WAYS AND METHODS OF RADIATION IMPACT REDUCTION USE OF MILK AND MEAT

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Abstract. Along the food chain, radionuclides enter the human body, accumulate, have a negative effect, have a radiotoxicological effect. Such interest in the effects of radioactive substances arose due to the harmful effects of strontium-90 (Sr-90) and cesium-137 (Cs-137) on the body.

Key words: Radionuclides, strontium-90 (Sr-90), cesium-137 (Cs-137), decay period, radiometric analysis, flour, whey, buttermilk, heating, dosimetric control.

Enter. Today, radiation protection of the population in Uzbekistan is based on the standardization of the main dose limits, the implementation of a system of reasonable measures related to animal husbandry and the processing of products of this sector in order to reduce the content of standardized radionuclides. in livestock products and to prevent unusable products from reaching the consumer's table. When radionuclides enter the body with food, the gastrointestinal tract becomes an important organ, after which they enter the bloodstream and are distributed throughout the body. It is the most important pollutant of animal products consumed by humans.

Materials and research methods. In the process of working on the article, materials posted on open Internet resources, official websites and periodicals were used. The methodological basis of the research was the use of generalization, comparison, analysis and synthesis methods.

Results from the study. In periodical publications, in particular, in the publications of local, Russian, Belarusian and other foreign researchers, it is recommended that the content of I-131 in the meat of irradiated animals after slaughter has a short decay period, and it is recommended to store it in a separate refrigerator for 3 months. (more than 80 days are mentioned in textbooks). During this period, the radionuclide contained in meat, canned food and other meat products loses its activity.

When meat is contaminated with Sr-90, the meat is removed from the bone, because the main percentage of the radionuclide is localized in the bones to be disposed of. If the animal is killed on the 2nd-4th day after irradiation, the radioactivity in the refrigerator will decrease by 15%, and on the 25th day by 45%. After radiometric analysis, the meat is neutralized or transferred to technological processing without restrictions on use.

The method of decontamination of meat contaminated with long-lived isotopes such as Cs-137, Sr-90 is selected depending on the situation. These methods include boiling in water, wet pickling (in 10% chloride, acetic or citric acid, saline solution) and soaking.

Regardless of the disinfection method, the meat is first cut into small, thin pieces or chopped (cut into equal cubes) and thoroughly washed with clean water. For any method, the ratio of water to meat should be 3:1.

After the meat is removed from the broth, the brine is washed with clean water and radiation monitoring is carried out. During cooking, the radioactivity of meat decreases by about 50%, when salted with water - by 70-90% in 2-3 days.

When radioactive dust falls, surface contamination of meat and meat products can occur. Insoluble fractions of radionuclides remain on the surface of unprotected products, and the soluble part enters the product when it falls on a wet surface.

Decontamination of such products should have two goals: to remove radioactive dust from the surface of the product by washing with water or by cutting a layer 0.5 cm thick, and to remove radionuclides that have penetrated deep into the product.

In decontamination of milk and milk products, there are two main methods of removing radioisotopes from milk:

1. - technological
2. - ion exchange.

1. Technological processing of contaminated milk into cream, sour cream, butter, curd, cheese, condensed and dry milk allows obtaining products with low radioisotopes. In order to destroy strontium compounds with proteins and transfer it to the soluble phase, milk is acidified with citric or hydrochloric acids, which form salts that freely pass into the aqueous environment.

During separation, most of the radionuclides are removed with skim milk, resulting in a cream with a low content of radionuclides and sour casein. The more fat the cream has, the less radionuclides it contains. On average, up to 90% of I-131, 10% of Cs-137, up to 4.7% of Sr-90 are removed with skim milk. The amount of Cs-137 in cottage cheese is up to 13.4%, and Sr-90 is up to 35%. In the production of dry milk and cream, raw materials are heated to 400 ° C, which causes almost complete evaporation of Cs-137.

When cream is turned into butter, radioisotopes are additionally released, and up to 3% of the original radionuclide content is transferred to the finished product. The main part of radionuclides remains in buttermilk. Strontium-90 and cesium-137 are almost absent in the oil, and iodine-131 is reduced to a tenth of a percent. Whey, buttermilk and ovens remaining after processing are disposed of depending on the level of contamination with radionuclides.

