BASIC COURSE IN

Emergency Mass Feeding

POCKET MANUAL

PM-12-1

ARC-488-A

Developed jointly by

FEDERAL CIVIL DEFENSE ADMINISTRATION

and

THE AMERICAN NATIONAL RED CROSS

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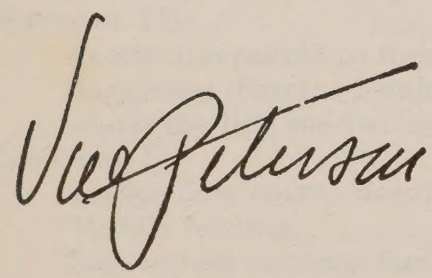
INTRODUCTION

This Pocket Manual has been developed by The American National Red Cross and the Federal Civil Defense Administration as a guide for uniform training of personnel of both agencies in emergency mass-feeding operations.

This uniform training is designed to provide our communities with a reservoir of trained citizens with the knowledge and skills to conduct large feeding operations in time of national emergencies created either by natural disaster or enemy attack.

In case of a major emergency, these trained food workers may be called upon as needed to work either through the Red Cross or Civil Defense. In a natural disaster, food workers will be under the direction of the Red Cross; in an enemy-caused disaster, under the direction of Civil Defense.

VAL PETERSON



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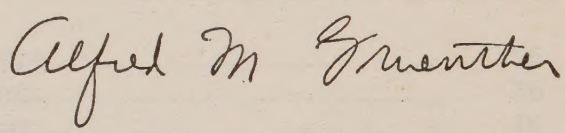
Federal Civil Defense
Administration

ALFRED M. GRUENTHER



President
The American National
Red Cross

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Section I

PURPOSE AND ARRANGEMENT OF MANUAL

A. *Purpose*

1. This pocket manual is to be used as a class instruction book for volunteers enrolled in the FCDA–ARC "Basic Course in Emergency Mass Feeding."
2. The manual is also designed as a pocket guide and ready reference for food workers engaged in actual emergency feeding operations.
3. The manual will assist in planning and organizing operations for the quick service of food in event of any form of disaster, whether caused by nature, by accident, or by enemy action.

B. *Arrangement*

1. The manual is arranged in two parts.
   a. The first part is five sections that are keyed to the sequence of subjects as they are presented in the "Basic Course in Emergency Mass Feeding." Pages for note taking are provided at the end of each section.
   b. The second part is composed of appendices, which furnish more detailed information on certain of the subjects covered in the course. Note pages are also provided at the end of each appendix.
2. The numbers that appear in footnote style throughout the sections and appendices indicate the sources from which material has been obtained. These sources are identified by corresponding footnote numbers in appendix M.

NOTES

NOTES

Section II

WATER

A. *Precautions in Choosing a Water Supply*

1. Choosing a source.
   a. As a first choice, use approved public water systems.
   b. As a second choice, use water from existing springs or wells; quality of ground water is usually better than that of surface water.
   c. If public systems or ground sources are not available, use water from surface sources such as rivers, streams, lakes, and ponds.
2. Precautions when selecting a surface source.
   a. Water should be taken from a point well above and away from sewer outlets.
   b. Avoid.
      (1) Places where refuse drains into a river, stream, or lake.
      (2) Oily shore areas where wastes and drainage may make the water unpalatable or unfit for use.
   c. Choose the clearest water possible; the clearer the water, the easier it is to disinfect and the better it appears. *Clearness is no guarantee of safety. All surface water must be treated.*
   d. Locate toilets so that their drainage will not contaminate the water sources.
3. Precautions in selecting a ground source.
   a. Wells and springs should be located at safe distances (100 feet or more) from sources of contamination such as latrines, septic tanks, cesspools, and sewers. In limestone ground formations, the distance may need to be much greater.

b. Wells and springs should be constructed to exclude surface water and high ground water infiltration.
c. Well and spring sites should not be subject to flooding.

B. *Methods of Disinfecting Water*

1. Boiling.
2. Chlorination.
3. Use of household iodine (for small quantities of water).
4. Use of purification tablets.

NOTE: None of these methods destroy radioactive substances or chemical poisons.

C. *Directions for Disinfection*

1. Boiling.
   a. Boil water 5 to 10 minutes to destroy germs. Allow to cool.
   b. Add pinch of salt to remove flat taste.
   c. If boiled water is to be stored, it should be chlorinated.
2. Chlorination.
   a. Add 10 drops of any ordinary household bleaching solution containing sodium hypochlorite (5.25 percent available chlorine) per gallon of water. (The strengths of bleaching solutions are given on the container labels.)
   b. After adding chlorine, mix thoroughly by shaking or stirring. Wait at least 30 minutes before using the water, after which the water should have a distinct taste and smell of chlorine.
   c. If the taste or smell of chlorine is not present, add another dose to the solution, mix and let stand for another 15 minutes.
   d. The taste or smell of chlorine in the treated water is a sign of safety and is not harmful.
   e. Chlorine dosages to purify water by adding bleaching solution of 5.25 percent chlorine strength.

Gallons	*Quantity of solution*
1	10 drops.
3	¼ teaspoon.
5	½ teaspoon.
48	2 tablespoons.
1,500	1 quart

3. Iodine (small quantities of water).
   a. Add 6 drops of tincture of iodine (ordinary household iodine) per quart of clear water (10 drops for cloudy water).
   b. Mix and allow to stand for 30 minutes.
4. Purification tablets.
   a. Use the tablets in quantity as directed on the container label.
   b. Double the dosage if water is cloudy.
   c. Let the water stand for 15 to 30 minutes after the tablets are dissolved.

WARNING: Do not use other chemicals for purifying or disinfecting water unless approved by health service officers.

D. *Emergency Containers for Water*
1. Small containers.
   a. Store water in any of the following containers *only* after they have been thoroughly cleansed and sanitized to remove all foreign matter.
      (1) Salvage oil drums that have one end cut out.
      (2) Salvage watertight barrels.
      (3) Salvage bathtubs.
      (4) Other containers such as tubs, sinks, and clean trash cans.
2. Large containers.
   a. Concrete swimming pools.
   b. Tarpaulin-lined pits.
   c. Railroad water tanks not in use.
   d. Industrial water tanks and boilers not in use.
3. If possible, seal all containers in which disinfected water is stored. If not possible, cover container securely to protect against contamination.
4. Store off the ground.
5. Locate away from garbage and toilet areas.
6. Provide single-use dispossable drinking cups. *Never use a common drinking cup.*

E. *Control of Food-Borne Diseases*
1. The importance of hygiene and sanitation to prevent the contamination of food is stressed throughout the manual because foods from safe sources that are properly stored, cooked, refrigerated, prepared, and served by clean, healthy people rarely cause illness.

2. Foodborne diseases can be prevented generally by—
   a. Meticulous personal hygiene and sanitary food handling practices by food workers.
   b. Using only clean, unspoiled foods.
   c. Maintaining clean facilities and establishment.
   d. Protecting foods from contamination by dust, flies, vermin, rodents, and drainage.
   e. Refrigeration of perishable foods at temperatures below 50° F.
   f. Proper cooking and processing of foods.
   g. Preparing foods as close to serving time as possible and keeping them hot until served.
   h. Avoiding foods and preparations which require a great deal of handling.
   i. Sanitary disposal of refuse and wastes.

F. *Cleansing Salvage Oil Drums and Other Containers for Emergency Use in Mass Feeding* [1]

1. In an emergency it may be necessary to use salvage oil drums or other large iron containers for cooking food in quantity. Before use as cooking vessels, these containers must be cleansed, scoured, and sterilized.
2. If there is a choice of containers, choose in order of preference as follows:
   a. Those in which fuels, oils, and lubricants were stored.
   b. Those in which chemicals and fertilizers were stored.
   c. Those in which paints were stored.
3. Procedure for cleansing:
   a. Cut 55-gallon oil drums in half.
   b. Wipe out oil and foreign matter.
   c. Fill containers with water, add detergent, and boil.
   d. Empty soiled water. Use an ordinary household abrasive to scour thoroughly. If ordinary household abrasive cleanser is not available, make a mixture of sand, fine gravel, and water. Remove any foreign matter deposited in crevices or under rolled rims.
   e. Rinse thoroughly with hot water several times.
   f. Repeat the above procedures if necessary.
   g. To insure the cleanliness and safety of the container for use as a cooking vessel, it may finally be "blued."

See app. M for footnotes.

4. Bluing utensils.
   a. The purpose of bluing is to prevent rust. Aluminum and tin utensils should never be "blued" as the high heat necessary to "blue" a utensil will melt them.
   b. Directions.
      (1) Wash and dry the utensil thoroughly. Place over a wood fire that has both flames and live coals. This burns out any remaining residue and opens the tiny pores of the metal.
      (2) Plunge the utensil in hot water and again scour and dry thoroughly.
      (3) Coat the utensil inside and out with a thin film of lard or other cooking grease (except bacon, ham, or other grease which contains salt that will corrode the metal).
      (4) Place the utensil in a hot oven (325° to 400° F.) for about an hour. If no oven is available, place upside down over glowing coals, being careful not to burn away the grease.
   c. The metal will slowly turn blue as the heat does its work. The spread of color is a guide in judging the progress of bluing. This heat treatment melts the grease into the surface, closes the pores of the metal and gives the utensil a smooth, glazed surface that resists rust.
5. Use of tin containers for cooking.
   a. The standard tin can is made of sheet metal with a 1.5-percent tin coating. Never heat the can when it doesn't contain liquid or food because the thin film will crack and burn away. This is a protective coating, and should remain on the can. Some cans are enameled and have a gold-colored interior. If these cans are to be used for cooking, this enamel should first be burned off, then the metal should be thoroughly cleaned.

EMERGENCY WASTE DISPOSAL

A. *Garbage*
   1. Includes—
      a. Food wastes from kitchen.
      b. Food left on plates by diners.

2. Methods for disposal.
   a. Burying.
      (1) Dig trench or pit 4 or more feet deep.
      (2) Dump garbage in pit.
      (3) Pack down in layers.
      (4) Cover exposed layer with few inches of dirt at end of each day.
      (5) When pit is filled, cover with earth and pack well by tamping or running over with a crawler tractor.
      (6) Cover an abandoned garbage site with at least 2 feet of mounded earth.
   b. Incineration.
      (1) Requires removal of all excess moisture.
      (2) Good fire must be started before adding garbage.
      (3) Garbage should be added in small amounts.
      (4) Additional fuel must be added as needed to keep good fire going.
      (5) Unburned residue must be buried and covered with at least 2 feet of mounded earth.

B. *Trash*
   1. Includes—
      a. Cans.
      b. Glass.
      c. Other noncombustible wastes.
      d. Combustible wastes.
   2. Methods for disposal.
      a. Cans.
         (1) Wash and use as substitutes for cooking and eating utensils.
         (2) Otherwise, open both ends, flatten, and bury with garbage.
      b. Glass.
         (1) Wash and, if needed, use as substitutes for eating utensils.
         (2) Otherwise, break and bury with garbage. (Breaking will reduce volume and save work of digging and covering.)
      c. Other noncombustible wastes.
         (1) Bury with garbage.

d. Combustible wastes.
(1) Separate from wet wastes and keep dry.
(2) Burn in incinerator.

C. *Liquid Wastes*

1. Includes—
a. Dishwater
b. Other liquid wastes from kitchen and dining areas.
2. Methods of disposal—
a. If needed, save usable grease and waste fat in tin cans for cooking use or
b. Burn, or bury with garbage.
c. Dispose of other liquid wastes in soakage pit. (See fig. 11, sec. IV.)
(1) Locate soakage pit at minimum of 25 feet from kitchen area.

D. *Toilet Facilities*

1. If latrine facilities are not already located at a feeding site, it will be necessary to provide some type of facility for the exclusive use of food workers.
2. Figure 12, section IV, shows the suggested construction of such a facility.
3. In providing these emergency facilities, the following precautions should be taken:
a. Facilities for men and women should be well separated and located at least 50 feet from areas used for storage, preparation, and service of food.
b. A handwashing facility should be provided near the toilet area and stocked with a supply of water, soap, paper towels, and a disposal receptacle.
c. The following ratio is suggested for food workers:
(1) Men—1 seat and 1 urinal per 10 workers.
(2) Women—1 seat per 8 workers.
d. Latrines should be kept well lighted at all times, doors and windows screened, if necessary.

NOTE: If temporary latrine facilities must be provided for diners, the same type construction as that suggested for food workers may be adapted. Latrines for diners should be located at least 300 feet from the serving area.

4. Operation of outdoor pit latrines.
a. Keep clean. Assign full-time monitor if needed.
b. Provide toilet paper. (Large covered tin cans protect paper against weather.)

c. Close latrine when no longer needed.
(1) Cover all pit contents with minimum of 2 feet of earth and pack down firmly.
(2) Spray area with oil or DDT.
(3) Mound earth 12 to 18 inches above pit and pack firmly.
(4) Mark the site "CLOSED LATRINE."
d. If animals are likely to unearth latrine contents, mix broken glass with earth used to fill the pit.

E. *Emergency Handwashing Facilities*
1. Provide facilities for food workers only for washing hands after using latrine and during preparation and service of meals.
2. Items needed.
a. Can containing soapy water for washing.
b. Can containing clean water with 1 ounce of laundry bleach per 2 gallons added for rinsing.
c. Paper towels and disposal receptacle.
d. See figure 7, section IV, for details on construction and operation of the facility.
3. Alternate method.
a. Materials.
(1) Large can of soapy water.
(2) Large can of clean water with 1 ounce laundry bleach added per gallon.
(3) Small cans (No. 1, No. 303, or No. 2) for each of above.
(4) Two small wash basins.
(5) Waste receptacle.
(6) Paper towels.
b. Operation.
(1) Place small can (No. 1) soapy water in first basin and wash hands thoroughly.
(2) Dump basin in waste receptacle.
(3) Place small can (No. 303 or No. 2) in other basin. Rinse hands thoroughly.
(4) Dump basin in waste receptacle.
(5) Dry hands with paper towels.

F. *Control of Rodents and Insects*
1. Keep all food in containers and facilities that will prevent access by rodents and insects.
2. Dispose of refuse and garbage properly and promptly.

3. Keep working surfaces clean at all times.
4. Promptly clean up anything spilled on floor or ground.
5. Screen all openings.

CAUTION: Use of insecticides such as DDT, chlordane, etc., and rodenticides such as Warfarin and Red Squill should be supervised by competent personnel. Formula 1080 (rodenticide) should never be used around feeding areas as it is too dangerous and highly poisonous. Never store any forms of rodenticides or insecticides near food.

DISHWASHING

A. *Equipment and Materials Needed for Washing Dishes by Hand*
   1. Scrapers.
   2. A receptacle for dish scraps.
   3. A spray or other rinsing device for prerinsing dishes.
   4. A 3-compartment dishwashing sink—1 sink for washing, 1 for rinsing, and 1 for sanitizing.
   5. Detergent or soap.
   6. Wire baskets or perforated pails for holding dishes when immersing in bactericidal solution or in scalding water.
   7. Scalding water or approved bactericidal solution for sanitizing dishes.

B. *Procedure for Hand Dishwashing*
   1. Scrape waste from dishes into receptacle.
   2. Prerinse the dishes to prevent overloading the dishwater with soil and bacteria.
   3. Sink No. 1.
      a. Wash dishes thoroughly in hot water (about 110° to 120° F.) and detergent or soap. As the temperature of the washwater decreases, change and add fresh cleanser. A detergent or soap is a cleansing agent, *not* a sanitizing agent.
   4. Sink No. 2.
      a. Rinse dishes in clear hot water (about 110° to 120° F.).
      b. Place dishes in a clean wire basket for sanitizing. Arrange so all inside surfaces are reached by sanitizing solution.
   5. Sink No. 3.
      a. Sanitize dishes in sink No. 3 by immersing them (using wire basket) in hot water (at least 180°

F. for 2 minutes or 212° F. for one-half minute). Keep the water hot by a heating arrangement under the sink, by an automatic boosting device, or with a thermostatically controlled boiler that will deliver water of 180° F. to the sink.

b. If chlorine or other approved bactericidal solution is used for sanitizing, immerse dishes for 2 minutes.

c. Remove dishes and place on drain board to air-dry and cool. *Never* dry with towels.

d. Remove to a clean, sheltered place. Invert glasses and cups on racks.

C. *Machine Dishwashing*

1. Follow steps 1, 2, 5c, and 5d (above) under procedure for hand dishwashing.
2. Use machine for steps 3, 4, 5a, and 5b.
3. Dishwashing machines vary in design and construction. Follow manufacturer's instructions for loading, amount of cleanser, washing and rinsing, temperatures, and repair.

PERSONAL HYGIENE FOR FOOD WORKERS

A. *Persons with outward signs of illness or disease, or with pimples, boils, skin eruptions, cuts, unusual skin blemishes, diarrhea, heavy colds and other respiratory infections, should not serve as food workers*

B. *Precautions*

1. Avoid handling food if you have any infected cuts or sores on your hands or fingers.
2. Touch food with hands only when necessary. Use forks, tongs, ladles.
3. When handling clean and sanitized eating utensils, do not touch portion that will contact the diner's mouth. Grasp glasses by the base, cups, and silverware by the handles.
4. Never place fingers in the mouth to remove food residue, nor moisten fingers with saliva to facilitate handling paper used to wrap food.
5. When handling food, do not scratch scalp. Keep hands away from nose, mouth, face, hair, and ears.
6. Wash hands frequently with soap and water while preparing food, *always* after using toilet or latrine.

7. Never sneeze, cough, or blow nose over food.
8. Do not smoke while handling food. Ashes may fall into food; saliva from the cigarette, cigar, or pipe may contaminate hands.
9. Wear caps or hairnets to prevent hair from falling into the food.
10. Wear clean, washable outer garments when working around food.

FOODS TO SERVE IN DISASTER

A. *All food supplies should be checked and approved by health officials before being used for emergency feeding*

B. *Foods Recommended*
1. Canned milk and dried milk.
2. Canned meats, fish, poultry.
3. Canned or packaged staples.
4. Canned fruits or vegetables.
5. Canned juices.
6. Packaged, dried, or dehydrated foods.
7. Canned or packaged biscuits, breads, crackers, cookies.

C. *Foods Not Recommended*
1. All home-canned foods.
2. Any bulging or badly rusted cans of food.
3. Salads made with meat, fish, eggs, poultry, or potatoes, and sandwiches made with such salads.
4. Meat and poultry dressings and stuffings.
5. Rare or medium-cooked meats (particularly pork and poultry).
6. Cream fillings, cream sauces, creamed meats, custards, and gravies.
7. Raw (unpasteurized) milk. (See app. I for methods for emergency pasteurization of milk.)

CAUTION: Hashes, croquettes, meat pies, and ground meats are readily susceptible of contamination. If used, they should be served promptly. Avoid keeping prepared or cooked food at room temperature or on steam tables with temperatures under 150° F.

RADIOACTIVE CONTAMINATION

A. *Precautions for Food*
1. Food and water which may have been exposed to radioactivity should not be used *unless declared safe* by

civil defense radiological personnel or other qualified civil defense officials.

2. If radiological assistance is not available, sealed or unbroken packages, cans, or jars of food from contaminated areas must be cleansed carefully to remove radioactive contamination, and care taken to avoid contaminating contents when removing from the containers. Following this, the contents of the containers must be monitored to assure that the food is safe for consumption.
3. Do not use fresh produce direct from gardens and fields in contaminated areas *unless it is determined safe* by radiological personnel.

B. *Precautions for Cooking and Eating Utensils*

1. Boiling will not destroy radioactive contamination.
2. Radioactive contamination can be washed or wiped off utensils, but this will not render the radioactive particles harmless.
3. Because the radioactive particles will remain on the cleaning cloth and in the washwater, precautions must be taken for disposal.
   a. Use separate tubs or pails for washing contaminated cooking and eating utensils and other food equipment.
   b. Tubs or pails used for washing contaminated utensils should be emptied and thoroughly rinsed outside the kitchen area, in a place where the radioactive material from contaminated water will not affect the safe water supply.

C. *Precautions for Water*

1. Boiling or chlorination does not remove radioactive substances from water. Special methods are required for decontamination, and the treatment must be supervised by trained personnel.

Be sure that the food, water, and utensils you are using are not contaminated by radioactive substances!

EMERGENCY FEEDING FOR SPECIAL GROUPS

A. *Necessity*

1. In the period immediately following an extreme disaster, it may not be possible for feeding teams to

provide the special diets required by such groups as—

a. Infants.
b. Nursing and expectant mothers.
c. The chronically ill.
d. The aged and infirm.
e. The unhospitalized injured.

2. Until special diets can be prepared for these groups, they may be fed (with the exception of infants) regular foods that have been liquefied, softened, or otherwise modified to meet the particular requirements.
3. With exception of disaster workers, who will need high-energy foods to enable them to carry on their duties with a minimum of exhaustion, feeding for all other groups enumerated above, where possible, will be under the direction, written or verbal, of medical, dietetic, or nursing personnel.
4. The greatest food urgency in an emergency is the feeding of infants. Adults can exist, in most instances, for several days without food and for lesser periods without water and not suffer physical harm. However, infants up to 1 year of age must be provided suitable food and liquid or serious dehydration will occur. Disaster planning for feeding special groups, therefore, should give priority to infants and expectant and nursing mothers.

B. *Types of Feeding*

1. Infants.
   a. It is essential that stocks of milk and sugar, and supplies of safe water, be available for infant feeding within a short period of time after a disaster.
   b. Milk, either evaporated or dried, sugar, and lactose (milk sugar) should be stored in sealed tins to minimize contamination by insects, dust, bacteria, vermin, other foreign matter, or radioactive materials.
   c. In addition to any central stations for formulas for infant feeding, formula ingredients and equipment should be made available, where possible, to those who wish to care for their own children.

d. The practice of parent preparation of formulas for their own children should be encouraged wherever feasible, because parents are more likely to become panic stricken over the care of their babies than over the loss of homes and property.

e. Details of formula ingredients, preparation, and equipment are shown in appendix J, together with other information pertinent to formula preparation.

f. The importance of sanitation in every aspect of infant feeding cannot be overemphasized.

2. Nursing and expectant mothers.

a. Nursing mothers should be encouraged to continue breast feeding and should receive their own allotment of milk (see app. J) as well as other fluids in adequate amounts.

b. Expectant mothers should receive priority in milk rations after nursing mothers, and their diets should be supplemented as much as possible through larger servings of calorie and protein foods, such as cereals, bread, dried beans and peas, and cheese.

3. The chronically ill.

a. Feeding of the chronically ill is essentially a medical problem, but feeding teams may be faced with furnishing food to chronically ill persons who are not hospitalized and are not under immediate medical care.

b. In general, chronically ill persons can subsist temporarily without undue injury on medications they may have with them supplemented by food supplied by a feeding team. For example:

(1) Ambulatory tuberculosis patients.

(2) Persons with peptic ulcers who know their own dietary restrictions.

(3) Diabetics with their own insulin supplies. These persons must avoid concentrated sweets and limit the intake of starches and fats.

c. Injured diabetics, especially if unconscious, are wholly a medical problem requiring hospitalization and medical care.

4. The aged and infirm.
   a. The problem with this group is providing foods that are nutritious and that can be easily chewed and digested, such as cereals, soups, eggs, and soft-filling sandwiches.
   b. Foods should be served in easy-to-handle form, particularly foods for those with arthritis, palsy, or other infirmities.
   c. Those in this group having sore mouths or other difficulties in chewing and swallowing should be given liquid or baby foods.
5. The injured.
   a. As in the case of the chronically ill, the feeding of injured persons is primarily a medical problem.
   b. An ambulatory person with minor injuries who is en route to medical treatment may be given the regular diet being prepared by the feeding team, modified by liquefying or softening food if necessary for ease of eating.
   c. Ambulatory persons in shock should be given only a warm sweet drink and a snack and then placed under medical care.
   d. Feeding teams may be asked by physicians to prepare salt and soda solutions for injured patients. For the proper preparation of salt and soda solution, see appendix J.

NONFAT DRY MILK (DRY SKIM MILK) [2]

A. *Nature and Use*
1. Dry skim milk is produced by removing the fat and water from fresh whole sweet milk. The powder form retains all of the bone- and muscle-building nourishment of liquid skim milk.
2. Dry skim milk is convenient to store and easy to use. It can be mixed quickly with water to make fluid milk, and can be used in any recipe that requires milk.
3. In most recipes that call for a large quantity of dry ingredients, the skim milk powder may be used from

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See app. M for footnotes.

the container without reconstitution. Use 3 tablespoons of milk powder for each cup of liquid milk. Mix the dry milk powder with the other dry ingredients, then follow recipe using water instead of milk.

4. Store milk powder in a cool, dry place in a tightly covered container. When exposed to air the powder becomes lumpy and changes flavor.
5. Fluid milk made from milk powder and water must be kept cool and clean and covered the same as fresh fluid milk.
6. Proportions of dry skim milk to water to form fluid skim milk are as follows:

Skim milk powder +	Water =	Approximate yield in fluid skim milk
3 tbsp	1 cup	1 cup
¾ cup	1 qt	1 qt.
1 lb	5 qt	5 qt.

B. *Directions for Reconstituting Spray-Dried Skim Milk Powder.*

1. Water should be at moderate temperature.
2. Pour water into a mixing bowl, or a jar or shaker with tight-fitting cover, large enough so water about half-fills the container.
3. Sprinkle dry skim milk on top of water.
4. Whip with a rotary beater, whisk, spoon, or fork—or shake closed container—until the powder is dissolved. Lukewarm water will speed the mixing. When mixed, keep cold same as fresh milk.
5. *Never* add dry milk powder directly to a boiling mixture.

C. *Instant Dry Milk Powder*

1. Instant dry milk powders need no beating or shaking to mix. They dissolve readily in either hot or cold water by simply stirring with a spoon.

DUTIES OF FOOD WORKERS

A. *Supervisor or Planning Group*

1. Plans and posts menus, recipes, work schedules, indicating numbers to be fed, amount of food to be prepared, and size of servings.

2. Requisitions food, equipment, and other supplies and receives, checks, stores, and allocates supplies to team.
3. Keeps necessary records.
4. Lists jobs to be done and divides them into basic work units. Assigns jobs to team members.
5. Supervises team workers.
6. Enforces sanitary and safety practices in the feeding area.
7. Maintains liaison with other feeding units throughout the disaster area.
8. Recruits and assigns *licensed* drivers for automotive units in mobile operations.

B. *Food Preparation Group*

1. Follows menus, recipes, and work schedules.
2. Schedules preparation of food to have it ready and in good condition at serving time.
3. Plans, collects, and assigns necessary equipment and food ingredients.
4. Arranges work space for efficiency.
5. Delivers food to serving counters.
6. Coordinates duties with those of the serving and cleaning groups.
7. Keeps working area clean.
8. Arranges for proper storage or disposal of leftovers.
9. Delivers soiled utensils to dishwashing unit.
10. Keeps close watch for spoiled or contaminated food. Consults with supervisor for proper disposal action.
11. Keeps necessary fires going and water at boiling temperature for general use.
12. Adheres to sanitation and safety regulations.

C. *Food Serving Group*

1. Before food is served.
   a. Assigns specific tasks for each member of the serving group according to menu.
   b. Arranges serving space for efficiency. Systematizes food arrangement on counter—cold foods first, hot foods last.
   c. Establishes lines for movement of diners from serving counter to eating area.
   d. Assembles serving utensils, eating equipment, and food accompaniments—such as salt, pepper, cream,

sugar, and drinking water, and places them at point of use. Arranges utensils so eating surfaces will not be grasped by hands. Wraps spoons and forks in napkins and places them at the start or end of the serving line. If stacks of paper cups and bowls are inverted on clean trays, towels, or paper, they may be grasped easily.

e. Sets up trash-disposal facilities, in collaboration with cleanup and sanitation group.

f. When ready to serve, arranges containers of hot food on counters. Has proper serving utensils handy.

g. Sets portion on each food item to be served. Assures there are enough servers for each station.

h. Serves food attractively. Avoids overfilling and spilling. When serving thick soup or stew, sees that everyone gets a fair share of both meat and vegetables.

i. Keeps prepared food covered when not being served.

j. Keeps serving area clean and neat "as you go."

2. After meal is served.

a. Clears the serving counter.

b. Delivers leftover food to kitchen area.

c. Disposes of trash and waste from serving area.

D. *Cleanup and Sanitation Group*

1. Sanitation and cleanup includes the following:

a. General cleanliness and sanitation of the area.

b. Care and issuance of cleaning supplies to other team groups.

c. Provision of handwashing facilities and drinking water.

d. Dishwashing and general cleaning.

