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WAR DEPARTMENT TECHNICAL MANUAL

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THE ARMY COOK

WAR DEPARTMENT • AUGUST 1946

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TECHNICAL MANUAL

THE ARMY COOK

CHANGES No. 2

DEPARTMENT OF THE ARMY
WASHINGTON 25, D. C., *17 December 1952*

TM 10-405 28 August 1946, is changed as follows:

239. Kitchen Truck

The kitchen truck * * * (See fig. 107①.) Rescinded. For information on the kitchen truck see C 1, TM 10-402.

a. Truck equipment. Rescinded.

b. Equipping the truck with a fly tent. Rescinded.

c. Installing lighting equipment. Rescinded.

* * * * * * *

[AG 300.7 (29 Oct 52)]

BY ORDER OF THE SECRETARY OF THE ARMY:

J. LAWTON COLLINS
Chief of Staff, United States Army

OFFICIAL:
WM. E. BERGIN
Major General, USA
The Adjutant General

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TAGO 1985A—Dec. 200480°—52

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W1.35:10-405/3/ch. 2.
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TECHNICAL MANUAL

THE ARMY COOK

CHANGES No. 3

DEPARTMENT OF THE ARMY
WASHINGTON 25, D. C., *15 September 1953*

TM 10-405, 28 August 1946, is changed as follows:

Figure 7 ① and ② is rescinded.

22. Cook's Work Sheet

(Superseded)

a. General. The Cook's Work Sheet (DD Form 407) 1 June 1953, is designed to assist mess personnel in scheduling the daily menu by setting forth information as to items to be prepared, quantity, recipe, special instructions, and other information pertinent to the preparation and serving of meals. Properly used, the cook's work sheet will insure that the basic precepts of mess management are followed in the operation of the mess.

b. Preparation Instructions. DD Form 407 will be prepared daily by the mess steward in all messes operating on a field ration basis. It will be posted in an accessible place so that all mess personnel may refer to it. Specific instructions for its use are as follows:

(1) *Column a.* Under this column list all food items in proper menu sequence to be served at the specific meal including "leftovers" from previous meals.

(2) *Column b.* Indicate in this column the quantity to be prepared. This quantity will be based on the number of persons indicated in the "number to prepare for" column (k) located in the lower left corner of the cook's work sheet. Food will not be prepared when it is known from experience to be above the required amount.

(3) *Column c.* Show the recipe number appearing in either the Master Menu, SB 10-260, or in TM 10-412.

(4) *Column d.* Instructions in this column should be brief, clear, and specific. Do not repeat previous reference to recipes in this column. When other recipes have been authorized they will be attached.

(5) *Column e.* In this column state the actual time that preparation of the particular food item is to start. For example, if hot biscuits are to be served, indicate in *column e* the time mixing of ingredients is to start.

(6) *Column f.* In this column indicate the time actual cooking will start.

(7) *Column g.* The mess steward will indicate in this column the size of portion to be served each individual. Where the item is "pork chops" the portion will be in number of chops; milk in liquid measure etc.

(8) *Column h.* Indicate quantity of "leftovers" by unit, i. e., pounds, quarts, etc., of edible food items. Bones, and other inedible waste will not be entered either in this *column* or in *column i* as described below.

(9) *Column i.* Quantity of "leftovers" discarded (does not include plate waste) will be indicated in the appropriate unit, i. e., pounds, quarts, etc.

(10) *Column j.* The mess steward will indicate in this column any comments such as favorable or unfavorable remarks on the quality of prepared food, reasons for portion shortage and excessive leftovers, etc.

(11) *Blocks k, l, and m.* The blocks k, l, and m at the bottom of the cook's work sheet are self-explanatory and will be completed accordingly.

239. Kitchen Truck

The kitchen truck * * * (See fig. 107①.) Rescinded by C 2, 17 December 1952. For information on the kitchen truck see C 1, TM 10-402.

a. Truck equipment. Rescinded by C 2, 17 December 1952.

b. Equipping the truck with a fly tent. Rescinded by C 2, 17 December 1952.

c. Installing lighting equipment. Rescinded by C 2, 17 December 1952.

* * * * *

[AG 300.7 (29 Oct 52) (27 Apr 53)]

*These changes supersede C 2, 17 December 1952.

BY ORDER OF THE SECRETARY OF THE ARMY:

M. B. RIDGWAY,
General, United States Army,
Chief of Staff.

OFFICIAL:

WM. E. BERGIN,
Major General, United States Army,
The Adjutant General.

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Army Reserve: Same as Active Army except one copy to each unit.

For explanation of distribution formula, see SR 310-90-1.

TAGO 974A

U. S. GOVERNMENT PRINTING OFFICE: 1952

WAR DEPARTMENT TECHNICAL MANUAL

TM 10-405

This manual supersedes TM 10–405, 24 April 1942, including C 2, 18 June 1943; and C 3, 2 February 1944; TM 10–406, 22 November 1943, including C 1, 14 December 1944; TM 10–411, 5 October 1943; TB QM 10, 28 April 1944; TB 10–405–1, 2 March 1944; TB 10–405–2, 29 April 1944; TB 10–406–1, 6 March 1944; and SB 10–122, 8 September 1944.

THE ARMY COOK

WAR DEPARTMENT • AUGUST 1946

United States Government Printing Office
Washington: 1946

WAR DEPARTMENT

WASHINGTON 25, D. C., 28 AUGUST 1946

TM 10–405, The Army Cook, is published for the information and guidance of all concerned.

[AG 300.7 (3 Jul 45)]

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Major General
The Adjutant General

DWIGHT D. EISENHOWER
Chief of Staff

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Refer to FM 21–6 for explanation of distribution formula.

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CHAPTER 1

GENERAL

1. IMPORTANCE OF FOOD TO HEALTH. "Food makes the man." The Army cook prepares the American soldier's food. If he prepares it well, the soldier will eat food that gives him the nutrition he needs. If the cook prepares it without wasting either the food or its nutritional value, the soldier will have all that he needs to satisfy his appetite and to keep him in sound health and fighting trim. If the Army cook fails, he has taken away from the soldier the food that he requires. A ration is issued to each soldier. This is sufficient for his daily requirements, but each soldier depends upon some particular Army cook to make that ration into appetizing, healthful, and invigorating meals.

2. COOKING MAKES THE DIFFERENCE. The experiences of our Armed Forces have proved that well-cooked food has an important bearing on health and morale. Soldiers must be fed properly, during peace as well as war, in garrison and in the field. Although many courageous deeds have been performed on short rations, it is necessary for soldiers to have enough of the right kinds of food, made into well-cooked meals, for efficiency and endurance through combat. The spirit vital to victory is maintained by food. The disgruntled soldier is a menace to his unit. Well-cooked food is one of the chief means of keeping men contented and alert under the pressure of Army life.

3. WHAT MAKES A SUCCESSFUL ARMY COOK. The successful Army cook is a soldier who prepares food well, serves it properly, and takes pride in his work. His reward is the satisfaction of the men in his mess and his own personal satisfaction in work skillfully done. A good Army cook has imagination and enthusiasm; he is never satisfied with just "getting by"; he is constantly looking for better ways of preparing and serving food. A poor cook can spoil the best food in the mess hall, while a successful cook can make the most ordinary food taste good.

4. HOW TO ACHIEVE SUCCESS. **a.** The first step up the ladder of cooking success is learning the *reasons why*. There are reasons why butter and onions should not be stored together, why eggs are cooked at a low temperature and potatoes at a high temperature, why vegetables should not be overcooked, why meat is better when baked in a slow oven and biscuits in a hot oven. Every detail of cooking has its reasons. (See ch. 5.)

b. The second step is learning to use the recipe. No one can carry in his head recipes for the dozens of menu dishes prepared during a month. Use TM 10–412, constantly. If the amount of ingredients and methods of combining them are followed, results should be uniformly good. After a recipe has been prepared successfully as it is written, liberties may be taken with the seasoning and garnishing. Experiment only if you are experienced in the practice of cooking and know that the changes will be acceptable to the men who eat the food. Vary the ways of preparing foods by selecting recipes which call for different methods of cooking: boiling, broiling, baking, stewing, frying. Alternate these methods. A deep fat fried potato tastes entirely different from a mashed potato; a baked biscuit is quite unlike a dumpling. Recipes will suggest many ways of varying the common foods as well as ways of preparing those less often used.

c. The third step is learning to serve. The good cook dresses up his meal in the serving. The appearance of the food can create appetite appeal. The appearance can be so enticing that the anticipation of eating the food will cause the gastric juices to flow and thereby create better digestion. Poor serving can ruin the best prepared meal. Good

meals can be ruined by allowing hot foods to cool before serving, or by serving too large or too small helpings, or by throwing foods on the dish rather than carefully serving them.

5. CHOICE OF TOOLS. All mess kitchens are supplied with equipment adequate for the preparation of good meals. Some may have the minimum number of tools; others may have mechanical potato peelers, toasters, meat slicers and the like. Whatever the equipment, a good cook must be familiar with each piece and see that it is used and cared for properly. He understands that certain utensils are right to use for the recipe he is preparing. Potatoes mashed in too large a kettle will get cold more quickly than when the heat is confined to a smaller space. If eggs are beaten in too large a pan, there will be more waste than if the pan is the right size. Paring can be done more quickly with a small knife than with a large one. A large spoon is better than a small spoon for preventing lumps in gravy. The success of the recipe depends in part on the choice of utensils. The care of equipment is discussed in chapter 8.

6. ARMY COOK. Cleanliness and good health are essential requirements for the Army cook. No one wants to eat food prepared by a cook who is not clean and physically well. The men eating the meals conclude that a cook with a dirty appearance has produced meals that are unclean. They know that if the cook is ill or has any infection he may spread disease germs through the food. The Army cook must be clean and he must look clean. A good check list for the Army cook should include the following:

a. Physically fit
b. Clean shaven
c. Short hair cut
d. Clean hands and nails
e. Clean clothes and cap
f. Careful cooking and serving
(1) Use special spoon for tasting
(2) Handle food with fork or spoon
(3) Use clean cloths
(4) Time food preparation accurately
(5) Serve food attractively

7. ARMY COOK AND ARMY MEALS. When the men file into the mess hall, their attitude toward the meal is formed as soon as they look at the food on the counter or table. If it looks good and smells good, they are ready to enjoy it and speak well of the cook. If it looks worn out, if the meat is dry and the salad wilted, the men make up their minds not to like it even before they taste anything. Their comments about the cook are descriptive although not complimentary. The cook's first responsibility is the food on the range, but a further responsibility is the way it is served. Garnishing improves the serving. A smart cook enjoys seeing food look tempting. He knows that this makes for better morale, good appetites, and less waste—all of which help in making soldiers better fighting men.

CHAPTER 2

FOOD—NUTRITION—HEALTH

8. GENERAL. Food provides fuel, material for growth and repair, and the special things like vitamins which are necessary for good nutrition. To obtain everything needed for vigorous health, a variety of foods must be eaten, because each food has a special duty. To be well physically, a soldier must have sufficient kinds and sufficient quantities of the right foods. There is no *one magic food* that will keep people well. Just as salt and vinegar look different and taste different, so the food value of one food differs from another. Each food has its own specific nourishment value even though the various nourishments cannot be detected by their taste or appearance. Food is eaten; then during the process of digestion, food is changed so that it can be absorbed by the blood and carried to every part of the body. Certain foods give heat and energy, others build bones and teeth, others manufacture soft tissues (muscles, flesh, heart, lungs, etc.) and still others supply the vitamin necessary to make the human machine run.

9. CLASSIFICATION OF FOODS. Each food that a soldier eats can be classed in one of three general groups according to the work that it does in the body. Tables I and II lists foods found in each group, the method of cooking each one, and the proper way to store it. Proper cooking and storage are essential to preserve the nutritional values of the foods. Every meal should include food from the three groups.

These are:

a. *Energy foods* to provide heat and energy. Carbohydrates and fats are the chief energy producing foods. The carbohydrates are the starches and sugars, bread, macaroni, candy, pastry, and similar foods. The fats are found in such foods as butter and salad oil.

b. *Building foods* to build up and repair body tissues. The proteins are also energy producing foods, but their primary function is in body building. Meat and eggs are examples of foods containing protein.

c. *Protective foods* supply the special substances necessary to keep the body healthy. Fruits and vegetables and certain animal foods such as butter are examples of these protective foods.

10. THE COOK'S COURSE IN NUTRITION.

a. Definition. Nutrition is the science of nourishing the body properly. This means providing the body with its required amount of energy, building and protective foods and the special substances such as vitamins. The requirements differ with the ages of people, their activities, their sex, and their physical make-up.

b. Energy or Fuel Foods. An automobile having eight cylinders and driven every day at 60 miles an hour uses more gasoline than one with four cylinders, driven every day at 25 miles an hour. A soldier on heavy duty needs more energy food than one doing desk work. The energy that food yields when burned in the body is measured in calories. A *calorie* is the unit used to measure the amount of heat or energy released from food when it is used up in the body. Scientists have measured the number of calories of heat available from 1 pound of each food. They have found, for example, that the heating power or energy value of 1 pound of sugar is high and that the energy value of 1 pound of cabbage is low. Therefore, sugar is classed in the Energy Group. Cabbage is an example of a food which has little energy value but is high in vitamins and minerals. Other foods are classified in the same way according to the work that they do.

c. Building Foods. (1) A body is built with different materials just as an airplane is manufactured from various metals. The foods which primarily supply a person with the essentials for growth and repair are called proteins. Proteins are made up of a number of "building stones" which scientists have named *amino acids*. Foods containing all the building stones needed for growth are called *complete protein foods*. In cookery terms they are milk, meat, eggs, fish, and cheese. These foods yield some heat and energy, but, since their main work is to build and repair, they are called building foods.

(2) Minerals are included in the Protective Foods Group, but they are also building foods because the body is a bony framework and requires minerals to build and maintain it.

d. Protective Foods. After an airplane is built it needs fuel to make it fly, and grease, oil, and water or air to keep the motor running smoothly.

Just so the body, having been provided with energy (fuel) foods and building-repair foods, needs other foods to keep it in Grade A condition. The other foods contain vitamins, minerals, and fiber; they are classified in the Protective Group.

e. Vitamins. (1) *General.* In addition to the work done by the three groups of foods, the body also needs certain substances called vitamins. Vitamins are absolutely necessary for normal growth and maintenance of health. If enough of the right

Table I. Energy foods and building foods

ENERGY FOODS

Food	Method of cooking	Storage
Carbohydrates		
Cereals		Cool, dry
dry breakfast cereals	Boiling	
hot breakfast cereals		
Flour and flour products		Cool, dry, well-ventilated racks
bread, all kinds	Baking	
crackers		
hot breads	Baking	
biscuits		
corn bread		
griddle cakes		
muffins		
pan bread		
popovers		
waffles		
macaroni, noodles, spaghetti	Boiling	Cool, dry
Sweets		
cake	Baking	Cool, dry, ventilated
candy		Cool, dry
cookies	Baking	Cool, dry, ventilated
honey		Cool, dry
ice cream	Freezing	Refrigeration
molasses		Cool, dry
pastries	Baking	Cool, dry
puddings	Boiling and baking	Refrigeration
sweet sauces	Boiling	
syrups		Cool, dry
sugars		Cool, dry
Fruits, canned or cooked w/sugar	Simmering or uncooked	Refrigeration after opening or cooking
Fats		
Butter	Used in cooking other foods	Refrigeration
Chocolate		Refrigeration
Cream		Refrigeration
Lard		Refrigeration
Margarine		Refrigeration
Meat fat		Refrigeration
Salad oil		Refrigeration
Salt pork		Refrigeration
Suet		Refrigeration
Nuts		Cool, dry

BUILDING FOODS

Food	Method of cooking	Storage
Proteins		
Cheese	Low temperature	Refrigeration
Eggs	Low temperature	Refrigeration
Fish	Low temperature	Refrigeration
Legumes	Boiling and simmering	Cool, dry
Meat and poultry	Low temperature	Refrigeration
	Roasting, simmering	
	Frying, broiling	
Milk	Low temperature	Refrigeration
Nuts		Cool, dry

Table II. Protective foods

Food	Method of cooking	Storage
Cereals, whole grain or restored		
dry		Cool, dry
hot	Boiling	Cool, dry
Flour, enriched	High temperature	Cool, dry
Fruits	Eaten raw, canned or cooked by simmering	
apples		Cool, dry
apricots		Ventilated or Refrigeration
avocados		
bananas		Room temperature
berries		Refrigeration
cantaloupe		Refrigeration
cherries		Refrigeration
cranberries		Refrigeration
dates		Cool, dry
figs		Cool, dry
grapefruit		Refrigeration
grapes		Refrigeration
lemons		Cool, dry
limes		Cool, dry
melons		Refrigeration
oranges		Refrigeration
peaches		Refrigeration
pears		Refrigeration
pineapple		Refrigeration
plums		Refrigeration
prunes		Cool, dry
raisins		Cool, dry
rhubarb		Cool, dry
tomatoes		Refrigeration

Table II. Protective foods (continued)

Food	Method of cooking	Storage
Dairy products	Low temperature	Refrigeration
butter		
milk, fluid, evaporated, powdered		
Vegetables		
green and yellow	Use as little boiling water as possible and cook only until tender. Use cooking water on vegetables or in soup or sauce	Cool, dry
asparagus	Boiling or steaming	Cool, dry
beans, string	Boiling	Cool, dry
beet greens	Boiling or steaming	Cool, dry
broccoli	Boiling or steaming	Cool, dry
brussels sprouts	Boiling or steaming	Cool, dry
cabbage	Boiling or steaming	Cool, dry
carrots	Boiling or steaming or eat raw	Cool, dry
chard	Boiling or steaming	Cool, dry
chicory	Eat raw	Cool, dry or refrigeration
endive	Eat raw	Cool, dry or refrigeration
greens	Boiling or steaming	Cool, dry or refrigeration
lettuce	Eat raw	Cool, dry or refrigeration
okra	Boiling	Cool, dry or refrigeration
Vegetables (continued)		
peas	Boiling	Cool, dry or refrigeration
peppers	Raw	Cool, dry
potatoes, sweet	Boiling, baking or steaming	Cool, dry
pumpkin	Boiling or steaming	Cool, dry
romaine	Eat raw	Cool, dry or refrigeration
spinach	Boiling or steaming	Cool, dry
squash	Boiling or steaming	Refrigeration
water cress	Eat raw	
Other vegetables		
beets	Boiling	Cool, dry
cauliflower	Boiling or steaming	Cool, dry
celery	Boiling or steaming or raw	Cool, dry or refrigeration
corn	Boiling	Cool, dry
cucumbers	Eat raw	Refrigeration
eggplant	Boiling or frying	Cool, dry
lima beans	Boiling	Cool, dry
mushrooms	Boiling, frying or broiling	Cool, dry
onions	Boiling, frying or baking	Cool, dry
parsnips	Boiling	Cool, dry
potatoes, white	Boiling, baking, steaming	Cool, dry
radishes	Eat raw	Cool, dry
rutabagas	Boiling	Cool, dry
tomatoes	Eat raw, boiling, baking	Cool, dry or refrigeration

kind of food is selected from the three food groups, and if the food is properly prepared, a soldier can get his quota of vitamins. Each vitamin has its particular mission in promoting good health.

(2) *Vitamin story.* Night blindness is a condition which was recognized many centuries ago. In our own country over 100 years ago Lewis and Clark, on their exploration of the Northwest, observed a condition of night blindness among Idaho Indians. Later, in 1865, a man named Camo Lobo reported that this eye disease occurred in many countries. For the next 50 years, observers reported definite symptoms of the eye disease not to be explained by the medical knowledge of the time. At last, scientists agreed that there must be some unrecognized substances in food. When people failed to eat food that had these substances they suffered from night blindness.

(*a*) *Vitamin A.* In 1913 it was found that certain foods contained a substance which was dissolved in fat. A lack of this substance—later designated as Vitamin A—produced a condition of poor health evidenced by retarded growth, night blindness, and injury to the eyes with impaired vision. Some of the vitamin A is lost when foods are exposed to air over a period of time or when they are heated in the presence of air, or when cooked too long or in too much water. If you prepare food so that it retains its vitamin A, it will help to assure normal vision and healthy skin to the men of your organization.

(*b*) *Vitamin A* is obtained from dairy products as butter, cheese, cream, and whole milk and from meats, as liver, fish roe, beef fat, and kidneys.

(*c*) *Vitamin B Complex.* A disease called beriberi has existed for many years in countries where polished rice has been a large part of the daily food. Polished rice is rice from which the outer coat of the grain has been removed. Scientists found that if the outer coat of the grain was eaten, the disease could be checked. Apparently there was a healthful substance in the outer coat of the grain. Later,

scientists discovered the substance in other foods. The substance was named vitamin B. Further research disclosed that the B substance was made up of several vitamins. The best known ones are named niacin, thiamine (vitamin B_1), and riboflavin (vitamin B_2).

1. If the food you prepare has retained its niacin, the soldier you feed will avoid pellagra and other diseases which are due to the lack of niacin. Niacin is found in meat, liver, salmon, green vegetables, tomatoes, wheat germ, and yeast.

2. If the soldiers in your organization get enough thiamine (vitamin B_1) in their food, they will not suffer from loss of appetite or nerve trouble caused by lack of thiamine. Thiamine is found in bread and whole grain cereal, enriched or restored meat and fish, eggs, milk, potatoes, yeast, and legumes.

3. If the food you cook has not lost its riboflavin (vitamin B_2), the men who eat that food will have more pep and clearer skin. Riboflavin is found in milk, cheese, meat, liver, peanuts, strawberries, wheat, yeast, and enriched cereals.

(*d*) *Vitamin C. 1.* Scurvy, a disease called "the plague of the sea" for hundreds of years, had been reported where only limited supplies of fresh fruits were available. Men on long sea voyages or on military expeditions, settlers in a new country, or people in a famine area can be afflicted with scurvy. Symptoms of this diease are frequently seen even in the United States. They occur where people eat very few fruits and vegetables. In 1795 lemon juice was issued to English sailors and the cases of scurvy decreased. (At that time lemon juice was known as lime juice and from that fact the English sailor became known as "Limey.") The relation between citrus fruits and scurvy was established.