2. Decontamination of milk by ion exchange using ion exchange resins is based on their ability to exchange Sr-90 and Cr-137 cations or I-131 anions found in contaminated milk. The method has two types. The first is "dose exchange", mixing the resin with contaminated milk and then filtering it. The latter involves the use of ion exchange columns, where contaminated milk is passed through a bed of ion exchange resin. When milk is passed through a cation exchange resin, the amount of strontium and cesium in it is reduced by 80-90%, if it is passed through an anion exchange resin, the amount of iodine is reduced by more than 90%.

There are two methods of decontamination with resin - dynamic and static. The essence of the first is that the milk flows through a set of TsM-A2 cellulose fibers. As they move, radionuclides are attracted to the surface of the fibers. With the static method, milk is poured into a container, a bundle of cellulose fibers is placed in it and mixed. After 15 minutes, remove the used beam with a fork and insert a new one, this is repeated 3-4 times. After removing the last part, it is necessary to filter the milk through a layer of cotton wool, gauze or cloth to get rid of the smallest particles of cellulose. In this way, it is cleaned of iodine-131 radionuclides by almost 90%. Such milk must be boiled before use, then it can be processed into any dairy product. Waste is incinerated by cellulose. Ashes should be buried in a designated place.

Summary. The results of the study showed that the maximum concentration of radionuclides is in the proteins of livestock products, so unprocessed products cannot reach the consumer; Freeing meat protein from radionuclides allows reducing economic losses by introducing meat and meat products into circulation. It is preferable to consume milk after technological processing that produces safe food products ready for consumption. It is especially important to consider this for people who are engaged in private farms in areas unfavorable for radiation pollution.

Adabiyot:

1. N.A.Korneeva, A.N.Sirotkina, 3. V.Dubrovina, O.M.Belova, G.S.Meshalkina, G.A.Donskoy. "Oziq-ovqat xom ashyosi va oziq-ovqat mahsulotlarining sifati va xavfsizligiga gigienik talablar". Knowledge.allbest.ru. qishloq xo’jaligi.

2. A.M.Axmin., D.P.Gasyuk. HACCP tamoyiliga asoslangan oziq-ovqat sifatini boshqarish. O’quv qo’llanma./2010. rntbcat.org.by. opak. Pls

3. Radioaktivlik va sutni zararsizlantirish // Kirish rejimi: URL: https://www.yaneuch.ru/cat_33/radioaktivnost-i-dezaktivaciya-moloka/308948.2399493.page1.html. – Kirish sanasi: 04/13/2024.

4. Radioaktiv zaharlangan hududlarda chorvachilik. -/ Kirish rejimi: Men johilman! URL: https://www.yaneuch.ru/cat_41/vedenie-zhivotnovodstva-v-usloviyah-radioaktivno/214559.2094076.page2.html. – Kirish sanasi: 04/13/2024.

5. Hayvonlar zaharlanganda va radiatsiyaviy shikastlanganda tana go’shti va a’zolarini veterinariya-sanitariya ekspertizasi. – Kirish rejimi: vsavm. byURL: https://www.vsavm.by/wp-content/uploads/2012/11/LEKCIYa-9.doc. - Kirish sanasi: 14.04.2024.

6. Хакимов, Б. Н. (1990). *Особенности биологии Multiceps multiceps (leske, 1780), coenurus cerebralis и усовершенствование мер борьбы против ценуроза овец* (Doctoral dissertation, Самаркандский с.-х. ин-т им. ВВ Куйбышева).

7. Хакимов, Б. Н., Кўлдошев, О. У., Хакимов, М. Б., & Суванов, С. А. (2023). ИТЛАРДА ЦЕНУРОЗ КАСАЛЛИГИНИ ҚЎЗҒАТУВЧИСИ ЧЎЛ ҲУДУДИДА МУЛЬТИЦЕПТОЗЛАР ЧЎПОН ИТЛАРИДА ТАРҚАЛИШИ. *RESEARCH AND EDUCATION*, *2*(1), 277-280.