2. Before the meal is served.

a. Plans specific tasks for each member of group.

b. Issues cleaning supplies to other groups.

c. Cleans and sanitizes tables and serving counters.

d. Prepares facilities for collecting garbage and trash.

e. Keeps kitchen utensils and dishes washed as meal is prepared. (See Dishwashing, sec. II.)

3. After the meal is served.

a. Washes and sanitizes all soiled dishes and utensils. Stores properly.

b. Checks all working surfaces, tables, shelves, and ranges for cleanliness.
c. Washes and rinses dishcloths, serving towels, and cleaning cloths—and hangs them to dry in the air.
d. Sweeps or mops floors, and dusts chairs.
e. Disposes of garbage and trash, and sanitizes the containers.
f. Puts away cleaning supplies and equipment.

SANDWICH FILLINGS LEAST SUBJECT TO CONTAMINATION AND SPOILAGE

A. *Peanut Butter*
1. Mixed with any of the following:
a. Crisp bacon and raw apple.
b. Crisp bacon and catsup.
c. Grated raw carrots, chopped raisins, or celery.
d. Chopped dried fruit and lemon juice.
e. Worcestershire sauce.
f. Chili sauce or catsup.
g. Grated cheddar cheese.
2. One slice of bread, with any of the following on the facing slice:
a. Applesauce or apple butter.
b. Chopped cooked prunes.
c. Jelly or jam.

B. *Meat Fillings*
1. Plain roast beef.
2. Corned beef and relish.
3. Corned beef and tomato.
4. Chopped corned beef and mustard.
5. Bacon.
6. Bacon and tomato.
7. Bacon, peanut butter, and jelly.
8. Frankfurter and mustard.

C. *Sweet Sandwiches*
1. Apple butter and cottage cheese.

2. Prune and nut.
3. Raisin and peanut butter.
4. Peanut butter and jelly.
5. Raisin and carrot.

D. *Cheese Sandwiches*

1. Cottage cheese combined with any of the following:
   a. Bacon.
   b. Sliced cucumber.
   c. Jam, marmalade, or jelly.
   d. Pineapple.
   e. Shredded carrot.
   f. Olive.
   g. Nut.
2. American cheese combined with any of the following:
   a. Tomato.
   b. Mustard pickle.
   c. Olive.
3. Swiss cheese combined with—
   a. Tomato.
   b. Dill pickle.

E. *Fish Sandwiches*

1. Sardine and tomato.
2. Sardine and olive.
3. Minced sardine, onion, and lemon.
4. Tuna, cottage cheese, minced onion, pickle, and relish.

F. *Raw Vetgetable Fillings*

1. Sliced tomato combined with any of the following:
   a. Lettuce.
   b. Cheese.
   c. Onion slices.
   d. Bacon.

G. *Miscellaneous Fillings*

1. Jelly and jam.
2. Baked beans and bacon.
3. Baked beans and catsup.
4. Applesauce.
5. Banana and lemon juice.

EMERGENCY COFFEE[3]

A. *Kettle Method With Bag*

1. Unbleached muslin, layers of cheesecloth, coffee sacks, or sugar sacks are suitable for making bags. *Never* use burlap sacking or other material that has been sized or otherwise treated.
2. Basic recipe for emergency coffee.

Container	Ingredients	Yield
10-gal. kettle	3 lb. coffee, ground 7½ gal. boiling water.	7½ gal. coffee. (30 qt.) (160 6-oz. portions).

3. Directions.
   a. Place ground coffee in cloth bag large enough to permit circulation of water and expansion of coffee (allow for expansion of as much as 2 or 3 times the amount of coffee used). Fifteen pounds of coffee is the maximum per bag for best results and convenient handling.
   b. Tie the bag securely near the top with strong cord or string long enough to fasten to the handle of the container for easy removal of the bag from the hot brew.
   c. Pour water (freshly drawn if possible) into large kettle or stock pot and bring to a boil.
   d. Place the coffee bag in boiling water; tie cord to handle or make secure otherwise. Reduce heat to keep water at just below boiling *at all times.*
   e. Submerge bag with paddle or stick, pushing up and down to force water through grounds.
   f. Cover kettle and brew coffee 12 to 15 minutes.
   g. Lift bag, drain into kettle. Remove.
4. Empty coffee grounds. Wash bags thoroughly in plain water and place in cold water until used again.

B. *Emergency Method Without Bag*

1. Requires same proportions of ground coffee and water as basic recipe.

See app. M for footnotes.

2. Directions.
   a. Pour water into container of adequate size.
   b. Heat water to boiling.
   c. Pour ground coffee into boiling water; stir.
   d. Reduce heat to just below boiling.
   e. Brew coffee 10 to 12 minutes, being careful not to boil or overcook.
   f. Settle grounds by sprinkling in a small amount of cold water. To avoid stirring up the grounds, carefully pour or ladle the coffee into another container.

C. *Boston Coffee*

1. Boston coffee is a mixture of brewed coffee diluted with an equal part of milk.
2. Directions.
   a. Use half the basic recipe for coffee and brew the coffee.
   b. Scald a mixture of 1½ gallons of evaporated milk and 1½ gallons of water and add to the prepared brew. Stir well over heat.

D. *Instant Coffee*

1. Instant coffee is made by mixing powdered commercial coffee concentrate with boiling water.
2. Directions.
   a. Pour water (freshly drawn if possible) into container of adequate size.
   b. Heat water to boiling point.
   c. Add water to powdered instant coffee.
   d. Reduce heat. Stir mixture well.
3. Proportions.

Ingredients	*Yield*
Instant coffee, 7½ cups	7½ gal. coffee (30 qt.)
Boiling water, 7½ gal	160 6-oz. portions

4. Directions for the preparation of emergency hot tea and hot cocoa are shown in appendix E.

SANDWICH SUPPLIES

Item *Approximate quantities for average portions*

BREAD

1. Allow 2 slices per serving. Number and thickness of slices will vary among different localities. Slices from a 3-pound loaf are larger in surface area than slices from a 2-pound loaf.

2. Loaf yields (without end crusts).

Kind	*Pounds weight*	*Number slices*	*Slice thickness (inch)*
White, regular	1¼	19	⅝
	1½	24	⅝
White, sandwich	2	28	½
	2	36	⅜
	3	44	½
	3	56	⅜
Whole wheat	1	16	⅝
	2	28	½
	3	44	½
	3	56	⅜
Rye	1	23	¾
	2	33	¾

Item	*Approximate quantities for average portions*
BUNS	Allow 1 sandwich bun per serving
BUTTER	1 lb. softened butter, at 1 tsp. per slice, will spread 96 slices of bread
BACON	1 lb. averages 25 medium strips, or 1½ cups cooked and chopped
CHEESE	
Sliced	1 lb. averages 16 slices (1 oz. each)
Cottage	1 lb. averages 1 pt.
Cream	1 lb. averages 1 pt.
Processed, grated	1 lb. averages 1 qt.
CELERY	1 lb. averages 1 qt. chopped
CHICKEN	5-lb. fowl averages 1 qt. cooked and diced
Sliced	1 lb. averages 12 slices (1½ oz. each) or 16 slices (1 oz. each)
EGGS	Hard cooked 1 doz. averages 3½ cups chopped
JELLY (or preserves)	1 pt. will spread 16 sandwiches
LETTUCE	1 medium head averages 16 leaves

Item	*Approximate quantities for average portions*
MARGARINE	1 lb. softened margarine, at 1 tsp. per slice, will spread 96 slices of bread
MAYONNAISE	1 pt. mayonnaise, at 1 tsp. per slice, will spread 50 slices of bread
MEAT	
Sliced	1 lb. averages 8 slices (2 oz. each)
Ground, raw	1 lb. averages 1 pt.
Ground, cooked	1 lb. averages 3 cups
NUT MEATS	1 lb. averages 3¾ cups chopped
ONIONS	1 lb. averages 1 pt. chopped
OLIVES (drained)	1 qt. averages 3 cups chopped
PICKLES (drained)	1 qt. averages 3 cups chopped
PEANUT BUTTER	1 lb. averages 1¾ cups
SALMON	1 lb. averages 1 pt. flaked
SANDWICH FILLING	3 qt., at one scoop (No. 20) per sandwich, will spread 60 sandwiches
TUNA FISH	1 lb. averages 1 pt. flaked
TOMATOES	1 lb. averages 3 or 4 medium-size tomatoes

PROCEDURES FOR MAKING SANDWICHES [4]

A. *Efficient Methods*

1. Arrange materials within easy reach. Tilt filling containers slightly.
2. If possible, adjust working surfaces to proper heights for comfort. Tired backs and aching feet reduce output.
3. Clean work surfaces "as you go," using only soap or detergents as cleansing agents.
4. Place "in-use" bread supply at left of worker in method No. 1, and in front of worker in method No. 2, as described in section III.

See app. M for footnotes.

B. *Tools Needed*

1. A spatula or spreader, with blade long enough to reach across a slice of bread.
2. Portion scoops.
3. Knives for slicing or dicing.
4. Forks for picking up slices.
5. Can openers.
6. Spoons.
7. Containers for dry bread and waste.
8. Trays.

C. *Bread Tray Setup*

1. Use ready-sliced bread for speedy production and uniformity.
2. Leave wrappers on until ready to use the bread.
3. Open wrapper by slitting through middle of loaf with knife.
4. Remove wrapper from a half-loaf at a time.
5. Place bread on tray, each half-loaf open side down, 6 half-loaves on tray.
6. Place bread heels in container for dry bread.

D. *Preparation of Fillings*

1. Cream butter or margarine in advance. Avoid use of melted butter because it soaks into the bread. Creamed butter or margarine forms a protective coating and doesn't soak in.
2. To save time and labor, use easy-to-spread fillings or sliced ingredients, such as cheese or meat.
3. Cross-stack sliced ingredients for easy pickup.
4. Add acid ingredients, such as pickles, relish, vinegar, lemon juice, olives, catsup, or chili sauce to cheese, meat, egg, poultry, and bean fillings. The acid improves keeping qualities.

E. *Handling of Sandwiches*

1. Handle bread and fillings as little as possible.
2. Don't use hands if equipment or tools can do the job.
3. Refrigerate fillings, if possible.

4. Keep only a working supply of sandwich materials at the counter; replenish as needed.
5. Prepare fillings only in quantities that can be used during one serving period.
6. Label sandwiches in groups to show kind of filling, date, and hour made. (This information will enable a determination of the time beyond which the sandwich should not be served.)

F. *Cleanliness of Workers*

1. The rules of "Personal Hygiene for Food Workers" shown on p. 15 of this section must be strictly observed.

NOTES

NOTES

Section III

FOODS ACCEPTABLE TO MOST GROUPS [5]

A. *Food Importance*

1. Adequate emergency feeding for those whose lives have been disorganized by disaster and who are unable to provide for themselves is more than a means of allaying hunger and sustaining life. Food also is a vital factor in the important matters of raising and maintaining morale.
2. Obviously, the period after a disaster is not the time to try to persuade victims to accept and eat new foods. Every effort should be made to provide foods in forms that are familiar and acceptable to the group to be fed and that can be prepared without difficulty by the cooks.

B. *Examples*

1. The following are examples of basic foods that are generally familiar and acceptable to most groups:
   a. Plain vegetable and split pea, or tomato soup; chicken broth with rice or needles; dried beans, peas, lentils.
   b. Beef in all forms; chicken, fish, and eggs.

See app. M for footnotes.

c. Potatoes, baked and boiled; boiled rice, spaghetti, noodles and macaroni; wheat cereal, bread, crackers.
d. Green peas, stringbeans, tomatoes, lettuce, celery, varieties of raw greens.
e. Most fruits—fresh, cooked, or dried; ice cream, cookies, cake.
f. Coffee, tea.
g. Milk for children.

SUGGESTED DISASTER FEEDING PLANS

A. *For Immediate and Continuous Feeding During Extreme Emergency*

1. During the first 24 to 48 hours following a disaster, there may be continuous need for food service for disaster victims. Several possible emergency situations are given, with suggestions for food service under the conditions assumed. The foods selected are those that require little or no cooking and can be easily distributed and served if facilities are limited or lacking.
2. Situation 1.
   a. Assume—
      (1) No safe water.
      (2) No refrigeration.
      (3) No cooking or serving facilities.
   b. What to do—
      (1) Rely on canned and packaged foods, eaten cold, directly from the container. Save tin cans for possible future use as eating utensils.
      (2) Use juices from canned fruits and vegetables as substitutes for water.
      (3) Serve foods only in containers that can be held in the hand.
   c. Food suggestions—
      (1) Canned soups, fruit and vegetable juices.
      (2) Canned meats and fish, beans, spaghetti.
      (3) Canned fruits and vegetables, dried fruits.
      (4) Evaporated milk, cheese.
      (5) Ready-to-eat packaged cereals, to eat out of the package.
      (6) Crackers, packaged cookies, tinned breads.

(7) Individual-pack jams and jellies.
(8) Instant chocolate or chocolate sirup, combined with evaporated milk.
(9) Peanut butter, table fat, edible oils.

3. Situation 2.
   a. Assume—
      (1) Safe water.
      (2) Some kind of improvised or existing cooking facilities.
      (3) Some safe receptacles for food and drink (tin cans or paper serving supplies).
   b. What to do—
      (1) Serve a simple hot soup, stew, bread or crackers, and a hot drink.
      (2) If water for cooking is rationed, use vegetable juices and canned soups as liquid for cooking.
      (3) Use water ration for coffee and tea.
   c. Simple menu suggestions—
      (1) Menu A.
         (a) Canned juice.
         (b) Thick hot vegetable soup.
         (c) Crackers.
         (d) Coffee with evaporated milk, sugar.
      (2) Menu B.
         (a) Thick bean soup.
         (b) Crackers (cornbread or emergency biscuits if ovens available).
         (c) Dried fruit.
         (d) Hot beverage.

4. Situation 3.
   a. Assume—
      (1) Some water.
      (2) No utilities.
      (3) Central kitchens with cooking facilities converted to LP gas.
      (4) Mobile canteens available.
   b. What to do—
      (1) Establish mobile feeding operations with line feeding.
      (2) Serve sandwiches with fillings not subject to quick spoilage, and an easily handled beverage.

c. Suggested menus—
(1) Menu A.
(a) Canned juice.
(b) Packaged, ready-to-eat cereals.
(c) Milk.
(d) Bread with spread.
(e) Hot beverage.
(2) Menu B.
(a) Soup, canned or fresh.
(b) Sandwich.
(c) Beverage.
(d) Cookies.
(3) Menu C.
(a) Sandwiches.
(b) Fruit, dried, fresh, or canned.
(c) Beverage.

B. *For Two Meals a Day After the Emergency*

1. During the emergency period when labor, equipment, and food supplies are limited, provide two meals a day until feeding facilities can be fully established. Following is a suggested pattern for two-meal plan:

a. Assume—
(1) Eating utensils available.
(2) No utilities. (LP gas available.)
(3) Buildings safe for feeding.
(4) Existing food establishment converted for emergency feeding.

b. What to do—
(1) Serve two simple meals a day using line feeding service.

c. Menus.
(1) First meal.
(a) Fruit juice.
(b) Packaged ready-to-eat cereal.
(c) Bread and spread.
(d) Hot beverage with sugar and evaporated milk.
(2) Second meal.
(a) Hearty soup, stew, or other main dish such as:
1. Bean soup.
2. Potato and corn chowder.

3. Meat and vegetable stew.
4. Macaroni with meat or cheese.
5. Rice and tomatoes.
6. Baked beans.
7. Hard-cooked eggs.

(b) Crackers or sandwiches.
(c) Fresh fruit, eaten out of hand.
(d) Cookies.

C. *For Three Meals During Extended Feeding Operations*

1. As soon as facilities and supplies permit, three evenly spaced meals should be provided.

a. Assume—
(1) Buildings safe.
(2) Utilities available.
(3) Central kitchen facilities available.
(4) Shelter established.

b. What to do—
(1) Establish line feeding. Serve 2 or 3 meals, as circumstances permit. Meals may be as normal as supplies permit.
(2) Suggested menus.
(a) First meal.
1. Fruit or juice.
2. Cooked or ready-to-eat cereal.
3. Milk, as available.
4. Bread and spread.
5. Beverage.
(b) Main meal.
1. Main dish, either meat, fish, cheese, egg, or beans.
2. Potatoes, rice, macaroni, or spaghetti.
3. Vegetables, raw, canned, or dry.
4. Bread and spread.
5. Dessert, if available.
(c) Third meal.
1. A simple snack of soup, sandwiches, and beverage, or fruit.

D. *General Meal Planning Suggestions*

1. Use only foods that have been rendered usable or declared safe.
2. Avoid foods subject to quick spoilage and bacterial contamination or that require careful refrigeration—

such as milk, creamed foods, hash, custards, salads or sandwich fillings mixed with mayonnaise, or other perishables.

3. Keep meals simple, even though facilities and equipment for more elaborate meals are available.
4. Plan meals that require a minimum of time and effort to prepare and serve.
5. Plan foods that fit utensils available for cooking and serving.
6. Plan meals in keeping with climate, temperature, and season.
7. Serve foods that are generally familiar and acceptable to most groups.

ASSEMBLY LINE SANDWICH MAKING

A. *General*

1. Sandwiches can be prepared quickly by using assembly-line methods. An experienced team using these methods can make as many as 10 to 15 sandwiches per minute (600 to 900 per hour).
2. In disaster operations, sandwiches are left whole to save time in production and for easier eating.

B. *Method No. 1 (requires 2 or more workers)* [4]

1. Materials needed.
   a. Sandwich fillings.
   b. Butter or margarine.
   c. Bread tray setup.
   d. Cut waxed paper or cellophane for wrapping.
   e. Spreaders, scoops, and knives at proper places.
2. Duties of worker No. 1.

What to do	How to do it
a. Place 2 matching slices of bread on board.	(1) Use left hand. (2) Place slices of bread in rows with matching slices alongside.
b. Spread softened butter or margarine on bread slices.	(1) Use right hand. (2) Use spreader. (3) Spread to edges of bread.

See app. M for footnotes.

What to do	How to do it
c. Place fillings on buttered bread.	(1) Use right hand. (2) Transfer sandwich-filling portions with scoop or spreader on alternate rows of bread in 1 operation. (If filling is sliced, such as cheese, tomato, or meat, transfer with fork.) (3) Make 1 stroke of the spreader away from you and 1 stroke toward you to spread the filling evenly to the edges of the bread slice.
d. Close sandwiches	(1) Use left hand. (2) Turn corresponding slice of bread over filling of each sandwich, matching edges of the bread.
e. Transfer sandwich to paper (to right, in front of worker No. 1).	(1) Use both hands. (2) Transfer completed sandwich to wrapping paper by sliding knife under the sandwich and supporting it with other hand. Center the sandwich so that top and bottom crusts are parallel to long sides of paper.

3. Duties of worker No. 2 (to right of worker No. 1).

What to do	How to do it
a. Place oblong pieces of cut paper for wrapping to right of worker No. 1. Arrange trays to right of worker No. 2.	(1) Place 1 sheet to right of worker No. 1. (2) Short edge toward worker.
b. Wrap sandwich	(1) Use both hands. (2) Bring ends of paper together in a pharmacist's fold. This forms a neat stay-in edge, which keeps air out. (3) Seal by tucking in ends of the paper. Fold top side in first. (4) Next, fold in the bottom side to form a neat and secure package.

What to do	How to do it
c. Label sandwiches in groups—showing time, date, and hour made. (An extra person may used for this duty and to store the sandwiches in refrigerator.)	(1) Use gummed labels, if available.
d. Stack wrapped sandwich.	(1) Use right hand. (2) Stack sandwiches 6-high on trays. (3) Do not stack in cardboard boxes for storage. The cardboard is an insulator that prevents sandwiches in the middle of the boxes from reaching low temperature quickly. (4) Store filled trays in refrigerators, if available. Maximum safe storage time is 12 hours.

C. *Method No. 2 (requires 5 or more workers)*[3]

1. Organization of assembly lines.
   a. Single line—requires 5 to 7 workers on one side of a table. (See fig. 1, p. 43.)
   b. Double line—requires 10 or more workers, using both sides of the table.
      (1) A double assembly line may be formed by adding 4 or 5 more workers to form a matching line on the opposite side of the table. The worker at No. 1 position in single-line assembly is placed at the head of the table, facing both lines. This person slides the bread alternately to the No. 2 workers on either side of table. The No. 6 or 7 worker in single-line assembly is placed at the foot of the table to collect, stack, and label the wrapped sandwiches from both sides of the line.
2. Materials needed.
   a. Have sandwich filling, butter or other spread, bread, waxed paper, and spreaders ready at the proper places in front of the workers.

See app. M for footnotes.

3. Procedure for making sandwiches.

a. Form a single assembly line by assigning 5 to 7 persons along one side of a table.

(1) Worker No. 1 cuts the paper into oblong pieces of single-sandwich size. Arranges cut paper with short edge toward worker, places two matching slices of bread side by side on the paper and slides along to—

(2) No. 2, who, with two strokes, spreads one slice of bread with butter or margarine and slides the paper on to—

(3) No. 3, who puts a scoop of filling or lays slices of filling on one slice of bread and slides the paper on to—

(4) No. 4, who spreads filling or places relish on a slice of filling and slides paper on to—

(5) No. 5, who puts the two slices of bread together, and slides paper on to—

(6) No. 6, who wraps the sandwich and slides it along to—

(7) No. 7, who labels and stacks sandwiches in basket, if they are to be sent out immediately. If they are to be stored, they are stacked 6-high on trays and placed under refrigeration.

Position 1	Position 2	Position 3	Position 4	Position 5	Position 6	Position 7
Cuts paper and places bread.	Spreads butter.	Places filling.	Spreads filling.	Puts slices together.	Wraps sandwich.	Labels, stacks, and stores.

Start Here

FIGURE 1.—Single-line sandwich-making assembly, showing positions of workers, and duties and flow.

NOTES

NOTES

Section IV

MOBILE FEEDING

A. *Need*

1. Preparedness for mobile feeding is an important part of the disaster programs of communities.
2. This is the type of food service that must be provided immediately following disaster for disaster workers and victims at or near the scene. In case of major natural disaster or enemy attack, assistance to stricken areas in the form of mobile support from unaffected communities will be imperative. Every community should plan mutual-aid programs with its neighboring communities.
3. Mobile feeding units may be of two types.
   a. A unit equipped only for serving food prepared elsewhere.

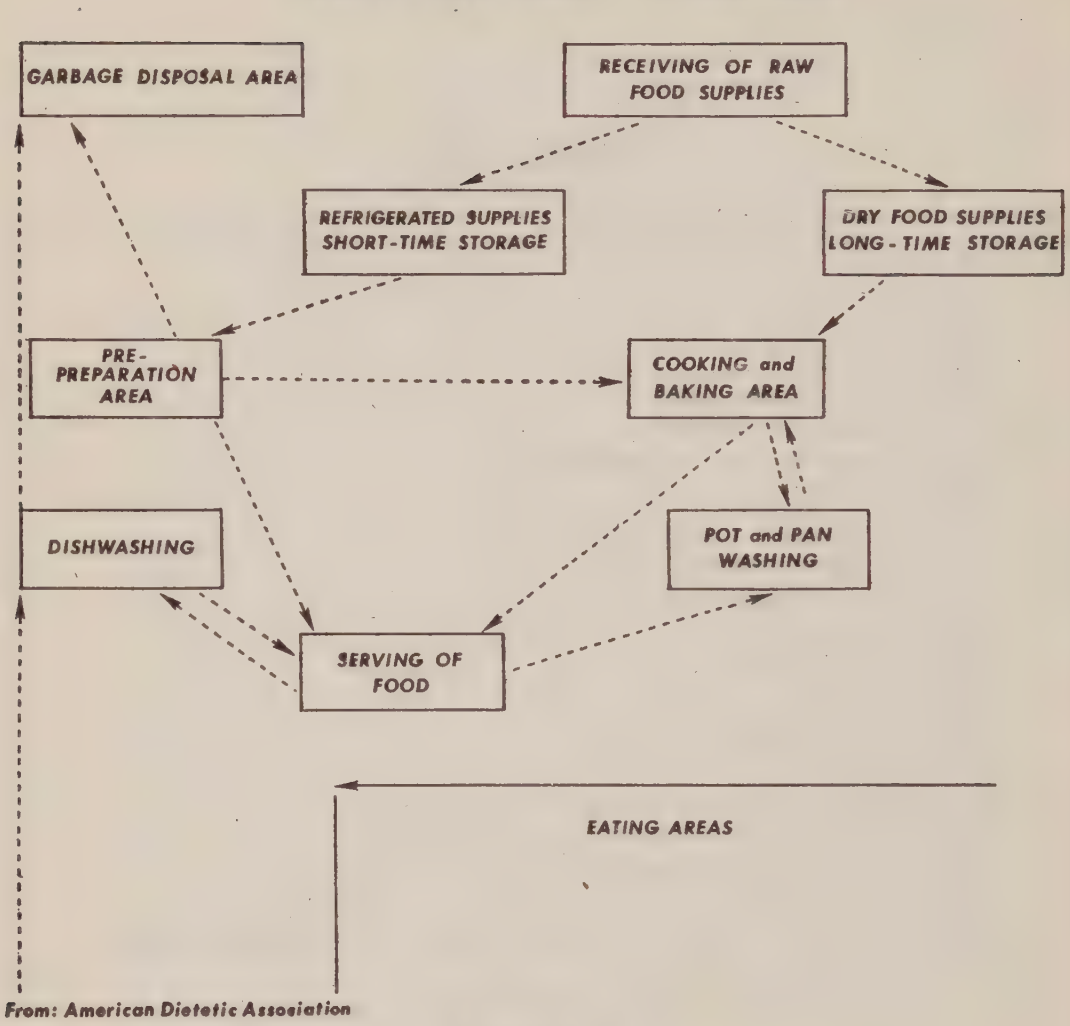

FIGURE 2.

b. A unit consisting of one or more vehicles fully equipped both to prepare and serve food.

4. It is not necessary to spend a great deal of money on equipment for mobile feeding. Equipment can be improvised to fit a variety of standard vehicles ordinarily found in every community.
5. Following are examples of standard vehicles that may be converted to serve as mobile feeding units.
   a. Standard commercial trucks.
   b. Military trucks.
   c. Bread trucks.
   d. Caterer's trucks.
   e. Postal trucks.
   f. Station wagons and private cars.
   g. Trailers.

B. *Mobile Kitchen*

1. A mobile kitchen is a one-vehicle, self-contained transportable unit capable of operating independently. It is equipped to prepare and serve food at any location and carries its own storage for water, fuel, and food supplies. (See fig. 3.)

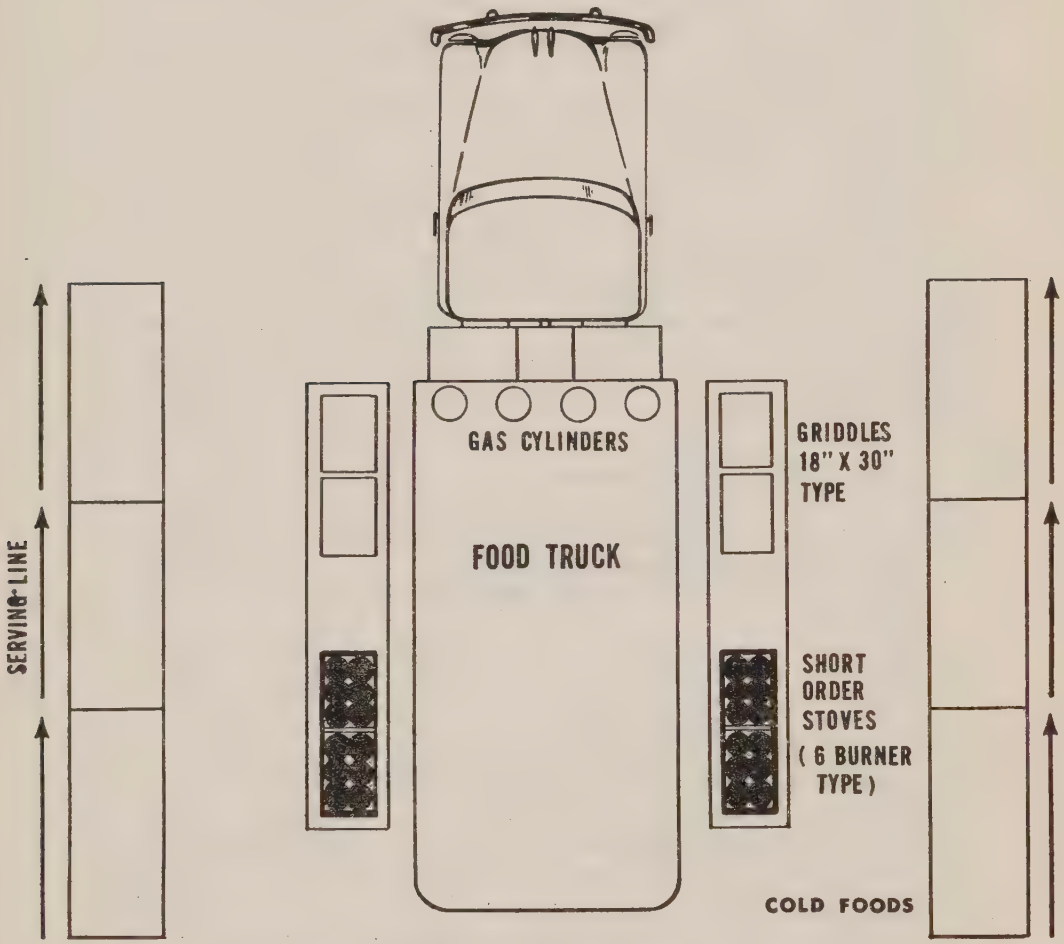

FIGURE 3.—*Layout of mobile kitchen.*

2. Suggested equipment for an improvised mobile kitchen.[3]

Equipment for food preparation	For 200 diners	For 500 diners
Essential equipment		
Burner plates, propane gas or Oil stove or trailer stove	2-burner	2 2-burner.