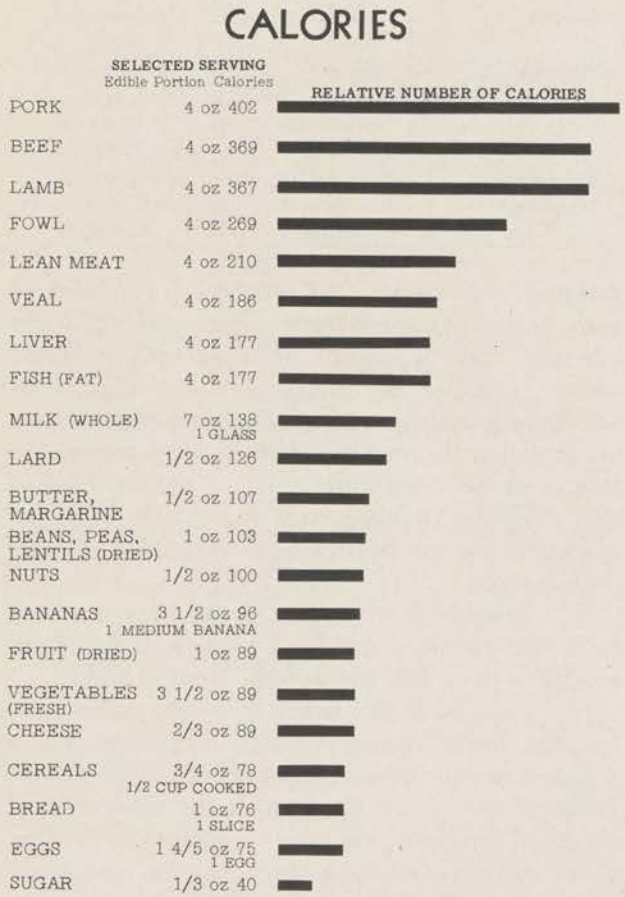

Chart 1. Calories.

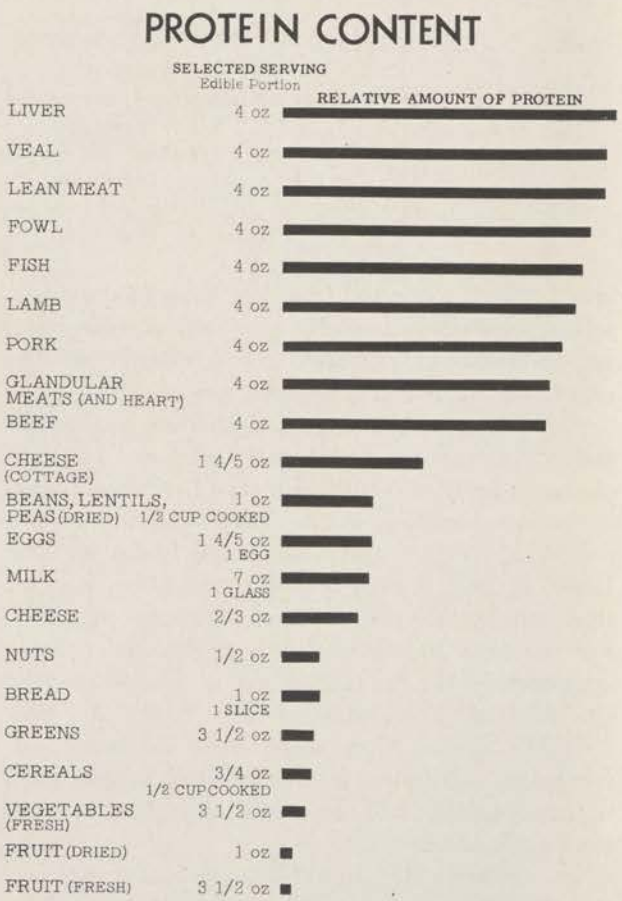

Chart 2. Protein content.

Table III. Vitamins—common foods as sources of vitamins

Food	Selected serving	A	B			C	D
			Thiamine	Riboflavin	Niacin		
	Ounce						
Liver	4	(1)	(2)	(1)	(1)	(3)	(3)
Heart	4	(4)	(2)	(3)	(3)	----	----
Kidneys	4	(3)	(2)	(3)	(3)	(2)	----
Sweetbreads	4	(4)	----	(2)	----	----	----
Brains	4	(4)	(2)	(2)	(3)	(3)	----
Beef	4	(2)	(2)	(2)	(3)	----	----
Lamb	4	(4)	(2)	(2)	(3)	----	----
Veal	4	(4)	(2)	(2)	(1)	----	----
Pork	4	(4)	(1)	(2)	(1)	----	----
Fowl	4	(4)	(2)	(2)	(3)	(2)	----
Oysters	3½	(2)	(2)	(2)	(2)	(2)	(2)
Cod liver oil	¼	(1)	----	----	----	----	(1)
Eggs	1⅘	(2)	(2)	(2)	----	----	(3)
Milk	7	(2)	(2)	(2)	(2)	(2)	(2)
Butter	⅓	(2)	----	----	----	----	(2)
Bread (Enriched)	1	(3)	(2)	(4)	(2)	----	----
Cheese	⅔	(3)	----	(1)	----	----	----
Oatmeal	⅔	----	(2)	----	(2)	----	----
Apples	5	(2)	(2)	----	(2)	(2)	----
Oranges	5⅓	(2)	(2)	----	----	(1)	----
Bananas	3½	(2)	(2)	(2)	(2)	(2)	----
Grapefruit	3½	(4)	(2)	(2)	----	(3)	----
Prunes	1	(3)	(2)	(2)	----	(2)	----
Spinach	3½	(1)	(2)	(2)	(2)	(1)	----
Potatoes	5⅓	(2)	(2)	(2)	(2)	(3)	----
Tomatoes	4½	(3)	(2)	----	(2)	(3)	----
Peas	2	(3)	(2)	(2)	(2)	(3)	----
Carrots	3½	(1)	(2)	----	(2)	(2)	----
Cauliflower	3½	(2)	(2)	(2)	(2)	(1)	----

[1] Excellent source.
[2] Fair source.
[3] Good source.
[4] Present, but in small amounts.

2. Vitamin C is found in fresh fruits, fresh vegetables, both fresh and canned citrus fruits, and fresh and canned tomatoes.
3. Much care must be used in handling food containing vitamin C as it is easily destroyed or lost by exposure to air or by too much cooking and by cooking in too much water. Foods containing vitamin C (ascorbic acid) should frequently be served raw. This will cause the men to have better teeth and bones and better gums, and their dispositions will be better.

(*e*) *Vitamin D.* The disease called rickets has been recognized for many years. The first full description of it dates back to 1650. Among the early observations were the reports that it occurred most frequently in the north temperate zone during the winter. This led to the idea that sunshine played a part in the prevention of rickets. It was found that when the sun shines directly on the skin, the body manufactures a substance that prevents rickets. That substance is named vitamin D. Other sources of vitamin D, in addition to the direct rays of the sun, are: fish oils, liver, fish, irradiated foods or foods enriched with vitamin D, and vitamin concentrates. Lack of vitamin D will cause bone deformities, dental defects and retarded growth. Enough vitamin D (calciferol) maintains stronger teeth and straighter bones.

(*f*) *Minerals.* For a long time nutritionists have known that in addition to vitamins, the diet must contain adequate amounts of the minerals, calcium, phosphorus, sodium and iron. Calcium and phosphorus are supplied most easily by milk. Iron is supplied by cereals and meats, especially liver and other organs. It takes many different minerals to build a strong body. The most important ones are: calcium, for bones and teeth, phosphorus, for a role similar to calcium; and iron, for red blood cells. The body must also have the required amount of

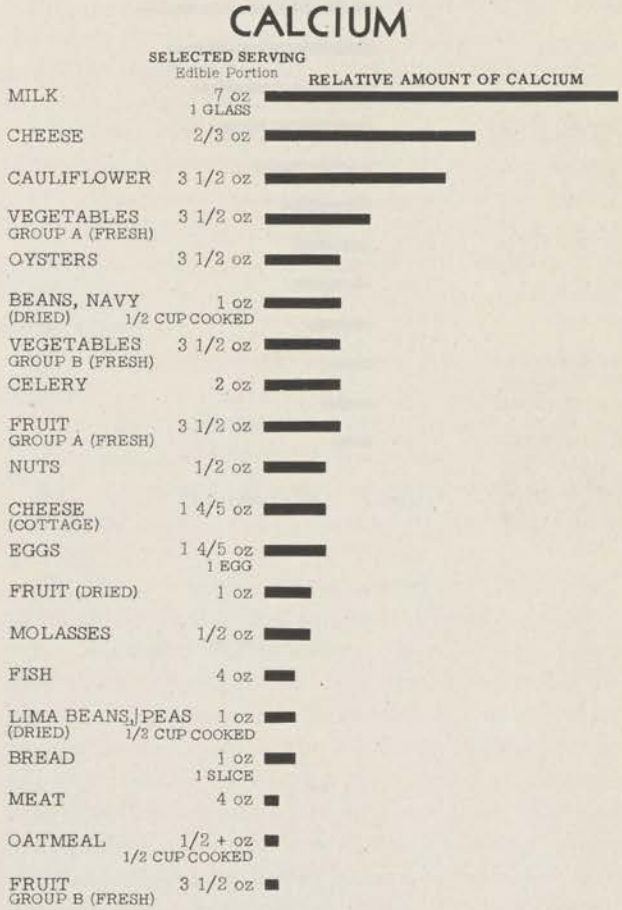

Chart 3. Calcium.

salt (sodium chloride) in order to maintain normal efficiency.

(*g*) *Water.* Water is not an energy-giving food but it is essential to dissolve materials carried by the blood, to keep tissues soft, to aid digestion, and to quench thirst. Water is an important food.

11. SUMMARY. Soldiers need enough of the right kinds of food to keep them in fighting trim. They must have energy foods, building foods, and regulating foods. The Army cook with an understanding of the functions of these foods and of the vitamins, minerals and water can prepare meals more intelligently. By using a varied menu, and by following the principles of cookery in chapter 5, he can be a key person in building and maintaining the health and high morale of the fighting men in his unit.

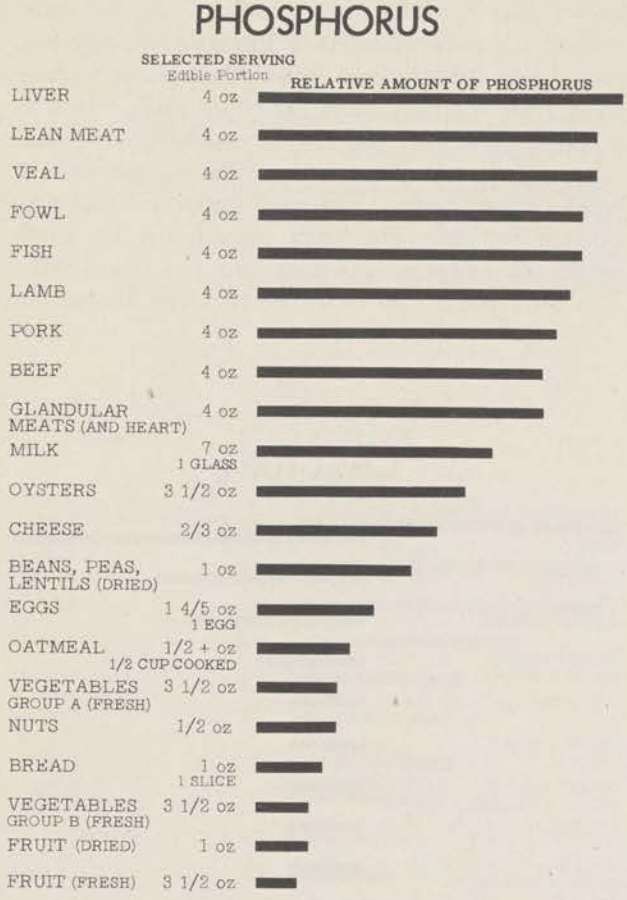

Chart 4. Phosphorus.

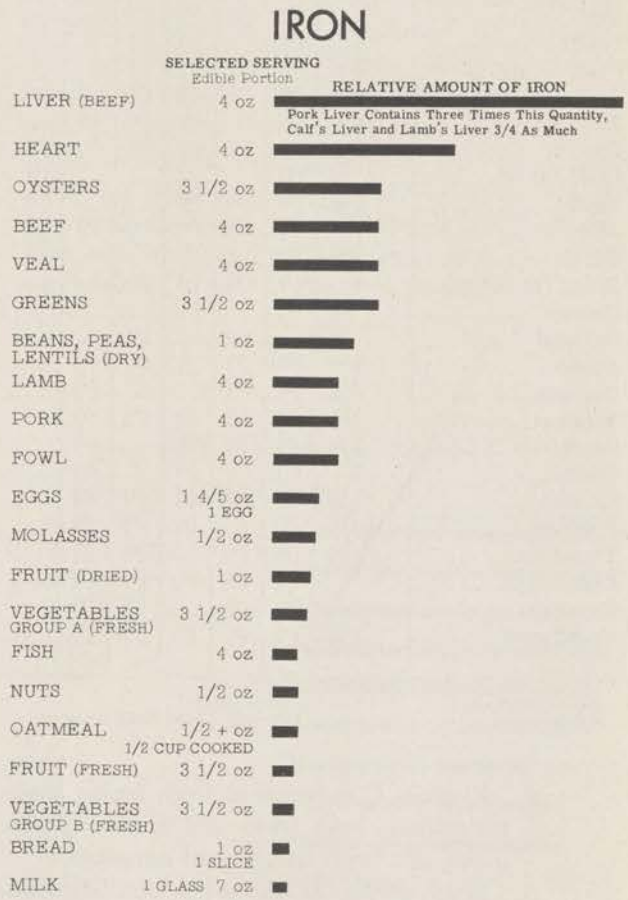

Chart 5. Iron.

CHAPTER 3

INSPECTION AND STORAGE OF SUBSISTENCE IN MESS

12. GENERAL. High standards for quality food in Army messes have been established. The responsibility of upholding these standards is a command function, but each individual must do his job well in order that these standards may be maintained.

a. Inspection. Food is received in the mess either by direct requisitions submitted by the organization to the commissary for the food it wishes to purchase, as under the garrison ration system, or automatic issues of food (issues in kind) from the quartermaster, as under the field ration system. On the post, the quartermaster and the veterinarian officer inspect all foods received for issue and sale. This does not relieve mess personnel from the responsibility of inspecting food received in the mess. The mess officer, the mess sergeant, and the cooks should have sufficient knowledge of the principles of food inspection to enable them, individually or as a group, to inspect all items of food received in the mess. (See pars. 13 and 14.) Mess personnel should insure that all food accepted is clean, sanitary, wholesome, and in right weight and measure. Food which is decayed, insect infested, moldy, or musty should not be accepted. Short weight, measure, or count should be noted on the delivery ticket, shipping ticket, or invoice at the time the food is received. The organization commanding officer should be informed of the difference discovered.

b. Storage. The quality of the food served in the mess depends to a considerable extent on the way in which it is handled after delivery. If food is to have the right quality when it is served, it must be kept at the proper storage temperature, protected against contamination, and its freshness maintained as far as possible. Messes operating on the field ration, in nearly all instances, will receive food today for use tomorrow. The exception to this would be the days double or triple issues are made as required by regulations governing commissary operations. Messes on the garrison ration should guard against overordering. Those on the field ration should accept food only in the amounts that they can use, even if this is under the prescribed issue. Limited refrigeration and other storage space in the mess make it impossible to care for large stocks. Mess personnel should order small quantities of food at frequent intervals rather than large quantities that may become useless through deterioration and spoilage.

c. Classification of Food. Food is generally classified as *perishable* or *nonperishable*. It must be remembered, however, that all subsistence is of a perishable nature. Each general classification presents its own problems of inspection and storage. Cooks are expected to know enough about both to see that the food received in the mess is of good quality and is not spoiled by improper storage.

13. INSPECTION OF PERISHABLE SUBSISTENCE. a. General. Each mess should be supplied with a copy of TM 10–210, and cooks should be guided by the inspection procedure outlined. Everyone handling food in the mess should constantly bear in mind that new and improved methods are being developed almost daily in the food world and that inspections should be sufficiently flexible to accommodate those changes.

b. Determining Quality. In general, the quality of perishable subsistence may be determined by:

(1) *Condition*, indicated by desirable characteristics like freshness, ripeness, plumpness, juiciness, tenderness, freedom from damage and blemish.

(2) *Color*, typical of the particular food item being inspected.

(3) *Odor*, suggesting the best condition of the product.

(4) *Flavor*, characteristic of the item in question.

(5) *Size*, not always an indication of quality.

(6) *Appearance*, closely associated with quality; but a fine appearance does not always signify fine quality.

(7) *Taste*; close examination and the "taste test" are desirable in the final determination of quality.

c. Packaged Perishables. Cases, crates, bags, and sacks of fresh fruits and vegetables should be opened and examined immediately upon their receipt in the mess. The contents should be examined previous to storage, and spoiled or deteriorated products removed to prevent their infecting and spoiling other portions of the container. Such products should be inspected and sorted each day during their storage and spoiled products removed.

d. Grades. Standard grades for fresh fruits and vegetables have been developed by the United States Department of Agriculture and are known as United States Grades. Fruits and vegetables graded according to these standards when packed may not grade the same when received in the mess hall because of deterioration or injury in transit. Whenever it is felt that the grade is below the United States Grade, the matter should be reported to the commanding officer.

Table IV. Storing perishable items—fruits

Fruits	Keep out of sun	Keep cool	Keep dry	Shake up to allow air to reach	Provide proper ventilation	Sprinkle frequently	Remove rots promptly	Handle gently avoiding bruising
Apples	X	X	X	----	X	----	X	X
Apricots	X	X	X	----	----	----	X	X
Avocados	X	X	X	----	----	----	----	X
Bananas	X	----	X	----	X	----	----	X
Berries	X	X	X	X	----	----	X	X
Cantaloupes	X	X	X	----	X	----	----	X
Cherries	X	X	X	----	----	----	X	----
Coconuts	X	X	X	----	----	----	----	----
Dates and figs	X	X	X	----	----	----	X	----
Grapefruit	X	X	X	----	----	----	X	X
Grapes	X	X	X	----	X	----	----	X
Lemons	X	----	X	----	X	----	X	----
Limes	----	X	X	----	----	----	----	----
Melons	X	X	X	----	----	----	----	----
Nectarines	X	----	X	----	X	----	----	X
Oranges	X	----	X	----	X	----	X	X
Peaches	X	----	X	----	X	----	X	X
Pears	X	X	X	----	X	----	X	X
Pineapples	X	----	X	----	----	----	X	X
Plums and prunes	X	X	X	----	X	----	X	X
Watermelons	X	----	----	----	X	----	----	----

Fruits requiring special attention

Apples. If damp, remove wraps and wipe dry.
Apricots. Keep out of drafts.
Avocados. Do not put in refrigerator.
Bananas. Do not put in refrigerator.
Berries. Do not put in refrigerator.
Cantaloupes. Do not put in refrigerator.
Coconuts. Keep stem end up.
Dates and figs. Do not put in refrigerator.
Grapefruit. If damp, remove wraps and wipe dry.
Grapes. Divide bunches with scissors.
Lemons. If damp, remove wraps and wipe dry.
Limes. May be kept fresh in refrigerator.
Melons. Store in dark place.
Oranges. If damp, remove wraps and wipe dry.
Pears. Do not put in refrigerator.
Pineapples. Keep out of air currents.
Watermelons. Cover cut melons with cellophane or waxed paper.

e. Quick Frozen Foods. Packaged quick frozen fruits and vegetables should be spot checked immediately upon receipt in the mess. If the contents appear to be of good quality and undamaged, the checked packages should be closed and all of the packages stored together in appropriate refrigeration.

f. Highly Perishable Foods. It is especially important that mess personnel inspect the condition of such highly perishable foods as meats, fish, poultry, butter, eggs, yeast, etc., immediately upon their receipt in the mess. The acceptable foods must be stored immediately in refrigerators.

g. Use of Perishables. A system should be devised for marking perishable subsistence to make certain that the oldest merchandise on hand is used first. Chalk, crayon, or pencil may be used to date crates, packages, etc. Shelves appropriately labeled are also helpful. Any method that will assure the use of the oldest merchandise first is satisfactory.

h. Spoiled Foods. The veterinarian should be called to pass on the edible condition of any perishable product received by the mess if there is evidence that it is spoiled or contaminated.

i. Perishable Items. The cook must know that different perishables require different treatment in storage. Tables IV and V, will give the cook a ready source of information on handling fruits and vegetables in storage.

14. INSPECTION OF NONPERISHABLE SUBSISTENCE. a. General. TM 10–210, devotes several chapters to inspection of nonperishable types of subsistence. Whenever the quality

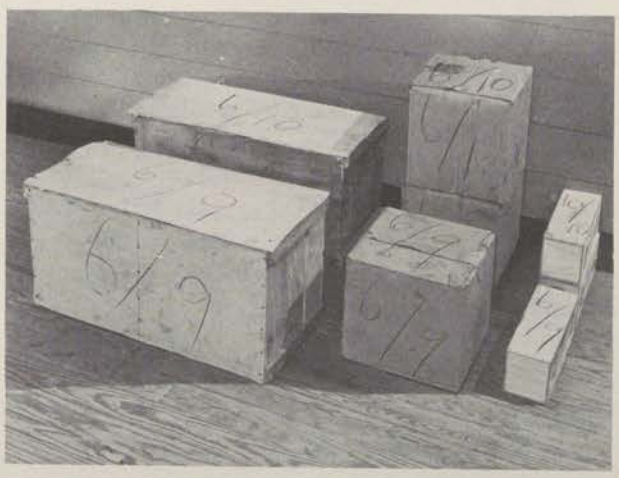

Figure 1. Marking perishables with date of receipt.

or condition of the nonperishables delivered to the mess is in question, the cook should refer to the above named Technical Manual for specific instructions. If the quality is inferior or if spoilage has taken place, the matter should be referred immediately to the commanding officer.

b. Nonperishable Subsistence. Once these are accepted by the mess they should be examined regularly and frequently to determine whether or not it has started to spoil. Supplies of nonperishable subsistence in the mess should be maintained at a minimum to assure that deterioration does not take place due to "shelf age." Each mess should provide for the use of the oldest nonperishable subsistence first. Cases may be marked with the date received, or storage shelves and containers may be labeled appropriately.

Whatever method is used, the rule of "first in, first out" must be maintained.

