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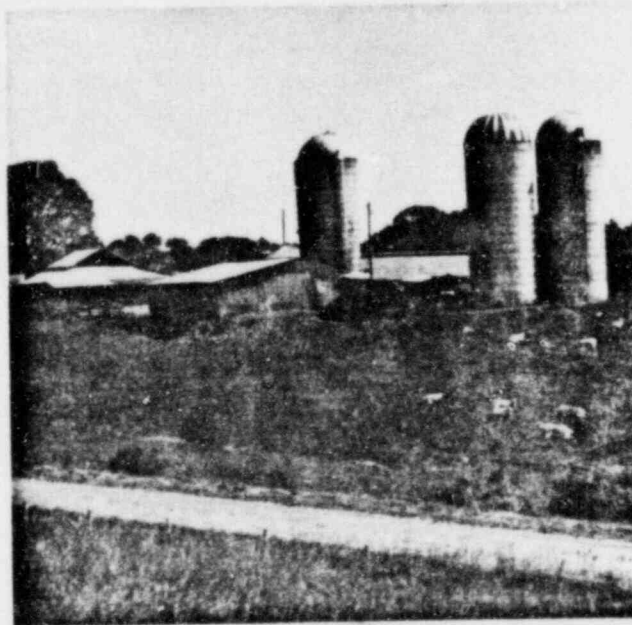
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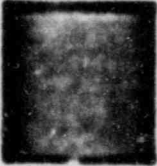

NUCLEAR POWER

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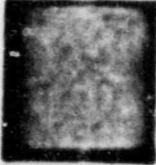
SOUTH CAROLINA



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INTRODUCTION

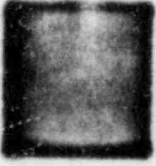
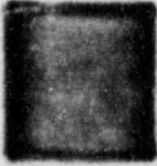


Nuclear power began early in South Carolina when the Savannah River Plant began operations in 1953.

Since that time, Carolina Power and Light Company, Duke Power Company and South Carolina Electric and Gas Company have joined the Nuclear Power age by building Nuclear Generating Plants. These are the H.B. Robinson Plant near Hartsville, the Oconee Plant near Seneca, and the V.C. Summer Plant near Jenkinsville, South Carolina. Soon to come on line is Duke's Catawba Plant near Rock Hill. Add to these Charleston's Nuclear Submarine Base and the Westinghouse Nuclear Fuel facility near Columbia and it becomes obvious that South Carolina is very much into the Nuclear Power age.

The nuclear industry, both commercial and military, has proven to be a very safe industry.

Other than the incident at Three Mile Island in Pennsylvania in 1979, the record shows no incident that would have affected the public's safety. Many worthwhile lessons were learned from the Three Mile Island incident. This brochure is a by-product of these lessons learned, and its information is directed to the farmer and the agricultural community in the unlikely event of a nuclear incident.

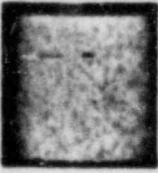




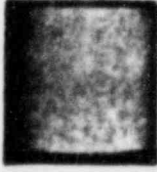
AGRICULTURE AND NUCLEAR POWER

This brochure provides specific information for farmers and livestock owners on protective action for farm animals and commodities, and what you may be asked to do if a nuclear power plant accident occurs. This information supplements other emergency procedures and details provided to those South Carolina citizens living near nuclear power plants. The public will be directed by state and local officials, through the Emergency Broadcast System and the local news stations, of the actions necessary to protect themselves.

In the event that an emergency may affect farming in your area, instructions specific to farmers' needs will be issued. This brochure provides you with an explanation of the actions you may be advised to take to protect the quality and marketability of your farm's products. Detailed, specific information for protection of farm animals and commodities is available at the Clemson University Extension office located in your county.



Nuclear power reactors are producing electricity in the United States and throughout the world. From the data available, the nuclear power reactor industry appears to be as safe, if not safer, than most other industries for the production of electricity. The possibility of major contamination of the agricultural community downwind from a nuclear power plant appears to be unlikely.



General Considerations

In the highly unlikely event a nuclear power incident should occur, advance planning will help you to take effective protective action in a timely manner. The following considerations should be given:

1. Protective actions taken after a warning but prior to the arrival of any radioactive contamination will be extremely important.
2. The source of any radioactive contamination will be airborne. Therefore, the greatest hazards are from breathing and consuming (through feedstuffs and water) radioactive particles.
3. Protective care relating to the shelter and feeding of livestock will probably provide the greatest potential for reducing injury or contamination.
4. Very little protection can be given to an unharvested crop in the field.
5. In most cases crops that have been harvested will present no significant problem if they have been stored in an enclosed facility.
6. Emergency procedures are in place to provide warnings of approaching radioactive contamination. Prior to its arrival, protective action would be called for. Should contamination occur, procedures are also in place to monitor contaminated animals or commodities, to provide for safe reentry into contaminated areas, and to remove contamination from affected food products.