See app. M for footnotes.

Equipment for food preparation	For 200 diners	For 500 diners
Essential equipment—Continued		
Stock pot (6-gal.) (may be used for making soup or coffee).	2	2.
Dish pan, 18-inch	3	4.
Saucepan (1-qt.) for dipping (lipped).	2	2.
Water pails (3-gal.) to be used for water only.	3	3.
Covered garbage can or pail	2	3.
Graduated 1-qt. meaure	1	1.
Knives:		
Bread	2	2.
Butcher	2	2.
Paring (some with loop handles)	4	6.
Sandwich spreader, 8-inch	4	4.
Measuring spoons and cups	1 set	1 set.
Large stirring spoon	3	4.
Can opener (wall or table type)	1	1.
Vegetable brush	2	3.
Desirable to extent available		
Simple coffee urn (9-gal.) with bag, ring, and faucet made to sit on single burner, hot plate or gas stove.	2	2.
Mixing bowls (9-qt.)	3	4.
Frying pan, 9-inch	2	2.
Cook's fork, 18-inch	2	2.
Food chopper (3-lb. capacity)	1	1.
Cutting board for sandwiches (2- by 18- by 12-inch).	2	2.
Household bleach (to purify water)	As needed.	
Equipment for transporting food		
Essential equipment		
Water tank (if portable water supply is needed).	400 gal	1,000 gal.
Milk cans or insulated containers	1 or more depending on size of can and amount of food to be transported.	
Baskets, boxes, or pans for transporting and serving sandwiches.	4	6.
Desirable to extent available		
Dish towels for covering sandwiches.	As needed.	

Equipment for serving food	For 200 diners	For 500 diners
Essential equipment		
Coffeepot (2-gal.)	4	4.
Soup ladles (8-oz.)	2	2.
Cups, plates, bowls, spoons, forks	For 200	For 500.
Desirable to extent available		
Cream pitchers (1 gal.)	2	2.
Sugarbowls	2	2.
Folding tables	2	2.
Equipment for cleaning		
Essential equipment		
Compound for sterilizing dishes	1 pkg	2 pkgs.
Dishcloths, hand towels (cloth or paper).	6 pkgs	10 pkgs.
Soap for handwashing	6 lg. cakes	10 lg. cakes.
Scouring powder	2 cans	4 cans.
Soap or detergent products (for dishes).	2 pkgs	4 pkgs.
Floor and other cleaning cloths	2	4.
Broom	1	2.
Miscellaneous equipment		
Essential equipment		
Knife sharpener	1	1.
Pot holders	8	8.
Matches	1 carton	1 carton.
Desirable to extent available		
Hammer	1	1.
Shears	1	1.
Fuel can with screw-top filler	As needed.	
Camp stools	3	4.
Wooden boxes for packing small equipment.	As needed.	
Lanterns for night feedings	As needed.	
Equipment for accident prevention		
Essential equipment		
First Aid 16-unit Kit	1	
Fire extinguisher	1	

C. *Mobile Canteen*

1. A mobile canteen is a one-vehicle unit equipped only for transporting and serving food that has been prepared in a central kitchen, either indoor or outdoor.
   a. The mobile canteen unit contains space for insulated containers, eating utensils, drinking water, folding tables, and other supplies necessary for serving and sanitation.
   b. Mobile canteens have limited use and must be replenished frequently.
   c. A standard truck or other large vehicle available in the community usually can be converted to a mobile canteen.
2. Feeding operations from a mobile canteen.
   a. Use truck, station wagon, jeep, or standard automobile for mobile canteen.
   b. Use canvas tarpaulin, spread over the rear of the vehicle for protection, and knockdown frames to cover the end of the car or truck.
   c. Set up serving tables (folding or other type).
   d. Direct feeding-line traffic, keeping the line formed and moving past the servers.
   e. Set up cans for collecting trash, waste, and garbage from those served.
   f. Use paper eating utensils (unless diners bring their own).
3. Equipment for a mobile canteen.
   a. Equipment is for food prepared in central kitchen for serving elsewhere.
   b. List is based on menu of soup, sandwiches, and coffee.
4. Suggested equipment for an improvised mobile canteen.

Equipment for coffee	For 50 diners	For 100 diners	For 500 diners
Essential equipment			
Covered container without spigot.	1—3-gal....	2—5-gal....	1—10-gal.
Desirable to extent available			
Thermal container with spigot.	1—3-gal....	1—5-gal....	2—10-gal.

Equipment for 1-dish meal	For 50 diners	For 100 diners	For 500 diners
Essential equipment			
Insulated or other container.	1—3-gal.	1—10-gal.	1—10-gal. and 1—5-gal.
Desirable to extent available			
2-burner stove (butane) or Camp range.	1	1	2.
Equipment for food service			
Essential equipment			
Paper cups, plates, bowls, spoons, and napkins.		As needed.	
Ladle, small	1	2	4.
Ladle, large	1	2	4.
Pitchers (2-qt.)	1	1	3.
Baskets or boxes for sandwiches, bread, or crackers.	2	4	20.
Garbage cans	2	2	4.
Enamel pail	1	1	2.
Can opener	1	1	2.
Wax paper (roll)	1 (small)	1 (small)	1 (large).
Desirable to extent available			
Serving spoon	1	2	4.
Folding tables	2	4	
Large folding table (or planks on wooden horses).			2.
Folding chairs (for workers).	2	4	6.
Trays	2	4	10.
Sugar shakers	1	2	4.
Salt shakers	1	2	4.

Equipment for cleaning	For 50 diners	For 100 diners	For 500 diners
Essential equipment			
Dish cloths	2	2	3.
Pot holders	2	4	6.
Dishpans	4	4	4.
Cleaning cloths		As needed.	
Broom	1	1	1.
Soap powder	1 small box	1 small box	2 large boxes.
Scouring powder	1	1	2.
Paper towels	1	1	2.
Desirable to extent available			
Dish towels	4	4	6.
Steel wool	1 pkg	1 pkg	2 pkgs.
Miscellaneous equipment			
Essential equipment			
Matches		As needed.	
First-aid kit		As needed.	
Water tank		As needed.	
Household bleach (to purify water).		As needed.	
Desirable to extent available			
Hammer		As needed.	
Shears		As needed.	
String or wire		As needed.	
Lanterns for night feeding.		As needed.	

5. If there is limited space in vehicle, garbage cans can be thoroughly cleaned, lined with wax paper, and sandwiches packed in them instead of in baskets and boxes.
6. If containers are not insulated, they should be packed in improvised insulated boxes to retain heat, or it may be necessary to carry additional stoves for keeping food hot. Factors to consider are distance from food preparation center to scene of disaster and interval of time between arriving and serving.
7. Paper plates should be large enough to hold both cup of soup or stew, coffee, and roll.

D. *Mobile Food Convoy*

1. A mobile food convoy is the most complete self-contained feeding unit and is comprised of a number of vehicles that are fully equipped to transport food supplies, fuel, water, and other necessary equipment for feeding simple meals to large numbers of persons.
2. Each vehicle of the mobile food convoy fleet has a specific use, such as:
   a. An office and resting place for the convoy staff.
   b. Storage of food supplies and utensils.
   c. Water storage.
   d. Fixed transport for stoves, ovens, grills, and other cooking equipment.
   e. A roving canteen that can serve food prepared in the convoy kitchen.

IMPROVISED OUTDOOR FACILITIES

A. *Open Fire Cooking and Heating Unit*

1. Materials needed (see fig. 4, p. 56).
   a. Twelve (12) bricks, flat stones, or (4) cinder or concrete blocks.
   b. Half of a 55-gallon oil drum or other large container for cooking.
   c. Upper half of oil drum or piece of sheet metal of similar size can be used as a shield.
2. Procedure.
   a. Outline a square large enough to accommodate the cooking container.
   b. At center of each of four sides of square, stack three bricks so that they will support the container. Stack bricks so that edge of container will center on each stack.
   c. Place pot on stack of bricks.
   d. Bend sheet metal to fit around stacks of bricks. Leave about a 6-inch space between ends of sheet metal.
3. Operation.
   a. Build wood or coal fire at center of stacks of bricks.
   b. Place 6-inch opening of shield so that it faces the wind.
   c. Move shield as required for draft and refueling.

4. Use.
   a. For cooking and water heating.
5. Number needed.
   a. Two per 100 diners.
   b. Six per 500 diners.

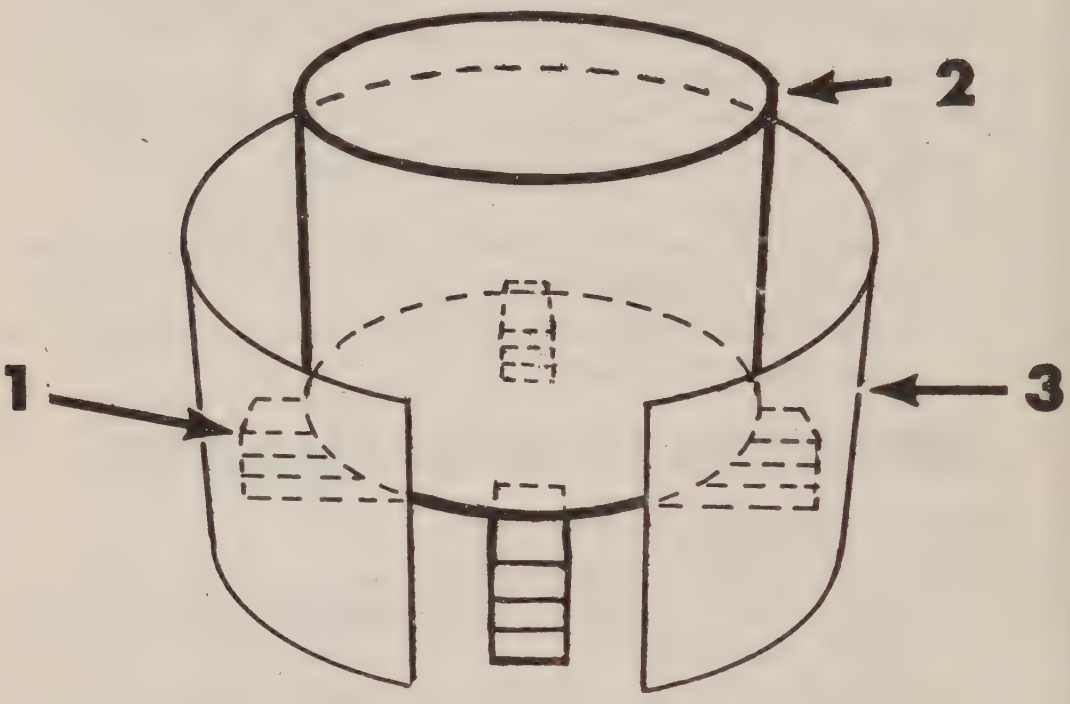

FIGURE 4.—Open-fire cooking and heating unit.
(1. Bricks. 2. Oil drum. 3. Shield.)

B. *Crossfire Trench*
1. Materials needed (see fig. 5, p. 57).
   a. Three (3) pieces of sheet metal 1½ by 1 foot to regulate draft.
   b. Approximately ten (10) pieces of scrap iron 2 feet long for grate (such as pipe, angle iron, or ½-inch round iron).
2. Procedure.
   a. Dig two (2) trenches, each 8 feet long, 1 foot wide, and 1 foot deep, crossing at their centers.
   b. The ends of each trench should taper to the level of the ground.
   c. Place scrap iron over the intersection of the trenches to make a grate.
3. Operation.
   a. Build coal or wood fire at intersection of trench.

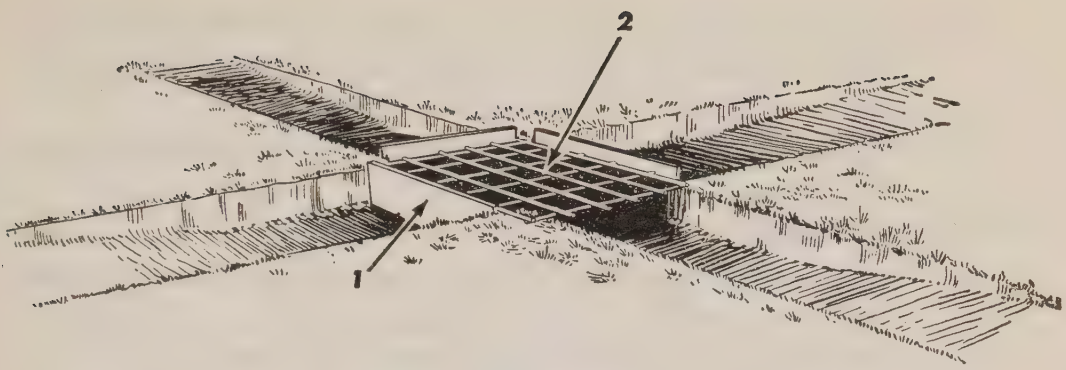

FIGURE 5.—Crossfire trench.

(1. Sheet metal. 2. Grate.)

b. Use the three (3) pieces of sheet metal to block off 3 of the 4 sides of the trenches. Leave open side facing the direction of the wind.

4. Use.
   a. For cooking and incinerating.
5. Number needed.
   a. Two per 100 diners.
   b. Six per 500 diners.

C. *Crossfire Trench—Above Ground*

1. Materials needed (see fig. 6).
   a. Approximately one hundred (100) bricks.

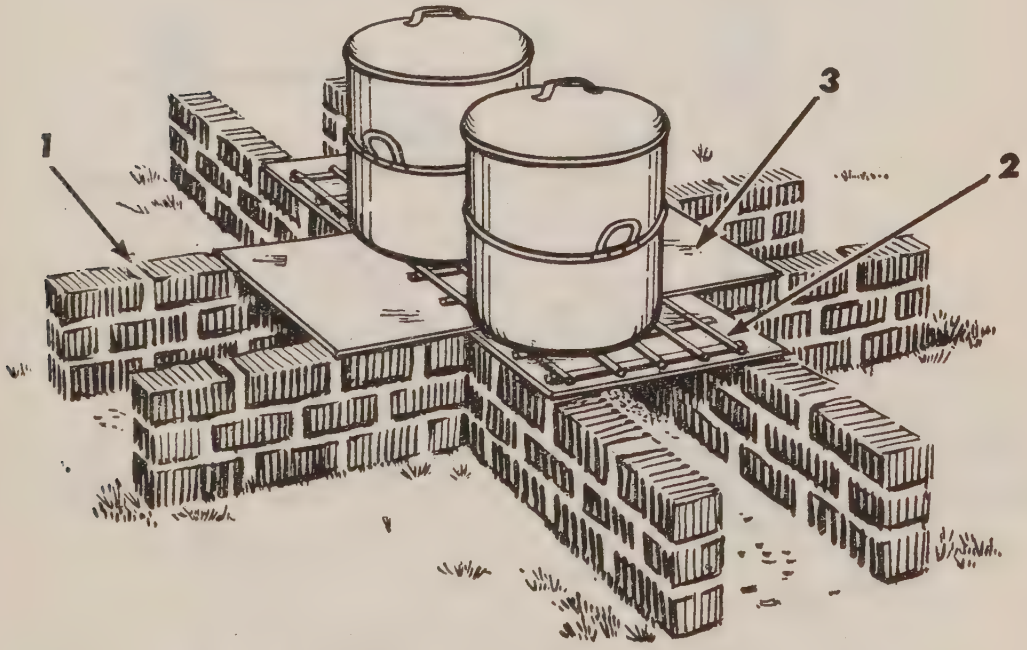

FIGURE 6.—Crossfire trench—above ground.

(1. Bricks. 2. Grate. 3. Sheet metal.)

b. Approximately ten (10) pieces of scrap iron for grate (such as pipe, angle iron, or ½-inch round iron).

c. Two (2) pieces of sheet metal to act as support for the grate.

2. Procedure.

a. Lay four (4) parallel rows of brick in a cross, so that they intersect at their centers to form a firebox.

b. Allow one (1) foot of space between rows.

c. Form sidewalls by stacking bricks three-high with mortar in between.

d. Lay sheet metal at intersection.

e. Place scrap iron over the sheet metal to make a grate.

D. *Handwashing Facility*

1. Materials needed (see fig. 7).

a. Two (2) No. 10 tin cans or other metal containers for water, with bails and tilt handles.

b. One (1) length of iron rod or pipe, or wood to suspend cans.

c. Six (6) lengths of wood to form tripods, with cord or wire for tying.

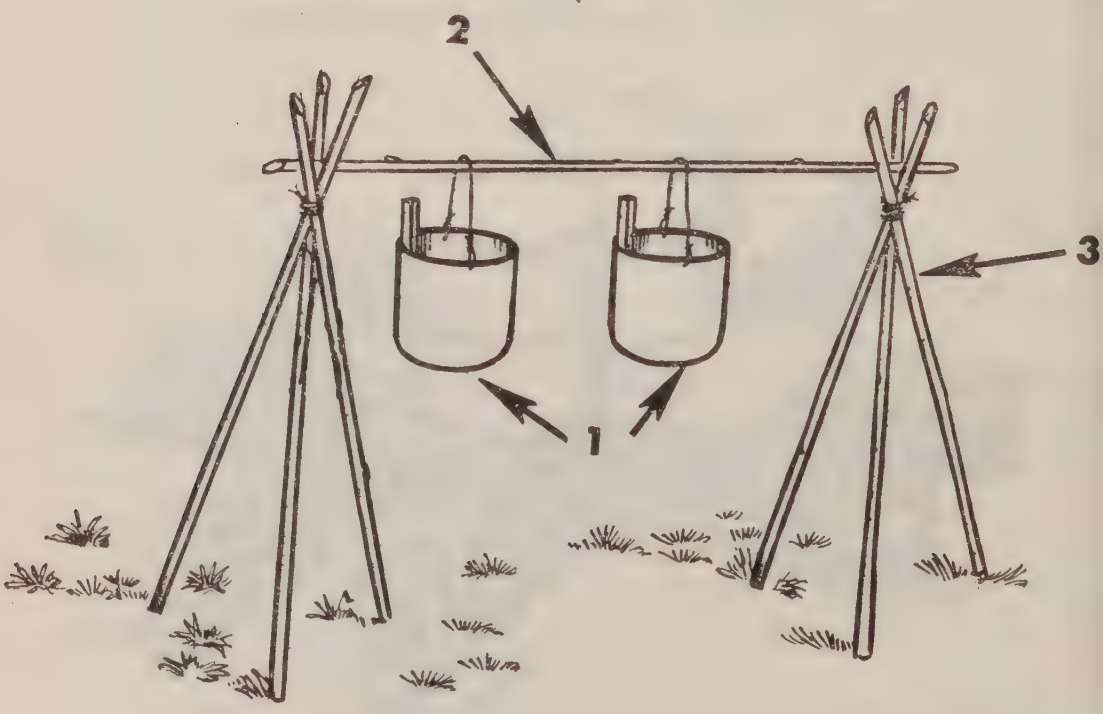

FIGURE 7.—Handwashing facility.

(1. Cans. 2. Rod. 3. Tripod.)

2. Procedure.
   a. Erect tripods.
   b. Put bails and tilt handles on cans.
   c. Suspend cans on pole, tie to pole, and place pole on tripods.
   d. Fill area below cans with sand or gravel to drain water.
3. Use.
   a. Fill one (1) container with soapy water.
   b. Fill other can with disinfecting solution (1 ounce of any ordinary household laundry bleach to 2 gallons of water.)
   c. Provide single-service paper towels for each person or air-dry hands.
   d. Provide trash can for towel disposal.

E. *Emergency Dishwashing Facility*

1. Materials needed (see fig. 8).
   a. Three (3) large cans.
   b. Length of tin or sheet metal for shield.
   c. Round iron or sheet metal for can supports.
2. Procedure.
   a. Dig a trench about 10 to 12 feet long, 1 foot wide, and 1 foot deep.
   b. One end of the trench should taper to the level of the ground.
   c. Place round iron or sheet-metal supports if needed.

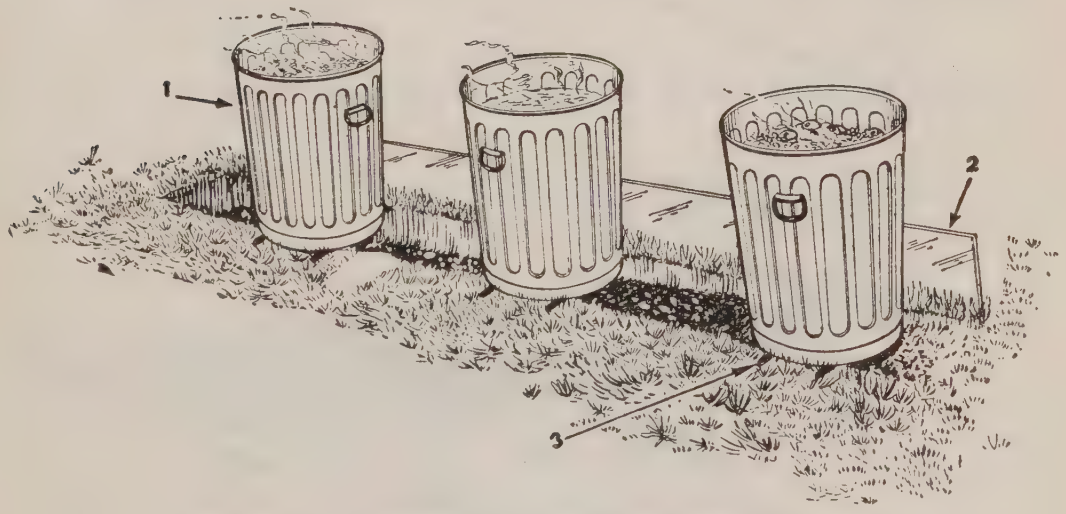

FIGURE 8.—Emergency dishwashing facility.
(1. Cans. 2. Shield. 3. Supports.)

d. Place length of sheet metal along one side of trench as shield against burns from the open fire.

3. Operation.
   a. Build coal or wood fire the full length of the trench.
   b. Use one can as soapy wash water container, one as hot rinse water container, and one as sanitizing water container.
   c. Hot coals should be spread so as to maintain the hottest fire under the sanitizing container.

F. *Ground Griddle*

1. Materials needed (see fig. 9).
   a. Two (2) pieces of steel plate at least 30 by 30 inches, approximately ¼-inch thick. If only one piece of steel plate is available, it may be used.
   b. One (1) piece of stovepipe or several No. 10 tin cans with both ends cut out.
   c. Two (2) lengths of pipe or round iron to support the steel plate.
   d. Sand or dirt to put between pieces of steel plate to prevent plate buckling from overheating.

2. Procedure.
   a. Dig fire pit about 2 feet square and 1 foot deep. One end should slope to the level of the ground.
   b. Place lengths of pipe across the fire pit as support for steel plate.
   c. Place one steel plate over fire pit.

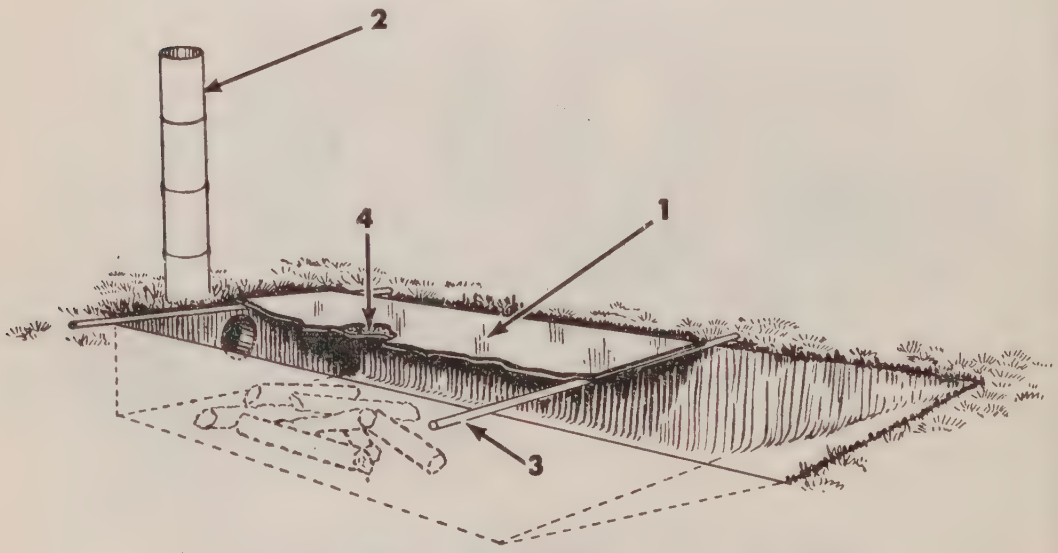

FIGURE 9.—Ground griddle.

(1. Steel plate. 2. Pipe or cans. 3. Plate supports. 4. Sand or dirt.)

d. Cover steel plate with 1 inch of sand or dirt.
e. Place second steel plate on top of sand or dirt.
f. Directly behind and at center of the deep end of the fire pit, dig a hole 6 inches square and 6 inches deep so that hole opens into the pit to make a chimney.
g. Place No. 10 cans one on top of the other to fit over hole in ground to form the chimney stack. A tighter chimney may be made by cutting several inch-wide sections around the bottom edge of each can so that it fits over the rim of the connecting can.
h. Bricks may be used to hold the chimney in place.

3. Use.
a. This facility may be used as a griddle, a quick-bread oven using a tin can to cover dough, or as a food warmer.

4. Number needed.
a. Two per 100 diners.
b. Six per 500 diners.

G. *Improvised Roaster*

1. Materials needed (see fig. 10, p. 62).
a. One (1) large can with tight-fitting cover. (Preferably institutional-size lard or shortening can.)
b. Bricks, cinderblock, or stones to construct sidewalls of a fire pit.
c. Length of steel rod, round iron, or heavy wire to be used as a spit.
d. Length of fine strong wire to tie the meat to the spit.

2. Operation.
a. Build fire around inside of brick fire pit, allowing space in center for cooking container to rest on ground.
b. Punch a hole for spit on each side of the can several inches below the rim.
c. Wrap fine wire around roast several times (or run wire through the center of the meat), leaving ends long enough to make a strong loop.
d. Run spit through one hole, then slip wire loops over the spit so that meat hangs suspended in the can.