15. STORAGE OF SUBSISTENCE IN GENERAL.

Much food waste in the Army mess can be avoided by knowing the kind of storage that best protects each food. Some foods spoil more rapidly than others. Fresh fish will spoil more quickly than butter, eggs more quickly than apples, etc. In like manner, dampness may hasten the spread of deterioration in certain nonperishable types of food such as flour, dry cereals, dried onions, and dried fruits and vegetables. Nearly all perishable foods lose some of their nutritive value even under ideal storage conditions, but the rate is much greater when storage conditions are poor. Meat and fish which have, through improper storage, become

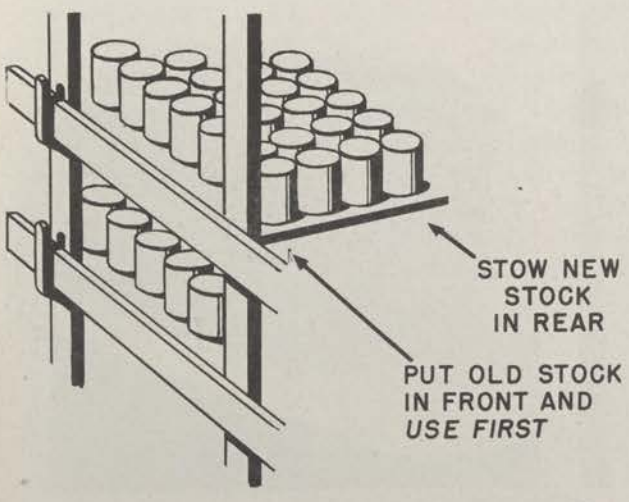

Figure 2. Be sure items at the front of the shelf are the oldest.

Table V. Storing perishable items—vegetables

Vegetables	Keep out of sun	Keep cool	Keep dry	Shake up to allow air to reach	Provide proper ventilation	Sprinkle frequently	Remove rots promptly	Handle gently Avoid bruising
Asparagus	X	----	(1)	----	----	----	----	----
Beans	X	X	X	X	X	----	----	----
Beets	----	----	(1)	X	X	----	----	----
Broccoli	----	X	X	----	X	----	(2)	----
Brussels sprouts	----	X	----	----	----	X	----	----
Cabbage	----	----	----	----	X	X	X	X
Carrots	----	X	----	X	X	X	----	----
Cauliflower	X	----	X	----	X	----	----	X
Celery	----	X	----	----	X	X	----	----
Corn	X	X	X	----	X	----	----	----
Cucumbers	X	X	X	----	----	----	----	X
Eggplant	----	X	X	----	----	----	----	X
Greens (cooking or salad)	X	X	----	X	X	X	----	----
Lettuce	X	X	----	----	----	X	----	----
Mint	X	X	----	X	X	X	----	----
Mushrooms	X	X	X	----	----	----	----	----
Onions (dry)	X	X	X	----	X	----	----	----
Onions (green)	X	----	(1)	----	X	----	----	X
Parsley	X	----	----	X	X	X	----	----
Parsnips	X	X	S	----	----	----	----	X
Peas	X	X	X	X	X	----	----	----
Peppers	X	X	X	X	----	----	----	----
Potatoes	X	X	X	X	----	----	X	X
Radishes	X	X	(1)	----	X	X	----	----
Rhubarb	----	X	(1)	----	----	X	----	----
Spinach	X	X	----	X	X	X	----	----
Squash	----	----	X	----	X	----	----	X
Tomatoes	X	X	X	----	----	----	X	X
Turnips	----	X	(1)	----	X	----	----	----

[1] Tops only.
[2] Bruised leaves.

Vegetables requiring special attention

Asparagus. Trim butts. Stand in shallow water or moss.
Beets. Trim tops as needed.
Broccoli. Remove blooms. Stand in cold water if wilted.
Cabbage. Store in dark room.
Carrots. Trim tops as needed.
Cauliflower. Do not stack; avoid bruising.
Celery. Trim butts. Revive in ice water.
Corn. Strip outer husks only: cut windows through husks of a few ears.
Cucumbers. Do not put in refrigerator.
Lettuce. Trim butts and leaves as needed. May be kept fresh in refrigerator.
Mushrooms. Avoid sunlight or chilling.
Onions (green). Trim tops as needed; trim butts.
Parsley. Soak in cold water if wilted.
Radishes. Trim tops as needed.
Rhubarb. If stalks wilt, trim thin slice off butts and stand in water.
Tomatoes. Keep out of air currents.

spoiled are very dangerous and should never be used. Sometimes it is found that the so-called nonperishable foods will spoil. Canned goods, when spoiled, display bulged end or small leaks. Foods from swollen cans should not be used because they may be poisonous. Ground coffee loses its strength rapidly. Organizations should draw ground coffee from the commissary at least twice each week and should be sure that the grinding date on the bag is within the preceding 2 weeks. Coffee should be stored in the mess in a clean metal can with a tight-fitting lid. Any coffee left over from old supplies should be used before the new coffee. Stored food can be contaminated by flies, cockroaches, mice, rats and other rodents, and insects. Storage rooms and storage containers should be so constructed and so maintained as to be as nearly insect and vermin proof as possible. Mess personnel should be familiar with the types and characteristics of the foods which attract these pests and should store them accordingly. Crumbs and other loose particles of food should never be allowed to accumulate in places that will attract pests. Cooked leftovers and prepared foods also present a storage problem. Many leftovers will spoil as quickly as fresh foods; proper storage for them must be given the same consideration that applies to fresh perishables.

16. STORAGE OF PERISHABLE SUBSISTENCE.

a. Perishable foods, according to their nature, require different kinds of storage and different degrees of refrigeration. Refrigeration in the commissary is generally divided into two classifications, "freezer" and "cooler" storage. Frozen fish, meats, fowl, vegetables and fruits are kept in "freezer" storage. Eggs, fresh milk, fresh meats, fruits, and vegetables are placed in "cooler" storage. Some fresh fruits and vegetables such as potatoes, onions, turnips, oranges, and apples can be held for short periods of time in ordinary room temperature storerooms. Others, such as lettuce, celery, tomatoes, grapes, and plums, must always be stored in refrigerators until used.

b. Refrigerators in the Army mess are not divided into "freezer" and "cooler" compartments, but some parts of the refrigerator are warmer than others. The part which receives the circulation directly from the cooling coils first, is the coldest space in the box. Since heat travels upward, the immediate top of the box is generally the warmest. Freezer type foods must always be stored in the coldest part. The loss of cold air can be kept at a minimum by reducing the number of times doors are opened and closed. A label on each door, listing the contents of each compartment, will help in using only the right door each time the refrigerator is opened and will also save time.

c. Products like melons, tomatoes, grapes, etc., will keep for a short time without refrigeration in the storeroom but they are at their best for eating when chilled before being served.

d. Some foods, such as onions, smoked meats, and cabbage, impart flavors and odors. Other foods, such as butter, cheese, milk, and eggs, "take up" or absorb odors and flavors. Odor- and flavor-imparting foods must not be stored near odor- and

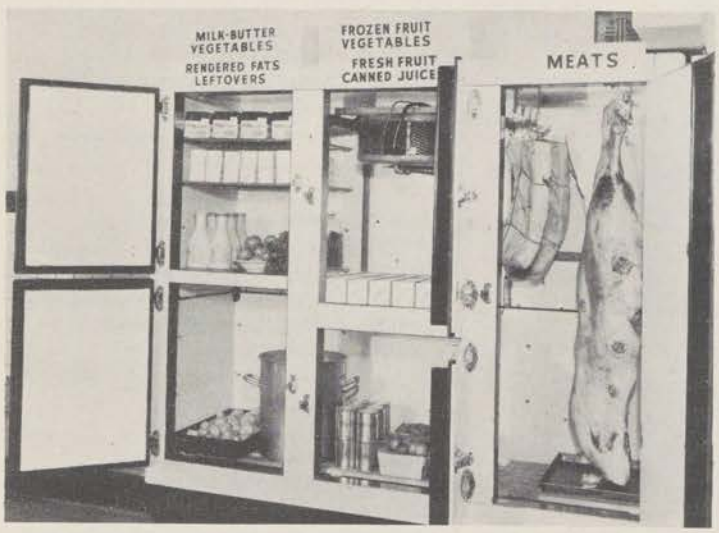

Figure 3. A refrigerator properly labeled. Foods stored in correct compartments.

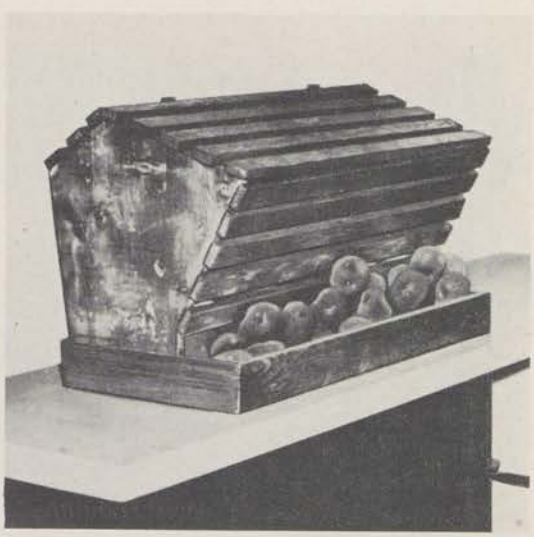

Figure 4. A bin that assures use of oldest first.



Figure 5. A good way to arrange GI cans in storeroom.

flavor-absorbing foods. In messes having two refrigerators, use one for the storage of odor-imparting foods and the other for odor-absorbing foods. When only one refrigerator is available, odor-imparting foods must be kept covered and must not be stored next to odor-absorbing foods.

e. Dunnage or duckboards should be placed on the floor of refrigerators. This increases circulation and is an aid to sanitation and cleanliness.

f. Refrigerators must be cleaned daily so that food stored therein will not become contaminated because of unsanitary conditions. At frequent intervals warm, soapy water should be used for washing the inside of the box, followed with warm rinse water containing borax or soda. This sweetens the air in the box.

g. The following items of subsistence should always be stored under refrigeration:

Butter	Celery	Tomatoes, ripe
Cheese	Cucumbers	Grapes
Cream	Lettuce	Plums
Fresh eggs	Leafy greens	Corn, fresh
Fresh meat	Berries	Broccoli
Milk	Yeast	Cauliflower

Cooked or prepared foods that are high in liquid content such as coleslaw, salads, custards, puddings, gelatin desserts, gravies, sauces, and cooked meats, vegetables, and fruits should also be kept under refrigeration.

h. The storage rule of using the old stock first will apply to all subsistence. Such stores should be so marked or arranged as to provide for this use. Open bins are sometimes used for such dry stores as potatoes, onions, carrots, etc. These boxes allow for circulation of air and are so constructed that the oldest produce is always in a position to be used first.

i. If ice is to be stored, it is desirable to place it in the refrigerator used for storing the vegetables. The melting ice increases the humidity and will help keep the produce fresh and crisp.

17. STORAGE OF NONPERISHABLE SUBSISTENCE. a. The storeroom in each Army mess is used for the storage of nonperishables. This room should be clean, light, cool, dry, and well ventilated. It must be free of rodents, insects, and foreign odors.

b. Each storeroom should be equipped with shelves, dunnage and metal containers. This equipment should be constructed so that maximum sanitation can be maintained. Canned and packaged

goods should be stored neatly on the shelves, labels out, so that each variety of food may be easily distinguished. Items that are stacked in bags and case lots should be placed on dunnage, high enough off the floor to avoid the absorption of floor moisture, to facilitate cleaning and to prevent the nesting of rodents and insects. Metal containers with tight-fitting lids (32 gal. GI cans are very desirable) should be used for the storage of sugar, coffee, flour, rice, beans, and other dry stores.

c. Subsistence should be arranged in the storeroom so that the most frequently used items are placed nearest the entrance door. Also foods of like kind should be placed together.

d. Stores of food on hand should be checked frequently for deterioration and spoilage. Open and broken packages of such items as spices, condiments, cereals, etc., should be kept at a minimum.

e. The storeroom must be kept clean. Daily scrubbing, sweeping, dusting, and shifting of items will facilitate cleaning.

f. Stores of food on hand in the mess must be kept at a working minimum as required by Army Regulations. Organizations on the field ration should make frequent inventories and turn in excessive stocks to the commissary. A simple storeroom control system for organizations subsisting on the field ration follows:

(1) Divide the shelves into four sections: One section is used for the day's issue, the next section for the next day's issue, the third section for excessive items from each day's rations, and the fourth section for the regular condiment issue.

(2) Only canned and packaged items are stored on the shelves. Bulk items are stored in their regular container on dunnage.



Figure 6. Model stockroom.

CHAPTER 4

KITCHEN MANAGEMENT

SECTION I. PLANNING WORK

18. FUNDAMENTALS. Cooking can be an orderly or a clumsy business. An orderly plan of operation and the use of the Cook's Work Sheet can do much to help the cook not only to do his own work but also to make the work of the other men in the kitchen easier.

19. PLANNING WORK. a. A cook who manages a shift in the mess should have a definite plan of operation. In order to do this he must know:

(1) What he wants to do.
(2) How he is going to do it.
(3) How to instruct another person to do it.
(4) How to supervise others.

This requires organizing and planning. A good rule to follow is: "Plan your work, and work your plan."

b. To carry out his plan of operation, the cook should follow these steps:

(1) Study the menu. Whether the menu is made up in the organization, as under the garrison ration, or by higher authority, as under the field ration, all members of a kitchen staff should know how the meal is to be prepared.

(2) Study the recipes and become familiar with its preparation.

(3) Know the number of men to be fed.

(4) Prepare certain items in advance of the time for their actual use with other ingredients. For example, when making "Fresh Apple Pie," the cook must pare and core the apples before he rolls out the pie crust. Frozen beef must be thawed out before it is placed in the oven. These are examples of the many things that must be planned ahead in order to eliminate *last minute confusion*.

(5) Assemble all utensils and ingredients that will be used in preparation. This will save many unnecessary steps and useless labor. When selecting a pot or pan be sure that it is the right size for the particular job to be done. Much valuable kitchen police labor will be conserved by this practice.

(6) Check tables of cooking times and temperatures to assure timely preparation and cooking.

(7) When the preparation of a dish is finished, all utensils, pans, and other articles not to be used in the preparation of the next dish must be removed and cleaned immediately. This will avoid cluttering up the entire surface of the work table, and in most cases the entire kitchen, with dirty pots, pans, and utensils.

(8) Complete preparations for service.

(9) Help with the service of the meal.

(10) Assemble leftovers and decide with the mess sergeant on their future use.

(11) Check garbage. It will show how the men liked the meal.

By following these steps, the cook will cut down waste, eliminate confusion, and have an orderly kitchen.

20. CHECKING THE MENU AGAINST THE FOOD IN THE STOREROOM. Army cooks are responsible, to a great extent, for preparing meals with a proper variety of food. Even under the field ration, there are times when it is necessary for the mess sergeant or cook to plan the entire menu, using the ingredients or stock on hand. If the mess is operating on the garrison ration, the making of menus is an absolute necessity. When the cook is called upon for suggestions, he should know how to arrange a good menu. One of the first steps is to check the stock of food in the storeroom and adjust the menu accordingly, always keeping in mind the necessity for variety in each meal. Old stocks of food should be used up before the new issue.

21. SUBSTITUTIONS. In the field ration, substitutions in the menu will have to be made when the items originally planned are not available. For example, if fresh corn is scheduled on the menu but fails to arrive, another vegetable must be substituted. The menu must be changed to use the new vegetable in place of fresh corn. To make such substitutions intelligently calls for a fair understanding of food values and nutrition. A substitution must have almost the same nutritive value

as the original food for which the substitution is made. It must also blend properly with the other foods in the meal. To aid in making such changes here are some general rules to remember:

a. Check all three meals and avoid the same or like dish being repeated in another meal for that day.

b. Avoid too many starches or two kinds of similar food.

c. Alternate foods with low nutritional value with those of higher nutritional content.

d. Combine or alternate mild-flavored foods with those of more pronounced flavor.

e. Have variety in color and arrangement.

f. Use up odds and ends of fresh vegetables in salad combinations.

g. Before using new issues of foods be sure to use up old stocks on hand.

h. When it is necessary to make changes in the menu consult the substitution chart, Table VI; it will help to keep the menu in balance.

Table VI. Substitution chart

Use of the table

1. Listed in the left hand margin, column 1, are the fifteen food groups. These groups furnish most of the nutritional values for the diet.

2. The names of the nutritional elements are at the top of the chart in Columns 2 through 12. Columns 4 through 12 indicate the principal contributions of the fifteen food groups to the diet. Each figure shown is high enough to be of significance. Those in italics, however, indicate the most outstanding contributions. The amounts of the nutritional contributions are based on actual pound weight of edible portion.

3. When substitutions are made, another food from the same group classification should be used in order that the nutritional values will remain nearly the same. If another food from the same classification is not available, however, make a substitution from a different group, or groups, providing as near the same nutritional values as possible.

4. Special attention should be given to substitutions of vegetables, leafy green and yellow (9). The nutritional value of this food group is considerably higher than vegetables (13). Therefore, vegetables in group 13 are not good substitutes for vegetables in group 9.

Nutritive balance

Food group	Weight	Calories	Protein GMS	Fat GMS	Calcium MG	Iron MG	Vitamin A I. U.	Thiamin MG	Riboflavin MG	Niacin MG	Ascorbic Acid MG
	Pound										
1. Meat	1	1095	62	93		8.7		.940		*20.2*	
Lean pork	1							*5.571*			
Liver	1					46.2	*125000*		*15.621*	*61.0*	*135*
Lwurst	1						30000		10.091		
2. Eggs	1		52		218	10.9	4040	.830	1.450		
3. Milk	1		23		*770*		1386				
4. Butter	1	*3325*		367			*15000*				
5. Fats, others	1	*3925*		435							
6. Sugar	1	1671									
7. Legumes	1	1747	[1] *101*		516	37.3		*2.365*	1.391	10.7	
8. Cereal	1	1392	42		151	9.6		*1.270*	1.080	11.6	
9. Vegetables											
Leafy, green and yellow.	1				110		*13472*				51
10. Tomatoes	1						3473				68
11. Citrus fruit	1										*118*
12. Potatoes	1										
Sweet Potatoes.	1						*13650*				
13. Vegetables, Others	1				101						
14. Fruit, others	1						1674				
Strawberries	1										*239*
15. Fruit, dried	1	1306			202	16.7	5587				

[1] Legume proteins contain incomplete amino acids. Meat proteins are composed of complete amino acids.

Table VI. Substitution chart (Cont'd.)

Food classified in each group

Meat

(All meat, fish and poultry)

Eggs

(Fresh and dehydrated)

Milk and Milk products

1. Milk (fresh)
2. Milk (canned and dried)
3. Cheese
4. Cream
5. Ice cream

Butter

(Butter and margarine)

Fats, other

1. Lard
2. Lard substitute
3. Mayonnaise
4. Oils
5. French dressing

Sugars

1. Cane
2. Powdered
3. Brown
4. Syrup
5. Jam, jellies, marmalades
6. Molasses
7. Dessert powders
8. Junket

Legumes

1. All dry beans and canned dry beans
2. All dry peas
3. Cocoanut
4. Lentils
5. Nuts
6. Peanut butter
7. Soybeans (dry only)

Cereals

1. Bread
2. All flours
3. All dry cereals
4. All cooked cereals
5. Doughnuts
6. Hominy
7. Macaroni, noodles and spaghetti

Tomatoes

1. Catsup
2. Tomato paste
3. Tomatoes canned and fresh
4. Tomato puree
5. Tomato sauce
6. Tomato juice

Citrus Fruits

1. Grapefruit
2. Lemons
3. Limes
4. Oranges
5. Tangerines
6. Citrus juices

Potatoes

1. Irish
2. Sweet

Vegetables, Leafy Green or Yellow

1. Asparagus
2. Beans, string
3. Beet greens
4. Broccoli
5. Brussels sprouts
6. Cabbage
7. Carrots
8. Chard
9. Chicory
10. Endive
11. Escarole
12. Greens, leafy
13. Kale
14. Kohlrabi
15. Lettuce
16. Mustard greens
17. Okra
18. Parsley
19. Peas
20. Peppers
21. Pimiento
22. Potatoes, sweet
23. Pumpkins
24. Romaine
25. Spinach
26. Squash
27. Turnip greens
28. Water cress

Vegetables other than leafy green or yellow

1. Artichokes
2. Bean sprouts
3. Beets
4. Cauliflower
5. Celery
6. Corn
7. Cucumbers
8. Eggplant
9. Lima beans
10. Mushrooms
11. Onions
12. Parsnips
13. Radishes
14. Rutabagas
15. Turnip roots
16. Sauerkraut
17. Soybeans, green or canned
18. Succotash
19. Vegetables mixed
20. Vegetables, La Choy

Fruits, other

1. Apples
2. Apricots
3. Avocados
4. Bananas
5. Berries
6. Cherries
7. Figs
8. Fruit cocktail
9. Fruit for salad
10. Grapes
11. Guava (tropical fruit)
12. Melons
13. Peaches
14. Pears
15. Pineapple
16. Plums
17. Prunes
18. Rhubarb

Dried fruits

1. Apples
2. Apricots
3. Cherries
4. Dates
5. Figs
6. Peaches
7. Pears
8. Prunes

22. THE COOK'S WORK SHEET. The Cook's Work Sheet can be an efficient aid in the timely preparation of foods, amounts to be used, and control of edible food waste; it can be a valuable record of food preferences of the men and it will enable the cook to keep leftovers at a minimum Verbal instructions given to the cook by the mess sergeant are frequently forgotten or neglected, but when posted on the Cook's Work Sheet they are always available for reference. A Cook's Work Sheet prepared according to instructions can help all of the kitchen personnel. The Cook's Work Sheet is reproduced in figure 7. The reversed side of the Cook's Work Sheet contains the instructions for filling it out, and this appears following the Cook's Work Sheet in figure 7.

The instructions should be followed carefully. The cook should understand the directions thoroughly.

He should know columns 5 and 6 especially well, for he is responsible for filling them in. The Cook's Work Sheet can be used to best advantage when reviewed at the Daily Meeting.

23. DAILY MEETING. The daily meeting is named from the fact that it is conducted each day soon after the new shift of cooks goes on duty. All of the cooks should meet with the mess sergeant. At the daily meeting, the cooks will be concerned with the meals prepared during their last tour of duty and with the three meals they will prepare on their present shift. In discussing the meals served on their last shift, cooks should talk freely about the failures and successes of the meals. The Cook's Work Sheet will disclose any leftovers, shortages, and the quantity of edible waste; these will give clues to the weak points and good points of the meal. The cooks should be concerned also with such matters as the cooking time of the foods and the special instructions they followed. The Cook's Work Sheet will give the information needed for discussing the meals. By talking over the work already done, cooking can be improved. The successful cook always looks for ways to mprove his work. At each daily meeting, instructions are given for the next meals. The Cook's Work Sheet will assist in this also. Each point on the Cook's Work Sheet should be considered, such as quantities, cooking time, use of leftovers, etc. This is the opportunity for the cooks to discuss any questions about the next meals. They should understand thoroughly what they are to do. They should offer any suggestions for improving the meals. The Daily Meeting makes it possible not only to review any errors or strong points about the last meals, but also to help in carrying out the work for the next meals.