Specific Procedures

In order to prepare for specific action, inventory your facilities and needs. If you are warned that a radiological emergency exists, do the following:

1. Follow instructions given over the Emergency Broadcast System.
2. If advised that it is necessary, shelter all farm animals, especially dairy cattle and valuable breeding stock, and use stored feed and protected water. Protected self-feeders and automatic livestock waterers are the most effective.
3. Bring feed into buildings or cover it if outdoors. Feed stored in buildings would be protected from contamination. You can keep radioactive particles out of other feed by covering it with plastic or canvas.
4. Store as much livestock water as possible. Cover wells and open tanks.

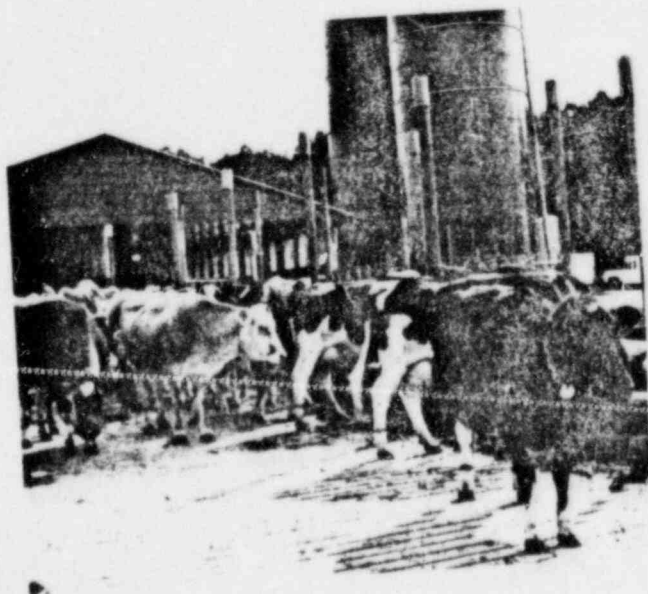



Supporting Information

Livestock Shelter

In the event of radioactive fallout, farm buildings can be adapted for use as shelters for livestock. Some buildings offer greater protection than others depending on their construction and shielding mass. Placing earth, hay, sacked feed or fertilizer, concrete blocks, or other materials over and around exposed walls of shelters will increase their shielding effectiveness.


A primary limiting factor in sheltering animals is ventilation. Avoid using fans for ventilation. If you must, set the fans on a very low speed. It is better to give adequate space to the best animals than to try to provide shelter for all animals and lose them from overcrowding.





Livestock Feed and Water

Feed and water should be protected from contamination. If animals ingest fallout particles, they will be exposed to internal radiation.



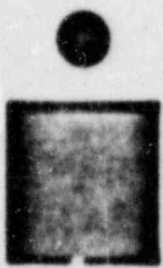
Safe water would be the animals' most crucial need—even more important than feed. Since you may be advised not to return and care for livestock during a period of heavy contamination, provide an emergency water supply in protected areas. Other water supplies should be protected from contamination. Standing, open water would receive the most contamination.

Feed stored in buildings would be protected from contaminant particles. Other feed can be protected before contamination arrives by covering with plastic sheeting or canvas.

Most livestock can survive for extended periods on limited rations. To conserve protected feed supplies, animals may be kept in shelter for a few days with reduced feed. If sheltered space is unavailable for all animals, feed from uncontaminated sources will reduce their consumption of contaminated pasture.

Animals can survive on these minimum rations for several months:

	Water/Day	Feed/Day	Space/Animal (sq. ft.)	
			24-36 Hrs.	Ext. Periods
Beef Cow	7 gal. summer	10-15 lbs.		
(Pregnant)	6 gal. winter	legume hay	20	35
Beef Cow	9 gal. summer	12-18 lbs.		
With Calf	8 gal. winter	legume hay	40	70
Beef Calf	6 gal. summer	8-12 lbs.		
400 lb.	4 gal. winter	legume hay	15	25
Brood Sow	4 gal. summer	8 lbs.		
With Litter	3 gal. winter	grain	30	35
Brood Sow	1-2 gal. summer	2 lbs.		
(Pregnant)	1 gal. winter	grain	14	18
150 lb. gilt	1 gal.	3 lbs.		
or boar		grain	5	8
Ewe	3/2 gal.	3 lbs. hay	8	12
Dairy Cow	9 gal. summer	10-18 lbs.		
	7 1/2 gal. winter	hay	20	35
Laying	5 gal/100 birds	17 lb/100 birds	0.5	0.1
Broilers	5 gal/100 birds	10 lb/100 birds	0.3	0.1
Turkeys	12 gal/100 birds	40 lb/100 birds	2	4



Dairy Cattle


Radioactive materials can be transferred to milk, which would likely be the food product needing most control during an emergency. Milking cows should be given preferred shelter and clean feed and water. The milk and milk products from dairy animals would be an acceptable source of human food if cows were adequately sheltered and fed stored rations during a period of radioactive contamination.