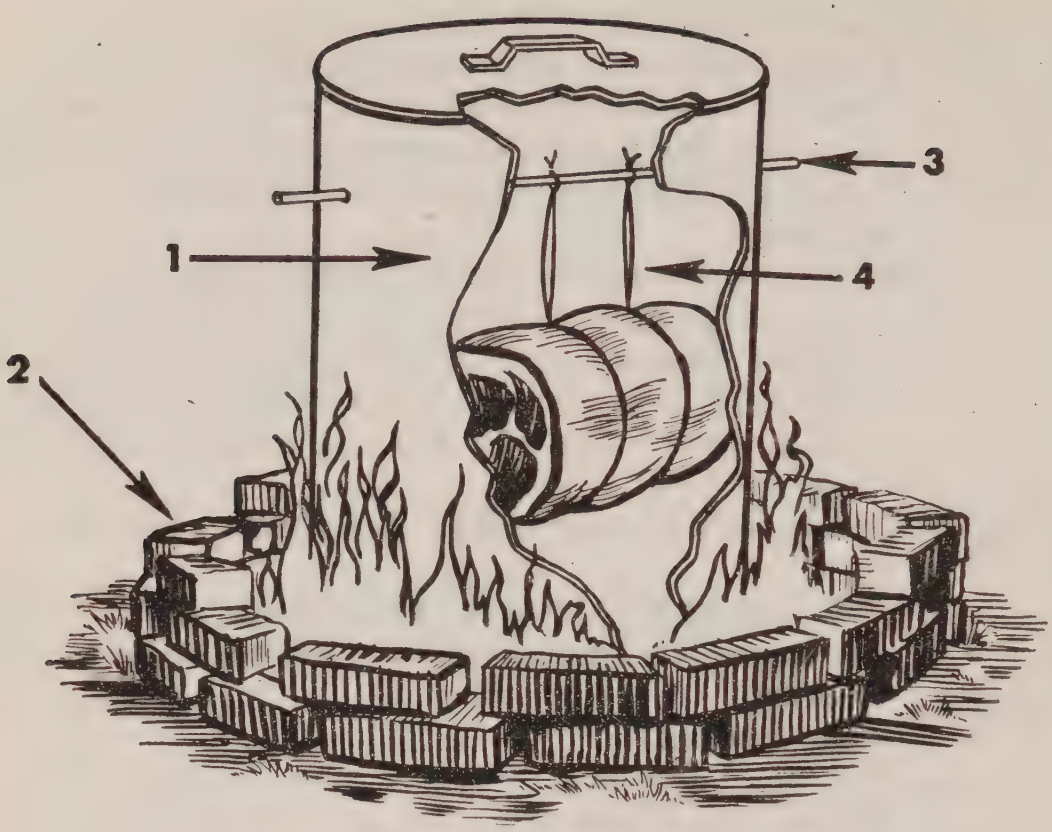

FIGURE 10.—Improvised roaster.

(1. Can with cover. 2. Bricks. 3. Rod. 4. Wire.)

Run spit through the other hole. (Do not put water in the container. Meat should cook in its own steam.)

e. Place the cover on the can.

f. Place container on ground within fire pit and put weight on cover to hold it securely.

g. Remember that meat cooks more quickly in this type of pressurized container. For example, a 20- to 25-pound chunk of roast beef will cook in 2 to 2½ hours.

H. *Soakage Pit*

1. Materials needed (see fig. 11, p. 63).

a. Cover made of two (2) 1-inch layers of wood, with lower layer of wood recessed to fit top of box, or constructed otherwise for tight fit.

b. Reinforcing strips of approximately 1- by 4-inch lumber to brace top of box.

c. Lumber for box, approximately 12 inches square and 2 feet high, open at both ends.

d. Layer of wire screen, matting, gunny sacking, tar paper, or heavy layer of newspapers to retain earth mound above rocks.
e. Rocks or rubble to fill pit 5 feet in diameter and 5 feet deep.
f. Wire basket of approximately ¼-inch mesh hardware cloth resting on 1- by 4-inch wood inner strips.
g. Earth mound approximately 6 inches high at center point.

2. Procedure.
a. Locate in well-drained ground suitable for good soakage, preferably sand or gravel soil.
b. Dig pit.
c. Fill pit with rocks or rubble to within 1 foot of ground surface.
d. Insert box as shown in figure 11.
e. Add enough rubble to fill pit to ground surface around box.
f. Cover rubble with screen wire or any other material that will serve as a separator between rubble and earth topping.
g. Mound dirt over pit.

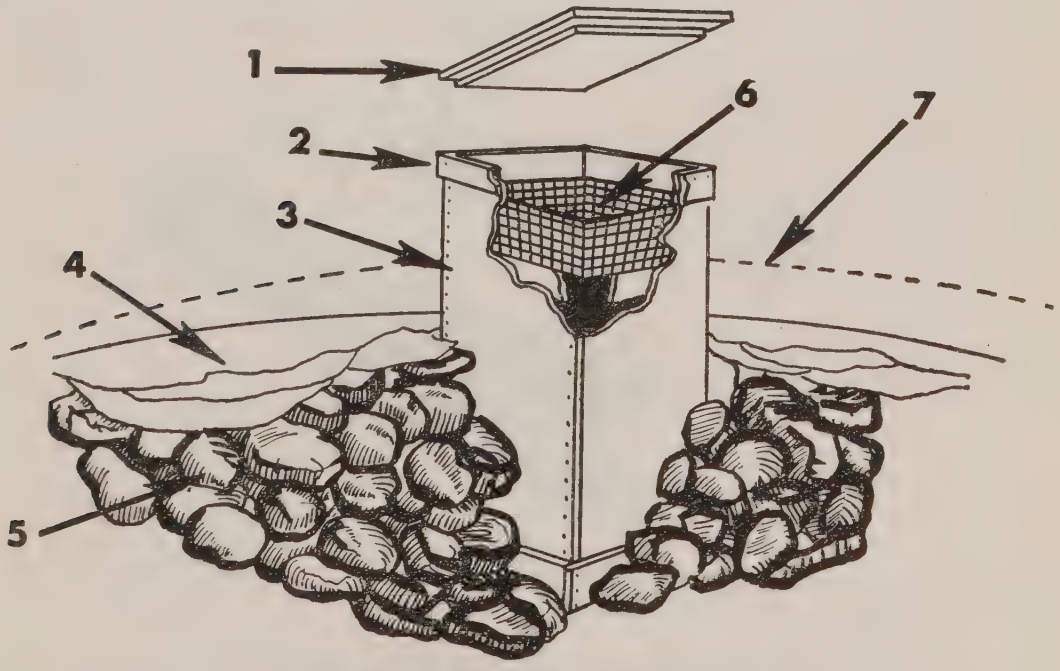

FIGURE 11.—Soakage pit.

(1. Box cover. 2. Reinforcing strips. 3. Box. 4. Rock cover. 5. Rocks or rubble. 6. Basket. 7. Earth mound.)

I. *Outdoor Pit Latrine*

1. Materials needed (see fig. 12).
   a. Enclosure curtain of burlap or similar material for entry, exit, and pit screening.
   b. Stall partition of burlap or similar material.
   c. Pit 1 foot wide, 6 feet long, minimum depth 2 feet.
   d. Straddle boards approximately 2 inches by 6 inches by 6 feet, held in place with crossboards 1-inch by 6 inches by 2 feet.
   e. Urinal trench approximately 18 inches wide and 18 inches deep, length dependent on number of pits.
   f. Hold post of sturdy pipe or wood approximately 4½ feet long.
2. Operation.
   a. Separate facilities for men and women should be well away (at least 50 feet) from areas used for storage, preparation, and service of food.
   b. The following ratio of latrines is suggested for food workers.
      (1) Men—1 seat and 1 urinal per 10 workers.
      (2) Women—1 seat per 8 workers.

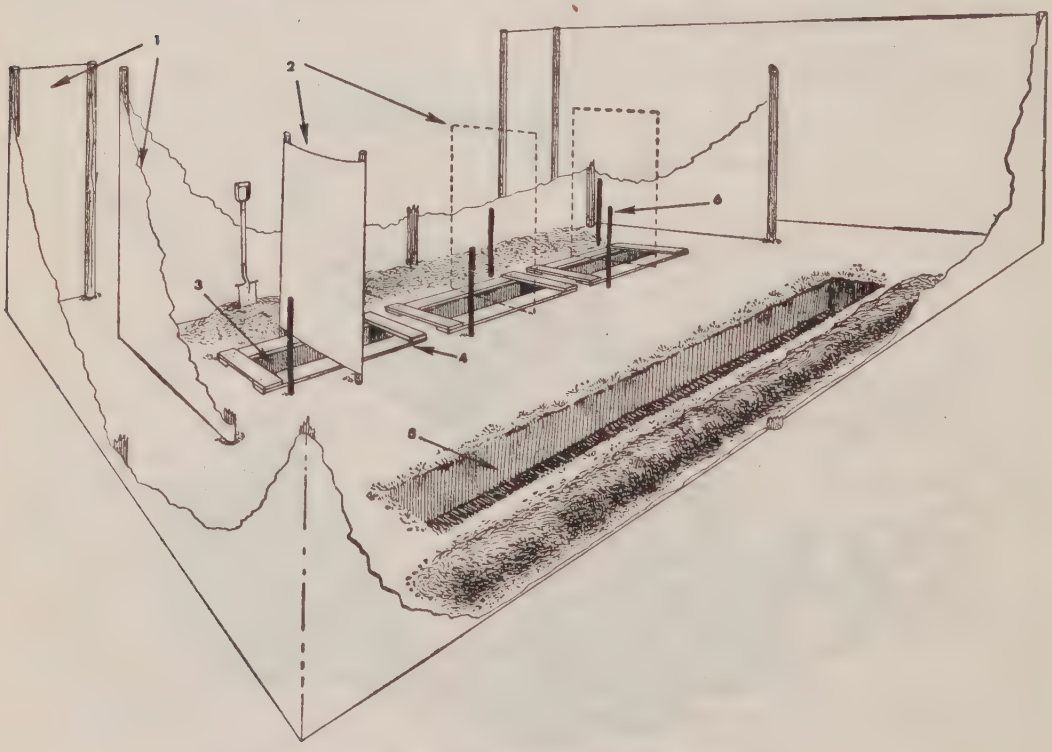

FIGURE 12.—Outdoor pit latrine.

(1 and 2. Curtains. 3. Pit. 4. Straddle boards. 5. Urinal trench. 6. Hold post.)

c. Provide a handwashing facility near the latrine area, stocked with a supply of water, soap, paper towels, and a disposal receptacle.
d. Keep supply of toilet paper in large covered containers to protect against weather.
e. Keep latrines well lighted, and doors and windows screened if possible.
f. Assign monitors to keep check on latrines and maintain cleanliness.
g. When latrines become filled within 1 foot of the surface, close the site and locate new latrine.
h. To close latrine:
(1) Cover all pit contents with minimum of 2 feet of earth and pack down firmly.
(2) Spray area with oil or DDT.
(3) Mound earth 12 to 18 inches above pit and pack firmly.
(4) If animals are likely to unearth latrine contents, mix broken glass or other obstructive material with earth used to fill the pit.
(5) Mark the site "CLOSED LATRINE".

NOTE: If temporary latrine facilities must be provided for diners, the same type of construction and operation as that suggested for food workers may be adapted. Latrines for diners should be located at least 300 feet from the serving area.

J. *Incinerator*

1. Materials needed.
a. One (1) 55-gallon oil drum with both ends removed.
b. Approximately ten (10) pieces of scrap iron 2 feet long for grate (such as pipe, angle iron, or ½-inch round iron).
2. Procedure.
a. Dig crossfire trench and add grating as shown in figure 5, page 57.
b. Place open-end drum on grate.
3. Operation.
a. Build hot fire in fire pit.
b. Add garbage and combustible trash in small quantities.
c. Keep fire hot with additional fuel as required.
d. Remove unburned residue and bury. (See Emergency Waste Disposal, page 10.)

K. *Improvised Cooking Vessels* (See fig. 13.)

1. 55-gallon oil drum.
   a. Construct by cutting the drum in half.
   b. Both ends of drum may be used if end with opening is plugged to prevent leakage.
   c. Drums must be thoroughly cleansed, scoured, and sanitized before use. (See cleansing direction in sec. II.)
   d. Number needed is 2 half-sections per 100 diners.
2. Pail or bucket.
   a. Enamel or stainless-steel pails or buckets may be used for cooking.
   b. Do not use galvanized pails or buckets.
   c. Pails or buckets must be thoroughly cleansed and sanitized before use.
   d. Number needed is 4 per 100 diners.
3. Lard can.
   a. A 37-pound lard or shortening can, or a lard can of similar size, can be used as a cooking container by removing one end and attaching a handle of baling or other wire.
   b. Number needed is 2 per 100 diners.

L. *Care of Commercial Insulated Containers*

1. The commercial insulated container is the most commonly used piece of equipment for carrying hot or cold iced foods from the place of preparation to the serving point. These containers are constructed on the principal of the thermos flask and are made of a metal alloy that is easily dented. The space between the inner and outer linings is packed with an insulated material that helps retain the heat or cold of the contents. If either of these linings is punctured, the heat-and cold-retaining properties of the container are lost.
2. Inspect containers frequently for signs of wear or damage to inner and outer casings, corrosion, loose-fitting lids, handles and clamps and worn gaskets. Repair promptly.
3. Harsh abrasives, steel wool, pot scrapers, and knives will damage the container and should not be used for cleaning purposes. To remove food particles use a brush or a rubber scraper.

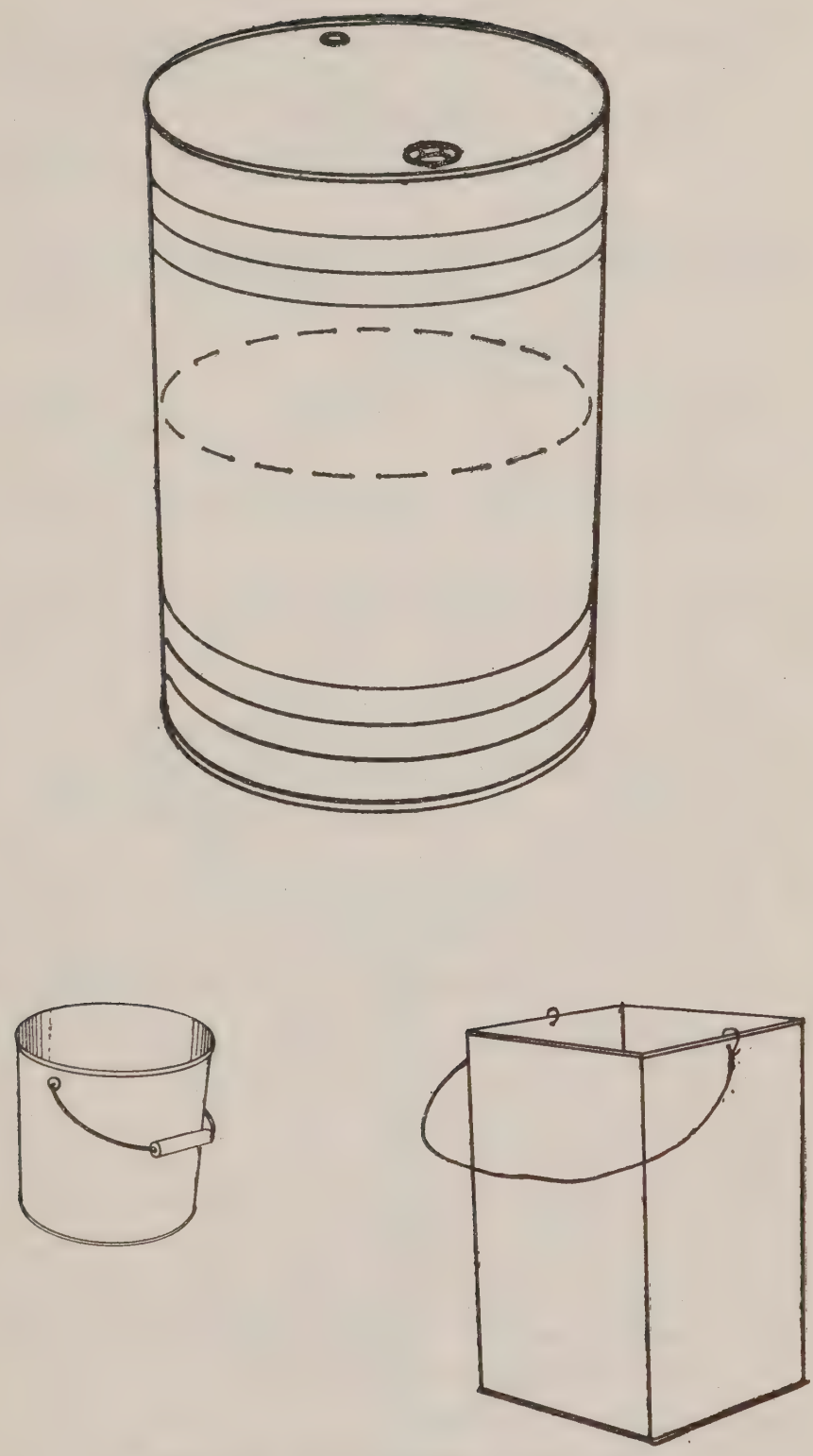

FIGURE 13.—Improvised cooking vessels.

4. Containers should *always* be thoroughly clean before use!
5. Directions for care.
   a. Before filling containers with food, rinse out with hot or cold water, depending on temperature of contents to be transported.
   b. Place food in the container as soon as possible after it is prepared.
   c. Fill containers to avoid loss of heat or cold.
   d. Place lid on container and clamp properly to insure a tight seal.
   e. Close temperature escape valve.
   f. Mark the container to show contents, time filled, and destination.
   g. Do not open container until ready to serve at destination.
   h. When transporting, secure containers firmly to avoid spilling. Cover, if possible, to aid in retaining proper temperature of contents.
   i. Handle containers carefully when loading and unloading as they are easily damaged.
   j. *Never place an insulated container on a hot stove, or near or over an open fire.*
   k. Immediately after use, empty contents, remove spigot (if any), wash container, lid, and spigot in hot water and detergent, rinse thoroughly, replace spigot, and allow to air-dry.
   l. Store on rack in dry place, leaving lids *off*.

M. *Improvised Hot Food Containers*
1. Materials needed (see fig. 14).
   a. One (1) large can, such as a 37-pound lard tin or a 5- or 6-gallon food container.
   b. Plywood or similar material for constructing a covered box one (1) inch wider and one (1) inch deeper than the container.
   c. Sand for insulation.
2. Procedure.
   a. Heat sand.
   b. Place 1 inch of hot sand in the bottom of the box.

c. Put preheated empty food container inside box. Cover to keep food container clean while filling box with sand.
d. Fill space between sides of container and box with hot sand.
e. Fill container with hot food.
f. Cover box with lid.

3. Use.
a. This improvised container may be used to transport hot food. If carried long distances, box should be

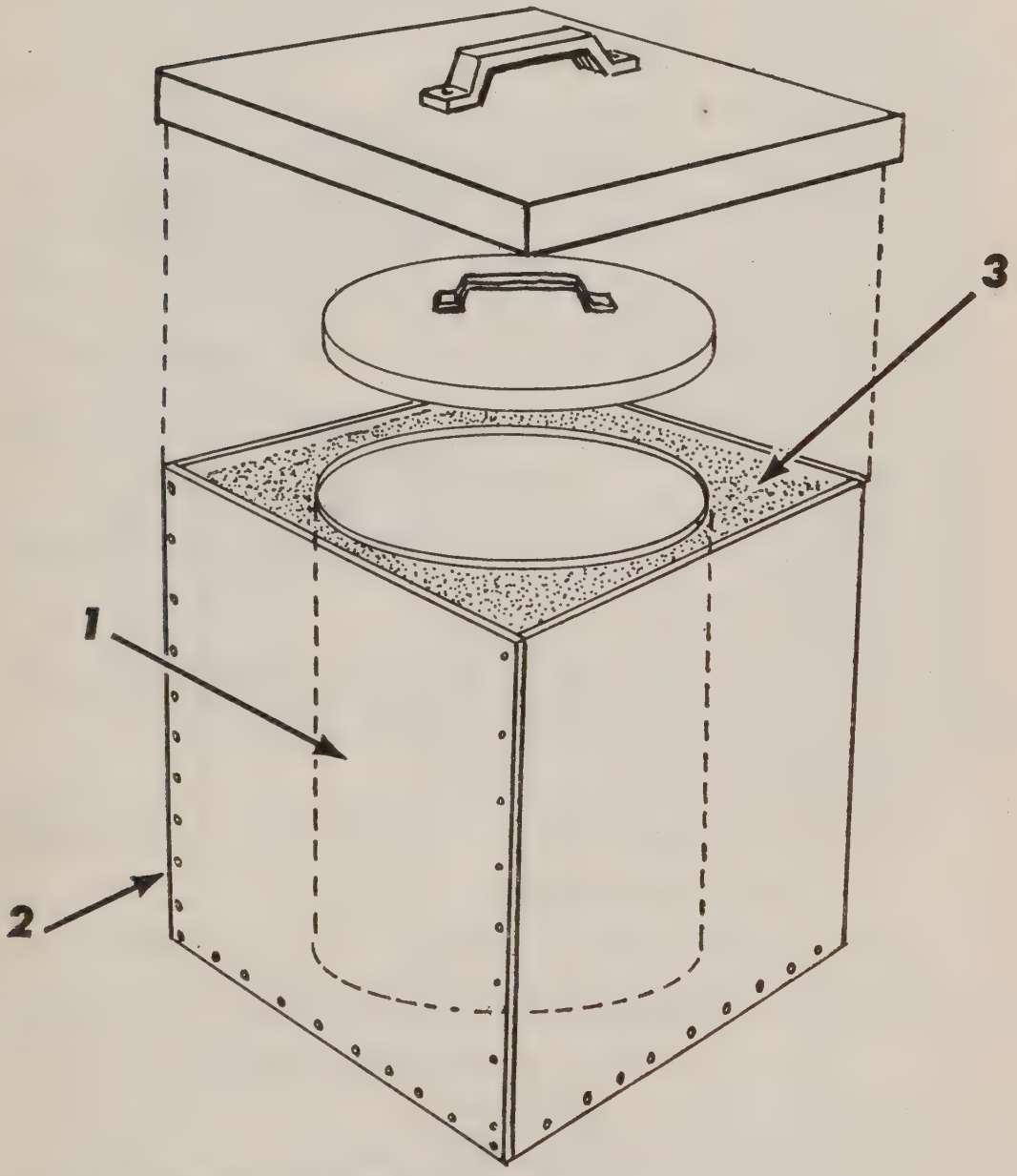

FIGURE 14.—Improvised hot food container.
(1. Can. 2. Box and cover. 3. Sand.)

covered entirely with heavy wrapping—blanket, tarpaulin, canvas, or several thicknesses of newspaper—to retain the heat.

4. Number needed.
   a. Hot beverages—2 per 100 diners.
   b. Solid food—3 per 100 diners.

N. *Improvised Refrigeration—Evaporation Cooler*

1. Materials needed (see fig. 15).
   a. Orange crate or box.
   b. Burlap or cheesecloth to cover.
   c. Pan of water.
   d. Stone or other weight.
2. Procedure.
   a. Remove two sides of box or crate.
   b. Place pan of water on top of crate.
   c. Gather material at the top and lay bunched end in a pan of water. Place stone on the material to hold it securely. Drape rest of the material around the box, leaving a small opening.
   d. Cooler may be suspended to protect against insects and animals.

O. *Barrel or Range Can (for icing foods and keeping foods hot).*

1. Materials needed (see fig. 16).
   a. Can or barrel (with cover) larger than the food container.
   b. Food container (with cover).
   c. Ice for cooling food or shredded newspaper or excelsior for keeping food hot.
2. Procedure for icing food.
   a. Place food in the sterilized container. If food is hot do not put lid on the container until the food cools to room temperature.
   b. When cool, place lid securely on the container
   c. Drop food container into the barrel or can.
   d. Pack can solidly with ice to near top of food container (do not cover top of container).
   e. Place cover on the barrel.
3. Procedure for keeping food hot.
   a. Place hot food in container and cover immediately.
   b. Drop food container in the barrel or can.

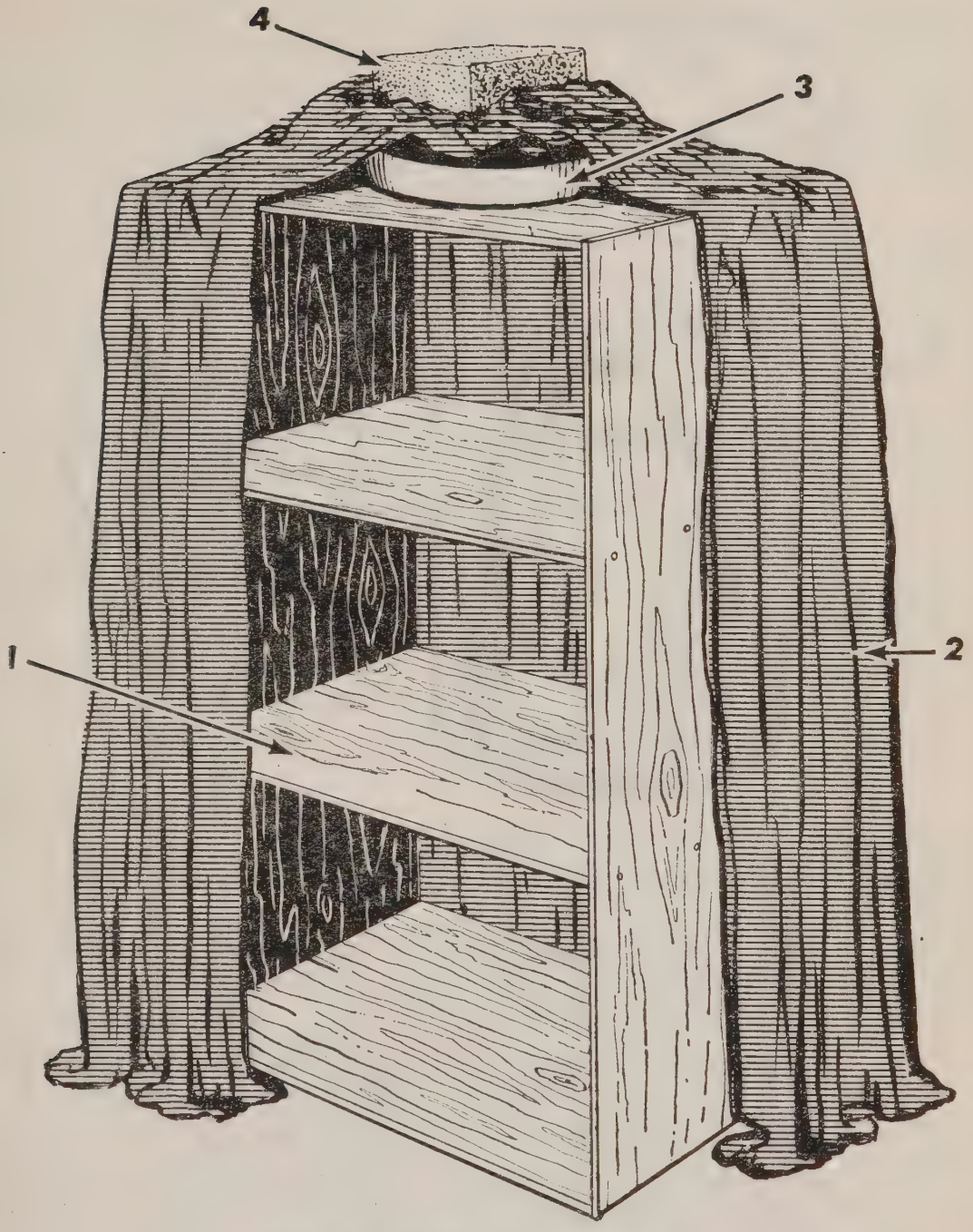

FIGURE 15.—Evaporation cooler.
(1. Crate or box. 2. Covering. 3. Water pan. 4. Weight.)

c. Pack the can tightly with dampened shredded newspaper or excelsior.

d. Place cover on the barrel.

P. *Liquefied Petroleum Gas (Bottled Gas) in an Emergency.*

1. If gas mains are destroyed or gas service is disrupted, the availability of bottled liquefied petroleum (LP

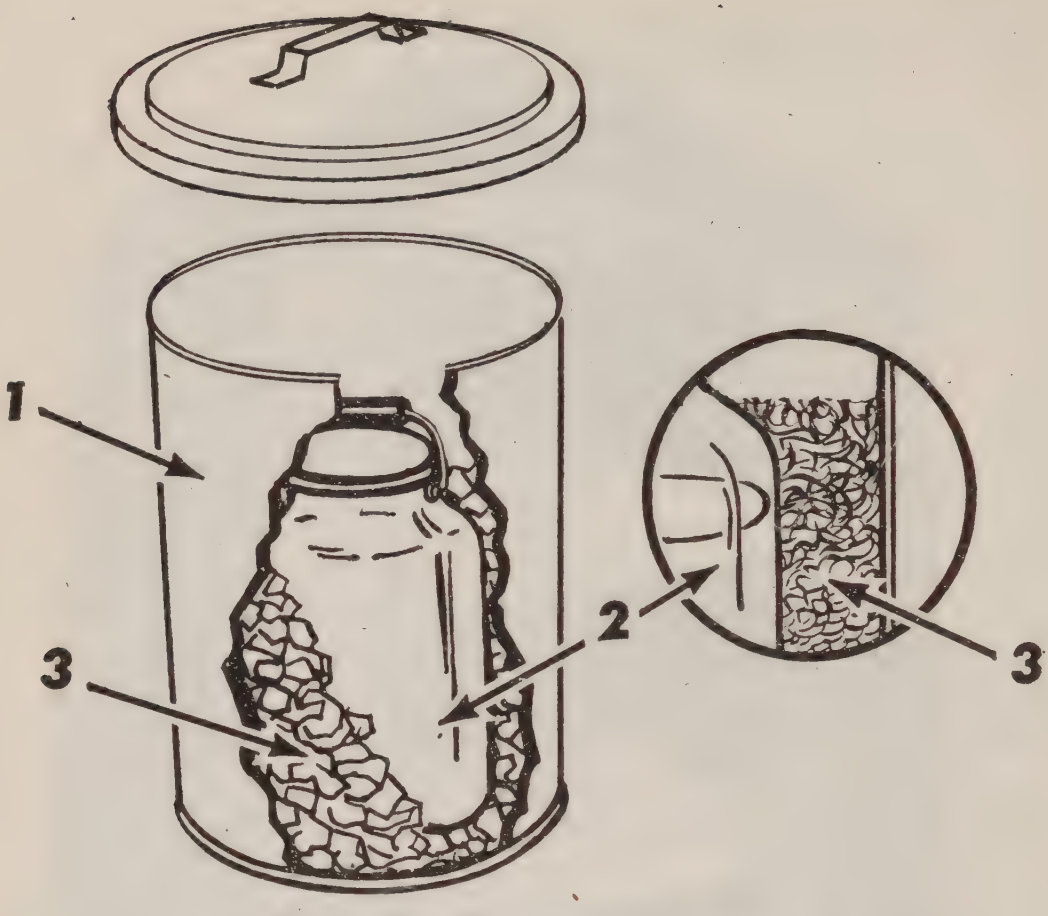

FIGURE 16.—Barrel or range can.