BREAKFAST — PREPARE FOR 194

MENU	QUANTITY TO USE	SPECIAL INSTRUCTIONS TO COOKS	COOKING TO START	QUANTITY PREPARED IN UNITS	LEFTOVERS TO BE USED	LEFTOVERS DISCARDED	EDIBLE PLATE WASTE	REMARKS
1	2	3	4	5	6	7	8	9
GRAPEFRUIT	100	SEPARATE SECTIONS— CHILL OVERNIGHT	—	200	0	0	0	
CEREAL, DRY	8 LBS.	½ BRAN FLAKES ½ CORN FLAKES	—	8 LBS.	20	0	0	RETURN TO STOREROOM
MILK, FRESH	50 QTS.	PLACE UPSIDE DOWN ON TABLE	—	50 QTS.	0	0	0	
EGGS, FRIED	396	USE THREE GRIDDLES— SERVE FROM GRIDDLE	0620	396	0	2	0	
BACON, FRIED	30 LBS.	USE LOW HEAT	0610	30 LBS.	0	0	0	
TOAST	20 LBS.	SERVE HOT	0605	20 LBS.	0	0	¼ LB.	
BUTTER	5 LBS.	CUT INTO INDIVIDUAL PORTIONS	0615	5 LBS	¼ LB.	0	0	RETURN TO REFRIGERATOR
JAM	20 LBS.	DIVIDE ONE JAR BETWEEN TWO TABLES		12 LBS.	6 LBS.	0	0	RETURN TO REFRIGERATOR
COFFEE	6 LBS.	WATER ON STOVE AT 0545 — ADD 6 LBS. SUGAR & CANS MILK BEFORE SERVING	0615	15 GAL.	½ GAL.	0	½ GAL.	

DINNER — PREPARE FOR 200

MENU	QUANTITY TO USE	SPECIAL INSTRUCTIONS TO COOKS	COOKING TO START	QUANTITY PREPARED IN UNITS	LEFTOVERS TO BE USED	LEFTOVERS DISCARDED	EDIBLE PLATE WASTE	REMARKS
CHICKEN FRICASSEE	65 LBS.	SAVE STOCK FOR RICE	0900	6 GAL.	0	0	¼ GAL.	
RICE, STEAMED	16 LBS.	STEAM IN CHICKEN STOCK	1000	¾ GAL.	¼ GAL.	0	0	SAVE FOR MEAT LOAF
PEAS	6 NO 10 CANS	HEAT AND SEASON	1125	5 GAL.	¼ GAL.	0	0	CHILL-SERVE WITH VEGETABLE SALAD
FRUIT SALAD	3 GAL.	60 ORANGES, 60 APPLES, 40 GRAPEFRUIT, LETTUCE, CHILL	0800	3 GAL.	0	0	0	
BREAD	20 LBS.	CUT SLICES IN HALF	1120	30 LBS.	2 LBS.	0	0	SAVE FOR NEXT MEAL
BUTTER	6 LBS.	SERVE IN BOWL OF CHIPPED ICE	1135	6 LBS.	0	0	0	
PEACH COBBLER	42 LBS.	10 LBS. FLOUR, 6 LBS. LARD, 6 CANS PEACHES 4 LBS. SUGAR — BAKE NIGHT BEFORE	—	5 SHEETS	¼ SHEET	0	0	SERVE FOR SUPPER
COFFEE	6 LBS.	START WATER 1100 — ADD 6 LBS. SUGAR 8 CANS MILK BEFORE SERVING	1130	15 GAL.	½	0	½ GAL.	

SUPPER — PREPARE FOR 198

MENU	QUANTITY TO USE	SPECIAL INSTRUCTIONS TO COOKS	COOKING TO START	QUANTITY PREPARED IN UNITS	LEFTOVERS TO BE USED	LEFTOVERS DISCARDED	EDIBLE PLATE WASTE	REMARKS
PORK CHOPS	110 LBS.	CUT LOIN INTO CHOPS — USE SAW	1615	309 CHOPS	15 CHOPS	0	3 CHOPS	SAVE FOR MEAT SAUCE
GRAVY	3 GAL.	USE DRIPPINGS FROM PORK — 3 LBS. FLOUR	1645	3 GAL.	⅛ GAL.	0	⅛ GAL.	DISCARD
POTATOES, MASHED		USE PLENTY OF SALT AND PEPPER	1600	7½ GAL.	½ GAL.	0	0	COOL-STORE REFRIGERATOR
SQUASH, BAKED	30 LBS.	SPRINKLE WITH BROWN SUGAR BEFORE BAKING	1615	194 PCS.	0	0	5 PCS.	
STRING BEANS	1½ GAL.	(LEFTOVER) RE-HEAT AND SERVE	1710	1½ GAL.	—	—	0	
VEGETABLE SALAD	5 GAL.	(6 LBS. CABBAGE, 7 LBS. CARROTS, 5 LBS. CELERY, 7 LBS. LETTUCE) ADD LEFTOVER PEAS	1530	5 GAL.	0	0	0	
BREAD	30 LBS.	CUT SLICES IN HALF	1715	30 LBS.	¼ LB.	0	0	SAVE FOR NEXT MEAL
BUTTERFLY ROLLS	40 LBS.	(18 LBS. FLOUR, 2½ LBS. SUGAR, 1⅞ DOZ EGGS, 5 CANS MILK, ¾ LBS. YEAST) ADD ICING	1330	5 PANS	1 PAN	0	0	SERVE FOR BREAKFAST
COFFEE	6 LBS.	START WATER 1640, ADD 6 LBS. SUGAR, 7 CANS MILK BEFORE SERVING	1710	15 GAL.	0	0	0	

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COOK'S WORK SHEET

Figure 7①. Cook's work sheet. (Front)

DAILY SUMMARY				REPORTING DATA
10				11
MEAL	NUMBER MEN PREPARED FOR	NUMBER MEN ACTUALLY FED	EDIBLE WASTE IN POUNDS	DATE (Day, Month, Year) 6 OCTOBER 1945
	a	b	c	
BREAKFAST	198	200	5¼	ORGANIZATION 215TH SERVICE CO.
DINNER	200	201	6	
SUPPER	194	193	5	MESS SERGEANT S/SGT. James Wilton
d. TOTAL	592	594	16¼	
e. AVERAGE NUMBER OF MEN FED		198		VERIFIED BY (Name & Grade) John Q. Jones, 1ST LT. QM. MESS OFFICER
f. NUMBER OF RATIONS ACTUALLY DRAWN — 203				

COLUMN	TO BE FILLED IN BY	12. INSTRUCTIONS
1.	M.S.	Enter each item of the menu, including leftovers from previous meals which are to be served or are to be discarded.
2.	M.S.	Enter quantity of each item to be prepared. The first cook uses this column as a guide.
3.	M.S.	Enter specific cooking instructions concerning the preparation of food, i.e. preparation data, proper timing, recipe number, etc.
4.	M.S.	Enter actual "starting time" for each item to be cooked.
5.	M.S.	Enter quantity of each item after preparation or cooking. Enter quantity in units, i.e. each, package, quarts, pounds, etc.
6.	M.S.	Enter those leftovers which will be used in some form in a subsequent meal. Quantity will be expressed as in Column 5.
7.	M.S.	At the completion of each meal, using pounds as the unit of measure, enter the quantity of food per item which is left over in cooking containers, serving dishes, etc. and is discarded. This also includes items left over from previous meals and which are discarded. (See instruction 1 above).
8.	M.S.	At the completion of each meal, plate waste will be gathered at a central location in the mess (segregated by items where possible). Using pounds as the unit of measure, enter the edible plate waste per item. Inedible waste such as bones, rinds, gristle, etc. should not be included.
9.	M.S.	State the number of portions short, if any. Give comment as to the reason for excessive amount of leftovers. Enter instructions for the use of the leftover as shown in Column 6. Leftovers must be utilized within 24 hours.
10.	M.S.	Enter figures in this table as follows: a. Number Men Prepared For b. Number Men Actually Fed c. Edible Waste in Pounds (Total of Columns 7 and 8) d. Total "b" and "c" at end of day e. To arrive at "Average Number of Men Fed" divide total "Number Men Actually Fed" by 3. f. Enter number of rations actually drawn by the mess. (This figure appears on shipping ticket)
11.	M.S.	Complete information called for, such as Organization, Mess Sergeant, etc. This form must be signed by a commissioned officer.
		(NOTE: M.S. indicates Mess Sergeant)

Figure 7②. Cook's work sheet. (Back)

SECTION II. KITCHEN POLICE AND MESS ATTENDANTS

24. GENERAL. Mess attendants or kitchen police are personnel appointed to assist the cooks. They are an important part in the efficient operation of an Army mess. Their efficiency depends largely on the instructions they receive. The cook must familiarize himself with the instructions and supervision of kitchen police. It is necessary to have a definite plan of job assignments for the kitchen police. *It will be found very effective to assemble these men before starting the day's work and explain to them just what is to be done* and the part that each will take in performing these duties. If possible, the various kitchen police should be furnished a written list of routine duties they are to perform. In addition to this, the mess sergeant, assisted by the cooks, must supervise their work and require them to put forth their best effort. It is always good practice to demonstrate to the kitchen police the best methods of performing their duties.

25. DUTIES OF KP'S. The following is a list of duties ordinarily assigned to kitchen police in a company size mess. The same duties will apply in a larger mess, although the actual assignment of duties will differ.

a. Kitchen Police No. 1 and No. 2. (1) Wash and sterlize dishes and silverware after each meal.

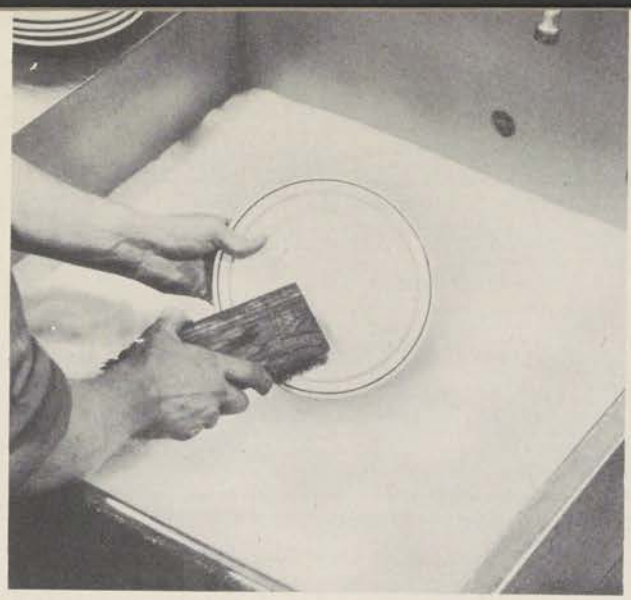




Figure 8. Steps in cleaning dishes.

①. *Use soapy water for washing.*

②. *Keep the rinse water clear. Sterilize after rinsing.*

Fill the first compartment of the sink with hot water (120° to 140°F.) to insure proper cleaning. The second sink is for rinsing. The water in this sink should be 160°F. for a 60 second rinse or 180°F. for a 30 second rinse. The number 1 man washes the dishes and places them in the compartment containing rinsing water. The number 2 man rinses them and places them on the rinsing board. The dishes are then sterilized in scalding water and returned to the drying racks.

(2) Wash pots, pans, and kitchen untensils immediately after use.

(3) Wash and scour sinks after use.

(4) Clean and wash pan racks.

(5) Clean and wash kitchen piping and metal wall guards of ranges.

(6) Clean and wash kitchen tables, dish racks, and serving counter after each meal.

(7) Care for and maintain meat block.

(8) Wash mop boards and doors of kitchen.

(9) *Clean and scrub the kitchen floor frequently.*

b. Kitchen Police No. 3. (1) Clean and scrub garbage racks.

(2) Wash and scour garbage cans and lids.

(3) Clean and wash outside entrance steps, door screens, and doors to mess hall as required.

(4) Clean grease trap frequently.

(5) Police coal bins and outside area.

(6) Supply coal for, and dispose of ashes from ranges and stoves as required.

(7) Dust and clean fire extinguishers.

(8) Dispose of trash and garbage as required.

(9) Clean and rebait fly traps regularly.

(10) Wash windows and screens of mess hall and kitchen weekly.

c. Kitchen Police No. 4. (1) Remove to serving counter the remaining dishes and silverware to be washed after each meal.

(2) Clean overhead lights, shades, and beams in mess hall.

(3) *Clean and scrub dining room tables after each meal.* (See KP No. 5.)

(4) *Clean and mop dining room floor after each meal.* (See KP No. 5.)

(5) Wash mop boards and doors of dining room.

(6) Set dishes and silverware on tables after they are washed.

(7) Clean and wash sugar bowls, salt and pepper shakers, and other condiment containers on mess hall tables after each meal.

(8) Polish stoves in dining room frequently.

d. Kitchen Police No. 5. (1) *Clean and scrub dining room tables after each meal.* (See KP No. 4.)

(2) *Clean and mop dining room floor after each meal.* (See KP No. 4.)

(3) Clean icebox and arrange articles therein.

(4) Clean bread box and sun frequently.

(5) Clean vegetable bins or rack.

(6) Clean and scrub stock room shelves and floors as required.

(7) Care for and maintain kitchen ranges.

(8) Care for and maintain deep-fat fryer.

(9) Inspect, sort, and pick over fruits and vegetables when received.

26. HOW TO ASSIGN DUTIES. Those items which require care and cleaning after each meal should be accomplished first. They should be completed by 0900, 1400, and 1900 hours. Units requiring care and cleaning once daily can be divided

between the morning and afternoon hours to equalize the time element. However, as much as possible should be accomplished in the morning. When the specific duties as outlined above have been completed, the kitchen police will be used for general mess hall work, such as paring of vegetables, setting food on the tables, and any other duties required by the mess officer, mess sergeant or cooks. KP's should not leave the kitchen unless definitely permitted by those in authority. After the entire mess establishment is considered in an excellent condition, KP's may be allowed time off to attend to personal affairs. If the work will require the attendance of KP's all day, however, they should be given a definite rest period at least once in the morning and once in the afternoon. Kitchen police, as well as other mess personnel, should be instructed to be thorough and clean in their work, and to avoid dropping food particles, spilling water, coal dust, ashes, grease, etc. Such carelessness increases the work of cleaning. In some messes, permanent KP's are employed. In most messes, however, it is impracticable to assign men to such duty on a permanent basis and KP's are selected daily from the roster by the first sergeant. Commanding officers should not assign men to KP duty as a punishment.

27. SEGREGATION OF WASTE. a. Even in the most efficiently operated Army mess there will be waste. Waste, however, must be kept at a minimum. In a permanent post, the government usually contracts with a hog farmer to haul away garbage, receiving in return free haulage and money. Thus, even garbage has cash value, aside, from the contribution it makes toward expanding our meat supply. A hog farmer, however, will not accept garbage that has not been segregated. Some types of garbage, such as citrus peelings, coffee grounds, onion skins, egg shells and indigestible solid garbage (bones, fruit pits), cannot be fed to hogs. A check-list of waste materials and miscellaneous salvage is provided in *b* below. This check list contains the various headings under which waste is segregated, and gives a brief description of each kind. Use the list as a check for making certain that waste is being cared for properly.

Table VII. Separation of waste and miscellaneous salvage—Check list

1 *Trap grease*	*2* *Clear*	*3* *Bones*	*4* *Edible food waste*	*5* *Inedible food waste*	*6* *Tin cans*	*7* *Bottles jars and jugs*
Skimmed weekly and free from trap sediment.	Clear and spent frying fats. (All fats to be rendered.)	Cooked and excess raw bones, fowl trimmings and entrails.	Edible garbage including cooked meats free of all bones, all fit for hog food; all foreign matter to be removed, egg shells[1], corn cobs, fish bones from plate waste.	Citrus fruits, fruit rinds, coffee grounds, fish heads and scales, asparagus butts, onion skins, banana peels, corn husks, tea leaves, etc., egg shells.[1]	Properly washed and processed; flattened by stepping on them, not hammered. Tops and bottoms removed.	Clear and colored; clean and labels removed. Keep clear and colored separate.
8 *Ashes*	*9* *Corrugated cartons*	*10* *Magazines and newspapers*	*11* *Trash*	*12* *Mixed metals*	*13* *Egg crates*	*14* *Bags*
Free from all trash.	Flattened and tied in convenient bundles.	To be bundled and tied. Usable waste paper to be placed in containers.	Sweepings, soiled, greasy and wax paper, shoe polish containers, small jars unemptied, medicine bottles, broken crockery, etc.	Iron, copper, aluminum, wire, bottle caps, jar lids.	Carefully opened, fillers, separators and lids to be replaced. Baskets and crates to be placed at collecting points intact.	Coffee, flour and sugar bags to be returned to salvage branch.

[1] Egg shells are classed as edible or inedible at the discretion of garbage contractor.

b. Garbage must not be allowed to accumulate in the kitchen. As it accrues, garbage must be placed in GI cans or other containers on the garbage rack. All kitchen byproducts from food sources will be segregated in the manner prescribed below.

(1) *Edible garbage.* This can takes garbage which animals can eat: table scrapings, vegetable and fruit (except citrus) peelings, cooked meat and vegetable scraps from plates, potato peelings, pea and bean pods.

(2) *Inedible garbage.* This can holds garbage which hogs cannot eat: egg shells, citrus peels, onion skins, coffee grounds, fruit pits, etc.

(3) *Trap grease.* GI sinks are equipped with grease traps, devices that filter from dishwater any grease which might clog the plumbing and complicate sewage disposal. These traps should be cleaned daily and the grease placed in a can for salvage, marked "Trap Grease."

(4) *Clear grease.* This can will hold kitchen fats, already rendered and used, and fat from the deep-fat fryer unfit for reuse. Do not contaminate these fats by mixing with bones or trap grease.

(5) *Raw and cooked bones.* Raw bones should be used for making soup and gravy stock. Raw bones in a garbage can indicate poor kitchen management. Cooked bones have many uses. They should be separated from other waste. No meat or fat should be left on the bones.

c. Dry salvage must be disposed of. All of the items listed below should be segregated and placed out for pick-up as directed by the post commander. Most of the items have salvage value.

(1) *Tin cans.* Remove labels, rinse, cut off both ends and flatten. A free space should be left inside the flattened can so that chemicals used to strip the tin will flow through the interior of the can. Flattening reduces the bulk of the material. The ends of the can should be included. Paint cans, cone-topped beer cans, and similar metal containers are not useful and should be disposed of as trash.

(2) *Mixed metals.* Any copper, aluminum, or other metals that can be salvaged should be placed in a separate container.

(3) *Bottles, jars, jugs.* Use them in the kitchen as refrigerator and kitchen storage containers. If they cannot be used in the kitchen, set them out for pick-up. They have a sale value.

(4) *Burlap bags, inner sacks, and rags.* These can always be used to advantage, but if there is an excess supply turn them in for salvage.

(5) *Wooden crates and paper cartons.* Those not required turn in for salvage.

(6) *Wrapping paper, newspaper, magazines.* All paper except that rendered useless by moisture or impregnation with food, grease, or dirt, should be baled for pick-up. A divided bin-shed for these articles, with compartments for each variety, may be constructed easily.

(7) *Trash can.* Floor sweeping, wet scrap paper, and other trash with no salvage value must be disposed of by burning or dumping.

(8) *Ashes.* Keep ashes and clinkers separated from other waste. They can be used within the company area or by the post for bedding roadways and filling low areas.

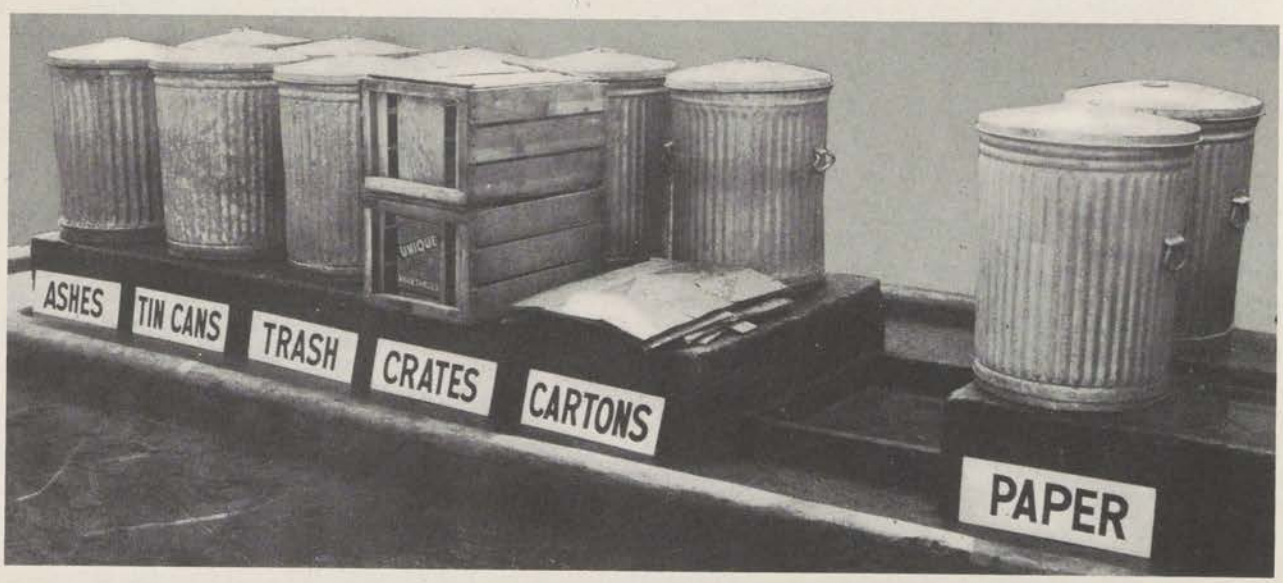


Figure 9. ① *Garbage rack.* (Front)

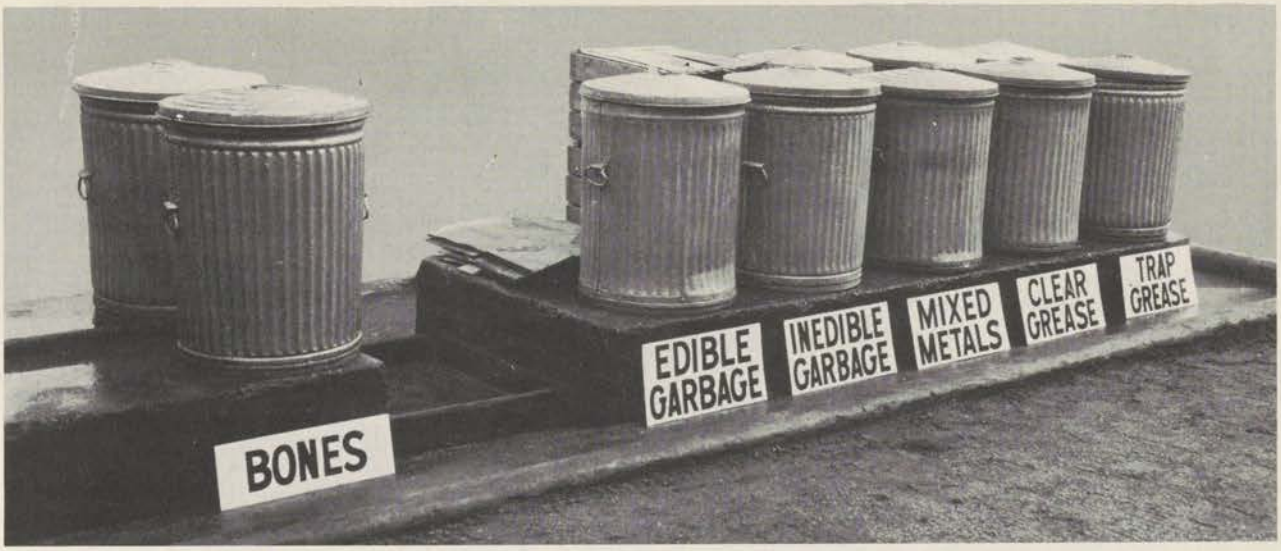


Figure 9 (continued). ②. *Garbage rack.* (Back)

SECTION III. LEFTOVERS

28. GENERAL. Leftovers are caused primarily by cooks preparing excessive amounts or preparing improperly. Leftovers can be controlled by consulting the Cook's Work Sheet. Some questions a cook must answer to find the cause and prescribe the cure for avoidable leftovers are:

a. Were there clashing food combinations?

b. Did I do a "halfway" job on the dish because I neglected to find out how to prepare it properly?

c. Did I use all of an item issued, even though I knew it would yield too much?

d. Did I overcook or undercook the food?

e. Was the cooking temperature right?

f. Did the dish contain ingredients that were improperly cleaned, cut, or mixed?

g. Did I serve with "eye appeal"?

h. Did I use methods in cooking that made for monotony?

i. Did I observe the principles of timely preparation so that the food was served at its pinnacle of perfection?

j. Did I serve hot foods hot and cold foods cold?

