

○ **Radiological**
○ **Emergency**
○ **Information**

For Farmers, Food Processors, and Distributors

Prepared by the

United States Department of Agriculture
Food Safety and Inspection Service
Office of Emergency Planning

and the
Federal Emergency Management Agency
Technological Hazards Division
Office of Natural and Technological Hazards Programs

In consultation with selected members of the
Federal Radiological Preparedness Coordinating Committee

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November 1989

IMPORTANT INFORMATION
Please Read and Save this Brochure

What to Do in a Radiological Emergency

A Summary of Recommendations

While it is unlikely that a serious radiological emergency will occur in this country, it is important that we be prepared for such an event. The information in this brochure may help you to more effectively respond to such an emergency.

If a radiological emergency occurs in your immediate area, you will be alerted by the sounding of a siren, an emergency vehicle equipped with a loudspeaker, a tone alert radio, or other appropriate means. You should take the following actions:

- Turn on your radio or television and tune it to a station or channel that carries Emergency Broadcast System (EBS) information or listen to the message on your tone alert radio. You may verify the EBS stations/channels that broadcast emergency information in your area by calling local emergency officials or your local radio and television stations.

Please do this now and insert the station frequency or channel number here for future reference.

Radio Stations

Television Channels

- Follow the directions of the State or local emergency response officials as provided by the above sources. You may be advised to take protective actions such as:

- Protect feed and water.
- Cover outside feed supplies with a tarpaulin or other appropriate material.
- Cover open water sources.

Remove dairy animals from pasture, shelter if possible, and provide them with protected feed and water.

Protect other livestock and poultry by sheltering them if possible, and providing them with protected feed and water.

If you live within 10 miles of the plant, you may be advised to take shelter (go inside) or to evacuate. (This would help protect you and your family from potentially harmful levels of radiation.)

If a release of radioactive materials occurs and contamination of agricultural products is verified by appropriate State and local government officials, the following are examples of protective actions that may be recommended:

- When you go outside, wear outer clothing that covers all portions of the body, similar to what you would wear when applying pesticides; for example, boots, gloves, coveralls, or long-sleeved shirts, and long pants.
- Wear a protective mask or place a folded (preferably dampened) cloth over your mouth and nose when working outside to prevent inhalation of radioactive materials.
- Remove outer clothing before going indoors.
- Wash hands thoroughly before preparing or eating food.
- Wash, scrub, peel, or shell fresh fruits and vegetables before eating them.
- Remove dairy animals from pasture, shelter if possible, and provide them with protected feed and water.
- Do not slaughter any animals.
- Do not use fresh milk from your dairy animals, vegetables from your garden, or eggs from your chickens.
- Do not engage in dust-producing activities such as cultivating, disking, baling, or harvesting.
- Do not process or distribute agricultural products until they have been sampled by appropriate government officials and found to be free of contamination.
- Do not transport or market contaminated food products.
- Do not fish or hunt.

Specific instructions will depend on the distance of your farm or facility from the commercial nuclear power station and the prevailing wind conditions.

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Introduction

This brochure provides emergency information for the agricultural community within a 50-mile radius of a commercial nuclear power station. It contains information concerning how you will be notified and what procedures you should follow in the unlikely event of a radiological emergency at the power station.

If an emergency results in a release of radioactive material to the environment, you may be advised to take actions to protect your family, farm animals, and agricultural products. This information, along with specific instructions you will receive over the Emergency Broadcast System (EBS) or through other official news releases, will help you to prevent or minimize the effects of a radiological emergency on food and agriculture.

The instructions in this brochure may also be used in response to other kinds of radiological emergencies. General information on radiation and postemergency activities is provided at the end.

Please read this brochure thoroughly.

Sources of Emergency Information

In the event of an emergency at the nuclear power station near you, specific protective action recommendations will be issued by appropriate State or local government officials. Information to prevent or minimize radiation contamination of food products will be provided to you through at least one of the sources listed below:

- The Emergency Broadcast System (EBS) will provide you with emergency information over designated radio and television stations. These stations will also provide additional emergency-related information.
- Your County Extension Office may provide you with information on the protection of agricultural products through local radio or television broadcasts, newspaper articles, or by telephone.
- National Oceanic and Atmospheric Administration (NOAA) weather radio broadcasts over tone alert radios will provide you with up-to-date weather information. The broadcasts may also provide you with emergency instructions on protective measures.
- Additional emergency agricultural information may be available to you through State or local government emergency organizations.

Emergency Planning Zones and Protective Actions

Two types of emergency planning zones (EPZ) may be referred to in an emergency:

The Plume Exposure Pathway EPZ

- is the area within a 10-mile radius around a commercial nuclear power station in which people may be directly exposed to radiation.

The Ingestion Exposure Pathway EPZ

- is the area within a 50-mile radius around a commercial nuclear power station in which people may be indirectly exposed to radiation by eating or drinking contaminated food, milk, and water.

