

In recent years an increase in the number of scientific researches concerning healthy foods, and particularly plant products have been observed. These studies suggest that biologically active compounds present in foods may be beneficial to human organism. One of which are betalains. Betalains are not widely known plant pigments. Only 55 structures of these compounds have been discovered till now. These compounds are natural, soluble in water, pigments, characterized by a red-violet color (betacyanins) and the yellow-orange (betaxanthins). The basic structure of betalains is betalamic acid which in the case of betacyanins molecule is attached cyclo-3,4-dihydroxyphenylalanine (*cyclo*-DOPA ) betaxanthins molecule in the case of an amino acid or amine. A rich source of betalain are: pitaya (dragon fruit), amaranth, beet leaves, pear cactus, ulluko and beetroot. However, the highest content of betalain compounds is present in a beetroot.

Beetroot is just the most commonly grown root vegetable in Poland. According to the Central Statistical Office, the harvest of this vegetable in 2014 was estimated at 314 thousand tons and increased by 5.3% in comparison to previous year. In Poland, this vegetable is very popular and eagerly consumed. It is consumed in the form of cooked salad, fresh or fermented juice and soups. Beetroot is a rich source of many vitamins (C, B1, B2), minerals (K, Ca, Mg, Fe) and a number of bioactive components which are beneficial to the human body. Betalains are strong antioxidant, which stems from the structure of their molecules. Therefore beetroot is among the top ten vegetables characterized by the most powerful antioxidant properties. Previous research suggests that consuming betalains brings a lot of positive aspects such as.: inhibit lipid peroxidation, protective effect in relation to red blood cells and can prevent oxidative haemolysis and act anticancer.

The main scientific objective of the project is to determine the possibility of betalains absorption from the stomach and understanding the metabolic processes which are subject to these compounds during the absorption process.

Currently, natural food substances exhibiting a range of biological activities are becoming more and more popular both among consumers, producers and researchers. The reason for undertaking research related to betalains is their beneficial effects on the human body, which is partly due to the high antioxidant potential of these substances. Betalains are characterized by high stability and due to this are successfully used for coloring food, ie.: yogurts, jams, ice cream and marmalade. Unfortunately, despite the wide use of betalains so far the substances included in this group have not yet been fully characterized. Therefore, the main reason for taking these study is the lack of scientific information talking about betalains absorption from the stomach into the bloodstream. This research are contribute to the development of sciences related to the effect of dietary components on the condition of the body humans and animals and will become the starting point for the development of new theories.