8. Аюпов, К. С., Худойназаров, З. Б., Валиев, С. А., Хакимов, Б. Н., & Мусаева, Д. М. (2022). Исследование электрофизических свойств кремния, полученных методом электрополевой диффузии.

9. Аюпов, К. С., Валиев, К. С., Бозоров, Н. Д., Хакимов, Б. Н., & Бобонов, Д. (2022). Примесные кластеры селена в решетке кремния.

10. Аюпов, К. С., Валиев, С. А., Мусаева, Д. М., & Хакимов, Б. Н. (2022). Расчет ионов кластеров марганца в кремнии.

11. Мирзаев, Б. Ш. (2000). О фагоцитарном механизме и иммуногенезе [Теоретические и практические аспекты возникновения и развития болезней животных и защита их здоровья в современных условиях]. In *Матер. междунар. конф* (Vol. 1, pp. 27-28).

12. Булханов, Р. У., Пяснянский, И. В., & Мирзаев, Б. Ш. Естественная резистентность и иммуногенез у вакцинированных животных. *В. Кн*.

13. Bulkhanov, R. U., Ryasnyansky, I. V., Yuldashev, R. Y., & Mirzaev, B. S. (2003). Interspecific radiostability of microorganisms.

14. Булханов, Р. У., Юлдашев, Р. Ю., & Мирзаев, Б. Ш. (2003). К вопросу о сроках вакцинации телят поливалентной радиовакциной. *Ветеринарная патология*, (3), 56-57.

15. Sh, M. B. (2023, June). RESISTANCE AND IMMUNOGENESIS IN CALVES VACCINATED WITH AN ASSOCIATED RADIOVACCINE AGAINST COLIBACILLOSIS AND SALMONELLOSIS. In *International Conference on Agriculture Sciences, Environment, Urban and Rural Development.* (pp. 1-2).

16. Sh, M. B., & Kurbanov, F. M. (2023). VETERINARY RADIO MONITORING IN THE OLOT DISTRICT OF BUKHARA AND BOYSUN DISTRICT OF SURKHANDARYA REGIONS. In *International Conference on Research Identity, Value and Ethics* (Vol. 3, pp. 7-12).

17. Butaev, M. K., Bulkhanov, R. U., Ryasnyanskii, I. V., Mirzaev, B. S., Safarov, A. N., & Suleymanov, R. D. (2006). Bacterial effect of accelerated electrons on several pathogens.

18. Мирзаев, Б. Ш. (2006). Иммуногенные свойства ассоциированной радиовакцины против сальмонеллёза и колибактериоза.

19. Bulkhanov, R. U., Butaev, M. K., Mirzaev, B. S., Ryasnyanskiy, I. V., & Yuldashev, R. Y. (2005). Gamma rays application in veterinary immunology.

20. Хушназаров, А., & Давлатов, Р. (2024). Эпизоотология эймерий кроликов, лечение и меры профилактики. *in Library*, *1*(1), 181-184.

21. Хушназаров, А., Ахмадалиев, Н., & Давлатов, Р. (2024). Диагностика и эпизоотический статус эймерий кроликов в некоторых районах Ферганской области. *in Library*, *2*(2), 23-29.

22. Axmadaliyev, N. T., Xushnazarov, A. X., & Davlatov, R. B. (2024). FARG ‘ONA VILOYATINING AYRIM TUMANLARIDA QUYON EYMERIOZINING DIAGNOSTIKASI VA EPIZOOTIK HOLATI. *ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ*, *44*(3), 23-29.

23. Akhmadaliyev, N. T., Kh, K. A., & Davlatov, R. B. (2024). DIAGNOSTICS AND EPISOTOTIC STATUS OF RABBIT EMERIOSIS IN CERTAIN DISTRICTS OF FERGANA REGION. *Western European Journal of Modern Experiments and Scientific Methods*, *2*(4), 56-62.

24. Хушназаров, А., & Давлатов, Р. (2023). Диагностика и эпизоотический статус эймерии кроликов в некоторых районах Самаркандской области. *in Library*, *1*(2), 38-42.

25. Хушназаров, А., Ахмадалиев, Н., & Давлатов, Р. (2023). Эпизоотология эймероза кроликов. *in Library*, *1*(2), 94-99.