

## MEAT PRODUCTS AND HEALTH OF RUSSIAN POPULATION

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Macro- and microeconomical situation in Russia brought the problems of the health of the nation in the foreground. Nutrition is an important aspect of health improvement of the population. According to the Russian Academy of Medical Science the life expectancy of Russian people is 57 years for men and 72 years for women versus 72 and 80 years, respectively for the population in Western countries. According to experts the health of the nation depends on the system of health protection only at 8-12%, while the share of the influence of socio-economical conditions and conditions of life activities is at 52-55%. At the present time there is no doubt that the right nutrition is one of the main factors providing the health of the nation, life prolongation and prophylaxis of health disorders. Obesity as an inevitable consequence of unbalanced nutrition is practically always a provoking background for the development of such serious diseases as diabetes, atherosclerosis and cardio-vascular diseases. Therefore the natural concern arouses from the fact that up to 45% of men and 55% of women of Russia have overweight. The results of large-scale examination by the workers of the Institute of Nutrition of the Russian Academy of Medical Science have revealed vitamin C deficiency with 70% of those examined, and vitamins of group B – with 40-60% of examined people. About 3% of the examined people had vitamin A deficiency, though it is known that normal foods create 2-3 years reserves of this vitamin.

During many centuries people have known about healing properties of individual plants and minerals, however, only in recent times the problem of prophylaxis and treatment of different diseases through special nutrition acquired the form of program and general name – health-enhancing nutrition. But the health-enhancing nutrition shouldn't be considered as a curative nutrition, which primarily provides for chemical and mechanical protection of the sick organ, substitution of the products for restoring its function or introduction of necessary nutrients that are in deficiency with sick people. Healthy nutrition is directed to the prophylaxis of diseases rather than their curing.

Thus, the necessity of development of the range of meat products maximally balanced over all the principal nutrients and enriched with different biologically active additives having specific functional loads becomes evident. Speaking about healthy foods we propose to classify them, as follows. These are the products:

- ◆ of general purpose, meeting the requirements of the population in rational foods taking into account traditions and local peculiarities;
- ◆ curative nutrition;
- ◆ special purpose, for different age groups and different professions. These foods should be differentiated by vitamin and mineral composition, caloric content;
- ◆ child nutrition, i.e. the foods for children of different ages, including curative nutrition for children;
- ◆ prophylaxis purpose and fortifying action. The products replenishing deficiency of individual nutrients, vitamins and minerals in the organism, shortages of which can bring about one or another disease, and also products containing the substances, strengthening immune system;
- ◆ those possessing a prophylactic action, i.e. the products containing components preventing, for example, from the formation of free radicals in the organism, or cells mutations;
- ◆ products having antitoxic effect. In these groups can be included products, containing additives reducing the risk of effects of harmful substances and helping to remove them from the organism. To such substances can be attributed salts of heavy metals, radionuclides, toxins, etc.

A new direction of food science – development of foods enriched with biocorrectors, i.e. substances adding to ready products curative and preventive properties – aroused great interest in recent time. In our opinion, the food biocorrectors can be divided into two categories: specific and non-specific. As non-specific biocorrectors we mean compounds, increasing the resistance of a human being to negative effects of the environment and preventing the development of a large range of diseases. The most common and known group of non-specific biocorrectors are vitamins. It is well known that vitamins increase the resistance of a human being to a wide range of diseases. For example it is lycopin – a plant pigment of carotin range. Lycopin is twice more actively inhibits a singlet oxygen and free radicals, than  $\beta$ -carotene protecting the cells from oxidative stress. Strengthening properties of micro- and macroelements are well known.

As specific biocorrectors we mean compounds, purposefully influencing the link of metabolism and eliminating alimentary deficiency that is a reason of pathogenesis of a disease. Specific biocorrectors also protect a biological target, the damage of which has evident undesirable consequences for health. Omega-3 polyunsaturated fatty acids can be related to such specific biocorrectors. Taking into account the fact that omega-3 polyunsaturated fatty acids aid in prevention of cardio-vascular diseases, arthrites and even carcinogenic diseases, the increase in the content of this compound in meat products will allow to produce meat products having pronounced curative and preventive effect. A specific biocorrector is also hemoglobin, preventing from the development of iron-deficiency anemia or, the bone preparations compensating for the calcium deficiency in the organism and thus preventing from occurring of osteoporosis and hypertension.