29. USE OF LEFTOVERS. The use of leftovers of any type may be carried out with assurance if a few common sense principles are kept in mind. The aim of leftover cooking is to satisfy men's appetites while eliminating food waste. Leftover cooking calls for thrift and ingenuity to fit the food for reuse without extravagance.

a. The following points should be remembered when using leftovers:

(1) Leftovers must be "fit to eat." They should be wholesome and palatable in their new form, and harmoniously blended with other ingredients or dishes.

(2) Do not serve the leftover in its original form if it can be altered. Change it for variety and new appeal.

(3) Store properly; refrigerate if necessary.

(4) Do not overcook. Most leftovers require only brief cooking.

(5) Season properly, but take into account the seasoning already in the food to avoid overseasoning or flavor clashes.

b. There are many practical ways to use leftovers. Following are some valuable suggestions to the cook on the use of leftovers. When the leftover is:

(1) *Bread*: use it as crumbs for coating foods to be pan fried, French toast, stuffing, bread cases, Melba toast, bread pudding, brown Betty, crumbs as extenders for hash and croquettes, scalloped tomatoes, oysters, cut in cubes and toasted or fried for soup extenders, omelets.

(2) *Egg whites*: meringues, substitute for whipped cream in ice box desserts, thickening for custards, scrambled with home fried potatoes.

(3) *Egg yolks*: binder for filling or stuffings, homemade mayonnaise with cooking oils, eggnog,

scrambled with home fried potatoes, mixed with milk as coating for French toast.

(4) *Cooked cereals*: sliced cold and fried as mush, mixed with chopped pork and fried as scrapple, extender for meat loaves, hamburgers, croquettes, add to stuffing.

(5) *Cooked vegetables*: combined in a cooked vegetable salad, added to soup, vegetable scallops, added to sauces and gravies, combined with other vegetables being cooked, used in vegetable puddings, added to souffles; boiled potatoes may be home fried, or made into potato salad, or browned with roast or creamed; mashed potatoes may be made into fried potato cakes, or fluffed up and used as topping for meat, fish or vegetable pie, or used with meat or fish to make meat balls or cakes.

(6) *Raw vegetables*: save outer leaves of leafy vegetables to use in soups; celery leaves may be dried and used for seasoning; turnip tops; beet tops, and mustard greens are valuable stewed or used in gelatin salads.

(7) *Cooked meats*: omelets, souffles, scrambled eggs, hash, stew, meat pie, salads, ground in sandwich fillings, added to scrapple, combined with fresh meat for meat loaves, garnishes for soup, creamed and served on toast, barbecued meat slices, breaded and fried, chop suey, save bacon drippings for frying, and for flavoring sauces, gravies, soups.

(8) *Uncooked meats*: large bones may be cut out and used for soup, meat trimming may be used for soup, trimmings may be chopped fine and mixed with corn meal to make scrapple, hash, stews, meat loaves, baked beans.

(9) *Poultry*: sliced cold, hash, pot pie, salad, creamed on toast or biscuits, sandwiches, scalloped with macaroni or rice, with noodles, croquettes, boil bones for broth, save fat for shortening and frying.

(10) *Fish*: hash; fish cakes or croquettes, sandwiches, salads, creamed on toast or biscuit, cream soups, made into loaves or casseroles with macaroni, noodles, or spaghetti, and baked.

(11) *Fruits*: fruit cups, salads, jellies and preserves, sauces, cobblers, stewed; baked apples, applesauce, or fried apple rings; short cakes, muffins, fritters, frozen desserts, and puddings.

SECTION IV. SANITATION

30. GENERAL. a. Sanitation is one of the most important phases of good messing. The health of the soldier depends upon proper sanitation. One error or one case of carelessness on the part of the cook can be the medium by which diseases are spread with drastic consequences. Using serving spoons for every platter is only one small detail. Nine out of 10 men seated at a mess hall table may be in perfect health; the use of their own silver to serve themselves possibly would result in no harm to any one. Yet, the tenth man, with a bad cold, can cause the beginning of an epidemic.

b. Sanitation must be considered throughout the preparation and service of meals; as a matter of fact, it is a 24-hour proposition. The first law of mess sanitation requires that the personal hygiene of the cooks and other mess personnel always be maintained at the highest standards. Even the best meals lose their appeal when served in an unsanitary manner. An organization gains nothing in having its meals prepared on time and its service letter perfect if the mess sergeant and cooks neglect simple rules of cleanliness. Sanitation is achieved only by the observance of many points; most of them are easily carried out, but close attention must be paid to details.

c. The mark of an efficient man in the kitchen is the neatness of his work, and his attention to details of sanitation. The less grease, oil, and food scraps spilled on work surfaces and floor, the less clean-up work is necessary. There is no need to let dirt accumulate. When a pot is dirtied or a table soiled, clean it up immediately. Spot scrub the floor, particularly around the ranges, as spillage occurs.

31. PERSONAL CLEANLINESS OF COOKS. The cook's responsibility for sanitation begins with himself. It is of great importance that he keep himself scrupulously clean and in good physical condition. No one wants to eat food prepared by a cook who is not clean. A cook who suffers from a cold or any other sickness can easily transmit his ailment to others. If he does not keep himself clean, disease germs may be carried to the food. He must wash his hands frequently and always after visiting a latrine. He should shave and bathe daily and change his underwear frequently. His outer clothing must be changed as soon as it becomes soiled. Fingernails should be kept trimmed short and free from dirt. Hair should be cut regularly. The cook must be careful to avoid coughing or sneezing when this might carry germs into the food.

Any symptoms of illness or infection should be reported immediately for medical attention. All cuts, scalds, or burns, no matter how slight, should be treated immediately to prevent infection. The white caps provided for cooks are not merely for ornament; they are to prevent hair, dandruff, or dust from the cook's hair from falling into the food. White caps must be worn when in the kitchen, and white caps and coats when serving meals.

32. CLEANING CHINA, UTENSILS, SILVERWARE. Dishwashing requires plenty of hot water, both soapy and clear, and should be drawn into clean sinks. The dishes should be rinsed or brushed free of food particles before going into the dish laundry. The final clear water rinse washes away soapsuds and puts a sparkle on the china. Scrub out the sinks between changes of water. (See ch. 8.) All china and utensils should be air-dried. Army regulations prohibit the use of a drying cloth. (See AR 40–205.) Most messes are provided with wooden racks for drying dishes. The racks should be removable so that they too may be scrubbed and air-dried daily. Chinaware must be stacked neatly after it is washed. A rack is most satisfactory for this. Racks may be moveable or stationary. A moveable rack for chinaware is illustrated in figure 10. After compartment trays are washed they may be piled in stacks or placed in racks. A suitable rack for trays is illustrated in figure 11. When trays are piled they must be placed bottom side up, each turned around in the opposite direction from the one below. With the exception of griddles, wash all utensils after every use. Griddles usually may be kept in cooking condition by thorough scraping and cleaning after each use. Pots and utensils are washed in the same manner as dishes, except that scouring agents may be used. These cleaning agents make a clean water rinse all the more necessary. Pans may be dried by placing them on the coolest section of a range for a few minutes. Silver comes under the critical eye of inspectors more than any other single item and for health's sake it must be sparkling clean. Instructions for washing silver follow:

a. Have a boiler of hot, soapy water where soiled silver can be placed by the men. (Some mess halls set out three dishpans, one each for knives, forks and spoons, making it easy to segregate later.)

b. When all the silverware is received, pour off the water and add a new, hot, soapy rinse.

c. After the soapy rinse, place a small quantity of silver in a dishpan. The dishpans should be about two-thirds full of soapy water as hot as the KP's can put their hands into. Each piece should be washed separately.

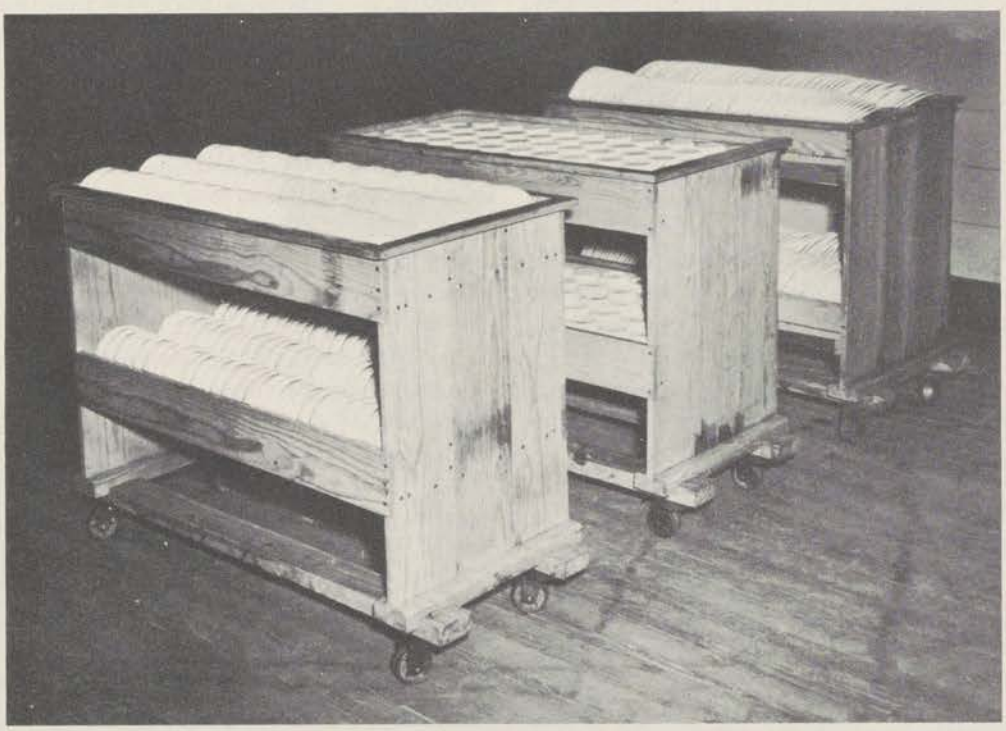


Figure 10. Chinaware in racks.



Figure 11. In this rack, the trays slant down.

d. As the silver is washed it should be placed in the "basket" sterilizer, a perforated metal container with high handles, issued to each kitchen. When about half full, the basket should be agitated for 30 seconds in a boiler of clear water kept on the stove at scalding temperature.

e. Then drain the silver and spread it out on a clean surface.

33. CLEANING TABLES, WALLS AND KITCHEN FAN INSTALLATIONS. Work tables and serving counters should be scrubbed and dried by room heat or sunlight. Kitchen walls should be kept clean. The kitchen fan installation should be cleaned out weekly since its mechanism and screen inclosure gather grease and dust. Windows should be washed every week, inside and out. A mixture of hot water and vinegar (about a tablespoon of vinegar to a quart of water) makes a good window cleaner and newspapers are satisfactory for drying and polishing the glass. Pipe racks and other metal fixtures should be polished daily. Most kitchen and dining room tables are constructed of parallel boards laid on a framework. The *center board should be removable* so that all sides of the boards may be scrubbed. Dining room tables should be washed after each meal and sunned weekly, weather permitting. The uprights and supports of all tables should be kept clean. Always clean tables, walls, windows, and kitchen installations before cleaning floors.

34. CLEANING FLOORS. The first impression of a mess usually is received from the appearance of its floors. There are, of course, right and wrong ways to scrub floors. The wrong way usually consists of floods of water splashed recklessly over the whole surface. Easier and much more effective is the right way. It follows:

a. Divide the floor area into sections. Scrub them one at a time and finish drying each section before going on to the next.

b. Have one bucket of soapy water and one of clear water. Make the soapy water by chipping the soap very thin and stirring it into the water until it dissolves. If a bar of soap is used, place it in a perforated, metal container and agitate it in the water until a suds forms.

c. Put only enough soapy water on the floor to wet the section to be scrubbed.

d. Scrub with a GI brush or broom working with the direction of the boards, not across them.

e. Use a clean dry mop to take up the soapy water. Rinse the mop frequently in the clear water, and wring it out thoroughly. The mopping will remove all excess moisture and will clean the floor. Do not slosh rinse water over the floor. This does not clean the floor as well as mopping and it will leave excess moisture that causes warping and shrinking of floor boards.

35. CLEANING AND CARE OF GARBAGE RACKS AND OUTSIDE AREA. The company garbage rack gives the first or last impression of an organization mess because it is the first or last installation that is inspected. It is the key to an efficiently operated mess. If it is kept clean and the area around it is free of miscellaneous bits of food, trash, and other material, usually the mess itself is in the same order. If the opposite is true, the mess can be expected to be disorderly and unsanitary. The following rules are aids for maintaining garbage racks:

a. Instruct and supervise kitchen police in placing garbage and trash in cans. Insist that care must be taken not to slop refuse over the cans and racks, and on the surrounding ground.

b. Garbage racks and cans must be washed at least once daily with hot soapy water.

c. Keep lids on the cans when not actually placing garbage in them or washing them.

d. Keep the surrounding area clean by placing sand or cinders on the ground and raking frequently. The ground around the garbage rack may be sprayed or soaked with refuse oil.

e. Keep a sufficient number of freshly baited fly traps around the racks during the fly season.

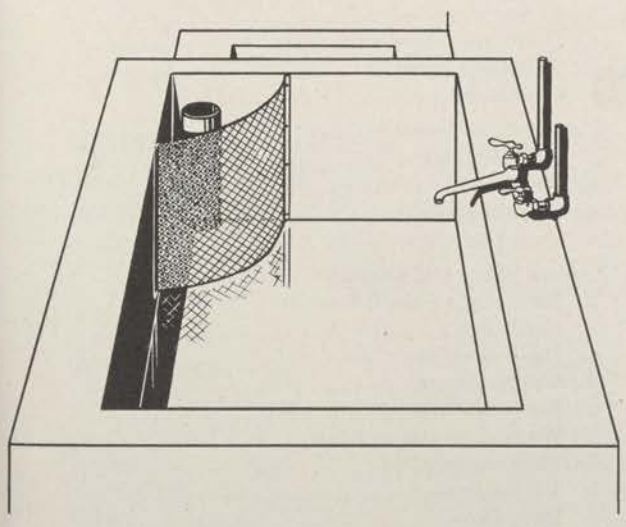


Figure 12. Tank for washing garbage cans.

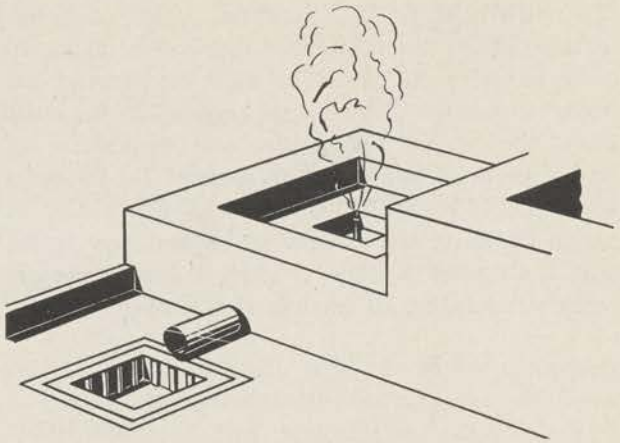


Figure 13. Steam jet for sterilizing garbage cans.

f. Mark all cans plainly as to type of refuse each contains and insist that only the proper refuse is put in each can.

36. WASHING AND STERILIZING GARBAGE CANS. Cans used for garbage must be cleaned after every emptying. The cleaning of garbage cans involves two steps: washing and sterilizing.

a. Cans should be washed inside and out with hot, soapy water and scrubbed with a stiff GI brush. All particles of waste must be removed. Bits of food remaining in cans quickly create an offensive odor and becomes sources for spreading disease and infection. When cans are very dirty, a period of soaking before washing is required. Figure 12 shows a tank for soaking cans. This tank can be used advantageously both for washing and soaking.

b. Sterilization is important because it acts as a purifier. A steam jet or a jet of extremely hot water can be used satisfactorily. Figure 13 illustrates a sterilizer. This should adjoin the soaking tank for convenience.

37. CONTROL OF INSECTS. Finally, insect pests should be controlled. Spray may be applied with an ordinary pump spray gun. If it is necessary to cope with any unusual pest conditions, the post surgeon should be consulted. When insecticides are used in the mess hall, make certain that they are kept away from foodstuffs. Insecticides are poisonous. Fly traps should be installed outside and near all mess hall entrances, and near garbage racks. Bait recipe: Cook 2 cups of oatmeal or cornmeal in 1 quart of water. While cooling, stir in 2 pounds of sugar or two pints of sorghum syrup. When the mixture is lukewarm, add 2 ounces of yeast dissolved in a little warm water.

38. SUMMARY. a. General. The cook has certain definite responsibilities in the mess hall. In order to carry out these, he must understand the fundamentals of kitchen management; he must know the proper segregation and disposition of waste; he must know how to account for leftovers and what to do with them; he must know how to assign duties to the kitchen police and how to see that their work is done properly; he must be extremely careful on all matters of sanitation.

b. Kitchen Check List. The kitchen check list in table VIII should serve as a guide to cooks and mess sergeants, and as a constant reminder of various details for which they are responsible. The cook must check each day to see that proper care has been taken of the garbage rack, the rear entrance, the kitchen storeroom, and the other places for which he is responsible. The cook must personally inspect these areas and check each on the list if it has been properly cared for.

Table VIII. Kitchen check list

1. Garbage rack
   a. Waste segregation
   b. Amount of edible waste
   c. Cleanliness
   d. Fly control
2. Rear entrance
   a. Coal bin
   b. Mop and broom rack
   c. Back steps and door
3. Kitchen store room
   a. Appearance
   b. Stock arrangement
   c. Surplus stock
4. Meat block and work table
   a. Condition of top
   b. Orderliness
   c. Racks nearby to hold tools
5. Pots-pans-utensils
   a. Arrangements
   b. Cleanliness
   c. Condition
6. Menu and cook's work sheet
   a. Record of preparation on work sheet properly used.
   b. Waste record
   c. Adherence to Army recipes
7. Cooks
   a. Training progress
   b. Personal appearance
8. Range
   a. Proper firing
   b. General condition
   c. Cleanliness
9. Food in preparation
   a. Conformity to menu and work sheet
   b. Instructions on timing
   c. Appearance and taste of food
   d. Methods of cooking
10. Kitchen sinks and dishwasher
    a. Water temperature
    b. Cleanliness
    c. Timing
11. Refrigerator
    a. Odor
    b. Arrangemen
    c. Proper use
    d. Excess stock and leftovers
    e. Cleanliness
    f. Temperature
12. Bread storage
    a. Cleanliness
    b. Air circulation
    c. Arrangement
    d. Freshness of bread
13. Serving counter
    a. Order of food service
    b. Appearance of food and servers
    c. Method of service
14. Mess hall general appearance
    a. Windows
    b. Attractive surroundings
    c. Floors
    d. Decorations
15. Mess tables
    a. Condition
    b. Arrangement
    c. Condiment containers
    d. China and silver
    e. Cleanliness
16. Food conservation measures
    a. Plate scrapings
    b. Food posters
    c. Waste segregation
    d. Proper portions
17. Mess officer and sergeant
    a. Ration requirement forecast
    b. Head count
    c. Daily meeting
    d. Weekly drives
    e. Fat conservation
    f. Waste in preparing food
    g. Mess organization
    h. Job assignment
    i. Early chow
    j. Money collected for meals

CHAPTER 5

PRINCIPLES OF COOKERY

SECTION I. GENERAL

39. COOKERY DEFINED. Cookery is the science of preparing food for the table in such a way that it will appeal to the eye, be tasty, be easily digested, and furnish nourishment to the body. Cookery includes the choice of proper food combinations, the preparation of foods, their cooking, seasoning and garnishing. Preparation means sorting good items from bad, washing, trimming, cutting, grinding, thawing as necessary, and combining one food with another. Cooking changes the original appearance of foods, brings out flavor and aroma, makes the food more appetizing, tender, and digestible, and destroys many bacteria found in raw food. Proper temperature must be maintained in the cooking process to protect the value of food and to prevent shrinkage in cooking. The cook's concern with temperature does not end until the food is served; it is served at its best only when the temperature is most appealing. Seasoning is the skillful use of spices and condiments to give foods a more pleasing flavor. Garnishing is the final touch added to food before serving to improve its appearance.