(1. Can with cover. 2. Food container. 3. Ice or insulation.)

gas) would permit full utilization of most of the available gas-burning kitchen facilities.

2. LP gas is an ideal emergency fuel. Considerable reliance can be placed on this fuel in an emergency because supply, equipment, and personnel are often located in suburban and rural areas and practically all cooking and heating equipment that burns natural or manufactured gas can readily be converted to burn LP gas. Because it is stored in self-contained cylinders of varying sizes—some small enough to be carried by hand—it is readily transportable to meet disaster needs.
3. For cooking, water heating, refrigeration, sterilization, and space heating.
   a. Any range or other equipment, large or small, that burns natural or manufactured gas can be quickly converted to use bottled gas by the installation of

a simple adaptor. For safety, only qualified technicians should make the conversions. In a serious emergency, if a qualified technician cannot be found, a natural gas range will burn bottled gas without an adaptor, but this wastes gas and will blacken utensils and equipment.

b. For mobile feeding, cylinders of bottled gas may be mounted on any improvised or commercial kitchen vehicle, along with gas appliances and other kitchen gear necessary to heat water and prepare and serve food.

c. Gas ranges salvaged from damaged homes or institutions can be converted for use to LP gas in outdoor operations. Those in undamaged homes or institutions can also be made operable on site.

d. Table-type gas burners, counter grills, and griddles may also be converted for emergency cooking with LP gas. When used with a camp-style ground utility stove, LP gas provides a hot flame for heating large containers of water, stew, soup, and coffee.

4. For lighting.
   a. Portable reflector floodlights fueled from cylinders of LP gas are available in weatherproof, self-contained units. They provide excellent lighting and have the same portable fuel features as LP gas for cooking.
5. For incineration.
   a. An LP gas-fired hand weed burner provides an intensely hot flame. It can be put to many other good uses in outdoor feeding, some of which are for quickly starting wood, coal, or charcoal fires, as well as for incineration.
6. For power.
   a. Internal combustion engines can be adapted to operate on LP gas to provide a source of power for pumping, for refrigeration, and for transportation.
7. Where LP gas may be used.
   a. Restaurants and cafeterias.
   b. Clubs and diners.

c. Hotels and motels.
d. Hospitals and institutions.
e. Feeding stations.
f. Auxiliary kitchens.
g. Mobile kitchens and canteens.
h. Outdoor feeding centers.
i. Homes.
j. Shelters and other emergency welfare centers.

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Section V

GUIDES TO THE CARE AND STORAGE OF FOOD

A. *General*

1. Proper storage and care of food are part of good food service management. Under disaster conditions, storage facilities may not be ideal, but the principles that contribute to good storage practices should be observed as closely as possible.
2. Good storage discipline is especially important in all emergency kitchens, whether indoor, outdoor, or mobile, because temporary facilities may increase risks of spoilage, contamination, or other waste.

B. *Types*

1. Dry storage.
   a. A food storage area must be convenient to delivery and kitchen areas, well ventilated, cool, dry, clean, and orderly, and protected against rodents and insects.
   b. Keep in the storage area all foods not in use by feeding personnel.
   c. Store all foods off the floor or ground on shelves and slatted floor racks. The racks protect foods from dampness. Leave a 2-inch airspace between shelves and walls to permit air circulation. Place deeper

shelves near the floor for heavy cartons, boxes, and large-size cans and containers.

d. Store staple foods such as flour, sugar, beans, and other bulk dry items in galvanized cans or other covered containers. Store bulk potatoes, onions, and other root vegetables in open containers or baskets. Stack dry stores such as boxed and cased fruits, vegetables, and condiments. Label the contents of each case.

e. Keep storage area dry and cool. Excessive moisture, heat, or light can cause food spoilage and deterioration.

(1) The food storage area should be in a cool, clean, building. If a building is not available, storage should be under improvised cover and insulation, such as:

(a) Roofing made of tarpaulins, canvas, boards, or roofing sheets supported by siding boards or sapling poles.

(b) Cool walls made of bales of straw or hay.

(c) Flooring made by racking planks, sapling poles, bricks, or other materials covered with straw or dry grass to keep food dry and off the ground.

f. Reserve separate space (away from foodstuffs) for soaps, disinfectants, and detergents that might impart odor and flavor to food.

g. Keep storage area free of rodents and insects.

(1) Never store insect powders or sprays in the food-storage area.

(2) Never use rodenticides and insecticides in food storage or food service areas, except under the personal supervision of authorized health officials.

h. When opening boxed, sacked, or packaged food, check for signs of spoilage or infestation. If spoiled food is found, destroy it promptly. Thoroughly clean the area where it was stored to prevent contamination of other food.

i. Keep food stocks moving in orderly manner.

(1) Date packages.

(2) Place oldest stock convenient for use first.

(3) Take regular inventory as a guide for food procurement.

(4) Avoid excessive stockpiling.

j. Dig drainage ditch around area where supplies are stored in the open.

2. Refrigerated storage.

a. Regardless of the type and amount of refrigeration equipment and facilities available in disaster, the following general principles and recommendations should be observed in the use and care of that equipment.

b. Mechanical refrigeration.

(1) Place refrigeration equipment in the coolest spot near the food service area.

(2) Keep temperature of refrigerators between 35° and 40° F. Don't open doors unnecessarily.

(3) Use refrigerator space wisely.

(a) Don't overcrowd.

(b) Cool cooked food quickly before storing.

(c) Keep most foods covered.

(d) Place foods so that air can circulate around them.

(4) Use cooked foods and leftovers as soon as possible. Use highly perishable ground meats, fresh liver, cured meats, fish, milk, and cheese within a day or two.

(5) Empty refrigerator once a week and defrost. Wash the inside with baking soda and water (1 to 2 tablespoons soda to a quart of water), and the outside. Wash shelves, containers, and trays with warm sudsy water. Rinse and wipe dry.

c. Improvised refrigeration.

(1) Insulated containers, desert coolers, underground or suspended food boxes, and other improvised cooling containers need the same care as to use, cleanliness, and sanitation as mechanical refrigeration.

(2) Improvised refrigeration facilities are, at best, poor substitutes for mechanical refrigeration and their use should be kept to a minimum.

GUIDES FOR FOOD PREPARATION AND SERVICE IN EMERGENCIES

A. *Timesavers in Food Preparation*

1. Keep plenty of boiling water on hand, especially in outdoor feeding.
2. Consult the menu and follow recipes.
3. Know the number to be fed.
4. Schedule preparation and cooking time, so as not to prepare and cook food too far in advance of service.
5. Assemble all equipment and ingredients and place at point of use. Use proper equipment for the job, if possible.
6. Keep knives sharp.
7. Make every motion count. Avoid unnecessary reaching, bending, and stretching and accomplish something each time you pass from one part of feeding area to another.
8. Keep working areas cleared and uncluttered.
9. Cook root vegetables in skins whenever possible. Don't peel unless you have to. But, if it is necessary to peel, a small, sharp paring knife peels faster than a larger one.
10. Don't attempt to chop finely or shred vegetables and fruits; cut in wedges or quarters for cooking; leave whole or cut in halves if serving raw. Cut onions in quarters and slip skins off.
11. To hasten heating time, preheat open cans of food before pouring into large containers.
12. Whenever possible, use assembly line method for mass production.

B. *Cooking for Quality and Palatability*

1. Cook most cuts of meat, cheese, milk, and eggs at low temperature to improve flavor and decrease cooking losses.
2. Cook vegetables and fruits just long enough to make them tender. If overcooked, they lose shape and become mushy.
3. Vegetables and fruits to be served raw must be washed thoroughly in safe water.

4. For a stew or filling soup, first cook the ingredients that take the longest time. Then add the others according to the length of cooking time required. Add ingredients that need only heating or cooking at low temperatures, such as milk, butter, eggs, and canned vegetables just before serving.
5. Suitable thickeners and extenders for soup or stew are barley, bread crumbs, cornmeal, rolled oats, flour, macaroni, rice, and tapioca. Mix thickener before adding to soup or stew.
6. Add macaroni, rice, or cereals that require cooking to boiling, salted water, stirring constantly to prevent sticking.
7. Eggs should be broken separately in a small dish, so that if an egg is bad it can be discarded without spoiling the rest.
8. Follow time and temperature requirements that vary with atmospheric pressure and altitude. Baking temperatures should be increased 2 to 3 degrees for each 1,000-foot increase of altitude.

C. *Organizing the Serving Area and the Work*

1. See figures 17 and 18 for suggested serving arrangement of food.
2. If large group is to be fed, arrange several counters to permit more than one serving line.
3. Decide where lines will form and how they will move to eating areas. Assign traffic directors to keep diners moving in orderly lines.
4. Have sufficient personnel to serve and assign each worker a specific task or item to serve.
5. Collect and count out paper eating and serving utensils needed. Stack on serving counters at proper place. (If several utensils are provided, wrap in napkins for easy pickup.)
6. Place trays (if used), napkins, and eating utensils at starting point. (If diners supply their own containers, have a sanitizing facility near the beginning of the line.)
7. Check menu to be sure nothing is missing.
8. Do not dish up and allow food to stand before service begins.

9. Before serving starts, establish size of portion and placing of food items on plate or other container. (If ladle or food container holds the right amount for serving, portioning is quicker and easier.)
10. Avoid spilling and overfilling.

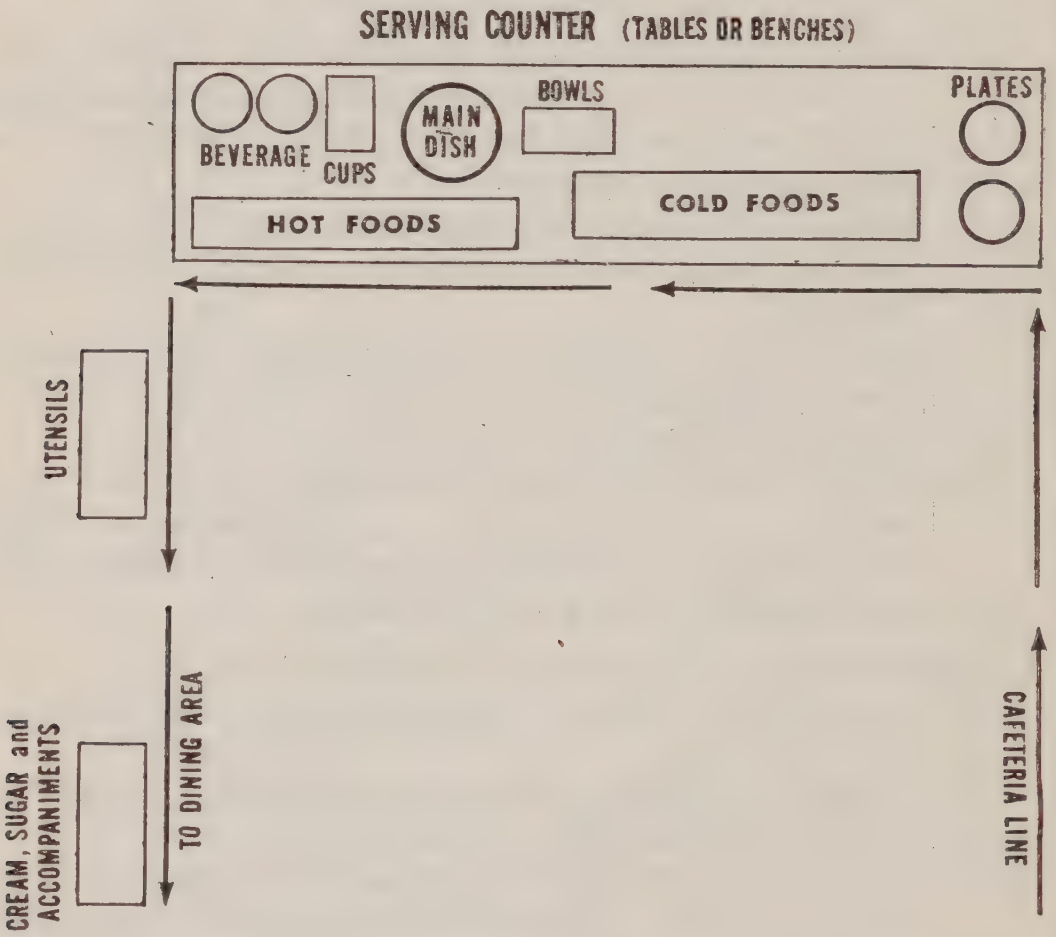

FIGURE 17.—*Single-line cafeteria service.*

GUIDES TO CARE AND MAINTENANCE OF EQUIPMENT

A. *Necessity*

1. Under normal conditions, good care is taken of large, mechanically operated equipment primarily because of large initial investment and cost of repairs. These factors of cost and care are more important in a period of disaster because of the possibilities of unavailability of replacement parts and lack of trained repair personnel.

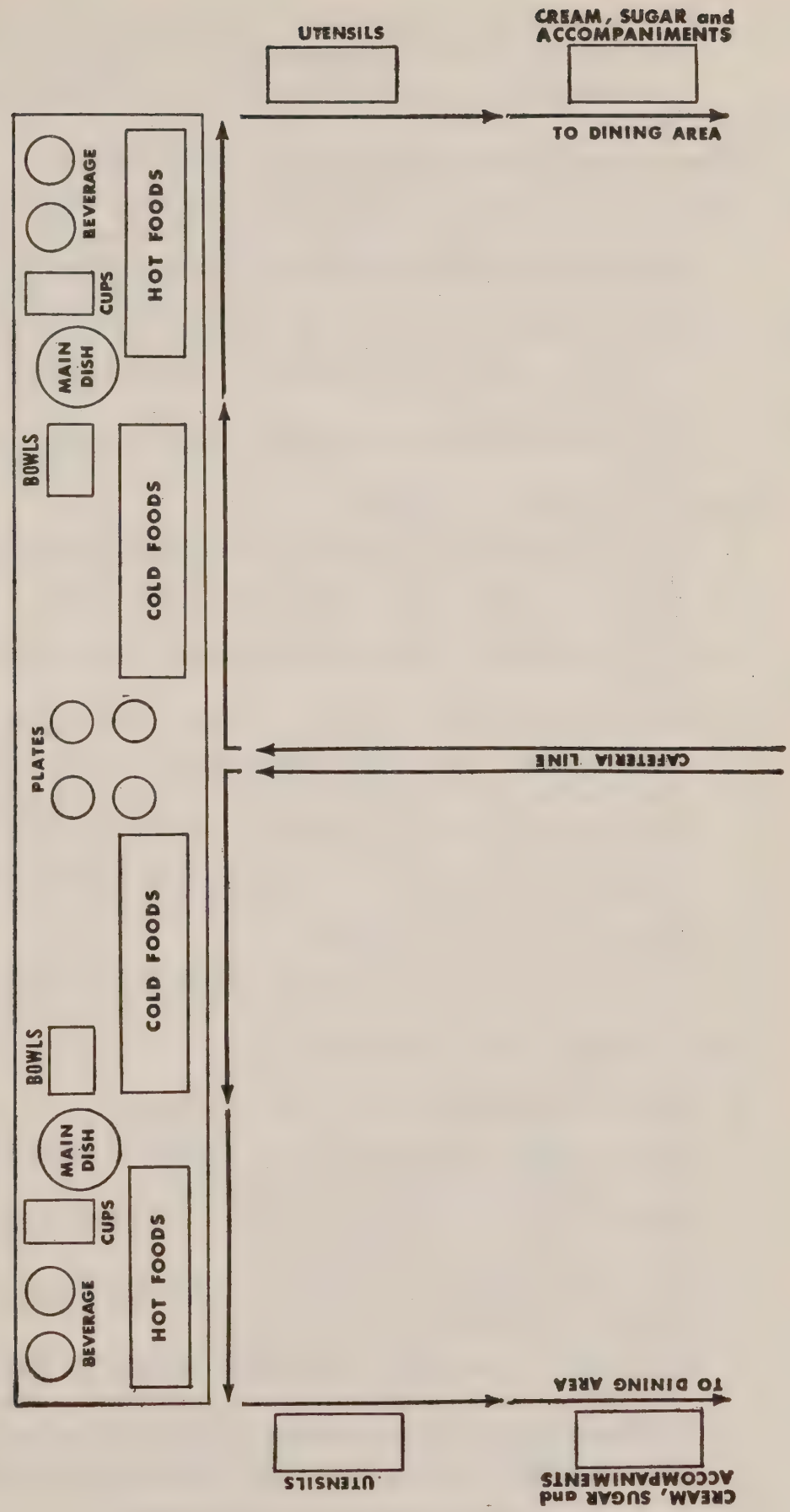

FIGURE 18.—*Double-line cafeteria service.*

2. A few simple procedures that will keep heavy equipment in good operating condition are most important in an emergency period if breakdown is to be avoided.

B. *Procedures*

1. Keep the equipment clean by approved methods.
   a. After each use, thoroughly cleanse and sanitize all equipment. Disassemble large, stationary pieces of equipment, such as peelers, slicers, cutters, bench-type can openers, urns, grinders, sifters, and juice extractors so that all operating parts may be washed, rinsed, and sanitized. (See Dishwashing, sec. II.)
   b. Defrost and clean refrigerators and ice boxes regularly.
2. Store equipment properly.
   a. Keep equipment in clean, dry, protected places. Improvise storage from empty packing cases or construct a small covered shed.
   b. Store containers, pots, and pans uncovered on their sides.
   c. Store all sanitized cooking and eating utensils and equipment in clean, dry places protected from flies, dust, or other contamination. Cups and glasses that are used and washed daily should be inverted on racks, clean shelves, or in closed cupboards. Cooking equipment in constant use may be suspended within easy reach.
   d. Store single-use utensils and other paper supplies in covered containers in which they are packaged.
3. Make needed repairs promptly.
   a. Lubricate moving parts frequently.
   b. Inspect and check equipment regularly.
   c. Assign repair of mechanically operated equipment to competent technicians, if possible.
   d. Replace worn or damaged electric cords as soon as wear or damage is apparent.
4. Follow manufacturers' directions for the operation and care of motors and equipment.
   a. Learn how to operate equipment properly, such as electrical and mechanical appliances, pressure cookers, steam kettles, mixers, coffee urns, heaters, slicers, grills, ranges, and other kitchen equipment.

b. Assign care of machines to a competent person, and make him responsible.
c. Inspect machines daily for cleanliness.
d. Post prominently any special warnings concerning care of equipment on or near equipment.
e. If instruction cards for operation are available, keep on or near each piece of equipment.
f. Handle equipment with care when moving it.

5. All equipment, whether borrowed or owned by the feeding groups, should receive the same inspection, care, and maintenance.
6. Improvised utensils and equipment must be given special care to prevent rust and deterioration, especially if salvage materials are scarce.

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APPENDICES

Appendix A

METHODS OF FEEDING IN DISASTER [3 6]

A. *General*

1. Although a program for the emergency feeding of victims of a natural disaster calls for large-scale planning, planning for emergency feeding in the event of an enemy attack may present a greater number of problems. Basically, however, the two situations are the same from the standpoint of emergency feeding because both involve plans:
   a. To keep people alive.
   b. To restore and maintain morale.
   c. To provide food that will keep people at work or get them back to work.
2. The common problems to be met in disaster feeding include:
   a. Planning primarily for the large numbers to be fed, giving consideration when possible to groups requiring special food preparation—such as infants, the injured, the aged, the chronically ill, and others.
   b. Fitting the type and place of feeding to existing conditions; for example, feeding stations for evacuees in transit, feeding from mobile kitchens and canteens, feeding at fixed food preparation and serving sites with either standard or improvised equipment.
3. There are two major categories of sites for emergency mass feeding—indoor and outdoor. These will be given general discussion in this appendix.

See app. M for footnotes.

B. *Emergency Indoor Feeding*

1. Establishing a temporary indoor feeding facility.

a. Location.

(1) In vacant buildings having these standards:

(a) Fireproof and moisture-resistant.

(b) Floors strong enough to withstand weight of equipment and heavy traffic.

(c) Good lighting and ventilation.

(d) In good repair.

(e) Adequate toilet facilities or space to provide them.

(2) As close as possible to the people to be fed.

(3) Near a street or road affording easy access to the site.

(4) On the street floor for convenient delivery, food distribution, and disposal services.

(5) Near a water supply.

b. Suggested minimum equipment for an indoor kitchen (with gas and electric facilities).

(1) Equipment for food preparation.

Essential equipment	For 200 diners	For 500 diners	For 1,000 diners
Range, with oven, gas or blue flame oil; or	6 burners	8 burners (two 4-burner units).	12 burners (two 6-burner units).
Camp range for coal or wood, with oven. (Oven not necessary but desirable for long-term feeding.)	6 covers	6 covers	8 covers.
Stock pot (6-gal.)	2	2	4.
Dish pan (18-in.)	3	4	4.
or			
Compartment sink	1	2	2.
Saucepan (2-qt.)	0	2	3.
Saucepan (1-qt. lipped)	2	2	2.
Water pails (3 gal.)	3	3	4.
Covered garbage can or pail	2	3	4.
Graduated 1-qt. measure	1	2	2.
Graduated 2-qt. measure	1	2	2.
Water tank if water is to be brought in.	400 gal	1,000 gal	2,000 gal.
Knives:			
Bread	2	2	3.
Butcher	2	2	4.
Paring, some with loop handles.	4	6	8.
Sandwich spreader	4	4	6.
Measuring spoons and cups	1 set ea	2 sets ea	2 sets ea.
Can opener (wall or table type)	1	1	1.
Vegetable brush	2	3	4.

Desirable to extent available	For 200 diners	For 500 diners	For 1,000 diners
Simple coffee urn with bag, ring, and faucet (9-gal.).	2	2	2.
Frying pan	2	2	4.
Baking pan to fit oven (2¼ in. deep).	Number and size depend on size and number of ovens.		
Mixing bowls (9-qt.)	3	4	6.
Colander (13¾ in. by 5¾ in.)	1	1	2.
Food chopper (3-lb. capacity)	1	1	2.
Basting spoons (14-in.)	2	3	4.
Split spoon	1	2	2.
Cook's fork (18-in.)	2	2	4.
Pancake turner (14-in.)	2	2	4.
Wire whip (14- or 16-in.)	1	2	3.
Cutting board for sandwiches, 2-in. by 18-in. by 24-in.	2	2	4.

(2) Equipment for food service.

Essential equipment	For 200 diners	For 500 diners	For 1,000 diners
Coffee pot (8 qt.) for serving coffee.	4	4	6.
Pitchers (1 gal.) for beverages (for table use).	4	8	10.
Deep ladle 8-oz. (for soup)	2	3	4.
Plates, cups, spoons, forks, etc.	For 200	For 500	For 1,000.
Desirable to extent available			
Trays (cafeteria style)	4	6	8.
Bowls for sugar	4	6	8.
Folding or trestle table with legs.	Number depends on size of table and space.		

(3) Equipment for cleaning.

Essential equipment	For 200 diners	For 500 diners	For 1,000 diners
Mop	1	1	2.
Broom	1	1	2.
Dustpan	1	1	2.
Scrubbing brushes	1	2	2.
Compound for sterilizing dishes		As needed.	
Dishcloths		As needed.	
Cleaning cloths		As needed.	
Paper or cloth hand towels, soap, soap powder for dishes, scouring powder.		As needed.	

Desirable to extent available	For 200 diners	For 500 diners	For 1,000 diners
Mop wringer with pail attached	1	1	2.
Chore boys or steel wool	As needed.		

(4) Miscellaneous.

Essential equipment	For 200 diners	For 500 diners	For 1,000 diners
Knife sharpener	1	1	1.
Box for knives	1	1	1.
Matches	As needed.		
Pot holders	8	8	12
Household bleach	To purify water as necessary.		
Desirable to extent available			
Bread box or covered metal container with holes punched in the cover.	As needed.		
Sterilized new garbage cans for storing of bulk, dry, staple foods.	Number depends on stock to be kept on hand.		
Oil cans with screw-top filler	Number depends on size of oil stove.		
Hammer	1	1	1.
Shears	1	1	1.
Clock	1	1	1.
Ladder	If needed.		
Kitchen stool	Number depends on number of workers and space.		
Scale for weighing recipe ingredients.	1	1	1.
Pulley for hanging clothes-line	Number depends on number of workers and space.		
Cooks' caps and aprons	Depends on number of workers and laundry facilities.		

(5) Equipment for accident prevention.

Essential equipment	For 200 diners	For 500 diners	For 1,000 diners
First aid 16-unit kit	One or more, dependent on size of feeding station.		
Fire extinguisher	One or more, dependent on size of feeding station.		

2. Conversion of existing facilities for emergency indoor feeding (includes restaurants, cafeterias, clubs, hotels, institutions, and hospitals, and similar fixed locations).

a. Before an emergency, make a disaster plan that will include:
   (1) A sketch of the physical layout of the establishment.
   (2) The location of the kitchen and the dining areas in relation to the street, and their position within the building.
   (3) Determinations of methods and areas of expansion to provide additional eating space.
   (4) An estimate of the number of extra persons the establishment could feed in an emergency.
   (5) Places where diners could dispose of trash and waste.
   (6) A plan for the emergency washing of soiled dishes and utensils.
   (7) A plan for the changes necessary in the kitchen and serving areas to convert from table-type to cafeteria service.
   (8) Charting and labeling steam, power, water, and gas connections for emergency purposes.
   (9) Establishment of the priority use of any food, equipment, and paper eating supplies on hand at the time of disaster.
   (10) An estimate of the number of additional food workers required.
   (11) Assignment of specific emergency duties to each staff member and to extra workers.
   (12) A list of work stations to be manned and the size and makeup of teams required for each station.
   (13) Arrangement for onsite orientation and instruction of staff members on the emergency plan.
   (14) Arrangement for workers to take the Basic Emergency Mass Feeding Course.

b. After disaster strikes, take the following steps:
   (1) Premises and equipment.
      (a) Convert table-type operations into self-service set up.
      (b) Establish space for the formation of several traffic lines.

(c) Post signs telling people where to go to eat.

(d) Direct traffic flow from entrance to exit.

1. Under normal conditions, people usually go in and out the same door. Under emergency conditions, a separate exit will facilitate the flow of traffic in and out of feeding area, and eliminate two-directional traffic at the entrance.

2. In some table-style establishments traffic flow could be directed through the kitchen where food may be served from the steam-table, other tables, or directly from the ranges or grills.

3. Lines may enter the kitchen to pick up food and proceed to the eating area.

(e) If utilities are disrupted, put any emergency or standby equipment into operation. For example:

1. Convert stoves that burn natural gas to operate on bottled gas.

2. Hook up steam-powered equipment to available portable steam generators or pipe steam into the plant from an emergency source.

3. If cooking equipment is not usable, but serving supplies and equipment are, use the establishment as a feeding station to serve prepared food brought from a central feeding facility in thermos or other insulated containers.

(2) Personnel.

(a) Organize staff into teams to prepare, transport, and serve the food and dispose of trash and garbage.

(b) Assign staff work-hours for 24-hour feeding service during the emergency.

(3) Menu.

(a) Simplify the menu and service of food during the extreme emergency.

(b) Use promptly any uncontaminated fresh food on hand to avoid spoilage and waste. Use canned, packaged foods, and other nonper-

ishables after fresh food supplies are exhausted.

(c) In the period immediately following emergency, limit menu items to foods eaten out of hand and easy to handle such as sandwiches or fruit.