Meat industry products have an important role in health-enhancing nutrition. It is primarily due to the fact that meat products are one of the main sources of animal protein. At the present time the annual per capita consumption of meat and meat products in Russia is on the average 47 kg. Meat raw materials are the main source of such necessary nutrients as vitamins D, B<sub>12</sub> and retinol, iron and zinc. It is known that more than 1/3 of iron coming to our organism as an easily digested iron we receive from meat and meat products. Meat raw materials – are muscular, connective, bone and fat tissues. The role of each component in provision of a human being with healthy nutrition is very significant, but different.

The All-Russian Meat Research Institute makes a contribution into the increase of the range of foods for curative and preventive nutrition. These foods contain both specific and non-specific biocorrectors.

These are foods for child nutrition helping in prevention of insipidus, anemia and diseases of gastro-intestinal tract. A large range of meat semi-prepared foods "Zdorovye" for the nutrition of children of different age groups is being developed.

These are also curative and preventive foods for adult people of the country, assisting in resistance of the organism to such diseases as iron-deficiency anemia, osteoporosis, diabetes, heart disease, dyskinesia of gastro-intestinal tract, calcium-phosphorus-iron deficiency states. These products contain: blood of slaughter animals or its fractions, bone powder, that allows to enrich products with highly digestible forms of iron, phosphorus and calcium of animal origin. Use of these products will allow to strengthen cardiac muscle and bone tissues, prevent from washing out of calcium from bones of people suffering from diabetes, improve general state of people. Of course, use of curative and preventive products will not substitute the use of medicinal preparations. However, they will aid to bear easier the medicinal preparations and smooth negative and side effects of chemically synthesized medicines.

Meat and hydrolysate of mussels meat, wheat germ flakes, plant and milk proteins have also pronounced heme stimulating, radioprotective and antistress effect. The technologies and formulations developed by our specialists of cooked sausage products (sausage, sardelles and frankfurters) enriched with these specific biocorrectors will allow to produce curative and preventive foods for a wide circle of persons, primarily for cancer carriers, subjected to intensive radio- and chemical therapy, as well as for people suffering from radiation emergency cases or living at radiation contaminated areas or in the places of ecological contamination with gene toxic compounds, inhibiting blood forming and immune systems. The work in this direction is actively going on.

Development of foods of new generation having strengthening and curative and preventive effects is also important. In this case it is necessary not only to protect the organism from adverse effects of the environment but from occurring sick cells inside the organism as well. Besides, with the increase of technogenic load on the environment, development of new kinds of food products, study of factors of adverse influence of the results of technogenic activities on the organism of a human being become important. Consumers are concerned with the safety of food products not only because of food poisonings and diseases. They are also concerned about the fact if one or another product contains the substances possessing mutagenic properties that can have an adverse effect on future generations.

The ability of proteins and other nutrients under the influence of chemical factors of exogenic and endogenic environment of a human being to form complexes possessing allergenic, carcinogenic, mutagenic effects led to the necessity of thorough study of food additives from the point of view of their ability to form such complexes, and also on the determination of the means for removal of such complexes from the organism of a human being. These substances removing toxic complexes from organism of a human being, in our opinion, can also be attributed to the group of specific biocorrectors.

From all the above-mentioned we see the following most promising directions of scientific research:

- ◆ revealing and investigating of food ingredients with biocorrector properties;
- ◆ development on the basis of natural biocorrectors of food compositions with curative and preventive properties;
- ◆ development of processing technologies of curative and preventive foods maintaining antioxidative, antimutagenic and immune systems, which suffer mostly in ecologically unfavourable conditions;
- ◆ development of a range of products for people with harmful conditions of labour. This direction envisages the development of products containing biocorrectors specifically preventing from or decreasing the effect of the damaging factor;
- ◆ development of methodology of evaluation of biological properties of ready products, containing biocorrectors.

Yet, it is important to note that for the improvement of the health of the nation not only wholesome products are necessary, but also wide educational activities. The elimination of information deficiency with regards to the assortment and functional orientation of special products – one of priority tasks of Russian scientific organizations.

The All-India Nutrition Research Institute makes a distinction between a diet which is specific and non-specific.

These are foods for which nutrition is being given in prevention of malnutrition, specific and non-specific malnutrition.

There are also nutritive and preventive foods for the people of the country, essential in relation to the organism.

Such diseases as iron-deficiency anemia, osteoporosis, diabetes, heart disease, rheumatoid arthritis, cancer, etc., are

malnutrition-related diseases. These are diseases which are caused by malnutrition, and the diet should be such as to

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