

Health-improving drinks

Local Foundation «Science-Technological Park», Minsk, Belarus

The main purpose of running in Technopark cooperative research projects is the development and manufacturing of functional food additives – phyto-(or herbal) health-improving food on the basis of natural raw materials (in the form of fine powders) enriched with vitamins A, D, B, minerals (magnesium, potassium, calcium), amino acids and dietary fibers, allowing creation of a range of food products that help to enrich the adaptive capabilities of the human body and reduce the negative effects of adverse environmental impacts.

Negative effects of harmful environmental conditions on the body are enhanced by the lack and imbalance of vital essential nutrients in foods of the population of the republic, which entails a weakening of the body's defense systems and reduces its resistance to colds, infectious and other diseases, contributes to the gradual development of immune disorders and chronic stress-induced diseases. In order to increase the adaptive capacity and resilience to adverse environmental factors it is important to use body reserves better.

According to many scientists' view, it is possible to improve one's health by changing just one component – the structure and the nature of nutrition. Nutrition should be not only balanced in proteins, fat, carbohydrates and energy component, but also contain a large range of different essential substances that are necessary for the human body. The functions of an adequate and optimal nutrition could be performed by functional foods that do not belong to medicines but at the same time help to prevent diseases and premature aging in the current environmental situation.

The basis of the concept of our developments is the results of clinical and experimental studies, carried out in our republic and abroad, as well as our own experimental data, that give a good reason to supplement the diet of people living and/or working in ecologically unfavorable regions and conditions, with food containing a number of biologically active substances required for immunity and for overcoming Chronic Fatigue Syndrome (CFS).

The most vulnerable group of population in our Republic and in the CIS countries are children and teenagers, exposed to excessive emotional and mental stresses. Permanent deficiency of vital nutrients, especially vitamins, minerals, amino acids, dietary fibers have a negative impact on the adaptive abilities, growth and development of children's organisms, and it is one of the reasons for the gradual development of immune disorders and stress-induced chronic diseases.

In clinical practice abroad for treatment of CFS different medications are mainly used: antimicrobial, antiinflammatory, antihistaminemedications, and antidepressants. Another way to deal with chronic fatigue is the use of herbal remedies, produced on the basis of plant extracts.

Analysis of the sources of research and patent literature gives us a possibility to suggest that fruits and berries in fresh and processed form play a crucial role in human nutrition. They are irreplaceable products, because they contain easily digestible carbohydrates, organic acids, vitamins, spices and flavors. There are a variety of minerals in the vegetable and fruit raw material – potassium, calcium, magnesium, iron, phosphorus, etc., insufficient use of which increases the risk of serious diseases. A large number of nutrients of natural origin contain berry, fruit and vegetable powders as from whole fruits, also from their marc. The functional significance of such powders is determined by the fact that they contain a set of materials adapted to the metabolic processes in the human body, and therefore cases of intolerance and allergic complications are almost always excluded. Components of biologically active substances of herbal powders are not accumulated in the human body, and therefore their dose of exposure should not be regulated.

These qualities of fruit raw material open up new opportunities to apply them effectively in creating health-improving mixtures that can be used as stand-alone supplements for dietary purposes, and for food fortification.

Since the human body consists of 75% of water, one must consume up to 3 liters of water in order to maintain the water balance, including water in functional beverage prepared from natural ingredients.

The technology of production of such drinks allows keeping all useful natural ingredients, taste, color and smell of raw materials after the processing of natural plant materials and therefore provides a high level of digestibility and bioavailability of biologically active substances from the final product.

On the instructions of the republican program "Food for Children" for 2011-2015 we develop science-based mixtures in series of functional drinks with tonic properties, intended for older and middle school age students.

Professionals of different areas of expertise with experience of research in chemistry, physics, microbiology, biophysics, medicine, specialists in the field of food production take part in present work,

The spectrum of the research includes the study of how global experience in the field of restorative drinks and direct scientific substantiation of the most promising functional ingredients, which can be used in the creation, determination of optimum dosages of introduced ingredients, optimization of particle sizes of plant material, providing high extractive ability of nutrients in the preparation of fortifying drinks; confirmation preventive profile of developed products.

In the line of developed health-improving drinks the following types are included:

- 1) tea drinks (powder) for a single wedding, that also could be used in catering establishments;
- 2) kvass drinks (powder);
- 3) bottled tea drinks and kvass.

Combined mixtures of health-improving drinks and tea kvass drinks are based on natural, vegetable raw materials and by-products of processing of fruit and berries: (powder of dried apples and / or apple pomace, dried beet powder, powder of dried carrots, chicory, Jerusalem artichoke, peppermint, melissa, black currant (berries), blueberry (berries), chamomile flowers, anise, thyme, tarragon, oregano, cinnamon, vanilla, black tea, green tea, etc).

Herbal health-improving products also contain proven in practice, functional food and necessary for the body:

- vitamins B (B2, B6, folic acid), vitamin PP;

- organic acids (ascorbic acid, succinic acid, citric acid);
- insoluble dietary fibers (inulin, pectin);
- vital trace elements;
- isotonic solutions.

Health-improving drinks of combined structure belong to preventive products of polyfunctional profile:

- with considerable biological value and high organoleptic qualities;
- with a high concentration of natural vitamin-mineral complexes, and other biologically active substances;
- adapted to the needs of a weakened organism in conditions of deficiency of macro- and micronutrients;
- with a maximum degree of assimilation.

Using these drinks, the entire spectrum of useful biologically active substances, including vitamins and minerals contained in plants that were used during the preparation of these drinks, goes into the organism and will provide synergistic, cumulative and prolonged effects.

It is important to note that the application of functional drinks will not lead to a dependence syndrome in case of cancellation and removing them from the diet. As a part of the daily diet such drinks can participate in the management and improvement of protective biological mechanisms of the body in order to protect it from certain diseases or even prevent them, improve endurance and normal psychological and psychosomatic condition of the person.

Implementation of the results of these research investigations into production allows organizing non-waste production and creation of health-improving drinks, having preventive properties, stable quality with guaranteed chemical composition.

Products of this kind are necessary for many groups of population, especially for school children, students, athletes, people engaged in heavy mental or physical work, requiring a lot of energy, and for people living in ecologically unfavorable regions as well. These drinks are beneficial to people of all ages, and could be recommended for the prophylactic use for the whole family.