(d) Limit the menu after first emergency hours to a one-dish, bowl-type meal and a beverage. Avoid monotony by adding a little variety. Additions are desirable if and when supplies, staff, and facilities permit. Simplification will help stretch the customary 2- or 3-day inventory of food supplies.

(e) Discontinue the following:

1. Appetizers.

2. Salads.

3. Individual cream, butter, and other side dishes (unless prepackaged and available).

4. Pastries and desserts that have to be prepared.

(4) Food service.

(a) Be prepared to serve meals on a 24-hour basis.

(b) Discontinue table and regular counter service.

(c) Bring food to the serving area in the containers in which it was cooked, and serve from the containers.

(d) Use single-use paper eating utensils.

(e) Serve a generous portion to each diner when menu is limited.

C. *Emergency Outdoor Feeding*

1. Construction of improvised outdoor feeding facilities.

a. Location.

(1) Rules for choosing an outdoor site include considerations of—

(a) Level, well-drained ground.

1. Should be level to help eliminate accidents.

2. There should be natural drainage to keep the kitchen area dry. Avoid clay or black muck.

3. Should have an area of no less than 60 by 40 feet, partially shaded.

(b) Convenience to persons to be fed.

(c) Accessibility to roads, for delivery of supplies and for dining traffic.
(d) Accessibility to drinking water.
(e) Location in a sanitary area free of—
1. Excessive shrubbery, trees, and other foliage that harbor insects and rodents and that restrict freedom of movement.
2. Broken glass, tin cans, and other debris.
3. Stones, ruts, tree stumps.
4. Stagnant ponds, streams, trash, and open or broken sewers.

b. Layout of site.
(1) Plan work areas for efficiency and convenience.
(2) Arrange following units to achieve direct traffic flow from point of delivery to point of waste disposal.
(a) Area for delivery.
(b) Area for storage of supplies.
(c) Area for handwashing.
(d) Area for cooking.
(e) Area for serving.
(f) Area for eating.
(g) Area for dishwashing.
(h) Area for garbage and trash disposal.
(i) Area for staff toilet facilities.

c. Arrangement of equipment.
(1) Keep a straight-line flow from entrance through the serving area into the dining area, then to the washing area, and then the exit.
(2) Arrange serving equipment cafeteria style.
(3) Set up a sanitizing unit at the head of the line for diners to predip eating utensils (if paper supplies are not used).
(4) Next place griddles so food may be served direct from the heat.
(5) Place ovens next, with openings facing away from the serving lines.
(6) Have the end of the serving line lead into the dining area.
(7) Place trash cans and utensil washing facilities for diners at the outer edge of the dining area leading away from the kitchen.

(8) Arrange cooking and other kitchen equipment parallel to the serving line, allowing a 10-foot aisle between and at least 6 feet between open fires.

(9) Place soakage pit at least 25 feet away from cooking area, and on the opposite side away from the dining area.

d. Emergency method for determining oven temperature.

(1) Oven hand count.

(a) Open oven door.

(b) Place your hand in the approximate center of the oven.

(c) Start counting as follows, "one thousand and one," "one thousand and two," etc., until you feel a tingling under the fingernails and have to withdraw the hand. (The count approximates time in seconds.)

(d) The number you have reached at that point will be the oven count.

1. 18–20 counts—200° to 225° F.

2. 16–18 counts—250° to 325° F.

3. 12–16 counts—325° to 400° F.

4. 9–12 counts—400° to 450° F.

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Appendix B

BUILDING AND MAINTAINING OUTDOOR FIRES

A. *General Instructions*

1. Before building a fire, clear the ground for at least 5 feet around the site.
2. Dry, dead wood makes good fuel.
3. Avoid wet, soft, rotten, or green wood.
4. Split wood burns better than unsplit wood.
5. Fire must be replenished.
6. *The fire should never be left unattended.*
7. *Never* use gasoline, oil, grease, or other flammable liquid in starting a fire.

B. *To Start Outdoor Fires*

1. Use timber and kindling, such as bark curls, wood shavings, fine dry twigs or fuzzy sticks and paper, or shaved paraffin candles. Add split soft wood, such as pine, maple, cottonwood, or spruce, construction salvage, or framing boards.
2. Line the fire pit base with crumpled paper; ignite.
3. Place small pieces of kindling on the lighted paper and continue to add larger pieces of light wood in crisscross arrangement.
4. When light wood is burning briskly, add heavier wood.
5. Spread the burning wood and hot ashes over the length of the fire pit. Place 1 or 2 new pieces of wood on the hot ashes.

C. *To Maintain Outdoor Fires*

1. Use hard woods that burn evenly and leave a good bed of coals, such as hickory, locust, maple, oak, apple, beech, and white ash, or charcoal briquets or coal.
2. Keep wood supply covered and dry.
3. Add a small amount of fuel often to keep fire efficient and to maintain an even cooking temperature.

D. *To Build a Tepee Fire*

1. Materials.
   a. Two forked poles and 1 pole of green wood. (In wet weather dry split wood or shavings may be used for tinder.)
2. Procedure.
   a. Lay tinder.
   b. Place kindling loosely around tinder in the shape of an Indian wigwam, permitting free circulation of air.
   c. Add large wood later.
   d. Suspend pot or spit over fire on a pole of green wood supported by two forked poles secured in the ground on either side of the fire.

E. *To Build a Hunter's Fire*

1. Materials.
   a. Two or 4 logs (about 5 inches in diameter) or enough flat stones to make an aboveground trench sufficiently long to hold the cooking utensils to be used.
   b. Level off tops and bottoms of logs so utensils will rest securely.
2. Procedure.
   a. Lay a basic fire.
   b. Then lay logs or stones parallel to each other to form trench (the trench width is determined by the width of utensils to be used).
   c. Place utensils on trench and light fire.

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Appendix C

SUGGESTED STAFF FOR FEEDING FACILITIES

A. *General*

1. Staff needs for either stationary or mobile emergency mass feeding facilities depend upon a number of factors, such as the experience of available workers, the type and extent of disaster, the types of meals served, facilities available, and other variables.
2. The following table of staff organization for the various kinds of feeding facilities is intended only as a basic guide for estimating personnel requirements.

B. *Suggested Staff for Feeding Facilities*

1. Food preparation and service in indoor facilities.

Workers	Suggested staff	
	500 persons per hour	1,000 persons per hour
Supervisors: Receiving and issuing supplies	1	2
Food preparation:		
Cooks	3	4
Assistant cooks	4	8
Kitchen helpers	12	24
Servers:		
Main dish	2	4
Bread or sandwiches	2	4
Beverage	2	4
Traffic directors	4	6
Cleanup:		
Dishwashers	2	3
Helpers (trash and garbage disposal)	2	3
Total	34	62

2. Food preparation only in auxiliary kitchens.

Workers	Suggested staff	
	500 persons per hour	1,000 persons per hour
Supervisors	1	2
Cooks	3	4
Assistant cooks	4	8
Kitchen helpers	12	24
Total	20	38

3. Food service only at feeding stations.

Workers	Suggested staff	
	500 persons per hour	1,000 persons per hour
Supervisors	1	2
Servers:		
Main dish	2	4
Bread or sandwiches	2	4
Beverage	2	4
Traffic directors	2	4
Cleanup:		
Dishwashers	2	4
Helpers (trash and garbage disposal)	2	4
Total	13	26

4. Food preparation and service from a mobile convoy.

Workers	Suggested staff	
	500 persons per hour	1,000 persons per hour
Drivers (per vehicle)	1	1
Supervisor—Chief of unit	1	2
Supply officer: Supplies and equipment	1	2
For each mobile kitchen (food preparation):		
Cooks	2	4
Assistants	2	4
Helpers	4	8
For each mobile canteen (serving only):		
Servers:		
Main dish	2	4
Bread or sandwiches	2	4
Beverage	2	4
Traffic directors	2	4
Helpers (trash and garbage)	2	4
Total	21	41

5. Food preparation and service from a mobile kitchen.

Workers	Suggested staff	
	500 persons per hour	1,000 persons per hour
Drivers	1	1
Supervisor	1	2
Food preparation:		
Cooks	2	4
Assistants	2	4
Helpers	4	8
Servers:		
Main dish	2	4
Bread or sandwiches	2	4
Beverage	2	4
Cleanup:		
Cooking equipment	1	2
Helpers	2	4
Traffic directors	2	4
Total	21	41

6. Food service only from a mobile canteen.

Workers	Suggested staff	
	500 persons per hour	1,000 persons per hour
Drivers	1	1
Supervisor	1	2
Servers:		
Main dish	2	4
Bread	2	4
Beverage	2	4
Traffic directors	2	4
Helpers	2	4
Total	12	23

7. Food preparation and service in improvised outdoor kitchens.

Workers	Suggested staff	
	500 persons per hour	1,000 persons per hour
Supervisor	1	1
Supply officer	1	1
Cooks	5	8
Cooks helpers	5	8
Water tender	1	2
Fire tender	1	3
Serving counters	8	12
Traffic directors	2	4
Cleanup	2	4
Total	26	43

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Appendix D

GUIDE FOR FOOD REQUISITIONING

A. *Importance of Estimating Food Needs*

1. In any kind of a disaster involving mass feeding operations, it is essential to know the approximate amounts of various foods required to feed a given number of people. In event of an enemy-caused disaster, this knowledge becomes increasingly important for a number of reasons, among them:
   a. Waste of food must be prevented to the greatest extent possible, because overall food supplies may be low in the postdisaster period.
   b. Food supplies may be inaccessible because of disruption of transportation.
   c. Some food supplies that survived blast or burn damage or are located at a considerable distance from a blast area may later become contaminated by radioactive fallout.
   d. Perishable items may be very scarce because of lack of proper storage or inadequate transportation.

B. *Food Requirements for Groups*

1. The following table may be used as a guide in requisitioning food for groups ranging between 100 and 1,000 persons. Use of the table will prevent food waste, and facilitate menu planning and food preparation.
2. The term "as purchased" in the table means the weight of the item prior to removal of waste through boning, trimming, or other reduction.

FOOD REQUISITION GUIDE[89]

Food items	Unit serving	Approximate amounts to requisition			Remarks
		100 servings	500 servings	1,000 servings	
Apples, eating	1 medium	1 box	4 boxes	8 boxes	1 lb. equals 3 to 5 apples. 1 box equals 44 lb.
Applesauce, fresh	½ cup	40 lb	200 lb	400 lb.	
Applesauce, canned.	½ cup	5 No. 10 cans	22 No. 10 cans	44 No. 10 cans	6 No. 10 cans to a case.
Apricots, dried	½ cup cooked	12½ lb.	62½ lb	125 lb	1-lb. package or 25-lb box.
Baking soda	As needed				Packed in ½- or 1-lb. packages in 6-, 10,- or 24-lb. cases.
Bananas	1	30–34 lb	150–170 lb	300–340 lb	1-lb. equals 2 to 4 bananas.
Beans, dried lima	½ cup cooked	11 lb. (dry)	50 lb. (dry)	100 lb. (dry)	
Beans, dried navy	½ cup cooked	10 lb. (dry)	45 lb. (dry)	90 lb. (dry)	
Beans, string	½ cup cooked	24 lb	120 lb	240 lb	1 lb. equals 3 cups cooked.
Beans, string, canned.	½ cup	4 No. 10 cans	20 No. 10 cans	40 No. 10 cans	
Beef, with bone		Allow ½ lb. per serving as purchased.			
Beef, ground	¼ lb	20 lb	100 lb	200 lb	
Beef for stew	3 oz. cooked	25 lb	125 lb	250 lb	
Beef stew, canned	½ to ⅔ cup	5 No. 10 cans	25 No. 10 cans	50 No. 10 cans	
Beef stew and vegetables, canned.	½ to ⅔ cup	5 No. 10 cans	25 No. 10 cans	50 No. 10 cans	

Beets, fresh	½ cup cooked	28 lb	140 lb	280 lb	1 lb. equals 4 medium. 1 bu. equals 52 lb.
Beets, canned	½ cup	5 No. 10 cans	25 No. 10 cans	50 No. 10 cans	
Bread, 1–lb. loaf	2 slices	13 loaves	63 loaves	125 loaves	1 loaf equals 16 slices.
Bread, 2-lb. loaf	2 slices	8 loaves	38 loaves	72 loaves	1 loaf equals 28 slices.
Butter and fortified margarine.	1 large square	2–2½ lb	10–11 lb	24 lb	32 1-lb. prints to case.
Cabbage	½ cup cooked	25 lb	125 lb	250 lb	
Cabbage, raw	½ cup shredded	16 lb	80 lb	160 lb	50-lb. hamper equals 1½ bu.
Carrots, canned	½ cup	4 No. 10 cans	20 No. 10 cans	40 No. 10 cans	
Carrots, fresh	½ cup cooked	30 lb	140 lb	260 lb	1 lb. equals 2 cups cooked.
Carrots, raw	½ cup shredded	20 lb	100 lb	200 lb	50 lb. equals 1 bu.
Cereal, granulated, farina type.	½ cup cooked	4 24-oz. pkg	20 24-oz. pkg	40 24-oz. pkg	
Cheese, American, cottage, cream.	1 oz	6¼ lbs	31½ lbs	62½ lbs	
Chili con carne	½ to ⅔ cup	5 No. 10 cans	25 No. 10 cans	50 No. 10 cans	
Cocoa	1 cup	1½ lb	7½ lb	15 lb	
Coffee	1 cup	2 lb	10 lb	20 lb	1 lb. coffee to 2½ gal. water.
Coffee, dehydrated	1 cup	4 4-oz. jars	20 4-oz. jars	40 4-oz. jars	2½ cups instant coffee to 2½ gallons water.
Corn, canned	½ cup	5 No. 10 cans	22 No. 10 cans	44 No. 10 cans	

See appendix M for footnotes.

FOOD REQUISITION GUIDE—Continued

Food items	Unit serving	Approximate amounts to requisition			Remarks
		100 servings	500 servings	1,000 servings	
Corned beef, canned.	3 oz	3⅓ 6-lb. tins	15 6-lb. tins	30 6-lb. tins	
Corned beef, hash	½ to ⅔ cup	5⅓ No. 10 cans	25 No. 10 cans	50 No. 10 cans	
Cornflakes	1 oz	8–9 12-oz. pkg	42 12-oz. pkg	80 12-oz. pkg	24 pkg. to case.
Cornmeal, coarse	½ cup cooked	4 lb	20 lb	40 lb	
Cornmeal, fine	½ cup cooked	3 lb	15 lb	30 lb	
Crackers, graham	2	3½ lb	17½ lb	35 lb	1 lb. equals 58 crackers.
Crackers, soda	2	3 lb	15 lb	30 lb	
Cream for beverage.	1 oz	3 qt	15 qt	30 qt	
Eggs, fresh	1	8⅓ doz	41⅔ doz	83⅓ doz	30 doz. to case.
Eggs, dry whole	2 tbsp. plus 2½ tbsp. water equal 1 egg.	3 lb	15 lb	30 lb	4 cups dried equals 1 lb.
Fish, fresh filet	3 oz. cooked	33 lb	165 lb	330 lb	
Fowl	¾ to 1 lb. as purchased.	75 lb	375 lb	750 lb	5-lb, average is best size to buy.
Frankfurters	1 or 2	12½ lb. or 25 lb	62½ lb. or 125 lb	125 lb. or 250 lb	Approximately 8 frankfurters to 1 lb.
Gelatin, dry, flavored.	½ cup dessert	4 lb	20 lb	40 lb	1 lb. equals 3½ cups.

Grapefruit, fresh	½	1 crate (54s)	4⅔ crates (54s)	9¼ crates (54s)	54–80 count p crate.
Grapefruit sections, canned.	½ cup	4 No. 10 cans	19 No. 10 cans	36 No. 10 cans	
Grapefruit juice	4 oz	4 No. 10 cans plus 1 No. 2.	21 No. 10 cans	42 No. 10 cans	
Hams, smoked, bone in.	3 oz. cooked	55 lb	275 lb	550 lb	
Hominy grits	½ cup cooked	4 lb	20 lb	40 lb	
Ice cream, brick	⅛ qt	12½ qt	62½ qt	125 qt	Bricks can be purchased cut in 8 slices per qt.
Jams and jellies	1 tbsp	6 1-lb. jars or ½ No. 10 can.	2½ No. 10 cans	5 No. 10 cans	
Lettuce salad	⅙ med. head	1⅓ doz. (16 lb.)	6⅔ doz	13 doz	
Liver	3 oz. cooked	25 lb	125 lb	250 lb	
Luncheon meat	2 oz	13 lb	65 lb	130 lb	
Macaroni	½ cup cooked	5 lb	25 lb	50 lb	
Meat spread, deviled and potted.	1½ tbsp	13 No. ½ cans	65 No. ½ cans	130 No. ½ cans	
Milk, fresh	1 cup (½ pt.)	100 ½ pt. or 25 qt. or 2½ 10-qt. cans.	500 ½ pt. or 125 qt. or 12 10-qt. cans.	62½ gallons or 25 10-qt. cans.	
Milk, evaporated	½ cup evap. milk plus ½ cup water.	31 14½-oz. cans or 3¾ 8-lb. cans.	134 14½-oz. cans or 18¾ 8-lb. cans.	308 14½-oz. cans or 37½ 8-lb. cans.	48 14½-oz. cans to a case.
Milk, dried whole	2½ tbsp. (dry ½ oz.)	3½ lb	15½ lb	31 lb	
Milk, dried skim	3–4 tbsp	6¼ lb	31¼ lb	62½ lb	
Molasses	2 tbsp	3 qt	15 qt	30 qt	10-lb. can equals 3 qt.

FOOD REQUISITION GUIDE—Continued

Food items	Unit serving	Approximate amounts to requisition			Remarks
		100 servings	500 servings	1,000 servings	
Noodles	½ cup cooked	6 lb	30 lb	60 lb	
Onions, fresh	½ cup cooked	30 lb	140 lb	270 lb	
Oranges	1	⅔ crate (176s)	3 crates (176s)	6 crates (176s)	176 count per case.
Orange juice	4 oz	4 No. 10 cans plus 1 No. 2 can.	21 No. 10 cans	42 No. 10 cans	
Peaches, fresh	1 whole	25 lb	125 lb	250 lb	4 med. peaches equal 1 lb.
	or ½ c. sliced	29 lb	145 lb	290 lb	1 bu. equals 48 lb. approx.
Peaches, canned	2 halves	4 No. 10 cans	20 No. 10 cans	40 No. 10 cans	
Peanut butter	2 level tbsp. or 1 rounded tbsp.	7 lb	35 lb	70 lb	
Pears, fresh	1	34 lb	140 lb	280 lb	48–50 lb. equal 1 bu.
Pears, canned	2 halves	4 No. 10 cans	20 No. 10 cans	40 No. 10 cans	
Peas, canned	½ cup	5 No. 10 cans	22 No. 10 cans	44 No. 10 cans	
Peas, dried	½ cup cooked	10 lb. (dry)	45 lb. (dry)	90 lb. (dry)	
Pineapple, canned	1 large or 2 small slices.	4 No. 10 cans	20 No. 10 cans	40 No. 10 cans	
Pineapple juice	4 oz	4 No. 10 cans & 1 No. 2 can.	21 No. 10 cans	42 No. 10 cans	
Plums, canned	3 plums	4 No. 10 cans	20 No. 10 cans	40 No. 10 cans	

Pork loin for roasting.	3 oz. cooked	Allow approximately ½ lb. per serving as purchased.			
Potatoes	½ cup cooked	30 lb	150 lb	300 lb	100 lb. per bag.
	1 med. baked	37 lb	185 lb	370 lb	60 lb. per bu.
Prunes, dried	4–5	12½ lb	62½ lb	125 lb	Purchased in 1- or 2-lb. pkg. or 25-lb. boxes.
Puffed cereals	½ oz	13 4-oz. pkg	65 4-oz. pkg	130 4-oz. pkg	24 4-oz. pkg. to case.
Rice	½ cup cooked	7 lb	35 lb	70 lb	
Rolled oats	½ to ⅔ cup cooked.	4 lb. or 6½ lb	20 lb. or 31 lb	40 lb. or 62 lb	1 lb. equals 5½ cups uncooked.
Salad dressing, cooked.	1 tbsp	2 qt	10 qt	20 qt	
Salmon	½ cup	25 (1-lb.) tall cans.	125 (1-lb.) tall cans.	250 (1-lb.) tall cans.	
Shredded Wheat	1 biscuit	8 or 9 12-oz. pkg	42 12-oz. pkg	84 12-oz. pkg	24 pkg. to case.
Soup, condensed	½ cup soup plus ½ cup liquid.	4 No. 10 cans	20 No. 10 cans	40 No. 10 cans	
Soup, dehydrated	1 cup	12½ lb	62½ lb	125 lb	Directions on pkg. for preparing.
Soup, ready-to-serve.	1 cup	8 No. 10 cans	40 No. 10 cans	75 No. 10 cans	
Spaghetti	½ cup	5½ lb	27½ lb	55 lb	
Spaghetti in sauce	½ to ⅔ cup	5 No. 10 cans	25 No. 10 cans	50 No. 10 cans	
Spinach	½ cup cooked	34 lb	170 lb	340 lb	18 lb. to bu.
Squash, summer	½ cup cooked	30 lb	150 lb	300 lb	Approx. 40 lb. to bu.
Squash, winter	½ cup cooked	50 lb	250 lb	500 lb	
Sugar, granulated	2 tbsp	2 lb	10 lb	20 lb	
Tapioca	½ cup cooked	2 lb	10 lb	20 lb	

FOOD REQUISITION GUIDE—Continued

Food items	Unit serving	Approximate amounts to requisition			Remarks
		100 servings	500 servings	1,000 servings	
Tea	1 cup	⅓ lb	1⅔ lb	3⅓ lb	1 lb. equals 6 cups (dry).
Tomato juice	4 oz	4 No. 10 cans plus 1 12-oz. can.	21 No. 10 cans	42 No. 10 cans	
Tomatoes, fresh	1 medium whole	25 lb	125 lb	250 lb	Slightly less for sliced tomatoes.
Tomatoes, canned	½ cup	5 No. 10 cans	22 No. 10 cans	44 No. 10 cans	
Tuna fish	½ cup	25 No. 1 cans	125 No. 1 cans	250 No. 1 cans	
Turnip greens	½ cup cooked	37 lb	175 lb	340 lb	
Turnip greens, canned.	½ cup heated	5 No. 10 cans	22 No. 10 cans	44 No. 10 cans	

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Appendix E

RECIPES

A. *General*

1. The recipes shown in this appendix have been selected on the basis of nourishment and ease of preparation.
2. Another consideration was to furnish recipes requiring a minimum number of ingredients.
3. The recipes shown are for yields of 100 portions. Larger amounts, in some instances, may be prepared with satisfactory results by multiplying the ingredients in a recipe for 100 by the unit number desired.
4. The capacities of eating utensils generally used in serving liquid portions are as follows:

Coffee cup, standard	6 ounces
Paper hot cup	8 ounces
Paper bowl, small	8 ounces
Paper bowl, large	12 ounces

B. *Recipes by Types*

1. Beverages.
   a. Coffee.
      (1) Directions for making emergency coffee, Boston coffee, and instant coffee are shown in section II of this manual.

b. Cocoa.[9]

(Yield: 5 gallons, 100 1-cup portions

Ingredients	*Amounts*
Cocoa	1¼ pounds (5½ cups)
Sugar	1 pound 14 ounces (3¾ cups)
Salt	¾ teaspoon
Water, cold	2½ quarts
Milk, fresh or evaporated	4½ gallons, or 18 tall cans plus 2¼ gallons of water
Vanilla, optional	1 ounce

Directions.

(1) Combine cocoa, sugar, and salt with enough water to make a paste.
(2) Add remainder of water gradually. Bring to boiling point; boil 5 minutes, stirring constantly.
(3) Add milk and reheat mixture.
(4) Beat well before serving.

c. Tea (emergency method).[10]

Yield: 8 gallons, 170 1-cup portions

Ingredients	*Amounts*
Tea, loose	½ pound (three 8-ounce cups)
Water, boiling	8 gallons (32 quarts)

Directions.

(1) Tie tea in cloth bag large enough to hold at least three times the amount of dry tea. Allow enough room for expansion of leaves when tying the bag.
(2) Tie cord to the container to make it easy to pull bag out of the water.
(3) Drop bag into kettle of boiling water; cover tightly.
(4) Reduce heat to prevent boiling; brew 5 to 7 minutes.
(5) Plunge bag up and down several times; remove bag from brew.
(6) If bag is not used and tea is put directly into the boiling water, strain beverage as soon as it is brewed. Otherwise, it will develop an undesirable flavor.

See app. M for footnotes.

2. Soups.

a. Bean chowder.[10]

Yield: 6¼ gallons, 100 1-cup portions

Ingredients	*Amounts*
Beans, dry, white	7 pounds (4½ quarts)
Water	4¼ gallons (17 quarts)
Pork, salt, diced	3 pounds (2 quarts)
Potatoes, diced	4 pounds (2½ quarts)
Onions, chopped	12 ounces (1½ pints)
or	
Onions, dehydrated	1 ounce (8 tablespoons)
Tomatoes	2 No. 10 cans
Sugar, granulated	3 ounces (6 tablespoons)
Salt	1 ounce (2 tablespoons)
Pepper	1 teaspoon

Directions.

(1) Wash beans. Add enough water to cover beans; soak 6 to 8 hours or overnight.
(2) Add remaining water and one-half the salt pork. Cover and heat to boiling point; reduce heat and simmer about 2 hours or until skins of beans begin to burst.
(3) Add potatoes and continue simmering.
(4) Fry remaining salt pork until crisp; remove from fat and drain.
(5) Fry onions in pork fat until tender. Add tomatoes, sugar, salt, and pepper; mix well.
(6) Cover and heat to boiling point; reduce heat and simmer about 20 minutes.
(7) Add crisp pork cubes just before serving.

b. Corn chowder.[11]

Yield: 6 gallons, 100 1-cup portions

Ingredients	*Amounts*
Stock (or water)	3½ gallons
Salt pork, cubed	2 pounds (1 quart)
Onions, chopped	1 pound (3½ cups)
Celery, chopped (optional)	½ pound (2 cups)
Potatoes, diced raw	2 pounds (1¼ quarts)
Green pepper, chopped (optional).	½ pound (2 cups)
Salt	4 ounces (½ cup)
Pepper	½ ounce (1¾ tablespoons)
Corn	13 pounds, 4 ounces (2 No. 10 cans)
Milk, evaporated	4 pounds, 7 ounces (2 quarts)

See app. M for footnotes.

Directions.

(1) Cut the salt pork in small cubes.
(2) Cook pork slowly with the chopped onions until the onion is tender but not browned.
(3) Add to stock.
(4) Add chopped vegetables to stock and simmer 20 minutes.
(5) Add salt, pepper, corn, and milk to stock and simmer until blended and all vegetables are tender.

c. Chicken noodle soup.[10]

Yield: 7 gallons, 100 1-cup portions

Ingredients	*Amounts*
Soup, chicken noodle, dehydrated.	4¾ pounds (1 No. 10 can)
Water, boiling	7 gallons

Directions.

(1) Add soup mix to boiling water.
(2) Boil 7 minutes.

d. Corn and chicken noodle soup.[10]

Yield: 7 gallons 100 1-cup portions

Ingredients	*Amounts*
Soup, chicken noodle, dehydrated.	4¾ pounds (1 No. 10 can)
Water, boiling	20 quarts
Corn, cream style	12 No. 2 cans
Onions, chopped	1 pound (1 quart)
or	
Onions, dehydrated	1 ounce (7½ tablespoons)
Salt	2½ ounces (5 tablespoons)
Milk, powdered, whole	2¼ pounds (9 quarts)
or	
Milk, evaporated	9 No. 1 (14½-ounce) cans
Water, for milk	2 quarts

Directions.

(1) Add soup mix, corn, onions, and salt to boiling water.
(2) Bring to boiling point; cook 7 minutes.
(3) Reconstitute the powdered milk in the water.
(4) Add milk to mixture just prior to serving, and reheat.

See app. M for footnotes.

e. Navy bean soup.[11]

Yield: 6 gallons, 100 1-cup portions

Ingredients	*Amounts*
Navy beans, dried	5½ pounds (3¼ quarts)
Water, cold	To cover
Ham stock	5 gallons
Onions, chopped	1 pound (3 cups)
Ham bones (optional)	8
Cloves, whole (optional)	1 teaspoon
Flour (optional)	½ pound (1 pint)
Water, cold (optional)	1 quart
Pepper	2 teaspoons
Salt, if needed	4 ounces (½ coup)

Directions.

(1) Wash and soak beans in water to cover for 3 to 4 hours. Drain.
(2) Add ham stock, bones, onions, and clove.
(3) Heat to boiling. Simmer 2 to 3 hours. Remove bones.
(4) Blend together flour and water to a smooth paste. Stir into soup. Add pepper and salt, if needed. Reheat to boiling.

