



## POSSIBLE WAYS OF FOOD CONTAMINATION

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**Abstract:** In this article, possible indicators of contamination of food products are mentioned. That is, through this, we can learn about the decrease in nutritional quality indicators of food products.

**Key words:** Radioactive, food, animal, nutrition, mineral substances, trace elements, plant, pollution, physiological.

The effect of radioactive radiation on a person is caused by radionuclides in the air and on the surface of the ground, as a result of contamination of contact skin and clothing, and internally - entering the body together with inhaled air and contaminated food and water (incorporated, that is, combined with one which takes place) covers external  $\gamma$ -,  $\beta$ -radiation at the expense of radionuclides.

The main rules of nutrition for children and adults in polluted areas are as follows:

- increasing the share of proteins to 15% of the caloric content of the rations mainly due to the proteins obtained from animals (they should make up 60% of the total protein intake);
- limiting the amount of fat to 30% of the caloric content of the rations by reducing the amount of vegetable oils to 30% of the total fat;
- increase the amount of antioxidant vitamins in the diet: vitamins E, C, A,  $\beta$ -carotene, bioflavonoids by 20 ... 50% compared to age norms;



- increase the amount of food fibers up to 20-30%;
- to ensure that mineral substances: calcium, potassium, iodine, magnesium, iron, selenium fall in excess;

In order to provide the population with recommended nutrients and energy, the following rules of rations should be provided:

- sufficient protein, vitamin A, iron, sources of trace elements in the diet - meat, poultry, lean varieties of fish, offal;
- the wide use of vegetables, fruits and vegetables that are sources of vitamin C,  $\beta$ -carotene, potassium, food fibers, and organic acids in food; drink juices taken with meat every day;
- enough consumption of milk, cottage cheese, cheese, which is a source of real calcium and complete protein;
- adding to the diet marine products (sea fish and milkweed) that are a source of iodine, alginates, trace elements.

The possibility of using prophylactic products in the public catering system and at home eases the task of actually providing the population with a set of products that meet hygiene requirements according to their chemical composition and energy value.

Among the ways of radionuclides entering the human body with food, the following should be distinguished:

- a plant is a person;
- plant - animal - milk - human;
- plant - animal - meat - human;
- atmosphere - precipitation - reservoirs - fish - people;
- water is a person;
- water - hydrobionts - fish - man.

Distinguish between surface (air) and structural contamination of food with radionuclides. In case of surface contamination, airborne radioactive substances are deposited on the surface of food products and partially penetrate into plant tissues. More effectively, radioactive substances remain in plants with a bark cover and soil part along the branches, in the folds of leaves and inflorescences. In this case, not only soluble forms of radioactive compounds are preserved, but also insoluble ones. However, surface contamination is relatively easy to remove even after several weeks. Systemic contamination with radionuclides depends on the physico-chemical properties of radioactive substances, soil composition and physiological characteristics of plants. Radionuclides falling on the surface of the soil remain in



the upper layer for many years and move to deeper layers several centimeters every year. This leads to their accumulation in most plants with a developed and deep root system.

According to the level of accumulation of radioactive substances, the plants are arranged in the following order: tobacco (leaves) › beetroot (root) › potato (root) › wheat (grain) › natural plant (leaves and stems). Those that come from soil to plants the fastest: strontium-90, strontium-89, iodine-131, barium-140, cesium-137.

In addition to food, there are many other ways to introduce radionuclides into the body. The main routes include the air and the skin. However, the most important is the way of food (food).

Products with a high content of radionuclides are sold on the Russian consumer market. If you do not have a dosimeter to measure the radiation level of a particular product, at least ask the seller where this product was produced, including the fact that because of the increased radiation level, vegetables and fruits are larger in size and much more beautiful in appearance. will be - for example, bright red or light brown large strawberries. Significant differences can be found for the rest of the products.

Taking into account the possibility of radioactive contamination of food products, it is necessary to take measures to reduce their level of radioactivity. In addition, these measures are widely used to remove other harmful substances from food - nitrates, pesticides.

Processing of food raw materials - thorough washing, products, etc separation, separation of low-value parts - allows to remove from 20 to 60 percent of radionuclides. Before washing some vegetables, it is advisable to remove the most contaminated leaves (cabbage, onions, etc.). It is necessary to wash potatoes and root vegetables twice - before peeling and after washing. In the conditions of increased contamination of the environment with radioactive substances, the most optimal way to process food raw materials in the kitchen method is cooking. When boiling, a significant part of radionuclides passes into the broth. To get the broth, you need to cook the product in water for 10 minutes, then drain the water and continue cooking in a new portion of water. This broth can already be used, for example, to prepare the first dishes.



Reducing the content of radionuclides in food  
during cooking

Raw materials	Finished product or food	Reduced content compared to the original, %	
		<sup>90</sup> Sr (Stronsiy)	<sup>137</sup> Cg
Milk		18	20
		55...58	91
		75...94	74...90
		99	98
Fish	Cottage cheese	95...99	15...28
Beef	Cheese	55...58	-
		-	45
Tomato	Cream	20	-
Potatoes	Oil	-	45

These tables confirm that there is a significant reduction in the content of named radionuclides in the final product as a result of product preparation. Naturally, the aqueous solutions obtained from the processing of raw materials (reverse, whey, broth, broth) contain a high concentration of the above radionuclides and are unsuitable for consumption.

After being in the human body, radioactive elements spread in organs, tissues and are removed from the body in various degrees.

It is believed that a high-protein diet is necessary to remove radionuclides that have already entered the body. Protein consumption should be increased by at least 10% of the daily value.

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