40. AIMS IN COOKERY. The aim in cookery is to put the foods served in the Army into the best possible combinations. Factors to be considered in making the finest food combinations are nutritional value, flavor, appearance, color, contrast, and variety. A cook can meet the aim of cookery if he brings to bear on his work his knowledge of foods available, the effects of the season of the year, troop preference, and the limitations and possibilities of his cooking equipment. The knowledge and skill the cook uses in preparing these foods directly affects his value in the organization. Each meal should represent his best effort. He should take pride in his work rather than be satisfied with merely slipping by; he should take advantage of every opportunity to find new and pleasing ways to prepare food, and he should use this book and related War Department publications to improve his skill. Before a cook begins the actual preparation of dishes from recipes, he must know the different foods, how they are used, what care must be taken to prepare them for cooking, and methods of cooking that will make them tasty and nutritious. This chapter gives the cook the information he needs to follow the Army recipes. After becoming an accomplished cook, this will serve him as a reference to improve his work.

SECTION II. COOKING PROCESSES

41. MOIST HEAT. Cooking is performed by two basic methods, moist heat and dry heat. Moist heat means that the food is cooked in a liquid, usually water. Moist heat is generally used for less tender cuts of meat and for vegetables. There are four types of cooking with moist heat:

Table IX. Temperature chart for cooking with moist and dry heat

Kind of heat	Degrees of temperature
Dry heat:	
Broiling	450–500
Baking (Pie)	450
Frying	375
Roasting	325

Kind of heat	Degrees of temperature
Moist heat:	
Pressure cooking	275
Boiling	212
Simmering	200
Braising	185–200

a. Simmering. Simmering is cooking in water below the boiling point, between 180° F. and 210° F. The usual temperature is 185° F. When the temperature is right for simmering, bubbles of steam will rise from the bottom of the dish but will disappear before reaching the surface of the water. Beef stew is an example of a food that is simmered.

b. Braising. Braising is similar to simmering. The food is browned first in a small amount of fat and is then simmered in a small amount of liquid until done. Braising provides long, slow cooking, and, therefore, is very good for less tender cuts of meat. All of the less tender cuts may be braised.

c. Boiling. Boiling means heating a liquid until it bubbles; the bubbles rise to the surface and pass off in the form of steam. If the dish is uncovered and the steam passes off, the temperature of the liquid will never be higher than its boiling point. The boiling point of water is 212° F. except at high altitudes in which case it is lower.

(1) *Meat* is never boiled.

(2) *Vegetables* and other foods are boiled.

(3) *Slow and rapid boiling.* In boiling any food, liquid that boils slowly is as effective as one that boils rapidly.

d. Steaming. Steaming is cooking in the steam rising from boiling water or other liquids. In the Army kitchen steaming is usually done in special equipment such as the pressure cooker and the steam-jacketed kettle. Table X gives the time for cooking various foods with steam.

42. DRY HEAT. When cooking with dry heat there is no liquid added. In most dry heat, cooking fats cook out of the food itself and prevent burning. Dry heat is used only for cooking the tender cuts of meat. There are five methods of cooking with dry heat.

a. Roasting. Roasting is cooking with dry heat in an oven. The dish must be uncovered; otherwise, the food will steam instead of roast. Roasting is essentially the same as baking. Originally, roasting meant cooking before an open fire or by covering with hot coals. Although the same methods are used, roasting usually applies only to meats, and baking applies to bread and similar products.

b. Broiling. Broiling is cooking by direct heat over coals or under a gas flame or electric unit. Broiling is usually used only with meats. It is extremely simple and very quick but is limited to more tender cuts of meat, steaks, and chops.

c. Pan or griddle broiling. Pan broiling is cooking on top of the stove in a frying pan or griddle, using for grease only the fat of the meat itself.

d. Frying. Frying differs from pan broiling in the amount of fat used. Pan frying is done with enough added fat definitely to cook the food in fat. It should be emphasized that certain foods are particularly adapted to pan frying, as noted below, while others are suited only for deep-fat frying. Examples are: potatoes, chicken, large fish, steak, vegetables (not breaded or batter covered), beef or pork liver, meat specialties (kidneys, sweetbreads, etc.), eggs, ham, bacon.

e. Deep-Fat Frying. (1) Deep-fat frying is the cooking of food by completely surrounding it with fat heated from 350° to 380° F. In deep-fat frying the foods are cooked quickly enough to prevent their absorbing fat. Deep-fat fried foods are popular in the Army kitchen because of their crisp, tasty crusts. This same condition cannot be reproduced by any other method of cooking. Foods adapted to deep-fat frying are: croquettes, fritters, vegetables (batter covered or breaded), sea foods (breaded, excepting large, whole fish), chops (breaded), cutlets (breaded), chickens (small, disjointed fryers or precooked, steamed fowl, never deep-fat fry large pieces unless precooked), doughnuts, French-fried potatoes, French toast.

Table X. Timetable for cooking with steam

Item	Time
Apples	8 to 12 minutes.
Asparagus	15 to 20 minutes.
Green beans	20 to 30 minutes.
Beets (Young)	30 minutes.
Beets (Old, large)	30 to 150 minutes.
Broccoli	20 to 25 minutes.
Brussels sprouts	15 to 25 minutes.
Cabbage	20 to 30 minutes.
Carrots	20 to 40 minutes.
Cauliflower	12 to 18 minutes.
Cereals	Until tender.
Corn-on-cob	7 to 15 minutes.
Dried fruits	20 to 30 minutes.
Fish	20 to 40 minutes.
Meats and fowl	Until tender.
Onions	20 to 35 minutes.
Parsnips	30 to 40 minutes.
Peas	10 to 15 minutes.
Potatoes (White)	25 to 40 minutes.
Potatoes (Sweet)	35 to 40 minutes.
Rice	20 to 30 minutes.
Rutabaga	50 to 60 minutes.
Spinach	7 to 10 minutes.
Squash (Summer)	10 to 20 minutes.
Squash (Winter)	20 to 30 minutes.
Turnips	30 to 40 minutes.

(2) The following suggestions should be helpful in the successful preparation of foods by this cookery method:

(*a*) Keep equipment clean.

(*b*) Use a thermometer if possible.

(*c*) Do not hold fat in the kettle. Drain, filter, and store it in the refrigerator or other cool place.

(*d*) Avoid overheating. All fats will smoke at ordinary frying temperatures after about 2 hours' use. Care should be taken never to fry at a temperature higher than required by the particular food being fried. All fried foods have a better flavor if not fried at too high a temperature.

(*e*) Taste the fat and the fried foods every day to see that the flavor of the fat is still satisfactory.

(*f*) Discard off-flavored fat and start with fresh fat.

(*g*) Precook large pieces of meat, large chickens, etc. before breading. Finish in deep fat at 360° to 370° F.

(*h*) In frying raw, wet foods, such as potato chips, dry them as much as possible before placing them in the hot fat. This can be accomplished by allowing the water to drain off, or the water can be removed with dry towels. This will conserve heat and make for improvement through more uniform frying temperatures.

(*i*) Always keep the frying kettle filled to the proper level with fat.

(*j*) Excessive breading should be avoided because it results both in inferior food products and in contaminated frying fat.

(*k*) A hood located over the frying unit and equipped with a satisfactory exhaust fan will make the entire kitchen more comfortable.

(*l*) Serve fried foods as soon as possible. They are best immediately after removal from the frying fat.

(*m*) Potatoes used for frying purposes should be kept out of the refrigerator and away from cold storage. Storing the potatoes at 70° to 80° F. helps to obtain a more even color and a better flavor in the fried product. It is preferable to use older potatoes for frying.

(*n*) Strain the frying fat several times each day when frying clams, oysters, and other highly breaded foods. The fat should always be strained after each day's work.

(*o*) When doughnuts are fried there is a deposit of dusting flour and small dough particles in the hot frying fat. If these particles are allowed to remain in the fat, they will become scorched and will give off unpleasant flavors and odors. Occasionally cinnamon rolls are deep-fat fried. This results in a lowering of the quality of the frying fat because absorption of cinnamon immediately produces a dark and bitter flavor.

(*p*) Never salt fried foods over kettle.

(*q*) Do not hold the frying fat at high temperatures when it is not in use. This is not only fuel consuming but it unnecessarily breaks down (impairs the quality of) the frying fat.

(*r*) Certain metals as brass and copper are injurious to the fat. It is therefore essential that only the equipment furnished for deep-fat frying be used.

43. CARE AND USE OF DEEP-FAT FRYERS. The fryers which have been installed in some mess kitchens are constructed on a scientific principle which practically assures good products. Heat is applied above the bottom of the cooking vessel. This results in having hot fat above the heating unit and much cooler fat below the heating unit. All sediment and particles drop into the lower portion of the fat, thus preventing burning which hastens the "break-down" of the fat. The thermostat should keep the fat at a constant temperature. Too much food should not be placed in the fryer at one time because this results in lowering the temperature too much, and the fried product will be greasier than necessary. Good care and intelligent use of a fryer insure its longer life, prolongs frying life of the fat and assures fried products of better flavor and quality.

a. Cleaning Before Use. Before using fryer it is essential that it be cleaned. Fill the kettle with cleaning solution. Baking soda or dishwashing compound type I or II may be used. Set thermostat to 250° F. Boil for 10 minutes. Rinse several times with clean, hot water and dry thoroughly. ***Caution:*** Unless cleaning solution is completely removed from kettle, the frying fat will be ruined quickly.

b. How Much Fat to Use. Fill kettle with fat to a level just high enough to cover food being fried.

c. Reuse of Fat. Put strained fat into kettle and add enough fresh fat to bring it to proper level. There should be enough fat to allow the temperature to remain reasonably constant during use.

44. DIRECTIONS FOR DEEP-FAT FRYING. Set thermostat of deep-fat fryer at the temperature given in the formula being used. When the fat has reached this temperature, place the food in wire basket, then lower into the fat. When browned and properly cooked, lift up basket, allow food to drain in order to remove excess fat. Certain products require special directions to cook them well.

a. Dough Products. (1) *Richness.* A rich dough is one with more fat content. A rich dough will soak more fat than a leaner dough. Unless the cook is careful in weights and measures, fat absorption will vary from batch to batch. It is recommended, therefore, that extreme care be taken when measuring ingredients. Small variations in sugar content will appreciably affect the fat absorption.

(2) *Dough temperature.* If dough temperature is too warm, the product will be tough and knotty. It is recommended that cool water be used in mixing dough.

(3) *Frying temperature.* Fat absorption of dough is affected by the frying temperature. A low frying temperature will mean a slow cook and a grease-soaked doughnut. A high frying temperature will brown the crust too fast and will cause cracks on the surface. A temperature of 360° to 370° F., inclusive is recommended. This should be carefully controlled.

(4) *Flavor of dough.* Since absorbed frying fat represents nearly 20 percent of the weight of the finished dough, it is essential that the frying fat have a desirable flavor.

(5) *Toughness of dough.* Toughness may be caused by variations in flour strength. This may be overcome by increasing slightly the amounts of either sugar or lard in formula. If dough is too tender and thereby becomes grease-soaked, reduce the sugar or fat slightly.

b. Fried Potatoes and Other Vegetables. There are several products obtained by cooking potatoes in deep fat. The essential difference between them is the way in which they are cut for frying. These include French-fried, Long branch and julienne potatoes, and potato chips. French-fried potatoes are cut the long way of the potato into strips about ⅜- to ½- inch square. Long branch potatoes are cut in strips about ¼-inch, and julienne about ⅛-inch, thick. Potato chips are cut into thin even slices. For best results select uniform No. 1 potatoes. Always keep potatoes at room temperature for several days before frying. Potatoes which are taken directly from cold storage will be dark brown, soggy, and sometimes bitter when cooked.

Table XI. Times and temperatures for deep-fat frying

Product	Temperature	Time
	Degrees Fahrenheit	Minutes
Croquettes	350	12–15
Breaded cutlets and chops	350	7–10
Chicken (small, raw and disjointed)	325	20–25
Chicken (precooked or steamed)	350	7–10
Chicken (in batter, precooked)	365–375	7–10
Oysters	360–375	3
Scallops	360–375	4
Fish fillets	350–370	5–7
Perch and smelts	365–375	5–7
Fritters	365–375	4–5
French toast	350–360	2–3
Julienne potatoes	325–335	4–8
Potato chips	325–350	5–6
Breaded vegetables	350	4–6
Doughnuts	360	3–5

45. LARD AS A FRYING FAT. The clarity, whiteness, and goodness of lard are evident the minute it is melted in the frying kettle. Lard will withstand temperatures necessary for deep-fat frying for long periods of time. It has foam resistance. If strained and kept free from food particles, lard will retain its natural flavor. All frying fats will smoke if heated to extremely high temperatures. The automatic frying kettles are usually thermostatically controlled in order to eliminate this danger. Lacking a thermostat, a deep-fat frying thermometer should be used to check the temperature of the fat. A thermometer also can be used to check the thermostat occasionally to see that it is working properly. Careful control of the frying temperature is recommended. This will pay big dividends in the form of fresher frying fat and better-tasting products.

SECTION III. FRUITS

46. FRESH FRUITS. a. General. Fruit has a definite place in the daily diet. It is a reliable source of many nutritional elements. Vitamin C is probably the most important nutrient provided although significant amounts of vitamin A and minerals are present in many of the fruits. Fruit provides much of the "bulk" or "roughage" which the body requires. The importance of eating fruit every day cannot be overemphasized. All fruit for messes is classified by the Army and is purchased by established specifications. In most cases only U. S. Grade No. 1 is used in the mess.

b. Types. Fruits are classified as follows:

(1) *Citrus.* Oranges, tangerines, grapefruit, lemons, and limes.

(2) *Pomaceous.* Apples, pears, and quinces.

(3) *Stone fruits.* Peaches, plums, cherries, and apricots.

(4) *Bananas.* They should be used as soon as ripe to avoid spoilage and waste. They should be rejected if over-ripe or if bruised excessively. If under-ripe, store them at room temperature until the skin is flecked with brown.

(5) *Grapes.* Some of the many types of grapes are: white grapes, Tokay, red muscat, American red grapes, muscadine grapes, Concord grapes, etc.

(6) *Miscellaneous fruits.* Figs, strawberries, blueberries, blackberries, raspberries, loganberries, dewberries, and cranberries.

c. Preparation and Cooking. (1) In paring fruit, as little as possible of the pulp should be removed. The parings should be thin. If they are thick, food values will be lost. Any other preparation, such as coring in the case of apples, should be done carefully to avoid waste. Table XII shows the percent of waste and edible portions of the most commonly used fruits. This should guide the cook in understanding the amount of edible fruit expected and in exercising care in the preparation to keep within the percent of waste normally expected.

(2) *Citrus fruit.* Oranges, grapefruit, and lemons are the most commonly used citrus fruits. These fruits are always served raw. They are very seldom cooked except in some instances for use as flavoring. The peeling can be candied and used for a number of purposes such as fruit cake, eat like candy, garnishing, puddings, and other desserts.

(3) *Other than citrus.* Pears, grapes, peaches, bananas, and most berries are served raw. In the raw state these fruits provide more of the nitritious elements needed by the body than when they are cooked.

(4) *Cooking fruit.* If fresh fruits, such as apples, are cooked, care must be taken to preserve their values. They should be cooked quickly in a small amount of water. The juice from the fruit should always be served as a part of the dish or served as a juice, because it contains nutrients and is appetizing.

Table XII. Waste and edible portions of fruit

Name of fruit	Waste	Edible
Citrus fruits, fresh	*Percent*	*Percent*
Grapefruit	34	66
Lemons	38	62
Limes	24	76
Oranges	28	72
Tangerines	29	71
Fruits other than citrus, fresh		
Apples	12	88
Apricots	6	94
Bananas	33	67
Blackberries	-----	100
Cantaloupes	53	47
Cherries	6	94
Honeydew Melons	37	63
Peaches	12	88
Pears	17	83
Pineapple	47	53
Rhubarb	32	68
Strawberries	4	96
Watermelon	54	46

47. DRIED FRUITS. a. General. Dried fruit has certain advantages. Drying is an economical method of preserving food. The dried fruit is packed without the addition of sugar or other preservatives. It retains the color and flavor of the fresh fruit. Dried fruit occupies less shipping space than fresh products and will remain in a good state of preservation over long periods of time. These are great advantages in the field and overseas where transportation and storage facilities are at a premium. Dried fruit has an important place in Army meals. It is easily prepared, provides many food values and adds variety to the menu. Almost all of the nourishment found in fresh fruit is contained in the dried product.

b. Types. All dried fruits have had moisture removed in the process of drying, but the drying is done by three different methods. The differences in the processes of drying account for the different names given to the products. There are three different names:

(1) *Sun-dried.* Fruits that have had moisture removed by exposure to the rays of the sun.

(2) *Evaporated.* Fruits that have been dried by the application of artificial heat but without control of heat and humidity.

(3) *Dehydrated.* Fruits that have been dried in a dehydrator which has controlled temperature, air flow, and humidity. In the Army, fruits that have been dried by sun-drying and by evaporation are commonly called "dried fruits." Those dried by dehydration are commonly called "dehydrated fruits."

c. Cooking Dried Fruit. The purpose of cooking dried fruit is to restore the moisture content and improve the flavor. Before cooking, dried fruit should be soaked until it returns to approximately

its original size. Then the fruit should be cooked in the water in which it is soaked. This procedure preserves the nutrients that have been dissolved in the water. Simmer, rather than boil, until tender. Simmering preserves the food value, shape, color, and flavor to a greater degree. Sugar may be added if a sweet dish is desired.

d. Serving Dried Fruit. Dried fruit should be served in moderate portions, and some of the water in which the fruit is cooked should be included with each serving. The fruit may be used at breakfast or as dessert for the dinner or supper meals. Many dried fruits are used to advantage as sauces or in pies. There are many interesting ways of serving them. Full advantage should be taken of all possible methods of preparation.

48. CANNED FRUIT. a. General. Fruits for canning are usually harvested at their prime, immediately sorted, graded, cleaned and prepared for canning. They are cooked in permanently-sealed containers at temperatures sufficiently high to destroy the bacteria that spoil fruit. Fruit is canned either in syrup or water. Fruit packed in syrup is ready to eat as it comes from the can; that packed in water is usually used in cooked dishes. The ease of serving syrup-packed fruit is a great help in feeding large messes. The canner has done all of the hard work of preparation. Canned fruits are economical and convenient for troop feeding.

b. Keeping Qualities. Commercially canned fruit will keep for extended periods of time without spoilage because the heat processing and the sealing of the cans make conditions unfavorable for growth and reproduction of bacteria. Canned products will normally keep without refrigeration.

c. Nutritive Value. Canned fruit has its greatest nutritive value if eaten soon after the can is opened. If the fruit is to be stored after having been opened, it should be kept in its own syrup and the can should be covered and refrigerated. This helps to preserve the nutrients. The rule to remember is "keep it cool and keep it covered."

d. Serving. There are numerous ways to serve canned fruit in the mess. Variety may be added to the menu by using many different canned fruits prepared in a number of ways, sometimes combining mixtures of other different varieties of fresh fruits if available.

49. QUICK-FROZEN FRUITS. a. General. The preliminary steps in freezing fruit are much more difficult than in freezing vegetables. If not frozen properly, changes occur in the appearance, texture and flavor of fruit: blackberries turn brown, become soft and flavorless; fruits such as peaches and apples darken before freezing and on thawing. They must be packed in sugar or syrup, or given other special treatment which will reduce exposure of the product to the air and retard these undesirable changes. Quick-frozen foods are frozen at extremely low temperatures and retain most of the food values of the fresh foods.

b. Types. Fruits for freezing are generally divided into two classes:

(1) Small fruits and berries which are cleaned and prepared whole without excessive injury to the skin or leakage of juice.

(2) Fruits which are pitted or peeled and oxidize quickly when the cut surfaces are exposed to the air.

c. Sugar Packing. Fruit packed with sugar may be whole, sliced, chopped, or crushed. One pound of sugar to three, four or five pounds of fruit is used, depending on the taste and acidity of the fruit. Sugar serves as both a preservative and a sweetener.

d. Thawing and Serving. Frozen fruits can be used to advantage in the mess because they are practically ready to use. There is no waste, and accurate measurements for various purposes are easy to make because of the package sizes. Frozen fruits must be thawed before using unless it is desired to serve them in a semifrozen condition. For best results, frozen fruit should be thawed in the refrigerator with the container closed. They should be served promptly after thawing or they will discolor.

e. Cooking Frozen Fruit. Frozen fruits yield more food value if they are not cooked. However, they are often found in baked products. The following rules should be followed in preparing frozen fruits for pastries:

(1) Permit the loose syrup (sugar) packed fruit to thaw so that the fruit will bleed or drain.

(2) Use this juice as you would the juice from canned fruit.

(3) Add sugar if the directions on the container indicate that sugar has not been included in the packing.

(4) Thicken with cornstarch or other thickener.

(5) Add fruit. Allow fruit to cool before placing in crust to prevent the crust from becoming soggy and to keep the fruit from boiling over.

(6) Bring to the simmering point—do not boil—and remove from fire. The fruit is cooked later when the pie or cobbler is placed in the oven.

(7) For preserves or stewed fruit, cook until tender.

SECTION IV. CEREALS

50. GENERAL. a. Definition. The term "cereal" means the edible products made from grains, such as wheat, corn, rice, oats, barley and rye. Cereals are fuel foods and are generally served with milk. They are very popular as breakfast food in the Army mess. They are also used in the preparation of many other foods on the daily menu.

b. Types. There are many types and kinds of cereals available on the market. They fall into three main groups, as follows:

(1) *Cooked.* There are many cereals in this class. Some of the most common in the Army are cornmeal, hominy grits, cracked wheat, rolled oats, and cracked oats.

(2) *Quick-cooking.* These are cereals that have been partially cooked before packing or have been "milled" in such a manner that they require but a few (3 to 5) minutes for preparation. Instant oats and instant whole wheat are examples of quick-cooking cereals commonly used in the Army.

(3) *Ready-to-eat.* These cereals have been processed and are ready to serve without further preparation. Examples are cornflakes, puffed wheat, puffed rice, and shredded wheat. These can be served without further preparation by the cook. There are many different kinds available.

(4) *Cooked and quick-cooking.* The cooked and quick-cooking types are the lowest in cost, and those made from the whole grains have the greatest food value. They are of especial value on cold days or when a considerable length of time elapses between the morning meal and the noon meal.

(5) *Variety.* Cooked, quick-cooked, and ready-to-eat cereals add variety to the menu.

c. Preparing Cereals. The cereals requiring cooking should be added *slowly* to boiling, salted water while stirring or whipping. The cooking time will depend on the kind of cereal being prepared. A double boiler is best for the cooking because it prevents scorching or burning. Raisins or other dried fruits may be added to cooked cereals to improve their flavor and add variety to the menu. A combination of fresh fruit and ready-to-eat cereals makes a very appetizing and nutritious dish. Ready-to-eat cereals are also useful in the preparation of muffins or for breading chops, steaks, chicken, and fish and as a binder or filler for meat loaf, hamburger, sausage, fish cakes, and croquettes. They may be used in dressings or stuffings and in puddings and cookies.

