UK PREPAREDNESS AND EXPERIENCE FOR MANAGING FOOD SAFETY AFTER A NUCLEAR ACCIDENT

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The Food Standards Agency (FSA) in the United Kingdom (UK) has a fundamental mission of food you can trust. This means that food is safe, what it says it is and is healthier and more sustainable. After a nuclear accident and once protective actions have been put in place for the more immediate health impacts, the safety of food and trust in the food chain will become increasingly important.

The FSA, with our partner organisation Food Standards Scotland (FSS), have responsibility for all aspects of food safety in the UK. This includes radioactive contamination of food. In the event of a nuclear accident, FSA and FSS would assess the impact of the accident on food and animal feed to provide advice and implement and enforce legal restrictions as appropriate. To fulfil this role, we work closely with other response agencies in both national and local government.

One example of working closely across national agencies has been the development of the Joint Agency Modelling (JAM) network. This has established a framework for the agencies responsible for public health, food safety, environmental protection, nuclear regulation and weather forecasting to share data and provide consistent modelling advice. The output from JAM is an information package for decision makers. This provides assessments for different protective actions, including those areas where food restrictions are likely to be required.

When considering the need for food restrictions, the European Union (EU) has established Maximum Permitted Levels (MPLs) in food and animal feed which apply in the event of a nuclear accident. These are set out in Council Regulation (Euratom) 2016/52. The same MPLs are retained in UK law following the UK's exit from the EU. The MPLs set the maximum activity concentration in food for four groups of radionuclides with different levels for milk and dairy produce, liquid foods, infant foods, minor foods and all other foods. MPLs are also set for animal feed in relation to radiocaesium.

At the FSA, we have developed a food chain model to calculate the activity concentration in food products as a result of the dispersion of radioactive contaminants into the environment. We have used this food chain model to back-calculate the air concentration and ground deposition levels which would lead to food produced in an area exceeding the MPLs. This allows us to use data on air concentration and deposition from modelling or monitoring to assess which areas would potentially be at risk of food exceeding the MPLs. We would then provide advice and, where necessary, implement legal restrictions in these areas. We would use this to target our monitoring resources to sample a range of foods. As more data becomes available, we would refine and amend our legal restrictions to permit food back into the food chain where we can be confident the risks are within acceptable limits.

The UK has applied emergency measures on food as a result of three nuclear accidents at Windscale, Chernobyl and Fukushima.

The fire in the Windscale nuclear reactor in 1957 (now part of the Sellafield nuclear site) released contamination across areas of North West England. Subsequent testing of milk found high levels of iodine-131. Restrictions were put in place on the consumption of milk for approximately one month over an area of 500 km^2.

The Chernobyl nuclear accident in 1986 released contamination across large areas of northern Europe. Heavy rainfall coincided with the radioactive plume passing over upland areas of the UK resulting in deposition of radionuclides including caesium-134 and caesium-137. These upland areas have poor-quality, low-mineral soils which means the radiocaesium remained readily available for uptake by grasses and other plants. Sheep farming is the primary agriculture in these upland areas and monitoring of the sheep meat found high levels of radiocaesium contamination. Restrictions were placed on the movement of sheep where each animal had to be monitored in the field before they could move out of the area. Any animals above the action level were marked with coloured paint to identify them and were prohibited from being sent to slaughter for a minimum of three-months. The final restrictions were lifted in 2012 following a review and risk assessment.

The Fukushima nuclear accident in 2011 did not directly affect UK food production. However, import restrictions were implemented across the EU. Specific foods from identified prefectures (regions) of Japan must be tested prior to export and have a certified declaration to show levels are below the maximum levels set in the legislation. These controls have been reviewed a number of times in the 11 years since the accident. At each review, the foods and prefectures covered by the regulations have been amended and more foods have been taken out of the requirements for pre-export testing. As a result, only some species of fish, wild mushrooms and foraged vegetables remain subject to the enhanced checks for import into the EU under Commission Implementing Regulation (EU) 2021/1533. Following the UK's exit from the EU, the FSA have undertaken a risk assessment which showed that, if the enhanced controls were removed, there would be a negligible increase in dose and therefore a negligible increased risk to UK consumers of Japanese food. As a result, the remaining controls are due to be removed in the UK (excluding Northern Ireland) by the end of June 2022.

The UK Health Security Agency (formerly Public Health England) publish the UK Recovery Handbook for Radiation Incidents in collaboration with other government departments and agencies, including the FSA. This has three sections on food production systems, drinking water and inhabited areas. Each section includes a series of datasheets on different recovery options. These can be used by decision makers to consider the most appropriate options depending on the types of radionuclides released and the characteristics of the area affected. The current edition is version 4 which was published in 2015. Further updates are currently being considered to reflect the latest data and lessons learnt from recent incidents.