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THE EFFECTS OF LOW DOSE RADIATION. RADIATION HORMESIS

Currently, there is no consensus about the influence of low doses of ionizing radiation on the body. Some researchers believe that low doses cause positive effects, also known as the hormesis effect. Others say about the dual nature of exposure with low doses. Accordingly, there are two opposing models for assessing effects of ionising radiation on the organism. The first one is the linear no-threshold model, which is based on the assumption that any dose of radiation is harmful. The second one is the threshold model. It postulates that there is a threshold dose below which radiation cannot cause diseases carcinogenic and non-carcinogenic nature. This model relies on the concept of radiation hormesis.The concept of "radiation hormesis" suggests, that ionizing radiation in low doses can induce positive biological effects and to provide a stimulating effect on the organism.

According to the last model of low doses impact, we can characterize effects of low doses not as a positive effect (or hormesis effect), but as a hyperfunctional effect. That means that small doses can result in both positive and negative effects, which are a deviation from the norm.

The effect of low doses of radiation on the body causes damage to DNA with the launch of the reparative systems. Also the stimulation of physiological processes, which neutralize damage to DNA, starts. However, the systems of DNA repair are not specific and are aimed at the neutralization of non-radiation DNA damage.

Any increase of ionizing radiation effect intensity leads to increase of the risk of mutations. Sometimes a cell goes through mitosis without eliminating radiation-induced damage. In this case, there may be a process of such rapid multiplication of clones of mutated cells. The result of this process is the formation of a tumor.

In view of the utmost importance of this problem, there are many studies on effects of low doses on the organism. Experiments were conducted on animals.

For example, experiment on x-ray irradiation of mice throughout life conducted in 1950 and 2005, experiment on infection of mice with Salmonella typhimurium a day after x-irradiation in 1953, study of the effect of gamma radiation onmice life expectancy in 1958 and 2002.

There have also been studies of the effect of low doses on humans as a result of their professional activities or emergency situations or natural sources.

For example, comparison of the mortality rates from cancer in the highlands (765 mSv/year) and in areas of lowlands (195 mSv/year), 1998, USA; study of the beneficial effect of chronically high exposure among women older than 35 years, 1990, China; a study of the influence of chronic irradiation as a result of the incident in Taiwan, 1982-1983.As well as a series of studies of the life expectancy and

quality of life of NPP workers, military personnel who participated in nuclear weapons tests, radiologists, etc.

All studies in this field are very contradictory. Therefore, the influence of low doses in general, and the effect of hormesis in particular, need additional study.

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THE ANALYSIS OF VOLUMES OF THE FOOD INDUSTRY WASTES

Food waste pollute vast areas of land. Almost all enterprises of the food industry emit gases and dust, worsening air condition and lead to an increase in the greenhouse effect and of course have a negative impact on water resources. Daily millions of people throw away remnants of food, tainted products, packages, glass and plastic bottles, and much more. All this accumulates and requires ongoing processing and disposal, but because of the large volumes of waste, lack of high-tech equipment, these operations may be slow.

The aim of our research is to analyze volumes of the food industry waste generation and the creation of innovative technologies for the use of various wastes as alternative energy sources.

The object of analysis is the city of Smorgon and its industries. Defining activities in the industry is the production of wood products and paper (56.8%), production of food products, beverages (24.6%), manufacture of machinery and equipment (10.5%), electricity supply, gas, steam and water supply (3.1%). The largest enterprises of food industry are "Smorgon Dairy" the branch of OJSC "Lida Milk Plant", UPE "Smorgon plant of bread production" and numerous catering facilities. On the territory of the Smorgon and Smorgon district landfill SMW "Black Forest" is located and 23 mini-sites are located. During the research such concepts as "food industry" were examined, its basic industries were named, environmental problems were characterized that are related to food production and analysis of the volumes of waste food generation was carried out.

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HORMESIS WITH THE AID OF DYNAMIC SYSTEMS

The term "hormesis" introduced S. Zontman and D. Ehrlich in 1943, comes from the Greek hórmēsis (fast movement, aspiration) and is the stimulating effect of moderate doses of stressors. To indicate the positive effect of low doses