

## Sugar-free fractionated red beetroot juice biological activity evaluation

In the case of type II diabetes, the most important preventive and therapeutic effect gives a diet with a minimal amount of easily digestible carbohydrates. Vegetable juices positioned as healthy food products, because of high content of phenolic and other biologically active compounds. However, due to the high glycemic index, juices contraindicated in diabetes, while juices with a reduced glycemic index are not available on the market. We have developed a technology for the fractionation of red beetroot juice based on molecular weight using ultrafiltration. The resulting fraction can stimulate duodenal absorption of iron, increase blood hemoglobin level in iron deficiency anemia and enhance capillary blood flow more effectively than native juice do. Both effects are extremely important for patients with diabetes because the impaired blood supply to tissues and organs is an important pathogenetic factor in the development of diabetic renal failure, blindness, gangrene. The sugar content in fractionated beet root juice is 5-7%, which makes its use in diabetes problematic. The purpose of the study was to develop a technology for removing sugar from fractionated red beetroot juice and assessing the safety of its functional properties.

The native red beet juice fractionated and fermented fractionated juices were studied. Fermentation was carried out using pre-activated yeast *Saccharomyces cerevisiae*. In experiment in vivo chickens were ingested once per os 0,17-0,35-0,70 mg of iron separately, as well as in combination with 1 ml of the studied juice. After 100 minutes, the iron content in blood, duodenal mucosa, liver, and spleen was determined. The balance of trace elements in chickens' body was evaluated by the iron quantity obtained with diet and excreted with droppings for 3 days. According to the same scheme, a similar experiment was conducted on laboratory rats with experimental iron deficiency anemia, in which the exposure time was 3 days.

It was found that after 5-day fermentation, the sugar content in the native and fractionated juice fell to 0.5-0.7%. Fermentation did not affect the ability of both types of juice to stimulate intestinal absorption of iron and its concentration in blood. However, hemoglobin level and the total retention of trace elements in chickens body administered fermented juice have decreased due to reduction of accumulation in liver. In rats with alimentary iron deficiency, the dynamics of indicators of trace element metabolism did not depend on the fact of juice fermentation. The described phenomenon requires a deeper study.

Key words: beetroot juice, sugar, iron, diabetes

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