The safety of the food supply within the 50-mile ingestion exposure pathway EPZ could be a concern to members of the agricultural community if a radiological release to the atmosphere occurred. During such a release, both water and land could become contaminated. Eating contaminated foods and drinking contaminated milk and water could have a harmful, long-term effect on your health.

State and local government emergency response organizations are prepared to quickly notify and advise the agricultural community on what actions to take in the event of a radiological emergency. The decision to recommend protective actions will be based on the emergency conditions at the power station, available information on the amount of radiation that has been released to the environment, and consideration of the health, economic, and social impacts of the proposed actions.

There are two types of protective actions that will help to prevent or lessen the possibility of persons eating or drinking contaminated food or water:

Preventive Protective Actions

- actions to prevent or minimize contamination of milk and food products. An example would be washing, scrubbing, peeling, or shelling fruits and vegetables to remove surface contamination.

Emergency Protective Actions

- actions to isolate or contain food and prevent its introduction into commerce and to determine whether condemnation or other action is appropriate. An example would be to restrict or withhold (embargo) agricultural and dairy products from the marketplace by prohibiting transportation from the affected areas.

Protective Actions for the Food Supply

The following are examples of preventive and emergency protective actions and related information that may be recommended to the agricultural community by appropriate State or local government officials. Location-specific protective action recommendations will be issued by these officials in the event of an actual emergency.

Milk

Remove all dairy animals from pasture, shelter if possible, and provide them with protected feed and water. State or local government officials may come to your farm to take milk, feed, and water samples for laboratory analysis to determine whether any of these products are contaminated.

If dairy products are found to be contaminated, it may be recommended that milk and milk products be withheld from the market. It is possible, however, for milk products contaminated with certain radioactive materials to be safe for human consumption after proper storage over a period of time. This will allow for decay of the radioactive materials. The decay may be achieved by freezing and storing fresh milk, concentrated milk, or concentrated milk products. Storage of milk for prolonged periods of time at reduced temperature is also possible provided ultrahigh temperature pasteurization techniques are used during processing. Using fluid milk for the production of butter, cheese, dry milk, or evaporated milk may also be possible.

You will be advised by State or local government officials as to what protective actions are appropriate.

Fruits and Vegetables

Wash, scrub, peel, or shell locally grown fruits and vegetables, including roots and tubers, to remove surface contamination.

If they are contaminated by short-lived radionuclides (e.g., iodine 131), preserve by canning, freezing, or dehydration and store to allow time for decay of the radioactivity.

Meat and Meat Products

If there is a release of radioactive material to the environment, you may be advised to place meat animals on protected feed and water and, if possible, provide them with shelter. If livestock consume feed and water contaminated with radioactive materials, some of the contamination will be absorbed into their bodies and could then enter the human food supply through meat and meat products.

Poultry and Poultry Products

Poultry raised outdoors, especially those kept for egg production, should be monitored by taking samples and performing laboratory tests to determine the presence of radioactive contamination. Poultry raised indoors and given protected feed and water are not likely to be contaminated. If contamination is verified, State or local government officials may advise that poultry and eggs should not be eaten.

Fish and Marine Life

Fish and other marine life raised in ponds may continue to be harvested unless appropriate State or local government officials have determined through laboratory analysis of samples that they are contaminated. Samples of water, fish, and marine life from open bodies of freshwater and saltwater should also be analyzed to ensure that they are safe.

Soils

If State or local government officials find that the soil is contaminated, proper soil management procedures can be implemented to reduce contamination to safe levels. Idling, the nonuse of the land for a specific period of time, may be necessary in some cases. However, in situations involving highly contaminated soil, removal and disposal of the soil may be more appropriate.

Planting alternative crops may also be recommended in some situations. Crops such as cotton and flax could be substituted for food crops because they contribute little or no radioactive material to the human diet.

Deep-plowing the soil will move radioactive substances below the plant root level, prevent plants from taking up contaminated nutrients, and allow the level of radioactivity to decrease with the passage of time.

State or local government officials will let you know what actions are appropriate.

Grains

If grains are permitted to grow to maturity, most contamination will probably be removed by the wind and rain. Milling or polishing will probably remove any remaining contamination. Sampling and laboratory analysis will determine if the grain is safe to use. When harvested, contaminated and uncontaminated grains should be stored separately.

Water

Open sources of water should be protected. Cover open rain barrels and tanks to prevent contamination. Covered wells and other covered or underground sources of water will probably not become contaminated. Radiation contaminants deposited on the ground will travel very slowly unless soils are sandy. It is unlikely that underground water supplies will be affected.

Filter pipes should be disconnected from storage containers that are supplied by runoff from roofs or other surface drain fields. This will prevent contaminants from entering the storage containers.

Close water intake valves from any contaminated water sources to prevent distribution (e.g., irrigation) of contaminated water.