SECTION V. DAIRY PRODUCTS

51. General. Dairy products are among the most popular and important foods. Records of the U. S. Department of Agriculture show that 16 percent of the American diet consists of milk and its products. Dairy products include milk, butter, and cheese. Butter and cheese are processed forms of milk.

52. MILK. a. The term "milk" means cow's milk. Raw milk is unprocessed milk. Fresh whole milk should be served daily. Some advantages of milk as a food are:

(1) It is highly nutritious.
(2) It requires no cooking.
(3) It is easily digested.
(4) It contains no waste.
(5) It is economical.
(6) It is easily obtained.

b. There are three kinds of processed milk any or all of which may be found in the Army mess.

(1) *Pasteurized milk.* Pasteurizing is the process in which raw milk is subjected to a temperature of 143° F. for at least 30 minutes to kill germs. It is then cooled quickly to 50° F. or lower. Milk used by the Army is required to be pasteurized.

(2) *Homogenized milk.* Homogenizing is the mechanical process in which fat particles in milk are broken up and evenly distributed throughout the milk. A cream layer will not form and it cannot be churned. Butter and cheese cannot be made from homogenized milk.

(3) *Concentrated milk.* Concentrated milk is made from pasteurized milk. It has had from 33 percent to 97 percent of the moisture removed. There are four kinds of concentrated milk:

(*a*) *Evaporated milk* has about 50 percent of the moisture removed and is sterilized.

(*b*) *Condensed milk* has 60 percent to 70 percent of the moisture removed. It is not sterilized. To supplement a limited supply of fresh milk, the Army

uses canned, evaporated, and condensed milk. These two kinds of milk are easily transported. Their good keeping qualities make them ideally suited for Army use. When reconstituted, a can of milk is added to a can of water; it is equivalent to fresh milk. To improve the flavor for drinking, add salt and vanilla to taste.

(*c*) *Sweetened condensed* milk is condensed milk with sugar added to sweeten it and to act as a preservative. This type of milk is not used to any great extent in the Army kitchen.

(*d*) *Powdered milk* is of two kinds:

1. Powdered whole milk is fresh milk reduced to a powder by evaporating about 97 percent of the moisture. Powdered whole milk is widely used by the Army. When reconstituted, 1 pound of milk to 7 pounds of water is equal to nearly 1 gallon of fresh milk. Salt and vanilla may be added to improve the flavor when reconstituted milk is served as a beverage.

2. Powdered skim milk is the product resulting from the removal of 95 percent of the moisture from skim milk.

53. CREAM. Cream is that portion of milk, rich in energy, which rises to the surface of milk on standing or is separated from it by a mechanical method. Ice cream is one of the frozen products in which cream is included in the recipe.

54. BUTTER. Butter is made from pasteurized cream. The process of making it is called churning.

a. Grading by U. S. Department of Agriculture. The U. S. Department of Agriculture has set up a scoring system for butter, employing numbers from 85 to 93 inclusive. Butter scored below 85 is classified "no grade." Butter for the Army must score 90 or above.

b. Flavor. Butter has a fine flavor which cannot be duplicated. When butter is an ingredient in baking and cooking, its fine flavor is imparted to the finished product.

55. CHEESE. a. General. Cheese is a product made from milk curd. The curd is obtained by the addition of rennet which curdles the milk, forming a mass. The curd may be treated by heat or pressure. Cheese may contain coloring matter.

b. Types. Cheeses are of the following types:

(1) *Whole milk cheese* is made from milk which has the same fat content as the raw milk. Examples are cheddar or American cheese, Limburger, and cream cheese.

(2) *Partially skimmed milk cheese* is made from milk which has a portion of the fat removed. Edam, Camembert, Parmesan and Brie are examples.

(3) *Skimmed milk cheese* is made from milk which has practically all of the butterfat removed. Cottage cheese and whey cheese are skimmed milk type cheeses.

c. Use of Cheese. The most widely used cheese in the Army mess is American, either natural or processed. Cottage cheese is also served when available. Cheese is used as a supplement to meat, for flavoring a great many dishes and as an ingredient of salads. It may be served as a combination with vegetables. Cheese with noodles, rice, or macaroni are favorite dishes in the Army. An occasional cheese omelet is a welcome treat for the men. Cheese is included in the Army emergency ration both in natural and in dehydrated form.

SECTION VI. SOUPS

56. GENERAL. Tasty soup stimulates the appetite and is high in nutritional value. It should be served at least once a day during cold weather and occasionally in warm weather. Soups may be served more often than called for on the menu.

57. STOCK. a. General. Good soup requires a good stock. Stock is the liquid that remains after meat, bones and vegetables are simmered in water. The stock resulting from one type of meat boiled in water is known as a broth. A very strong clear stock of one or more meats or meat and vegetables is known as consomme.

b. Serving Stock. Stock is perishable. If not used immediately after preparation, it should be allowed to cool. It is then strained, poured into a covered container and placed in the refrigerator. Before stock is served it should be brought to the boiling point to sterilize it. The temperature is then reduced and the stock allowed to simmer until served.

c. Meat Stock. Stock is started in fresh, cold water. The proper proportion is 1 quart of water

to each pound of bones. Bones should be sawed in pieces not over 6 inches long. Meat should be cut into 1 inch pieces and added with the vegetables to the stock pot. The stock is then brought to the boiling point and placed on the back of the stove to simmer. During the simmering process the meat, bones, and vegetables should be completely submerged in water. Stock containing bones should be simmered for at least 6 hours. While the stock is simmering, the meat gives off fat which rises to the surface. When thoroughly cooked, the stock should be allowed to cool and the thick grease skimmed off, or a greasy stock will result.

d. Vegetable Stock. Stock may also be prepared by boiling vegetables in water. The cooking water is used with the pulp of the vegetables rubbed through a strainer. This type of soup may be combined with milk, the proportion usually being half, though less milk may be used if the liquor or stock contains a large quantity of pulp.

e. Chicken Stock. Chicken stock is made by simmering chicken in water with the addition of a few vegetables and seasoning. For this purpose, a fat hen is best. During the long period of simmering the meat is tenderized and may be used later in such dishes as chicken a la king, chicken pie, and chicken fricassee. The chicken, if whole, may be placed in the oven and browned.

(1) *Chicken broth.* Chicken stock, when strained and clarified, becomes chicken broth. It may be served clear or with rice, noodles, barley, etc.

(2) *Increasing flavor and nutritional value.* The juices of canned vegetables or the cooking water of fresh vegetables should be added to meat or chicken stock to increase its flavor and nutritional value.

58. THIN AND THICK SOUPS. Soups are of two kinds: thin or clear soups and thick or heavy soups. Soup stock when strained and served clear is the thin type.

a. Preparation of Thick Soups. Any stock may be thickened by adding butter, milk, fat, flour or cooked vegetables mashed through a strainer.

b. Serving. The proper time to serve a heavy soup is when the meal is light. A typical example is pea soup. Fish or shellfish may be combined with vegetables and milk to make chowder.

SECTION VII. MEAT

59. DEFINITION. Meat is the flesh of any animal used for human food. It consists of muscle tissues, connective tissues, fat, and bone. Edible glands and organs from animals are also classed as meat, but are generally referred to as meat specialities, sundry meats, fancy meat, or variety meats. The most common meats are beef, pork, lamb, mutton, and veal. Beef comes from cattle, veal from calves, pork from hogs, lamb from young sheep, and mutton from mature sheep.

60. MEAT ANIMALS. a. Beef. Army specifications normally call for the purchase of steer beef only and the carcass may weigh from 450 to 900 pounds. If the side is cut with a twelve rib forequarter the average forequarter represents about 52 percent of the weight and the hindquarter about 48 percent of the weight. The classes of beef are:

(1) Steers, males castrated when young.
(2) Cows, females that have calved.
(3) Bulls, fully developed males.
(4) Stags, males castrated after maturity.

b. Veal. Veal is the flesh of calves. The minimum dressed weight of veal for the Army is 75 pounds and the heaviest 190 pounds.

c. Lamb. Spring lamb is considered best for the mess. It has certain characteristics that distinguish it from older lamb. The flesh is light colored and fine in texture; the bones are small and red in color.

d. Pork. Pork is sold in separate cuts and seldom in carcass form. The average hog is 1 year old when slaughtered.

61. CLASSES OF MEATS. a. Fresh Meats. Fresh meats include beef, pork loins, pork butts, ground meat, lamb, and veal. Fresh meats may be in two forms: carcass and wholesale cuts. Carcass meat must be cut or boned or otherwise prepared for cooking after it is received in the mess. Examples of carcass meats are quarters of beef and lamb. Wholesale cuts, sometimes called primal cuts, are prepared in part or entirely for cooking before they are delivered to the mess; they are not in carcass form. Examples of wholesale cuts are boneless beef, pork loins, and pork butts. Frozen meats are classed as fresh meats.

b. Meat Specialties. Meat specialties are sometimes called variety meats. They are the parts of beef, veal, pork, and lamb not classed with the

regular cuts. They include brains, heart, kidneys, liver, oxtails, sweetbreads, tripe, pig's feet, and tongue.

c. Prepared Meats. Prepared meats are also known as ready-to-serve meats. They are made from finely chopped or ground meats, usually seasoned with condiments and spices, either fresh, cooked, or smoked, marketed in bulk or stuffed into casings. They include luncheon meats, liverwurst, frankfurters, Bologna and other sausages of different kinds, and like products.

d. Cured and Smoked Meats. Cured meats are those meats that have been cured with salt or other curing agents. Examples are salt pork, corned beef, pickled tongue, and pickled ham. Smoked

CUTS OF BEEF

BEEF FOREQUARTER

Tender Cut

Cut	*Use*
7 Inside chuck	Roasts, steaks
2 Rib section (prime rib)	Roasts, steaks
Less tender cuts	
4 Shoulder clod	Braise, stew, roast if necessary
8 Neck	Braise, stew, roast if necessary
5 Chuck tender	Braise, stew, roast if necessary
1 Plate	Braise, stew, ground meat
6 Brisket	Braise, stew, ground meat
3 Shank	Stew, ground meat
Fats and bones	
Surplus fats	Render and use for cooking purposes
Bones	Use for soups and gravies

BEEF HINDQUARTER

Tender Cuts

Cut	*Use*
7 Tenderloin	Roasts, steaks
9 Loin strip	Roasts, steaks
8 Sirloin-rump butt	Roasts, steaks
3 Knuckle (tip)	Roasts, steaks
6 Inside round (top)	Roasts, steaks
Less tender cuts	
6 Outside (bottom) round	Braise, stew, roast if necessary
4 Heel	Braise, stew, ground beef
2 Flank	Braise, stew, ground beef
5 Shank meat	Stew, ground beef
1 Kidney	Stew
Fat and Bones	
Cod Fat	Slice and lay on lean cuts during cooking
Other fat	Render and use for cooking purposes
Bones	Use for soups and gravies

Table XIII. Meat shrinkage is affected by oven temperatures

Meat cut	Temperature Used	Weight before cooking	Weight after cooking	Shrinkage, pounds	During cooking, percentage	Remarks
Pork loins	300° F.	33 lbs.	16½ lbs.	16½	50	Three loins were cooked in each pan.
	350° F.	33 lbs.	14½	18½	56	
	500° F.	32⅛	13½	18¾	58	
Cured hams	250° F.	14	12	2	15	One ham to each pan.
	300° F.	14	11	3	21	
	375° F.	14	10	4	28	
Leg of lamb	250° F.	16⅓	12	4¼	26	Three lamb legs in each pan.
	300° F.	16	11	5	31	
	350° F.	15¼	10¼	5	33	
	500–300° F.	16	10¾	5¼	33	
7-Rib beef	250° F.	24¼	21⅘	2⅖	10	Medium done.
	250° F.	23¼	19½	3¾	16	Well done.
	300° F.	25¼	19½	5⅘	23	Well done.
	350° F.	28	20½	7½	27	Well done.
	450° F.	24½	17¼	7	29	Medium done.
Beef rounds	200° F.	43½	24¼	18¾	43	Well done.
	245° F.	49¼	25⅗	23¾	48	Well done.
	300° F.	45½	22¾	22¾	50	Well done.
	450–300° F. (seared)	52	24	28	54	Well done.

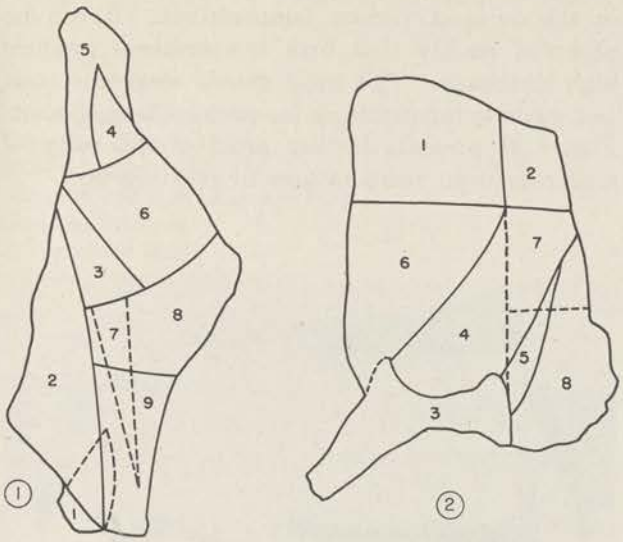


Figure 14. Cuts of beef. ①. Fore quarter. ②. Hind quarter.

meats are cured meats treated with smoke to add to their keeping qualities and flavor. The principal smoked meats are hams, bacon, briskets, and dried beef. Most dried beef is smoked, but some is not. Cured and smoked meats are especially valuable in the field because they are less perishable than fresh meats.

62. COOKING OF MEAT. a. General. Flavor is about equally distributed in all the cuts of a given animal. Connective tissues are largely responsible for the toughness of meat and if heated with water at 158° to 194° F., are softened and changed. Tender and less tender cuts of beef are given in figure 14.

In cooking, meat falls into two groups:

(1) The tender cuts.

(2) The less tender cuts.

b. Shrinkage. Shrinkage is important in the cooking of meat. Meat should be cooked slowly at

Table XIV. Meat cuts for roasting with timetable

Beef

Inside (Top) round
Outside (Bottom) round
Knuckle (Tip)
Tenderloin
Sirloin-rump butt
Loin strip
Boneless rib
Inside chuck
Shoulder clod
Loaf (Ground beef)

Lamb

Boneless leg
Boneless loin
Boneless rack
Boneless shoulder
Loaf (Ground lamb)

Pork (Fresh)

Boneless leg
Boneless loin
Boston butt
Boneless picnic
Spareribs
Pork (smoked)
Ham
Picnic
Shoulder butt

Veal

Boneless leg
Boneless loin
Boneless rib
Boneless shoulder

Timetable for roasting meat (Oven temperature 325° F.)

Kind of meat	Weight	Approximate cooking time per pound		
		Rare	Medium	Well done
	Pounds			*Minutes*
Beef, boneless	6–8	25–30 min.	30–35 min.	35–40
Lamb, boneless	3–6	Never rare	35–40 min.	40–45
Pork, boneless	4–6	Always well done		45–50
Veal ham	4–6	Always well done		40–45
Smoked ham	8–10	Always well done		30
Smoked ham	10–12	Always well done		25
Smoked ham	12–14	Always well done		20
Smoked ham	14–16	Always well done		20
Smoked picnic	4–8	Always well done		35–45

a medium temperature rather than in a shorter time at a high temperature. Quick cooking at high temperatures shrinks meat very greatly. Excessive shrinkage means that fewer servings are available, important nutritional values have been lost, juiciness, tenderness and flavor have been decreased, and the meat has a less desirable appearance. Table XIII shows the amount of shrinkage of meats cooked in the oven at various temperatures. It can be observed readily that high temperatures produce high shrinkage. This table should serve the cook as a guide to temperatures for oven cooking of meat. Figure 33 presents further proof of the value of moderate oven temperatures in roasting beef.

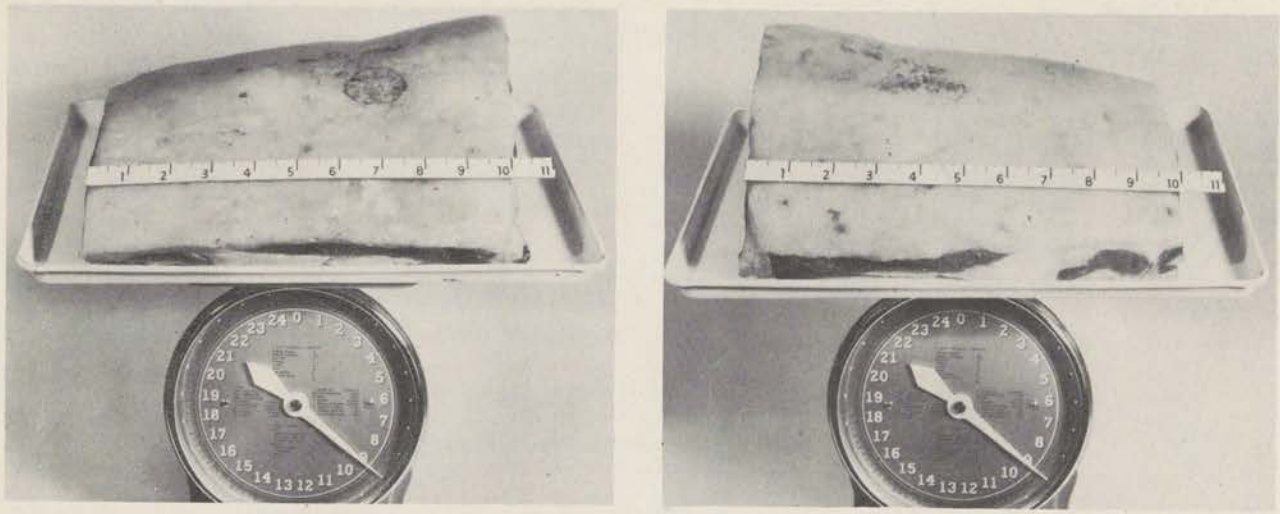
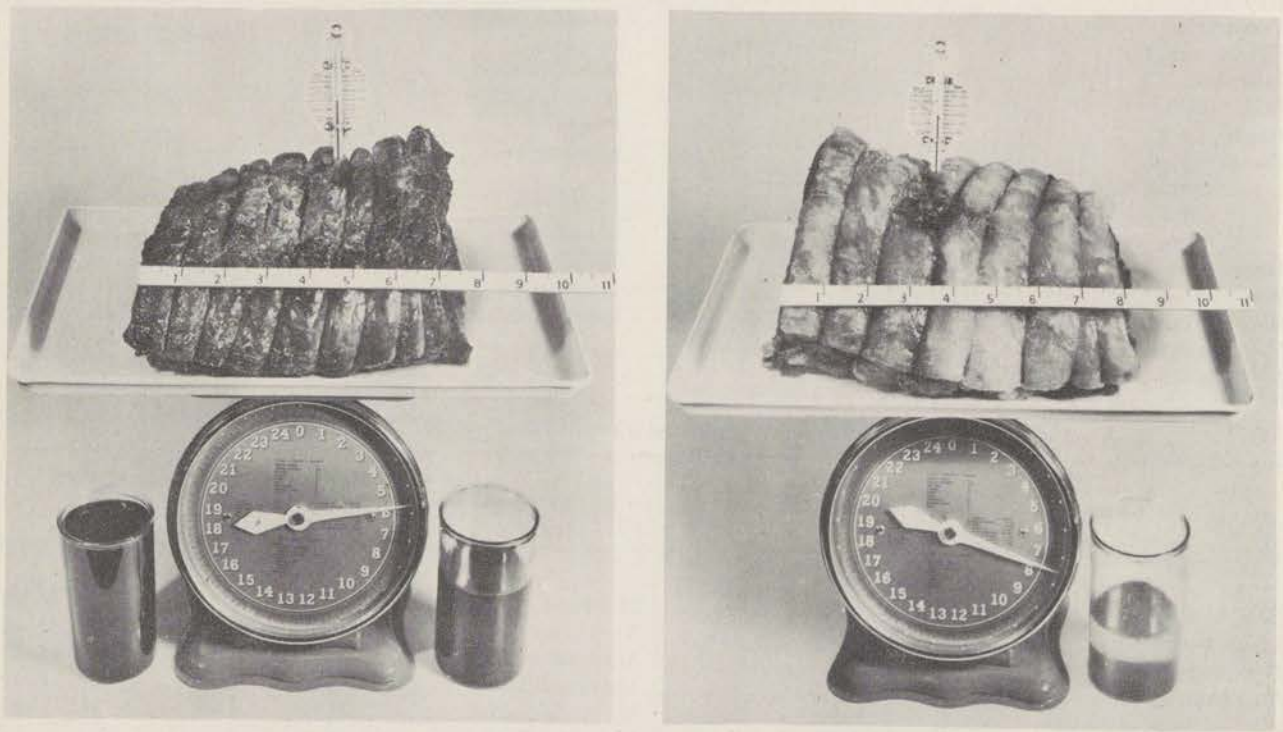


Figure 15. Roasting test. ① and ②. Two roasts of exactly same weight and measure.



③. This roast was cooked at 500° F. for 2½ hours.

④. This roast was cooked at 325° F. for 4 hours. Note the difference in weight, size, waste and appearance.

Table XV. Meat cuts for broiling and pan or griddle-broiling with timetable

Beef

Top round steak (inside)
Tip steak (knuckle)
Filet mignon (tenderloin)
Boneless sirloin steak (sirloin butt)
Boneless rib steak
Inside chuck steak
Patties (Ground beef)

Lamb

Leg chops
Loin chops
Rib chops
Shoulder chops
Patties (Ground lamb)

Pork (Fresh)

Fresh pork is not broiled or griddle-broiled

Pork (Smoked)

Sliced ham
Sliced bacon
Sliced shoulder butt

Veal

Veal is not broiled or griddle-broiled.

