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A.M. Safarov
Termez State University
researcher

S.Ch. Eshkaraev
Termez State University
researcher

M.X. Musayeva
Termez branch Tashkent state technical university named after Islam Karimov
researcher

RADIOMETRIC DETERMINATION OF CESIUM RADIOACTIVE ELEMENT IN MEAT AND DAIRY PRODUCTS

Abstract: This article presents the research work on radiometric detection of radionuclides in meat and dairy products selected from market plants in Surkhandarya region (Sariosiyo and Denov Central Food and Farmers). According to the study, dairy products, yogurt (0.65) and whey (0.70) and meat products contain lamb (0.72) and goat meat (0.83). cesium-137 radionuclide concentrations were found to be high.

Key words: meat, milk, radionuclide, cesium-137, degree of damage, radiometer.

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Introduction

Meat and dairy products are the main sources of food in the country. A person's daily diet should include 1 liter of milk and 150 grams of meat. Foods contain small amounts of radionuclides, which can cause various diseases in people who consume them. Therefore, the detection of radionuclides in meat and dairy products is of great scientific and practical importance.

Radionuclides are widespread in nature, but their distribution is relatively small, most of the ore deposits are located in the deep underground part. As a result of the development of industry, the discovery of these deposits and the processing of ores led to the release of radionuclides. Radionuclides accumulated in the environment (water, air and soil) began to have

a negative impact on human health as a result of their transfer to plants and animals.

The greatest risk of radionuclide contamination is food in the environment. The main contaminant in food is cesium-137, which is transmitted to plants through the soil and accumulates in the body of the animal that consumes the plant. Cesium accumulated in the digestive organs of domestic animals is passed to the blood and mammary glands, and milk containing cesium-137 radionuclide is formed.

Of the radioisotopes of cesium, cesium-137 is the most important, with a half-life of 30.2 years and high levels of harmful effects on the human body. It is one of the most important radionuclides in nuclear fission products.

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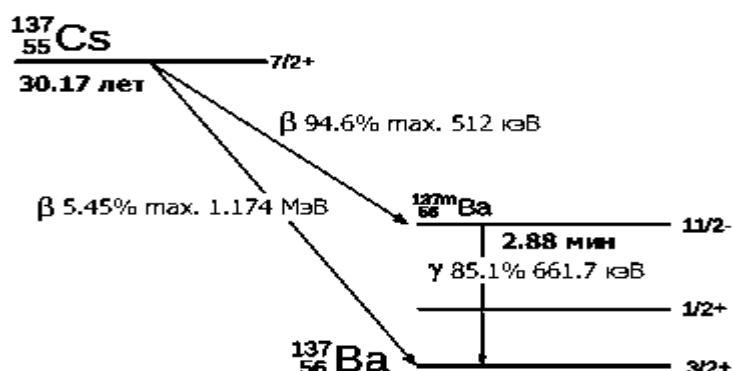


Figure 1. Simplified scheme of cesium decomposition.

Research method.

In this study, a radiometric method for the determination of radionuclides in food was used.



Figure 2. RADEK MKGB-01 radiometer

For this purpose, a radiometer MKGB-01 (Russia) is used, which works with the program "ASW" and provides energy distribution of gamma radiation in the energy range from 40 to 3,000 keV and beta radiation in the energy range from 65 to 4,000 keV.

Part of the experience.

The sample of milk and dairy products (milk, yoghurt, cream, cottage cheese and cheese) selected

from the "central market" in the city of Sariosiyu, Surkhandarya region of the Republic of Uzbekistan. Samples of liquid products are collected in a container after thorough mixing. The prepared containers were mounted on a radiometer and measured the cesium-137 beta-radiation activity of each sample in 45 minutes. The results of the determination are given in Table 1.

Table 1. RADIOECOLOGICAL RESULTS AVAILABLE IN MILK AND DAIRY PRODUCTS
(tmeas = 45 min, Emax = 624 keV, CV = 0.64 imp / s * Bq, BDEG-80, Marinelli vessel)

№	Name of dairy products	Activity value β-radiation Cs-137 Bq / kg * (D/D = 0.5)
1	Milk	0,60
2	Yogurt	0,65
3	Whey	0,70
4	Cottage cheese	0,20

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5	Sour cream	0,16
6	Cream	0,15
7	Fat	0,10

* (3D = 0,5) The degree of damage of cesium 137 in milk and dairy products

Studies have shown that butter contains 6-7 times less milk, cottage cheese-3 times less, sour cream and sour cream - 4-5 times less, and whey and yogurt contain more radionuclides.

Cesium-137 radionuclides accumulate mainly in meat and meat products. Radioactive sensations accumulate in the muscle tissue of animals, internal organs, kidneys, liver and lungs, as well as in the tissues of the heart. Cesium-137 accumulates more in the bone tissue of a growing animal. This is due to the

fact that a large amount of food is absorbed by the growing bones.

In order to carry out our research, to determine the presence of cesium-137 radionuclides in meat and meat products, a variety of meat products were sampled from the central food market in Denov district of Surkhandarya region. In these products, the activity of cesium-137 beta-radiation was measured in each sample. The results of the determination are given in Table 2.

Table 2. RADIOECOLOGICAL RESULTS AVAILABLE IN MEAT AND MEAT PRODUCTS

(tmeas = 45 min, Emax = 624 keV, CV = 0.64 imp / s * Bq, BDEG-80, Marinelli vessel)

№	Name of dairy products	Activity value β-radiation Cs-137 Bq / kg * (D/D = 0.5)
1	Cattle meat	0,30
2	Mutton	0,72
3	Goat meat	0,83
4	Fish meat	0,45
5	chicken meat	0,36
6	Pork	0,40

* (D/D = 0,5) The degree of damage of cesium 137 in milk and dairy products

As a result of our findings, due to differences in the food sources consumed by different animals, the concentration of cesium-137 radionuclides varies, and in pork and chicken meat is low, in cattle, sheep and goats - 13. In addition, it was found that the fish has a higher concentration in the body, ie in the internal organs, and a lower concentration in the tail and tail.

Conclusion.

Scientific research on radiometric detection of radionuclides in meat and dairy products selected

from market stalls in Surkhandarya region (Sariosiyo and Denov Central Food and Farmers) was carried out and the result was Cesium-137 radionuclide concentrations were found in meat (0.72) and goat meat (0.83).

Recommendation: Meat and dairy products exported to the market should be monitored on a daily basis, as food contaminated with radionuclides has a negative impact on human health.

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