

## THE ESTIMATION OF LEVELS OF RADIATION EXPOSURE TO PEOPLE DUE TO FOOD RATION

*Sokolovskyi D.N., Kutsak A.V.*

*Academic adviser: Ph.D. in med., senior lecturer's Kutsak A.V.*

*Zaporozhye State Medical University, General hygiene and ecology department*

**Purpose and research problems:** To carry out an assessment of exposure doses of the population at the expense of a diet and possible negative consequences.

**Methods and their use:** The analysis of an annual ration of the population according to Head department of statistics in the Zaporizhzhia region and data of the state statistical documentation – semi-annual "Reports of a research of a radioactivity of foodstuff and objects of the environment" (ф. P1). For calculation of doses from technogenic sources results of radiochemical researches of strontium-90 and cesium-137 in foodstuff were used.

**The received results:** In the Zaporizhzhia region radiative and hygienic monitoring of food is carried out according to the regional "Protection program of the population of the Zaporizhzhia region from ionizing radiation" within system of social-and-ecological monitoring.

It is established that the most powerful in the radiative relation are fish fresh-water, meat and meat products, least – bread and bakery products, water. At the same time, if in 1987 contents  $^{137}\text{Cs}$  approximately at 5-10 times exceeded contents  $^{90}\text{Sr}$ , then contents excesses  $^{137}\text{Cs}$  from  $^{90}\text{Sr}$  in the studied products were never registered in recent years. During the analyzed period of 2010-2014 activity  $^{137}\text{Cs}$  and  $^{90}\text{Sr}$  in foodstuff was almost made even.

Respectively and population exposure doses at the expense of a diet don't exceed 0,4% of the admissible quota (no more than 1 mSv) established to Ministry of health of Ukraine. Calculations showed that population exposure doses at the expense of a diet for 2010-2014 made 0,0033-0,0038 mSv (on average 0,0035 mSv) that is 21,1 times less, than in 1987.

The received results demonstrate that in 1987 the greatest exposure doses at the expense of a diet were recorded. Negative consequences for the population for the studied period from radiation at the expense of a diet are extremely insignificant and can be only markers of level of radio-contamination of the territory of the Zaporizhzhia region radionuclides of the Chernobyl parentage.

## THE RADIATION EXPOSURE TO PEOPLE DUE TO NATURAL RADIATION IN BUILDINGS

*Zaytzev A.S., Kutsak A.V.*

*Academic adviser: Ph.D. in med., senior lecturer's Kutsak A.V.*

*Zaporozhye State Medical University, General hygiene and ecology department*

**Research goals and objectives:** To perform the research on the territory Zaporozhye region to identify the existing level of gamma background at the open area and inside the living buildings, and to estimate possible doses of radiation from the natural sources.

**Methods and their usage:** Dosimetric, statistical and calculated methods were used. To identify the radiation dose from the natural sources, the results of radon-222 identifying at the air of the living buildings, the activity of natural radionuclide in the construction materials, and the level of gamma background at the open area and inside the living buildings. The existing of radon-222 were conducted passive track radonometry method.

**Obtained results:** It was established, that the total average annual effective radiation dose from the main natural sources is 4,3 mSv, what exceeds average annual in 1,8 times and it in 19,4% higher than the average Ukrainian. The main contribution to the dose carries in radon-222 – 76%. Average results of the existing of the power of devoured dose in the air at the open area, conducted during radiation-hygienic monitoring average for 5 years, the power of devoured dose in the air at the open area was 11,3 mR·h<sup>-1</sup>. Average amount of the power of devoured dose gamma-radiation in the air inside the building is - 12,2 mR·h<sup>-1</sup>. It was established, that the total dose of radiating people in the region at the expense of the external radiation into the buildings and at the open area was 0,64 mSv/year-1, 80% of the dose determines radiation inside the buildings. It was established, that

the radon-222 level at the air inside the living buildings fluctuates from 36 to 112 Bq·m<sup>-3</sup>. Standart exceeding percent, according to RSNU for living buildings, is from 5% to 62% depending of the region. It was established, that average effective dose of radiation is 3,3 mSv·year<sup>-1</sup>, at the separated regions this index varies from 2 to 5,4 mSv·year<sup>-1</sup>. Controlled component of total dose of natural genesis at the expense of construction materials, drinking water, radon-222 in the air of living building is 89,7 %.