Variation: Bean soup with tomatoes. To above recipe add 1 No. 10 can (3 quarts) tomatoes to ham stock before simmering.

f. Onion soup (dehydrated).[11]

Yield: 6 gallons, 100 1-cup portions

Ingredients	*Amounts*
Onions, dehydrated	1 pound, 2 ounces (1¾ quarts)
Water, for onions	8 pounds (1 gallon)
Fat	2 pounds (1 quart)
Flour	½ pound (2 cups)
Bouillon cubes	70
Water, hot, (for bouillon stock).	5 gallons
Salt	3 ounces (6 tablespoons)

Directions.

(1) Stir onions into water and let soak 60 minutes. Cover.
(2) Heat to boiling. Let simmer 15 to 20 minutes or until tender. Drain and reserve liquid.
(3) Heat fat to frying temperature. Add reconstituted onions and cook until lightly browned. Stir frequently.

See app. M for footnotes.

(4) Add flour gradually to fried onions and stir until flour is well distributed.
(5) Dissolve bouillon cubes in water. Add reserved liquid.
(6) Add part of hot stock to thin out the onion-flour paste. Combine thinned paste with remainder of stock.
(7) Add salt and let simmer 60 minutes.

g. Vegetable soup (No. 1).[10]

Yield: 6¼ gallons, 100 1-cup portions

Ingredients	*Amounts*
Water	24 quarts
Carrots, dehydrated	10 ounces (¾ quart)
Potatoes, dehydrated	1 pound (1½ quarts)
Onions, dehydrated	6 ounces (¾ quart)
Salt	5 ounces (10 tablespoons)
Rice, dry	1 pound (1 pint)
Tomatoes, canned	2 No. 10 cans
Pepper	½ tablespoon
Bouillon cubes	72

Directions.
(1) Add dehydrated vegetables to water and soak 20 to 40 minutes. Bring gradually to the boiling point in a covered stockpot.
(2) Add salt, rice, tomatoes, pepper, and bouillon cubes and continue to simmer for 1 hour or until all vegetables are tender.

h. Vegetable soup [10] (No. 2).

Yield: 6¼ gallons, 100 1-cup portions

Ingredients	*Amounts*
Water	24 quarts
Meat and vegetable stew	15 30-ounce cans or 37 12-ounce cans
Tomato juice, canned	1 No. 10 can
Salt	4 ounces (8 tablespoons)
Pepper	¼ ounce (1 tablespoon)

Directions.
(1) Use large stockpot (10 gallons). Add water, meat and vegetable stew, tomato juice, and seasonings.
(2) Bring to the boiling point and simmer for 20 minutes.

See app. M for footnotes.

i. Vegetable chicken soup.[10]

Yield: 6 gallons, 100 1-cup portions

Ingredients	*Amounts*
Soup, chicken noodle, dehydrated.	4¾ pounds (1 No. 10 can)
Water, boiling	6 gallons
Salt	2½ ounces (5 tablespoons)
Tomatoes	1 No. 10 can
Onions, chopped	1½ pounds (1½ quarts)
or	
Onions, dehydrated	1½ ounces (12 tablespoons)
Lard (or fat drippings)	½ pound (½ pint).

Directions.

(1) Add all ingredients to boiling water.
(2) Bring to boil and cook 7 minutes.

j. Vegetable soup [11] (No. 3)

Yield: 6 gallons, 100 1-cup portions

Ingredients	*Amounts*
Beef stock	4½ gallons
Carrots, diced	3 pounds (2¼ quarts)
Celery, chopped	2 pounds (2 quarts)
Onions, chopped	2 pounds (1½ quarts)
Peppers, chopped	½ pound (½ quart)
Potatoes, diced	3 pounds (2 quarts)
Cabbage, chopped	2 pounds (2 quarts)
Tomatoes	12¾ pounds (2 No. 10 cans)
Salt	5 ounces (⅝ cup)
Pepper	½ ounce (1 tablespoon)

Directions.

(1) Heat stock in stock pot.
(2) Add diced carrots, chopped celery, and onions to stock and simmer until vegetables are almost tender.
(3) Add remaining ingredients and simmer about 30 minutes. If necessary, more water may be added.

See app. M for footnotes.

3. Bread.

a. Biscuit mix with nonfat dry milk [12]

Yield: 6½ pounds mixture, 100 portions

Ingredients	*Amounts*
Sifted flour	4 pounds (4 quarts)
Dry milk	¾ pound (3 cups)
Baking powder	½ cup
Salt	2 tablespoons
Fat	3 cups

Directions.

(1) Sift dry ingredients together three times, if possible, or mix ingredients thoroughly.
(2) Rub or cut in the fat.
(3) Store in tightly covered container until ready to use.

For making drop biscuits.

(4) Add enough water (about 1½ quarts) to the above dry mix to make a very soft dough.
(5) Drop by spoonfuls on ungreased baking sheet.
(6) Bake in hot oven (450° F.) for 12 to 15 minutes.

b. Cornbread.[11]

Yield: 24¾ pounds mixture, 100 portions

Ingredients	*Amounts*
Flour, sifted	5 pounds (1¼ gallons)
Sugar, granulated	2 pounds (1⅛ quarts)
Cornmeal	4¾ pounds (3½ quarts)
Baking powder	9 ounces (1½ cups)
Salt	1 ounce (2 tablespoons)
Milk	9 pounds (1⅛ gallons)
Eggs, beaten	1 pound 4 ounces (12 eggs)
or	
Eggs, powdered	4¾ ounces
and	and
Water	1¾ cups
Shortening, melted	2¼ pounds (1⅛ quarts)

Directions.

(1) Sift flour, sugar, cornmeal, baking powder, and salt together.
(2) Mix milk and water, add beaten eggs.
(3) Add milk and egg mixture to dry ingredients; partially mix. Add melted shortening, stir only until dry and liquid ingredients are combined. Avoid overmixing.
(4) Spread mixture in greased baking pans. Bake in hot oven (425° F.) about 25 to 30 minutes.

See app. M for footnotes.

c. Cornbread (with dried whole egg).[13]

Yield: 100 portions.

Ingredients	*Amounts*
Water	1½ cups
Dried whole egg	5 ounces (1¼ cups firm-packed)
Sifted flour	3 pounds (3 quarts)
Baking powder	4½ ounces (⅔ cup)
Sugar	10 ounces (1¼ cups)
Salt	3 tablespoons
Cornmeal	2½ pounds (7½ cups)
Milk	2½ quarts
Melted fat (or oil)	2½ cups

Directions.

(1) Add ¾ cup water to the dried egg; beat until smooth. Add remaining ¾ cup water and beat well.
(2) Sift flour, baking powder, sugar, and salt together twice. Add cornmeal and mix well.
(3) Combine milk and fat, or oil, with egg and add to dry ingredients.
(4) Pour into well-greased baking pans.
(5) Bake at 425° F. (hot) 30 to 40 minutes until brown.

4. Cereals.[11]

Cereal	Approximate quantity		Salt [a]	Water [b]	Cooking time		Serving size for 100 portions
	Weight	Amount			Steam jacketed kettle	Double boiler	
	Pounds	*Gallons*	*Tablespoons*	*Gallons*	*Minutes*	*Minutes*	*Cup*
Regular:							
Rolled oats	6	1¾	6	5	20	30–45	⅔
Wheat cereals	6	1⅛	6	5	20	30–45	⅔
Cornmeal	6	1⅛	6	6	20–30	60	¾
Hominy grits	6	1⅛	6	6	20–30	60	¾
Quick cooking:							
Rolled oats	6	1¾	6	4¾	5	5–10	⅔
Wheat cereals and whole wheat cereals	6	1⅛	6	4¾	5	5–10	⅔

[a] It may be necessary to increase the amount of salt.
[b] The amount of water needed may vary according to the method of cooking, the type of utensil used, and the length of the cooking period.

See app. M for numbered footnote.

Directions.

a. *Steam jacketed kettle.*

(1) Add salt to water; heat to boiling. Amounts of salt and water may vary according to the method of cooking, the type of utensil used, and the length of cooking period.

(2) Add cereal gradually, stirring to prevent lumping. Bring to a boil; reduce heat and simmer until thick, stirring occasionally to prevent lumping.

b. *Double boiler.*

(1) Place water in top of double boiler. Add salt. Heat to boiling.

(2) Stir in cereal gradually. Continue stirring until thickened.

(3) Place top of double boiler over bottom, filled to two-thirds capacity with boiling water.

(4) Cook without stirring until done.

c. *Variations in serving cooked cereals.*

(1) Hot cooked cereals may be served with milk and sugar. Raisins, chopped seeded dates, or chopped dried figs may be added to the cereal a few minutes before serving.

(2) Cooked cornmeal, oatmeal, or hominy grits may be fried. Pour the cooked cereal into well-greased pans to a depth of about 1 inch. Cool, cut into squares, and fry. If the squares are moist, dip in flour before frying. Serve with syrup or jelly.

5. Eggs.

a. Eggs are a protein food and must be cooked at low temperatures. High temperature toughens egg whites and darkens the yolks.

b. Boiled eggs.[10]

Yield: 100 portions

Ingredients	*Amounts*
Eggs	200
Water, boiling	To cover

See app. M for footnotes.

Directions.

(1) Place 100 eggs at a time in a large wire basket or other similar utensil with long handle.
(2) Lower basket into boiling water; reduce heat and simmer 3 to 5 minutes for soft cooked eggs and 12 to 15 minutes for hard cooked eggs.
(3) Remove from water. Plunge hard cooked eggs into cold water. If hard cooked eggs are to be used in salads or other dishes, remove shells immediately after plunging in cold water.

6. Vegetables.

a. Buttered carrots.[10]

Yield: 100 ½-cup portions

Ingredients	*Amounts*
Carrots, dehydrated	4 pounds (4½ quarts or 1½ No. 10 cans)
Water, cold (for carrots)	16 quarts (32 pounds)
Sugar, granulated	2 ounces (4 tablespoons)
Butter or margarine	1 pound (1 pint)
Salt	3 ounces (6 tablespoons)
Pepper	¼ ounce (1 tablespoon)

Directions:

(1) Soak carrots in cold water for 45 to 60 minutes.
(2) Bring slowly to boil, then simmer until tender.
(3) Remove from the stove; add the sugar, fat, salt, and pepper, and stir until thoroughly mixed.

b. Buttered sweetpotatoes.[10]

Yield: 100 ½-cup portions

Ingredients	*Amounts*
Sweetpotatoes, dehydrated	7½ pounds (10 quarts)
Water, cold	15 quarts
Salt	1 ounce (2 tablespoons)
Butter or margarine	2 pounds (1 quart)

Directions:

(1) Soak potato slices for 40 to 60 minutes.
(2) Slowly bring to a boil. This should require 40 to 50 minutes. It is important that the potatoes be tender and moist at this stage. Be sure to cook sufficiently.

See app. M for footnotes.

(3) Drain off and reserve the surplus water, add salt and fat, and mash by stirring vigorously.
(4) Place in large baking pan, add the surplus water which was previously drained off, stir, and bake for 20 minutes in a moderate oven.

c. Cole slaw.[14]

Yield: 100 ½-cup portions.

Ingredients	*Amounts*
Vinegar	1¼ quarts
Sugar	2 pounds (1 quart)
Celery seed (optional)	2 tablespoons
Salt	1 tablespoon
Pepper	2 teaspoons
Shredded cabbage	14 pounds (3½ gallons)

Directions.
(1) Combine vinegar, sugar, celery seed, salt, and pepper. Mix well.
(2) Stir vinegar mixture into shredded cabbage and allow to stand at least 10 minutes. Serve cold.

d. Diced beets and bacon.[10]

Yield: 100 ¼-cup portions.

Ingredients	*Amounts*
Beets	25 pounds
Water, boiling	To cover
Bacon, sliced, chopped	2 pounds
Vinegar	To taste

Directions.
(1) Remove beet tops about 3 inches from the beets, leaving tap root attached. Wash beets thoroughly without breaking the skin. If the skin is broken, juice will escape from the beets while cooking.
(2) Add enough boiling water to cover beets. Heat to boiling point; reduce heat and simmer 30 to 35 minutes or until tender. Drain; reserve liquid.
(3) Cool and remove stems and skins with fingers; slice.
(4) Fry bacon crisp. Add beets and heat through.
(5) Add salt and pepper; mix well.

See app. M for footnotes.

e. Pickled beets.[10]

Yield: 100 ¼-cup portions

Ingredients	*Amounts*
Beets, dehydrated	3½ pounds (4 quarts)
Water, cold (for beets)	12 quarts (3 gallons)
Onions, dehydrated	5 ounces (1 pint)
Water (for onions)	1½ quarts
Sugar, granulated	8 ounces (½ pint)
Salt	1½ ounces (3 tablespoons)
Pepper	¾ ounce (3 tablespoons)
Vinegar	1½ quarts

Directions.

(1) Soak beets and onions separately 20 to 40 minutes.

(2) Bring beets slowly to a boil and cook 15 to 20 minutes after they reach the boiling point. The 100-portion recipe should require 50 to 60 minutes total time, a smaller amount, 25 to 35 minutes.

(3) Bring vinegar to a boil and pour over the reconstituted onions, sugar, salt, and pepper. Drain the beets and add to the onion-vinegar mixture. Cool for 4 hours. Serve as cold as possible.

f. Simmered lima beans.[10]

Yield: 100 1-cup portions

Ingredients	*Amounts*
Beans, lima, dry	12 pounds
Butter or margarine	1½ pounds
Salt	¼ ounce
Pepper	¼ ounce

Directions.

(1) Wash beans thoroughly. Cover with cold water. Soak 3 to 4 hours. Drain and cover with fresh water.

(2) Cover and heat to boiling point; add salt, reduce heat and simmer until tender but not split or mushy. Drain.

(3) Add fat, salt, and pepper to beans and heat to serving temperature.

See app. M for footnotes.

7. Main dishes.

a. Baked beans.[14]

Yield: 100 1-cup portions.

Ingredients	*Amounts*
Navy beans	16 pounds
Boling water	4 gallons
Salt pork, sliced	3 pounds
Pepper	1 teaspoon
Brown sugar	2 pounds (4⅔ cups, well packed)
Dry mustard	¼ cup
Salt	4 ounces (½ cup)
Onion, chopped	1½ pounds (1 quart)
Molasses	1 quart.

Directions.

(1) Cover beans with water and boil 2 minutes. Remove from heat, cover, and let stand for 1 hour. (If more convenient, soak beans overnight.)
(2) Drain beans, and heat the drained liquid.
(3) Place half of beans in roasting pans.
(4) Cover beans with half of the slices of salt pork.
(5) Spread the rest of the beans over salt pork. Top with remaining slices of salt pork.
(6) Combine pepper, sugar, mustard, salt, onion, and molasses. Pour mixture over beans.
(7) Add the hot drained liquid. (Add water as needed to moisten the beans during baking.)
(8) Cover pans and bake at 300° F. (slow) for 7 to 8 hours.

b. Baked beans (canned) and bacon.[10]

Yield: 100 ⅔-cup portions.

Ingredients	*Amounts*
Beans, baked	4 No. 10 cans
Onions, chopped	1½ pounds (1½ quarts)
or	
Onions, dehydrated	2¼ ounces (1¼ measuring cups)
Catsup (optional)	1 quart
Bacon, sliced	4 pounds

Directions.

(1) Combine baked beans and catsup; pour into baking pans.
(2) Slice and fry bacon; fry onions in bacon grease; add onions and bacon grease to beans. Stir well. Place bacon strips on top of beans.

See app. M for footnotes.

(3) Bake in moderate oven (375° F.) about 40 minutes or until beans are hot.
(4) Beans may be heated on top of stove. Fry bacon and onions; add to beans. Stir occasionally.

c. Beef stew (using canned roast beef and gravy).[10]

Yield: 100 1-cup portions.

Ingredients	*Amounts*
Onions, dehydrated	8 ounces (1 quart)
Carrots, dehydrated	14 ounces (1 quart)
Potatoes, dehydrated	4 pounds (6 quarts)
Water (for vegetables)	13 quarts
Tomatoes, canned	1 No. 10 can
Roast beef and gravy, canned	27½ pounds (13 34-ounce cans)
Salt	4½ ounces (9 tablespoons)
Pepper	¼ ounce (1 tablespoon)

Directions.
(1) Soak carrots in water for 45 minutes. Bring slowly to the boiling point. Add potatoes. Combine with with tomatoes and onions and simmer until vegetables are tender but not mushy.
(2) Add meat and seasoning and heat to a serving temperature. Avoid stirring vigorously after meat has been added as it breaks up readily.

d. Baked frankfurters and rice.[15]

Yield: 100 ¾-cup portions

Ingredients	*Amounts*
Frankfurters (cut in ½-inch slices)	9 pounds
Tomatoes, cooked	1½ gallons
Green pepper, chopped (optional).	1¼ pounds (1 quart)
Onion, chopped	3 pounds (2 quarts)
Cheese, grated	4½ pounds (1⅛ gallons)
Rice, cooked	12 pounds (2 gallons)
Salt	1½ ounces (3 tablespoons)

See app. M for footnotes.

Directions.

(1) Combine all ingredients.
(2) Pour into greased baking pans.
(3) Cover and bake at 400° F. (hot) for 50 minutes. Uncover and bake 15 minutes longer or until green pepper and onion are tender.

e. Cheese bean loaf (with dried whole egg).[13]

Yield: 100 ⅓-cup portions

Ingredients	*Amounts*
Chopped onions	9 ounces (1½ cups)
Chopped celery	1½ pounds (1½ quarts)
Fat	6 ounces (¾ cup)
Water	2½ cups
Dried whole egg	8 ounces (2 cups firm-packed)
Cooked kidney or other beans, ground or mashed (about 4 pounds uncooked dry beans).	5½ quarts
Bean liquid	2 cups
Cheese, finely grated	5 pounds
Salt	3 tablespoons
Bread crumbs, soft	1½ pounds

Directions.

(1) Cook onions and celery in fat until celery is tender.
(2) Add 1¼ cups of the water to dried egg; beat until smooth. Add remaining 1¼ cups water and beat well.
(3) Combine remaining ingredients until well blended, adding bread crumbs last.
(4) Place in greased baking pans.
(5) Bake at 350° F. (moderate) 40 to 45 minutes.
(6) Serve with tomato sauce or with a relish such as cranberry sauce.

See app. M for footnotes.

f. Diced meat in gravy.[10]

Yield: 100 1-cup portions

Ingredients	*Amounts*
Onions, chopped	1 pound (1 quart)
or	
Onions, dehydrated	1½ ounces (12 tablespoons)
Meat or bacon fat	2 pounds (1 quart)
Flour, sifted	2 pounds (2 quarts)
Meat stock (hot)	2 gallons (8 quarts)
Milk, evaporated	8 14½-ounce cans
Water (for milk)	1 gallon (4 quarts)
Salt	2 ounces (4 tablespoons)
Pepper	¼-ounce (1 tablespoon)
Meat, cooked, diced	23 pounds
Bread or toast	200 slices

Directions.

(1) Cook onions slowly in fat until tender. Add flour and mix well.
(2) Add meat stock gradually. Heat to boiling point, stirring constantly.
(3) Mix milk and water. Add milk, salt, and pepper to hot onion mixture, heat to boiling point; boil about 3 minutes, stirring constantly. Remove from heat.
(4) Add cooked meat; reheat to serving temperature.
(5) Serve on bread or toast.

g. Macaroni and cheese.[16]

Yield: 100 ½-cup portions

Ingredients	*Amounts*
Elbow macaroni	4 pounds (1 gallon)
Boiling water	2 gallons
Salt	1 ounce (2 tablespoons)
Sauce	
Butter or margarine	8 ounces (1 cup)
All-purpose flour	8 ounces (2 cups)
Salt	3 ounces (⅓ cup)
Dry mustard	3 tablespoons
Hot milk	1¾ gallons
Cheese, grated	6 pounds (1½ gallons)

Directions.

(1) Cook the macaroni in boiling, salted water until just tender—about 15 minutes. Drain and rinse.

See app. M for footnotes.

(2) Make sauce: Melt fat and blend in the flour and seasonings. Stir into hot milk and cook until thickened. Add the cheese.
(3) Combine sauce and macaroni.
(4) Pour mixture into greased baking pans.
(5) Bake at 350° F. (moderate) for 45 minutes.

h. Macaroni with tomatoes and cheese.[10] [11]

Yield: 100 1½-cup portions

Ingredients	*Amounts*
Macaroni	8 pounds (2½ gallons)
Salt	1 ounce (2 tablespoons)
Water, boiling	8 gallons
Sauce	
Tomatoes or puree	2 No. 10 cans (6½ quarts)
Onions, chopped	2 pounds (2 quarts)
or	
Onions, dehydrated	3 ounces (1½ measuring cups)
Celery leaves (optional)	1 ounce
Sugar, granulated	6 ounces (¼ measuring cup)
Salt	3½ ounces (7 tablespoons)
Pepper	To taste
Butter or margarine	½ pound (1 measuring cup)
Cheese, shredded	4 pounds (4 quarts)

Directions.

(1) Break macaroni into 2- to 3-inch pieces.
(2) Add macaroni slowly to boiling salted water; boil 10 to 15 minutes or until macaroni is tender. Drain well.
(3) Combine tomato puree, sugar, onions, celery leaves, salt (3½ ounces), and pepper. Heat to boiling point; reduce heat and simmer 20 minutes.
(4) Add fat and cheese to hot tomato mixture; stir until cheese is melted.
(5) Combine sauce and macaroni.
(6) Place in baking pans. Bake in moderate oven (350° F.) 25 minutes.
(7) Noodles or spaghetti may be substituted for the macaroni.

See app. M for footnotes.

i. Noodles and buttered crumbs.[10]

Yield: 100 1½-cup portions.

Ingredients	*Amounts*
Noodles	12½ pounds
Salt	6 ounces (12 tablespoons)
Water, boiling	12½ gallons
Bread crumbs, dry	3 pounds (3 quarts)
Salt	1½ ounces (3 tablespoons)
Pepper	¼ ounce (1 tablespoon)
Butter or margarine, melted	3½ pounds (1¾ quarts)

Directions.

(1) Add noodles to boiling salted water; boil 10 to 15 minutes or until tender. Drain well.
(2) Mix bread crumbs, salt, and pepper; cook in melted fat until bread crumbs are brown.
(3) Mix bread and noodles together.

j. Salmon loaf (with dried whole egg).[13]

Yield: 100 ½-cup portions.

Ingredients	*Amounts*
Rice, uncooked	1½ pounds
Dried whole egg	1⅛ pounds (4½ cups firm-packed)
Water	1½ quarts
Milk	2 quarts
Salt	5 tablespoons
Salmon	10 No. 1 cans (8 pounds)
Lemon juice	½ cup
Lemon rind	1½ tablespoons
Green pepper, finely chopped (optional).	1 cup
Parsley, chopped (optional)	1 cup
Bread crumbs	2 quarts
Baking powder	3 tablespoons

Directions.

(1) Cook rice until tender in 1 gallon boiling water to which 3 tablespoons of salt have been added. Drain.
(2) Add 3 cups of water to the dried egg; beat until smooth. Add remaining 3 cups of water and beat well. Add milk and salt.
(3) Flake salmon and combine with salmon liquid, lemon juice and rind, green pepper, parsley, bread crumbs, and rice.

See app. M for footnotes.

(4) Mix baking powder with egg mixture, and add to other ingredients.
(5) Pour into greased baking pans, set in pans of hot water, and bake at 400 degrees F. (hot) 45 to 55 minutes.

k. Spaghetti tuna loaf.[17]

Yield: 100 1-cup portions.

Ingredients	*Amounts*
Spaghetti, broken into 2" pieces.	6 pounds, dry (1½ gallons)
Cheddar cheese, shredded	6 pounds (1½ gallons)
Evaporated milk	1¼ gallons
Eggs, slightly beaten	2½ pounds (20–25 eggs)
Salt	2 tablespoons
Pimiento, chopped (optional)	1½ cups
Onion, grated	1½ cups
Canned tuna, flaked but not drained.	5¼ pounds (2½ quarts)

Directions.
(1) Drop spaghetti into boiling salted water. Cook until tender. Drain and rinse.
(2) Melt cheese in the milk in top of double boiler.
(3) Add hot milk and cheese to the spaghetti. Stir in beaten eggs, seasonings, and tuna. Mix well.
(4) Pour into greased baking pans.
(5) Bake in moderate oven (350° F.) until a knife inserted in center comes out clean, 50 to 60 minutes.

l. Spanish rice.[10]

Yield: 100 1-cup portions.

Ingredients	*Amounts*
Tomatoes	4 No. 10 cans
Water	3 gallons
Onions, chopped	3 pounds (3 quarts)
or	or
Onions, dehydrated	4½ ounces (2½ measuring cups)
Peppers, green, chopped	2 pounds (2 quarts)
Salt	8 ounces (1 measuring cup)
Pepper	¼ ounce (1 tablespoon)
Rice, uncooked	12 pounds (6 quarts)
Cheese, shredded	9 pounds (9 quarts)

See app. M for footnotes.

Directions.

(1) Combine tomatoes, water, onions, peppers, salt, and pepper; heat to boiling point.
(2) Wash rice: drain thoroughly.
(3) Add rice to tomato mixture. Cover and heat to boiling point; reduce heat and simmer until rice is tender, stirring frequently.
(4) Remove from heat; add cheese. Stir until cheese is melted.

8. Desserts.

a. Peach crisp.[10]

Yield: 100 ½-cup portions

Ingredients	*Amounts*
Flour, sifted	½ pound
Shortening	2 pounds
Sugar, brown, packed	3 pounds
Salt	1½ ounces
Cinnamon	1 tablespoon
Rolled oats	2 pounds
Peaches, canned, sliced, drained.	4 No. 10 cans

Directions.

(1) Mix dry ingredients thoroughly.
(2) Place a 1-inch layer of drained sliced peaches in a greased pan and cover with a layer of the oatmeal mixture. Add another layer of peaches and top with a generous layer of oatmeal mixture.
(3) Bake (350° F.) 45 minutes.
(4) *Other fruits such as fresh and dried apples, cherries, or cooked dried apricots may be substituted for peaches.*

b. Applesauce (using dehydrated apple nuggets).[11]

Yield: 100 ½-cup portions.

Ingredients	*Amounts*
Apple nuggets, dehydrated	4 pounds (2 gallons)
Water, hot	3 gallons
Sugar	2½ pounds (1¼ quarts)
Cinnamon	½ ounce (2 tablespoons)

See app. M for footnotes.

Directions.

(1) Mix together apple nuggets, water, and sugar. Cover.
(2) Heat slowly, to boiling temperature, stirring occasionally.
(3) Let simmer 1 hour, stirring occasionally. Stir in cinnamon.
(4) A better product is obtained by continuous stirring during the cooking period.
(5) Nutmeg may be used in place of cinnamon, or spices may be omitted.

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Appendix F

DEHYDRATED AND DRIED FOODS [11]

A. *General*

1. Dehydrated foods.
   a. These are fresh foods from which water and the inedible parts such as peels, cores, seeds, and stems have been removed by manufacturing processes.
   b. When stored in airtight, moistureproof containers until ready to be used, dehydrated foods will keep well in moderate temperatures.
2. Dried foods.
   a. These are foods from which part of or virtually all water has been removed by air or other drying. Representative of these are dried fruits, such as raisins, apricots, or peaches; eggs; and cereals, such as ready-to-eat corn flakes, rice and wheat kernels, and brans.
   b. Dried foods do not require airtight and moisture-proof storage to the degree necessary for dehydrated foods. Dried foods, however, must be kept covered and at temperatures that will prevent spoilage.

B. *Preparation*

1. Dehydrated foods.
   a. Before cooking dehydrated foods, it is necessary to restore to them approximately the same amount of water, through absorption, that was originally re-

See app. M for footnotes.

moved in the drying process. This restoration process is termed rehydration or reconstitution.

b. Methods for rehydration and use differ among the various dehydrated food products. Directions furnished by the manufacturer of a dehydrated product should be followed for best results.

c. Most dehydrated vegetables need to be rehydrated by soaking in cold water just before cooking. They should be cooked in the water in which they have been soaked in order to retain their water-soluble vitamins and minerals.

d. Cook rehydrated vegetables in as little water as possible and until just tender. Additional seasonings may be needed.

e. Dehydrated packaged soup mixes are nourishing tasty, and can serve as a base for the addition of fresh or canned vegetables and meat.

f. Dehydrated carrots.
   (1) One pound of dehydrated carrots equals 12 pounds of raw carrots as purchased.
   (2) One pound of dehydrated carrots equals 7 pounds of raw prepared carrots.
   (3) Ratio of rehydration is 1 pound of dehydrated carrots to 8 pints of water.

g. Dehydrated potatoes.
   (1) One pound of dehydrated potato shreds, julienne, equals 10 pounds of raw unpeeled potatoes.
   (2) One pound of dehydrated potatoes equals 8 pounds of raw peeled potatoes.
   (3) One 5-gallon can dehydrated potato shreds, julienne, weighs 14 pounds and serves 200.
   (4) One No. 10 can of dehydrated potato granules weighs 6 pounds, 2 ounces, and serves 100.

h. Dehydrated onions.
   (1) Onions should rehydrate to practically their fresh form when the dehydrated product is barely covered by cold water and allowed to soak for 2 hours.
   (2) Dehydrated onions may be used dry where there is sufficient moisture in the food being prepared, such as in stews or soups.