Honey

Honey and bee hives will need to be sampled and analyzed by appropriate State or local government officials if radioactive contamination is detected in the area. You will be instructed by these officials on how to handle the hives and honey.

Food Processors and Distributors

Radioactive contamination of milk or food products in an affected area can occur during processing, or during transportation. This can result from exposure to radioactive materials on the ground or in the air, and from contact with contaminated products.

Following a radiological emergency, government officials may restrict the movement of food products and withhold them from the marketplace if they are found to be contaminated. These products should not be released until they are considered to be safe for consumption, or until a decision is made to dispose of them. You will be instructed how to safely handle and dispose of contaminated food products.

Postemergency Actions

The following sections describe postemergency actions that will occur if contamination is verified.

Reentry

Reentry is the temporary entry, under controlled conditions, into a restricted, contaminated area, in all probability within the 10-mile radius of the commercial nuclear power station. If you have been evacuated from your area, you may be allowed to return temporarily to your farm when conditions permit. State or local government officials will advise you through the Emergency Broadcast System (EBS) or other official means if a decision to permit reentry is made. You will receive specific instructions on routes to use and safety precautions to take. Reentry will allow you to perform such vital activities as milking, watering, and feeding farm animals.

Recovery

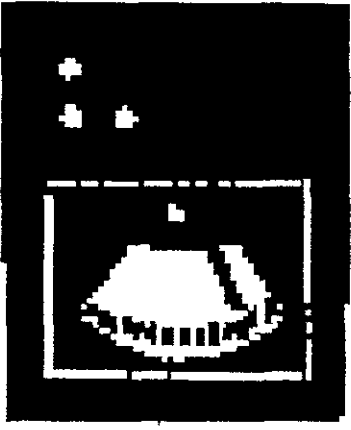
Recovery is the process of reducing radiation in the environment to acceptable levels for normal daily living. Following the emergency, State and local government officials will identify the types and levels of contamination. They may need to take samples of air, water, soil, crops, and animal products from your farm or business. They will provide you with instructions and assist you in decontaminating your animals, food, and property if such actions are necessary. Contaminated food will be isolated to prevent its introduction into the market place. State and local government officials will determine whether condemnation and disposal are appropriate.

General Information on Radiation

Radiation and radioactive materials are a natural part of our environment. They are in the air we breathe, in the food we eat, in the soil, in our homes, and even in our bodies. The level of radiation naturally existing in our environment is called "background radiation." It may vary greatly from one location to another depending on related factors such as solar radiation, geographic elevation, soil composition, and the presence of radon gases from the soil and building materials. We are also exposed to sources of manmade radiation such as X-ray machines, and color televisions. Commercial nuclear power stations may release small, nonharmful amounts of radioactive materials to the environment under controlled conditions and during routine operations.

The health effects to people from radiation exposure is measured in units of millirems. In the United States the average background radiation exposure received by each person is about 300 millirems per year. Each person also receives about 53 millirems a year from medical care sources. An approximate 7 millirems is received from consumer products and occupational and other environmental sources. The total average exposure per person per year is about 360 millirems, not including exposure from tobacco use. Persons living near a commercial nuclear power station receive less than one additional millirem per year.

The effects of radiation on people depend on the amount and length of time of exposure, how much of the body is exposed, how much radioactive material stays in the body, and the general health and age of the exposed person. The effects of radiation can be decreased by reducing the time the person is exposed and increasing the distance from the source of radiation.



Summary of Effects of Radioactive Deposits on Human Food and Water Supplies

Depending on the amount of radioactive materials released into the atmosphere and the prevailing weather conditions, people, animals, crops, land, and water near the site of the emergency could be affected. Of initial concern would be the condition of fresh milk from dairy animals grazing on pasture and drinking from open sources of water. Sampling for contamination could occur at the farm, the transfer station, or the processing plant. If contamination of fresh milk and processed milk products is verified, State or local government officials will determine whether to dispose of these products or to hold them until safe for consumption.

A later concern would be the possible contamination of vegetables, grains, fruits, and nuts. The severity of the impact of the contamination would depend on the time of the year the emergency occurred. The time immediately prior to or during harvest is the most critical period. Crops will be sampled and analyzed by the appropriate government officials to ensure that they are safe to eat.

An additional concern would be the possible impact of the contamination on livestock and poultry. Pasture, feed, and water sources, as well as meat and poultry products will be sampled and analyzed to ensure that the meat and poultry products are safe to eat.

Contamination of drinking water supplies is not likely to be significant. If it occurs, it will probably affect only surface water supplies and not ground wells or underground water sources. The safety of water would be determined by sampling public and private sources. If land becomes contaminated, proper soil management techniques can be implemented to reduce contamination of crops grown on the land. The procedures recommended would depend on the severity of contamination and the specific crops to be grown.

In conclusion, while it is unlikely that a serious radiological emergency will occur in this country, it is important that we be prepared for such an event. The information in this brochure may help you to more effectively respond to such an emergency.