Remember, any shelter is better than none and that animals need adequate space and ventilation. Plan to give your most valuable animals best shelter and care.


Beef Cattle

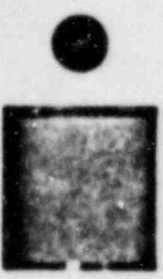
Although it is difficult to protect animals in open pastures from radioactive exposure, several procedures may help reduce contamination.

Natural shelters afford some protection. Caves, ravines, forests, and woodlots offer some protection. You may have access to cattle underpasses or bridges where cattle could be penned. Cattle confined in pens would shield each other to a limited extent.



Cattle should be restrained from grazing on contaminated pastures. If possible, feed them protected stacked hay, silage from a silo or trench, or stored grain. Where grazing cannot be avoided, supplementing with protected feeds will limit the amount of contaminated forage cattle will ingest from pastures.





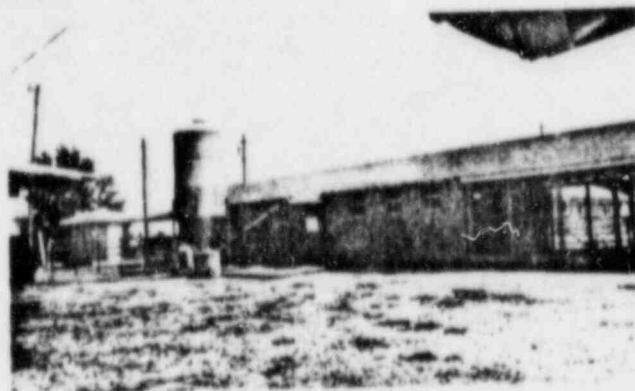
To the extent possible, prevent cattle from drinking from ponds, lakes, rivers, and streams. Water from covered sources such as springs and wells would be essentially free of contamination.

To the extent that farm buildings are available, these will provide the greatest protection. The most valuable breeding stock should receive priority care and shelter.

Swine

Most swine are raised in buildings that will provide some protection from radioactive contamination. Generally, the larger, heavier constructed buildings will provide the best protection. Foundation breeding stock and/or the most productive breeding stock should be given the best shelter and care.

Adequate space is important. Water is hogs' most important feed. Make sure it comes from sources which have been protected. Stored feed would usually have adequate shielding from contamination. Swine feed is customarily stored in the complete ration form. Certainly, this supply should be exhausted before switching to grain only as indicated in the minimum requirements table.



Poultry


Poultry products, particularly eggs, are other important food sources needing protection. Poultry can endure higher doses of radiation than other animals. Confined housing usually employed in poultry operations provides another benefit. Protection should be provided to insure continued productivity. Lowering sidewall curtains and panels will reduce contamination. Mechanical ventilation systems should be operated at the lowest level possible while still providing adequate air movement.

Land and Crops

Contaminated soil would not be of immediate concern but proper management procedures could do a great deal to reduce a problem should it occur. Farm workers may be unable to manage and cultivate land for a period of time. It is anticipated that most land could be returned to normal use within several weeks after having been contaminated, depending upon the amount and type of radiation deposited in a given area.

For contaminated grains, protective action would probably never be needed. If protective action is required, it should include milling and polishing. Time from harvest to consumer would be an important factor. In many cases, this takes several months.





Fruits and Vegetables

When growing fruits and vegetables are exposed to concentrations of radioactive particles, they can become externally contaminated. Leaves, pods, and fruits that retain radioactive particles can be cleaned before being eaten. Washing is probably the most effective measure, just as it is the best way to clean garden foods that get dirty from other causes. Cleaning operations should be performed away from the kitchen and food storage areas.

Roots and tubers absorb little contamination before it is mixed with the soil. The normal cleaning or peeling of underground vegetables such as potatoes or carrots would be adequate for removing contamination.

Fruits and vegetables which are grown on heavily contaminated soil could absorb radioactive elements. However, the level of contamination from an emergency at a nuclear power plant is not likely to cause this to occur.

Ripe fruits at the time of a radiological emergency may be lost because of the personal hazard caused by contamination involved in harvesting them. Fruits that do not have to be picked immediately can be saved and picked after the contamination has decayed to a safe level.