(3) In preparing hamburgers, croquettes, or similar foods, onions should be covered with boiling water and soaked for 5 minutes or with cold water and soaked for 20 minutes.

(4) In using dehydrated onions in recipes where vinegar is also used, onions must be soaked in water first, since the acid in the vinegar retards rehydration.

(5) Ratio of dehydrated onions.

(a) One pound dehydrated onion flakes equals 10 pounds onions as purchased.

(b) One No. 10 can dehydrated onion flakes equals 2½ pounds.

(c) Ratio for rehydration 1 part dehydrated onion flakes to 8 parts water.

i. Dehydrated apples.

(1) One pound dehydrated apples equals 10 pounds raw apples as purchased.

(2) One No. 10 can dehydrated apples, pie type, equals 1¾ pounds.

(3) Ratio of 1 pound dehydrated apples, pie type, to 7 pounds of water.

(4) One quart dehydrated apples, pie type, equals 8½ ounces.

(5) One No. 10 can dehydrated apples, sauce type, equals 2¼ pounds.

(6) Ratio of 1 pound dehydrated apples, sauce type, to 7 pounds of water.

(7) One quart dehydrated apples, sauce type, equals 11½ ounces.

2. Dried foods.

a. Dried fruits.

(1) Dried fruits need not be soaked before cooking. Fruit should be rinsed and drained before cooking water is added. Sugar should be stirred in during the last 5 minutes of cooking.

(2) Directions for cooking.

Fruit	Weight in pounds	Water	Sugar	Method
Apples	9	To cover	None needed. Add 1 ounce to each pound of apples if desired.	Heat to boiling. Cook 40 minutes.
Apricots	9	do	Allow 2 ounces to each pound of apricots.	Heat to boiling. Cook 30–40 minutes.
Peaches	9	do	Allow 1 ounce to each pound of peaches.	Heat to boiling. Cook 35–45 minutes.
Prunes	11	do	None needed. Add 2 ounces to pound of prunes if desired.	Heat to boiling. Cook 45–60 minutes.

b. Dried whole eggs.

(1) General.

(a) Dried whole eggs may be used in place of fresh whole eggs, if care is taken in their reconstitution (liquefying) and cooking.

(b) After reconstitution, they must be treated the same as fresh eggs removed from the shell. They should never be allowed to stand for more than an hour unless refrigerated.

(c) In recipes where dry ingredients are sifted together, dried eggs may be mixed with the dry ingredients. The water required to reconstitute the egg *must* be added to the other liquid in the recipe.

(d) After opening, store unused powder in a tightly covered container in a cool place (not over 55° F.). Refrigerate if possible.

(2) Equivalents.

Dried whole egg +	Water =	Large fresh eggs
2 tablespoons	2–2½ tablespoons.	1.
1 cup (4 ounces)	1½ cups	10 (1 pint).
1 pint (½ pound)	1½ pints	20 (1 quart).
1½ quarts (2½ pounds).	3¾ quarts	100 (1¼ gallons).

(3) To reconstitute dried whole eggs.

(a) The directions for reconstituting should be followed exactly. Eggs may be reconstituted by hand or a mechanical mixer.

(b) Directions:

1. Sift powder before measuring or weighing.

2. Measure correct quantity of powder using standard measure.

3. Pour one-third of the water (cold or lukewarm) into the mixing container.

4. Add all of the egg powder at one time.

5. Blend and beat well to a smooth, thick paste. Add remainder of water and blend.

6. Strain mixture to eliminate lumps. An improvised strainer may be made by punching small holes with an ice pick or nail from the inside outward in the bottom of a No. 10-size tin can.

c. Cereals and other dried foods.

(1) The various methods of preparing dried foods, such as cereals and beans, are shown in appendix E preceding.

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Appendix G

WEIGHTS, MEASURES, AND EQUIVALENTS

A. *Abbreviations for Weights and Measures*

1.	tsp	teaspoon
2.	tbsp	tablespoon
3.	c	cup
4.	pt	pint
5.	qt	quart
6.	pk	peck
7.	oz	ounce
8.	lb	pound
9.	gal	gallon
10.	bu	bushel
11.	bbl	barrel

B. *Equivalent Weights and Measures* [18]

1. Dry or fluid measures.

Measure	*Equivalent*	*Weight*
3 teaspoons	1 tablespoon	½ ounce
2 tablespoons	⅛ cup	1 liquid ounce
4 tablespoons	¼ cup	2 ounces
5 tablespoons—plus 1 teaspoon.	⅓ cup	2⅔ ounces
8 tablespoons	½ cup	4 ounces
16 tablespoons	1 cup	8 ounces
2 cups	1 pint	16 ounces or 1 pound

See app. M for footnotes.

Equivalent	*Measure*	*Weight*
2 pints (4 cups)	1 quart	2 pounds
4 quarts (16 cups)	1 gallon	8 pounds
8 quarts	1 peck	
4 pecks (32 quarts)	1 bushel	

2. Fluid measures.

Measure	*Equivalent*	*Weight*
1 fluid quart	4 8-ounce cups	32 ounces
1 barrel		31½ gallons
2 barrels	1 hogshead	63 gallons

C. *Bulk Measures and Their Equivalents in Weight*

Measure	*Equivalent weight (approximate)*
1 bag rice or navy beans	100 pounds
1 sack flour, cornmeal, sugar	100 pounds
1 sack potatoes	100 pounds
1 bushel most root vegetables	50 pounds
1 crate cabbage	80 pounds
1 sack corn (100 ears)	55 pounds
1 bushel apples	48 pounds
1 box oranges (California)	70 pounds (176 count)
1 box oranges (Florida or Texas)	90 pounds (200 count)
1 box grapefruit (California)	68 pounds
1 box grapefruit (Florida or Texas)	80 pounds
1 box dried fruits	20–25 pounds
1 carton of chip butter or margarine	5 pounds (160 ½-ounce chips)
1 can shortening	50 or 100 pounds
1 bag salt	25 or 50 pounds
1 case eggs	30 dozen
1 tine peanut butter	25–50 pounds
1 tierce of lard	375 pounds

D. *Useful Weights and Their Equivalent in Measures*

Weight	*Equivalent measure*
1¼ pounds unsifted flour	1 quart (5 8-oz. cups)
2 pounds sugar	1 quart
1 pound grated cheese	1 quart
1 pound cocoa	1 quart
1¼ pounds raw macaroni	1 quart
2½ pounds rice	1 quart
1 pound rolled oats	1½ quarts (6 cups)
2 pounds dried beans	1 quart
2 pounds uncooked farina-type cereal	1 quart
1 pound baking powder	2½ cups
1 pound loaf bread	18 slices, ½-inch
2 pound loaf sandwich bread	36 to 40 slices, thin
1 pound butter	2 cups

Weight	*Equivalent measure*
1 pound coffee (coarse)	5 cups
1 pound cornmeal (coarse)	3 cups
1 pound cornmeal (fine)	4 cups
1 pound crackers (2-inch by 2-inch)	108 crackers
1 pound cube sugar	96 cubes
1 pound whole fresh eggs	9–11 eggs (2 cups)
1 pound whole dried eggs	4 cups
1½ ounces (2 tablespoons) whole dried egg plus 2½ tablespoons water.	1 large egg
1 ounce cheese	1 cube, 1-inch square
1 ounce jam	1½ tablespoons
1 ounce peanut butter	2 tablespoons

E. *Equivalent Substitutions* [18] [19]

1. Thickeners.	
a. 1 ounce flour	3½ whole eggs or 7 egg yolks
b. 1 ounce flour	1⅓ ounces minute tapioca
c. 1 ounce flour	¾ ounce breadcrumbs
d. 1 ounce flour	⅔ ounce cornstarch
2. Shortening.	
a. 1 pound butter or margarine	⅘ pound hydrogenated shortening
b. 1 pound butter or margarine	⅘ pound lard or oils
c. 1 pound butter or margarine	⅞ pound chicken fat
d. 1 cup butter or margarine	2½ cups 40 percent cream
e. 1 cup butter or margarine	5 cups 20 percent cream
f. 1 cup lard	1 cup plus 1½ tablespoons vegetable fat
g. 1 cup butter	⅞ cup lard (1 cup less 2 tablespoons)
3. Leaveners.	
a. ½ teaspoon soda	2 teaspoons baking powder
b. ½ teaspoon baking powder	1 egg white
4. Milk and cream.	
a. 1 cup coffee cream	⅘ cup milk plus ⅕ cup fat
b. 1 cup heavy cream	⅗ cup milk plus ⅖ cup fat
5. Chocolate and cocoa.	
a. 1 ounce chocolate	3 tablespoons cocoa plus 1 teaspoon fat

F. *Scoops and Ladles*

1. The number of the scoop indicates the number of level scoopfuls obtained from a quart. Servings will vary somewhat because scoops may be rounded by some and packed by others.

See app. M for footnotes.

Scoop size	*Level measure*
No. 6	⅔ cup
No. 8	½ cup
No. 10	⅖ cup
No. 12	⅓ cup
No. 16	¼ cup
No. 20	5⅓ tablespoons
No. 24	2⅔ tablespoons
No. 30	2⅕ tablespoons
No. 40	1⅗ tablespoons

G. *Content of Common Sizes of Cans* [20]

Can size	Number in case	Average weight	Average cupful
No. 300	24	15½ ounces	1¾ cups
No. 1 tall	48	16 ounces	2 cups
No. 303	24	16 ounces	2 cups
No. 2	24	20 ounces	2½ cups
No. 2½	24	29 ounces	3½ cups
No. 3 cylinder	12	46 fluid ounces	5¾ cups
No. 5	12	3 pounds 10 ounces	6½ cups
No. 10	6	6 pounds 9 ounces	12 cups

H. *Can Size Equivalents*

Can size	*Equivalent*
No. 10	7 No. 303 (1 pound) cans
No. 10	5 No. 2 (1-pound 4-ounce) cans
No. 10	4 No. 2½ (1-pound 13-ounce) cans
No. 10	3 No. 3 cyl. (46- to 50-ounce) cans

See app. M for footnotes.

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Appendix H

IMPROVISING EMERGENCY MEASURING UTENSILS FROM TIN CANS

A. *General*

1. When regular measuring utensils are unavailable, fairly accurate measuring can be accomplished by improvising utensils from emptied tin cans. After being prepared, the improvised utensils should be sanitized and marked with adhesive tape or paint for easy identification.

B. *Methods*

1. For small measures.[6]
   a. ¾ cup from No. 1 can.
      (1) Cut down each side of seam (strip should be 1 inch wide) to within two and one-half (2½) inches of the bottom.
      (2) Cut from seam of can around to other side of seam.
      (3) After removing sharp edges to prevent injury, bend seam over to make a handle.
   b. A 6-ounce concentrated fruit juice can equals ¾ cup.
   c. An 8-ounce can equals 1 cup.
   d. 1½ cups from a No. 2 can. (Follow directions under (1), (2), and (3) above.)
   e. 2 cups from a No. 2½ can.
      (1) Cut to within 2¾ inches of the bottom of the can.
      (2) Make handle as above.
2. For large measures.

See app. M for footnotes.

a. Use tin cans as follows: [20]

Size of can	*Approximate equivalent measure*
No. 303 cylinder	15 ounces or 2 cups
No. 2 can	18 ounces or 1 pint and 2 ounces or 2½ cups.
No. 2½ can	26 ounces or 1 pint and 10 ounces or 3½ cups.
No. 3 cylinder	46 ounces or 1 quart 14 ounces or 5¾ cups
No. 10 can	96 ounces or 3 quarts or 12 cups.

b. To permit portion control, a wooden handle of the desired length may be nailed to the seam of the measure for use as a serving dipper or ladle. This handle may be a broom handle, or a 1-inch thick piece of tree limb, or board cut to desired size.

See app. M for footnotes.

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Appendix I

EMERGENCY PASTEURIZATION OF MILK [18]

A. *Necessity*

1. All milk and cream not used in cooking must be pasteurized to destroy disease-producing organisms and harmful bacteria. The following emergency methods of pasteurization will make raw milk safe for drinking.

B. *Methods*

1. Method No. 1.

a. Equipment needed.

(1) Two containers, one larger than the other, of sizes adaptable to amount of milk to be pasteurized.

(2) An inverted perforated piepan or cake rack, to be placed on the top of the larger container as a rest for the smaller container.

(3) A thermometer reading to 170° F., or higher.

(4) A spoon or stirring paddle.

(5) Clean, sanitized containers for storing the pasteurized milk.

b. Procedure.

(1) Place water in the larger container. Bring it to the boiling point.

(2) Pour the raw milk or cream into the top section (smaller container). Place over the boiling water and heat the milk until it reaches a temperature of 160° F. Stir continuously.

See app. M for footnotes.

(3) Remove the container of milk from the heat and place it in running cold water in a sink, or in a container of ice and water, and cool to 50° F. The best flavor is obtained when the hot milk is cooled rapidly.

(4) If it is to be stored, pour the cooled milk into sterilized containers. Cover and keep cool either in very cold water or in a refrigerator.

2. Method No. 2.
   a. For use if no thermometer is available.
   b. Bring milk just to the boiling point, stirring continuously to prevent scorching. Remove from fire at once. *Do Not Boil Milk!*
   c. Cool quickly in a container that has first been sanitized, then cooled.
   d. Cover and place container in a pan of ice (if available) or in very cold water to cool.

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Appendix J

FEEDING FOR SPECIAL GROUPS

A. *General*

1. In any type of disaster, the feeding of groups requiring special diets or infant formulas should be carried out with the advice and guidance of authorized medical or nursing personnel.

B. *Children Under 2 Years*

1. In an emergency mass feeding situation, milk mixtures or formulas for babies should be given special consideration, both as to priority of supplies and sanitation precautions. The hazards from contaminated water and milk are greatly increased under conditions of disaster. Bacterial contamination can result from pollution of the public water supply, lack of facilities for sterilization and refrigeration, and improper preparation of formula and food by inexperienced volunteers.
2. If radiological contamination is suspected, assistance should be sought immediately from radiological personnel.
3. Substitutes for water.
   a. During an emergency, infant feeding should be given the use of uncontaminated water and milk supplies. The infants' need for water is more important because of the general reliance on concentrated milks in the absence of sufficient safe supplies of fresh fluid milk. If water is temporarily unavailable, other sterile fluids, such as bottled and

canned fruit liquids or carbonated water might be used in formulas.

4. Fresh milk equivalents.
   a. Because canned evaporated milk (unsweetened) is widely used in infant feeding under normal conditions, it is a familiar and acceptable food for use in making emergency formulas. One tall can (14½ oz.) contains the food equivalent of slightly less than 1 quart of fresh, fluid, whole milk. A daily allowance of 1 tall can per child under 2 years of age will meet requirements.
   b. When safe water for liquefying is available, dried whole milk is also satisfactory for emergency infant formulas. Four and one-half ounces (4½ oz.) of dry whole milk is equal to the solids in a quart of fresh whole milk.
5. Sugar for energy.
   a. Sugar or corn syrup is commonly added to infant formulas (*of dilute whole milk*) as an extra source of energy. If sugar or corn syrup is not available, an equal quantity of a more concentrated milk mixture may be substituted, provided the milk (if fresh, whole milk) is modified by heating so that a finely divided curd is formed in the stomach.
6. Warming milk.
   a. The usual practice of warming milk to body temperature before feeding the infant may not be possible in an emergency. Safe, unwarmed milk will not harm an infant in most cases, but it should be first given in small quantities to test its effects.
7. Children from 6 months to 2 years should receive the same quantity of whole milk as infants under 6 months, plus enough suitable and available staple foods to satisfy hunger.

C. *Daily Food Requirements for Children Under 2 Years* [21]

1. Period of or immediately following disaster.

Item	*Quantity per infant per day*
Water	1 quart
Milk, evaporated	1 tall can (14½ ounces)
Sugar	1 ounce
Crackers, soda	1 ounce
Cereal (wheat or rolled oats)	1 ounce

See app. M for footnotes.

2. Period following disaster and before complete return to normalacy.

Item	*Quantity per infant per day*
Water	1 quart
Milk, evaporated	1 tall can (14½ ounces)
Sugar	1 ounce
Cereal	½ ounce
Sieved meat or meat soup	1 3½-ounce can
Stewed meat or vegetable	1 4½-ounce can

3. Formulas.
   a. Formula No. 1.
      Using evaporated milk.
      4 ounces evaporated milk.
      1 tablespoon sugar or corn syrup.
      8 ounces water (boiled 5 minutes).
   b. Formula No. 2.
      Using fresh whole milk (pasteurized or boiled).
      8 ounces fresh whole milk.
      1 tablespoon sugar or corn syrup.
      4 ounces water.
   c. Either formula makes 6 feedings of 2 ounces each. Double the amount of ingredients for 6 feedings of 4 ounces each.
4. Procedures for making infant formulas.
   a. Equipment needed.
      (1) Pitcher or jar (1 quart).
      (2) Measure (1 quart).
      (3) Measuring cup marked in ounces.
      (4) Knife or spatula.
      (5) Long-handled stirring spoon.
      (6) Measuring spoon.
      (7) Funnel.
      (8) Can opener.
      (9) Bottle brush.
      (10) Towel.
      (11) Pot holders.
      (12) Tongs for handling bottles.
      (13) Baby bottles.
      (14) Nipples.
      (15) Nipple caps (metal, plastic, glass, or paper).
      (16) Kettle or other deep cooking utensil (9 inches high with tight-fitting cover and rack for bottles).

(17) Pan for washing bottles.
(18) Pan for rinsing bottles and utensils.
(19) Nipple jar.
(20) Detergent.

b. Improvised equipment.
(1) Vinegar or soft drink bottles (6-ounce). (Wide nipples will fit over standard 4½-ounce glass baby food jars.)
(2) 5-quart oil cans for sterilizers (may be obtained from gasoline station and must be thoroughly cleansed before use).
(3) Towels or lids of 5-quart oil cans to use as a rack.
(4) Pie pans or inverted kettles for cover.
(5) String, wrapping paper, absorbent cotton, or gauze to make nipple caps.

c. Ingredients.
(1) Evaporated milk or fresh, pasteurized.
(2) Cane sugar or syrup.

d. Directions for making formulas (oil can technique).
(1) Wash and rinse all utensils. Use bottle brush to scrub bottles and nipples in hot, soapy water.
(2) Rinse in hot, clear water; squeeze water through nipple holes, and let drain. *Do not wipe.*
(3) Assemble formula ingredients.
(4) If evaporated milk is used, wash top of can with soap and water and rinse with hot water before opening.
(5) Measure required amounts of each ingredient into saucepan, pitcher, or other container. Stir or beat until thoroughly mixed and dissolved.
(6) Pour required amounts into bottles.
(7) Place nipples on bottles. Cover with metal, plastic, or glass nipple caps (do not tighten caps), or by other covering such as clean brown wrapping paper, waxed paper, absorbent cotton, or gauze.
(8) Place a rack or towel in the bottom of the kettle or other sterilizing container. If a 5-

quart oil can is used, the top may be made into a rack by cutting inch-wide sections at four places evenly spaced around the edge and turning them under. A pie tin or inverted kettle that fits properly may be used as a lid.

(9) Place bottles on rack in the container for sterilization. Arrange to prevent tipping or spilling.

(10) Put 2 or 3 inches of cold water in the bottom of the container until water is halfway up the bottles. Cover.

(11) Bring the water to a boil. When it starts to boil, note the time. Simmer gently for 25 minutes. *Time accurately.* After the water has simmered for 25 minutes, set the container off the stove. Leave the lid on. Do not remove until cool to the touch.

(12) Remove bottles, tighten the nipple caps (if glass, plastic, or metal), label, and refrigerate. If refrigeration is inadequate, suitable facilities must be improvised or the formula must be used immediately after preparation.

D. *Infant Formula Mixtures*

1. It is important to keep emergency milk mixtures or baby formulas as near the preemergency proportions as possible. The formulas should be made up under strictly sanitary conditions and kept refrigerated. If refrigeration is not available, suitable facilities must be improvised or the formula must be used immediately after preparation.
2. All opened milk left from formula making should be sent to feeding centers for use and not used for subsequent infant feeding.

E. *Expectant and Nursing Mothers*

1. One quart of fresh whole or skim milk, or its equivalent in evaporated or dried milk, plus the full food allowances for other adults is recommended for nursing mothers.
2. If supplies are adequate, the same quantity of fresh whole or skim milk, or milk equivalent, is recommended for expectant mothers.

F. *Recommended Milk Ration in Emergency* [21]

Groups (in order of priority)	Where supplies are extremely limited per person per day	Where supplies are moderately limited per person per day
	Can	*Can*
Infants under 1 year [a]	1	1
Children 1 to just under 2 years	1	1
Sick children 2 to 9 years	1	1
Women in last half of pregnancy	1	1
Women in first half of pregnancy	None	1
Well children 2 to 9 years	½	1
Sick persons over 10 years	½	½
Well children 10 to 14 years	None	½
Well children 15 to 19 years	None	½

[a] Mothers of breast-fed infants should receive the infant's ration of milk.

G. *High Protein Feeding* [23]

1. High protein supplementary feedings may be required for convalescents and for patients with extensive surgery or severe burns. The following recipes supply approximately the same amount of protein per ounce of feeding or about 150 grams (5 ounces) per quart.
2. Recipes.
   a. Feeding No. 1.
      (1) 3 cups nonfat dry milk (dry skim milk).
      (2) 3 cups fresh whole milk.
   b. Feeding No. 2.
      (1) 3¼ cups nonfat dry milk (dry skim milk).
      (2) 1 (14½ ounces) can evaporated milk.
      (3) 14½ ounces water.
3. For patients who dislike the taste of milk, flavorings such as vanilla, cocoa, or coffee sirup may be added.
4. Procedure.
   a. Measure the liquid milk into a bowl or glass jar.
   b. Measure the dry milk powder and sprinkle over the liquid milk.
   c. Stir with a spoon or fork, or shake in the covered glass jar. (A rotary egg beater or wire whip is generally used but may not be available in a disaster.)

See app. M for footnotes.

d. Allow foam to settle.

e. Refrigerate.

H. *Salt and Soda Solution*

1. Salt and soda solution is not a preparation for mass feeding, but feeding teams may be asked by physicians to prepare the solution for their patients, such as those with severe burns. Although the solution is simple to make, *proportions must be correct.* A recipe for the solution follows:

	For 1 quart	*For 24 quarts*
Stir:	1 teaspoon salt and	½ cup salt and
	½ teaspoon baking soda into	¼ cup baking soda into
	1 quart of water	6 gallons of water

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Appendix K

CHECKLIST FOR SANITARY OPERATION OF A FEEDING FACILITY

A. *Has the assistance of health officials in checking the facility been requested?*

B. *Health Requirements*

1. Are workers free from infectious disease?
2. Are workers' hands or other exposed parts of the body free from cuts or sores?
3. Are clean washable clothing or uniforms worn by workers?
4. Are workers' hands washed thoroughly and frequently, always after using toilet?
5. Are workers' fingernails kept clean?

C. *Kitchen, Dining Area, or Storage Place*

1. Is ventilation good?
2. Are doors and other openings covered with insect screens?
3. Are floors clean? Are they cleaned after food preparation and service, not during these operations? If a dirt floor is used, is it raked daily and kept dry? Can floor covering or racking be installed?
4. Is lighting adequate?

5. Are the worktables, serving counters, and shelves kept clean and dry?
6. Are refrigerators kept clean and is refrigerated food stored properly?
7. Is the outside area kept clean and free from debris?

D. *Cooking and Eating Utensils*

1. Are utensils thoroughly washed, sanitized, air-dried, and stored in clean place after each meal?
2. Are utensils protected from dust?
3. Are utensils free from chips or cracks and easily cleaned?

E. *Water Supply* [24]

1. Is the water source and method of handling throughout the feeding facility checked by proper authorities?
2. Is water supply convenient to points of use and properly stored?
3. Is water chlorinated, boiled, or otherwise disinfected?

F. *Refrigeration*

1. Is food refrigerated to prevent spoilage? (If refrigeration is inadequate or food has to be kept for any time, avoid serving such perishables as cream sauces, mixed salads, hamburgers, bread puddings, custards, meats, poultry stuffing, and similar foods.)
2. Are leftover cooked foods discarded when refrigeration is inadequate?
3. Is only enough food for present use prepared?

G. *Protection of Food Supply*

1. Are foods protected from dust, flies, rodents, vermin, and other sources of contamination?
2. Are food supplies properly covered and stored?
3. Are food supplies handled from receipt to preparation in a sanitary manner?
4. Are paint, chemicals, and insecticides stored at safe distances from the food?
5. Are meat and meat products kept in good condition, and only Government-inspected meats and meat products used when possible?
6. Are canned goods with breaks or bulges in can discarded?
7. Is all fluid milk pasteurized?

See Appendix M for footnotes.

H. *Dish and Utensil Washing Facility*

1. Is hot water (100° to 212° F.) available for washing and sanitizing utensils?
2. If hot water is unavailable, are dishes and utensils sanitized by chlorination or other disinfection?
3. Are cleaning agents (detergents, soaps, powders) in ample supply and properly used?
4. Are racks for air-drying and storage in ample supply and kept clean?
5. Is use of dish towels kept to absolute minimum?

I. *Handwashing Facility*

1. Are handwashing facilities adequate and convenient?
2. Is a separate handwashing facility convenient for food workers?
3. Are soap and paper towels provided?

J. *Toilets, Standard or Improvised*

1. Are they properly constructed and separately located for food workers and for others at the feeding site?
2. Are they maintained in a sanitary manner?
3. Are they stocked with an adequate supply of toilet paper?
4. Are handwashing facilities provided and employees directed to use them by prominently posted signs?

K. *Garbage and Refuse Disposal*

1. Are garbage cans free from leaks? Do they have tight-fitting covers? Are they properly cleansed?
2. Is garbage separated into burnable and nonburnable waste, and taken from feeding station daily?

L. *Has water, food, and milk been checked for radiological contamination?*

M. *Are first-aid kits readily available?*

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Appendix L

SAFETY PRACTICES FOR FOOD WORKERS [7]

A. *To Prevent Burns*

1. Turn handles of utensils away from edge of the stove to prevent tipping and spilling hot liquids.
2. Put out grease fires in frying pans by clamping a tight lid over flame to shut out air. Do not use water!
3. Use well-padded, dry pot holders to handle hot pans or lids.
4. Use tongs or gloves to protect hands and arms when removing food from oven.
5. In taking lids off kettles, lift the lid slowly, further edge first to permit steam to escape away from arms and face.
6. Avoid using flammable cleaning fluids. If they must be used, use them out of doors. Always be sure they are stored properly and away from fires.
7. Keep matches in covered cans and provide a metal container for burned matches.

B. *To Prevent Cuts*

1. Provide a safe place for sharp knives. Do not place in drawers with other kitchen equipment.
2. Wash sharp knives by themselves. Do not put in dishpan with other utensils.

See app. M for footnotes.

3. Use broom and dustpan to pick up broken glass. Wrap and place glass in a special container.
4. Use can opener that leaves a turned edge in cutting.

C. *To Prevent Falls*

1. Clean up any spilled grease, water, or food immediately.
2. Use a sturdy stepladder. Do not stand on chairs, stools, or tables.
3. Keep passageways and stairs clear of boxes, brooms, mops, and other obstructions.
4. Provide adequate lighting at steps.
5. Wear comfortable, low-heeled shoes.

D. *To Prevent Injury by Mechanical or Electrical Equipment*

1. Do not touch electrical outlets or equipment with wet hands or while standing on wet floor. Disconnect all electrical equipment before cleaning it.
2. Demonstrate or have demonstrated the proper use of mechanical and electrical equipment, such as coffee urns, pressure cookers, electric mixers, water heaters, and meat slicers.
3. Replace worn or damaged electrical accessories, such as cords and plugs, as soon as wear or damage is apparent.

E. *To Care for Injury*

1. Always have a standard first-aid kit available; inform workers about its location and uses; and require them to use it.

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Appendix M

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