composition analysis, changes in calcium and other selected components content.

In the next stage of the research, innovative pumpkin pulp enriched in calcium will undergo the process of digestion in a laboratory bioreactor that simulates the conditions of digestive processes in the human body. Based on these results it can be concluded on what extent calcium and carotenoids found in the pumpkin pulp will be absorbed within the organism. The most important step in the research is to check on laboratory animals, if the consumption of pumpkin pulp enriched in calcium affects the health of their bones. For this purpose, in order to induce osteoporosis, the rat ovaries will be removed. Then, during 12 weeks of experiment, the rats will be fed with pumpkin pulp enriched in organic and inorganic compounds of calcium. Subsequently, after the experiment animal's blood and internal organs will be examined for the content of calcium and antioxidative status. In order to determine the safety of enriched pumpkin pulp collected blood samples will be marked for morphological parameters and the concentration of AST and ALT. Additionally, within the acquired femoral tissue the study will be performed, allowing to conclude whether the calcium-enriched pumpkin consumption influenced advantageously bone structure.

Results of studies conducted in this project will determine whether the consumption of the calcium-enriched pumpkin, as the new attractive diet component, could affect the health of the bone and may result in beneficial changes in relation to the antioxidant activity. Demonstration of the benefits resulting from the consumption of pumpkin enriched in calcium would serve as a tool in designing of food with health promoting activity. This knowledge is an important element for the prophylaxis and treatment of osteoporosis support, and therefore the reduction the expenditure for the pharmacological treatment. Additionally, the project will indicate the direction of developed enrichment technology application in another plant matrix.