Variety meats

Sliced liver (Beef, lamb, pork, veal)

Timetable for broiling meat (Moderate broiling temperature) [1]

Meat cut	Thickness	Approximate cooking time		
		Rare	Medium	Well done
	Inches		*Minutes*	*Minutes*
Beef:				
Individual boneless steaks	½	6 min.	10	15
	1	15 min.	20	25
	1½	25 min.	30	35
	2	35 min.	46	50
Patties	1	15 min.	20	25
Lamb:				
Leg chops	½	Never rare	10	15
Shoulder chops	1	Never rare	20	25
Double loin and rib chops	1½	Never rare	25	30
Patties	1	Never rare	20	25
Pork:				
Ham slice	½	Always well done		20
	1	Always well done		25
Bacon	⅛	Always well done		4–5

[1] Time for pan or griddle-broiling is approximately one-half the time for broiling.

c. Cooking with Dry Heat. The methods of cooking with dry heat are roasting, broiling, pan or griddle broiling, and frying.

(1) *Roasting.* Roasting is one of the most popular methods of cooking meat. The oven should be hot before the meat is placed in it and should be kept at a constant temperature throughout the roasting period. This practice will increase the flavor, juiciness, and tenderness of roasted meat. There should be no initial searing of the meat. Searing does not keep the juices in and does not improve the flavor of the interior of the meat. Seasoning with salt and pepper may take place at the start, during, or at the end of roasting.

(2) *Broiling.* In broiling meat, a moderate temperature is used which is controlled by keeping the meat on the broiling rack at the proper distance from the heat. The first side is seasoned with salt and pepper after it is browned, and the bottom side is seasoned when it is turned. Broiling time will vary with the size and thickness of the meat. Broiled meats should be served on hot plates immediately after cooking.

(3) *Pan or griddle broiling.* Meat is pan or griddle broiled in an ungreased pan, or on an ungreased griddle. A moderate temperature retains meat juices and prevents the meat from over browning. Enough fat cooks out to keep the meat from

sticking. Extra fat should be removed as it collects to prevent the meat from frying. Meat is turned occasionally while pan broiling to insure even cooking. It is seasoned after browning. Pan-broiled meat should not be covered, and water should not be added during the cooking. To pan broil bacon, place it in a cold pan, broil it slowly, and pour off the fat as it collects.

(4) *Frying.* Meat for frying should be sliced thin, browned on one side, then on the other; turn it occasionally to insure even cooking, and fry in an uncovered utensil. Each side of the meat is seasoned after browning. Meat is fried at a moderate temperature until done.

(5) *Deep-fat frying.* The chief advantage of deep-fat frying is that the meat is entirely surrounded by hot fat. Therefore, it is cooked so quickly that there is no time for fat absorption.

d. Cooking with Moist Heat. Less tender cuts of meat with considerable amounts of connective tissue must be cooked by moist heat, which softens connective tissue while dry heat toughens it.

(1) *Braising.* Meat for braising should be cut quite thin. Braising is a method of cooking meat

Table XVI. Meat cuts for braising with timetable

Beef

Outside (Bottom) round
Heel of round
Rump butt
Boneless flank
Shoulder clod
Inside chuck
Boneless neck
Chuck tender
Boneless plate
Boneless brisket
Shank meat

Lamb

Shoulder (Boneless or bone in)
Breast (Boneless or bone in)
Shank (Boneless or bone in)
Neck (Boneless or bone in)

Pork (Fresh)

Loin chops
Leg steaks
Shoulder steaks
Spareribs
Hocks

Veal

Shoulder, (Boneless or bone in)
Breast (Boneless or bone in)
Shank (Boneless or bone in)
Neck (Boneless or bone in)

Variety meats

Liver
Heart
Kidneys

Timetable for braising meat (Low cooking temperature)

Meat cut	Average weight or thickness	Approximate cooking time
Beef		
Steaks, boneless	½ to ¾ inch	1 to 1½ hours
Swiss steak	1 to 1½ inches	2 to 3 hours
Pot-roast or "soft" roast	6 to 8 pounds	3 to 4 hours
Fricassee	2 inch pieces	2 to 3 hours
Veal		
Cutlets (chops or steaks)	½ to ¾ inch	45 to 60 minutes
Breaded slices	½ to ¾ inch	45 to 60 minutes
Fricassee	2 inch pieces	1½ to 2 hours
Lamb		
Chops	½ to ¾ inch	45 to 60 minutes
Fricassee	2 inch pieces	1½ to 2 hours
Pork		
Chops and steaks	½ to ¾ inch	45 to 60 minutes
Fricassee	2 inch pieces	1½ to 2 hours
Spareribs	Individual servings	1½ to 2 hours

Table XVII. Meat cuts for cooking in water with timetable

Beef

Flank
Shank meat
Boneless neck
Boneless brisket
Boneless plate
Rib fingers
Hanging tender

Lamb

Shoulder (Boneless or bone in)
Breast (Boneless or bone in)
Shank (Boneless or bone in)
Neck (Boneless or bone in)
(Large cuts of lamb are not cooked in water)

Variety (organ) meats

Heart
Tongue
Kidneys

Pork (Fresh)

Spareribs
Pig feet
Hocks

Pork (Smoked)

Bacon
Ham
Picnic
Shoulder butt

Veal

Shoulder (Boneless or bone in)
Breast (Boneless or bone in)
Neck (Boneless or bone in)
Shank (Boneless or bone in)
(Large cuts of veal are not cooked in water)

Timetable for cooking meat in water

Meat cut	Average weight	Approximate cooking time per pound
	Pounds	*Minutes*
Smoked ham	8 to 10	30
Smoked ham	10 to 12	25
Smoked ham	12 to 14	20
Smoked ham	14 to 16	20
Smoked picnic	4 to 8	35 to 45
Corned beef	4 to 6	40 to 50
Fresh beef	4 to 6	40 to 50

in a small amount of water or steam. Herbs, spices, and vegetables may be combined with the meat for variety in flavor. First, the meat is browned quickly on all sides in hot fat, then the meat is placed in a covered utensil containing a small amount of liquid and simmered at a low temperature until tender.

(2) *Cooking in water.* Meat is never boiled. It is simmered. Simmering temperature ranges from 180° to 210° F. This is an excellent way to utilize trimmings and less tender cuts of meat. Stew is made of meat and vegetables simmered a long time. Know the time required to cook vegetables. Add them to the liquid and allow time for their cooking with the least loss of nutritive value and still impart flavor to the stew. There are three methods of making stews:

(*a*) The meat may be browned before the water is added. This gives the meat a "roast" flavor and the gravy a rich color.

(*b*) The meat may be placed in simmering water. This method of stewing lacks the richer flavor of the browned meat, but the vegetables cooked with the stew will have more of a meat flavor.

(*c*) The meat may be placed in cold water and brought to a simmer. The broth in which the meat is cooked will have a rich flavor.

e. Cooking Beef and Lamb. Tables XVIII and XIX give the cookery methods for beef and lamb.

f. Cooking Frozen Meat. It is not necessary to thaw meat completely before cooking. However, a more uniform product is likely to result if meat is at least partially thawed before cooking.

(1) *Thawing.* (*a*) Whatever method of thawing is most convenient may be used. If time and space are available, meat may be thawed at room temperature. When defrosting at room temperature such meats as quarters and wholesale cuts of beef carcasses and wholesale cuts of lamb and veal, pork loins, smoked hams, etc., the meat should be hung up or spread out in such a way that there will be a good circulation of air around it. It can be

Table XVIII. Beef cooking methods

Roasting

1. Season with salt and pepper.
2. Place roast on rack in pan, fat side up.
3. Do not sear.
4. Do not add water.
5. Do not cover.
6. Roast at constant temperature—325° F.
7. Turn boneless roast.
8. Roast until done.

Griddle-broiling

1. Place meat on ungreased griddle.
2. Brown, turn and brown.
3. Season each side after browning.
4. Turn occasionally.
5. Cook at moderate temperature.
6. Scrape away surplus fat as it collects.
7. Do not add water. Do not cover.
8. Cook to desired degree of doneness.
9. Serve hot on a hot plate.

Braising

1. Season with salt and pepper.
2. Brown meat on all sides in hot fat.
3. Add very little liquid.
4. Cover closely to retain steam.
5. Use oven or top of range.
6. Cook at simmering temperature—185° to 200° F.
7. Cook until tender.

Simmering

1. Cut meat in small pieces.
2. Season with salt and pepper.
3. If desired, brown on all sides in hot fat.
4. Cover meat with hot or cold water.
5. Cover kettle and cook meat until tender.
6. Cook at a simmering temperature—185° to 200° F.
7. Add vegetables before meat is done.

Frying

1. Dredge thin slice of meat in flour if desired.
2. Brown quickly on both sides in small amount of hot fat.
3. Season each side after browning.
4. Turn occasionally.
5. Do not cover.
6. Cook at moderate temperature until done.

protected from dust and dirt with a paper. If there is space in the refrigerator and the meat is not needed for a few days, let it thaw in the refrigerator. Different methods of thawing seem to give the same results in the finished product and about the same loss in weight during thawing and cooking. If meat can be thawed in pans in which it is to be cooked, there will be no loss of drippings. If there is not time to thaw the meat, put it in pans while still frozen, being sure to allow extra time for cooking.

(*b*) Thin cuts of frozen meat, that is, cuts not more than 1 inch thick, may be satisfactorily pan fried by putting the frozen cuts directly into the hot pan without first thawing them. In pieces of this size, the frost is quickly driven out and the interior becomes cooked before the outside is overcooked. However, if the thin cuts are to be fried in deep fat, they must first be thawed. If this is not done, the cold in these cuts will cool the fat below the proper frying temperature. About the only thin frozen cuts used in Army messes are frozen fish fillets,and when cooked without being first thawed they are more palatable.

(*c*) When frozen meats are supplied to troops in the field as part of the field ration, usually there will be no refrigerator in which to thaw them. They must be thawed in the open, the rapidity of thawing depending on weather conditions. In hot weather the surface of the meat will begin to spoil before the meat is thawed at the center. This spoilage may be prevented by hanging wet cloths or sacks around the thawing meat. The wind blowing on these wet sacks will keep the meat cooler than the surrounding atmosphere. Sometimes frozen meat will be received in the field only a short time before it must be cooked for the next meal. In such a case, a stew may be made, using the chuck, shanks, or round. The meat saw and cleaver must be used to cut off these cuts. In hot weather cooked meats will keep longer than chilled fresh meat, and when necessary to save meat to prevent loss through spoilage, the cook should not hesitate to cook more meat than is needed for immediate service.

(2) *Spoilage.* It should be borne in mind that thawed meat is always moist and provides an ideal place for development of bacteria and molds. Therefore, thawed meat should be cooked promptly. Thin cuts of meat expose greater surface area to spoilage than thick cuts, such as roasts.

(3) *Cooking time.* One principal common to both tender and less tender cuts of meat is a low cooking temperature. This applies whether roasting, broiling, stewing or braising. Thawed meat should be cooked in the same way as meat that has

Table XIX. Lamb cooking methods

Dry heat

Roasting

1. Season with salt and pepper.
2. Place roast on rack in pan, fat side up.
3. Do not sear.
4. Do not add water.
5. Do not cover.
6. Roast at constant temperature (325° F. or 16 counts).
7. Turn boneless roast.
8. Cook until meat is as well done as desired.

Broiling

1. Turn heat to highest point.
2. Put chops in broiler.
3. Broil until top side is nicely browned.
4. Season browned side with salt and pepper.
5. Turn, brown, and season second side.
6. Cook until meat is as well done as desired.

Griddle-broiling

1. Place meat on ungreased griddle.
2. Brown, turn and brown on the other side.
3. Season with salt and pepper.
4. Turn occasionally.
5. Scrape away surplus fat as it collects on the griddle.
6. Do not add water and do not cover.
7. Cook until meat is as well done as desired.
8. Serve hot on hot plates.

Moist heat

Stewing

1. Cut lamb into small pieces.
2. Season meat with salt and pepper.
3. Brown meat on all sides in hot fat.
4. Cover meat with hot or cold water.
5. Cover kettle and cook at simmering temperature until tender.
6. Add vegetables before meat is done.

not been frozen. If cooked without thawing, extra time must be allowed for cooking, or otherwise it may appear to be done by outside appearance, but, when cut, found to be cold and raw in the interior. Allow 15 to 20 minutes more per pound for cooking frozen meat, and cook at extremely low temperatures; for roasting frozen cut, the temperatures should not exceed 250° F. However, overcooking should be avoided. In cooking more tender cuts, the meat should be prepared as follows: use a low, constant temperature, add neither water nor flour, and cook uncovered. The method for preparing less tender cuts is: use a low, constant temperature, add moisture, and cover the utensil.

(4) *Frozen boneless beef.* (*a*) Frozen boneless beef that has not been partially defrosted prior to issue should be thawed in the original container whenever practicable. The box becomes the equivalent of a refrigerator, due to the frost in the meat, and keeps the outside portions refrigerated while defrosting is taking place. The surface of the meat is not exposed to the air and heat of the room, and surface deterioration (slime) does not develop.

Table XX. Approximate thawing time for meat in army mess refrigerator

	Hours
Frozen beef, quarters, chucks, or rounds	36 to 48
Frozen beef, loins, ribs	36 to 48
Frozen veal, mutton, or lamb carcasses	24 to 36
Frozen veal, mutton, or lamb cuts	18 to 30
Frozen pork, cuts	18 to 30
Frozen poultry or whole fish	18 to 24

When packed and defrosted in the original containers, 24 hours or more will be required to thaw the meat. When it is impracticable to follow the above method of defrosting, due to insufficient time between issue and cooking, remove the frozen meat from the cartons 16 to 24 hours before preparation. Do not remove the wrapping paper. Place the meat in a clean pan and cover with a clean cloth to protect the meat from dirt and insects. Never defrost meat in water, either hot or cold. Deterioration can be avoided by keeping the product wrapped and defrosting at the slowest rate practicable.

(*b*) *Equivalent issues of carcass and boneless beef.* During the process of boning the beef carcass in the packing plant, the boneless meat is divided into the following portions:

	Percent
Roast and frying	40
Stewing	30
Ground	30

Issues of boneless beef must be correlated to prevent the accumulation of any of the above classes. There is a yield of approximately 70 pounds of boneless beef from every 100 pounds of carcass beef.

63. TYPES. Sea food may be classed as finfish and shellfish. A finfish is an animal that has a spine, scales, and gills. Cod, haddock, trout and white fish are examples. A shellfish is a spineless animal, protected by a shell. Examples are oysters, clams, and crabs.

a. Delivery. Fish may be delivered as fresh, canned, frozen, quick-frozen, dried, smoked, and salted. Fresh fish must always be packed in ice; unless properly iced, this type of fish spoils easily. Frozen or quick-frozen fish must be delivered in a solidly-frozen condition. Evidence of thawing or refreezing is cause for rejection. Dried, smoked, and salted fish will be handled in covered containers. Keeping quality depends on the degree of dryness and salt penetration of the fish.

b. How to Determine Quality of Sea Food. (1) *Fresh fish.* Fresh fish has a bright appearance, firm flesh, closed mouth and gills, and sinks when placed in water. Blood of a fresh fish is bright red.

(2) *Stale fish.* Stale fish has a dull appearance, soft and flabby flesh, and will float when placed in water.

(3) *Putrid fish.* The body is withered and flabby, dull in appearance and the blood is of a dirty brown color. Such fish has an offensive odor and will float when placed in water.

c. Storage. (1) *Fresh fish.* This fish will not keep; it must be used promptly. From the time it is received until it is used, the fish must be kept under ice in the coolest part of the refrigerator.

(2) *Frozen fish.* Containers of frozen fish should be stacked together and stored in the coolest part of the refrigerator; this fish should be used promptly. It must be carefully handled to avoid bruising and loss of juice.

(3) *Salted fish.* This fish depends on the degree of salt penetration for preservation. It must be kept under refrigeration. Hard salted fish keeps well, but must be covered as it has a tendency to darken if exposed to the air. Fish in brine may be kept long periods of time if held in temperature below 40° F.

(4) *Smoked fish.* The keeping qualities of smoked fish depends on the degree of salting, smoking, and weather conditions. Moisture hastens spoilage. Smoked fish keeps best in a cool, dry atmosphere of 60° F. or below.

(5) *Canned sea food.* Canned sea food must be stored in the same manner as canned meats. High temperature and humidity must be avoided, but under ordinary conditions canned fish will keep safely from 6 months to a year and under ideal conditions, it may be kept longer.

d. Processed Fish. The Army receives the following types of processed fish:

(1) *Dressed fish.* Head, tail, and guts removed. Large dressed fish are received in chunks or pieces.

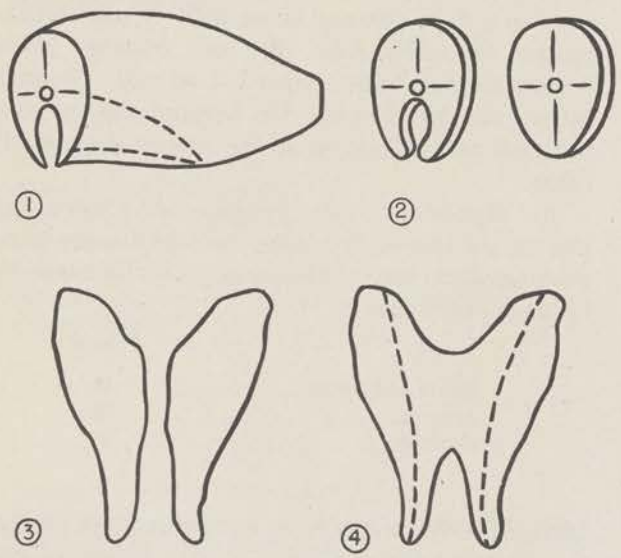


Figure 16. Cuts of fish. ① Dressed or pan dressed. ② Steaks ③ Single fillets ④ Butterfly fillets.

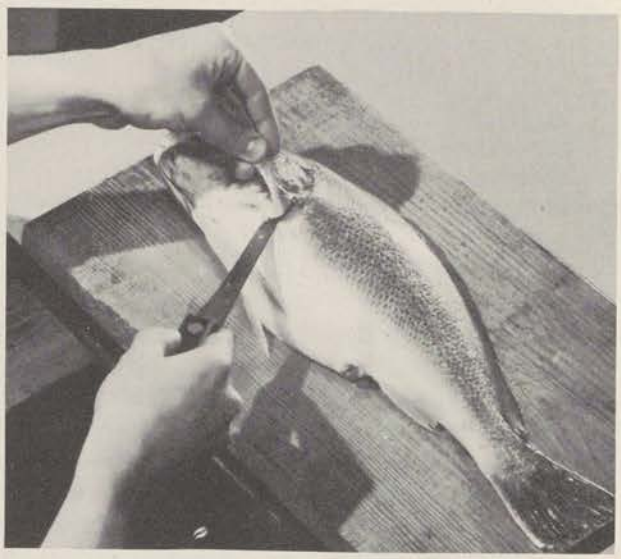
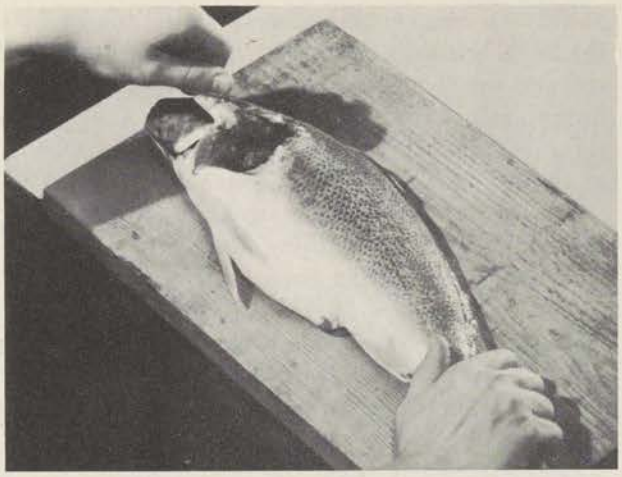
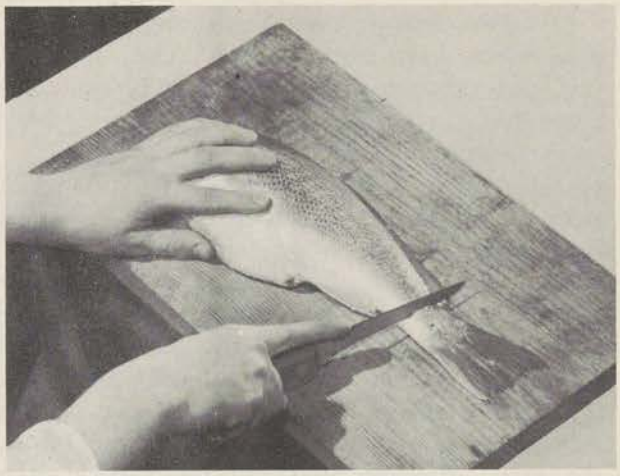


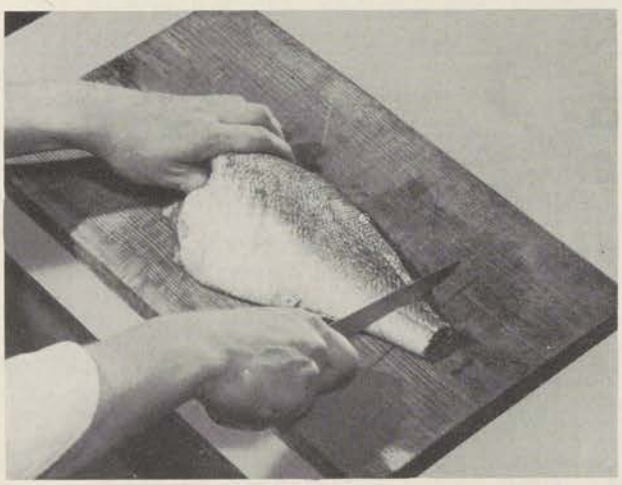
Figure 17. Cleaning and dressing finfish. ① Cut a slit on each side of the fin.



② *Pull fin toward the head.*



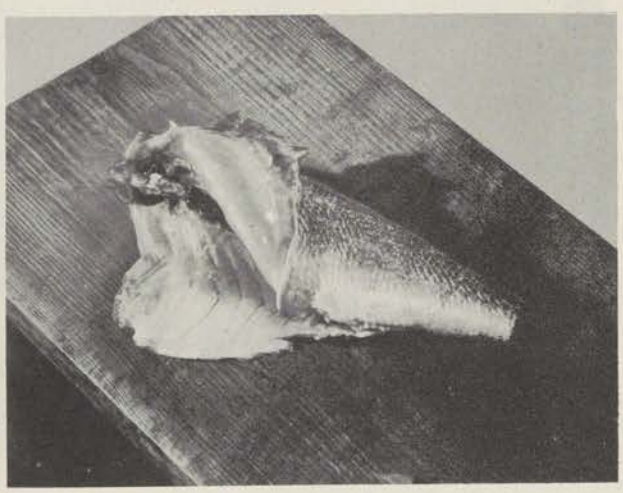
③ *Cut off head and tail.*



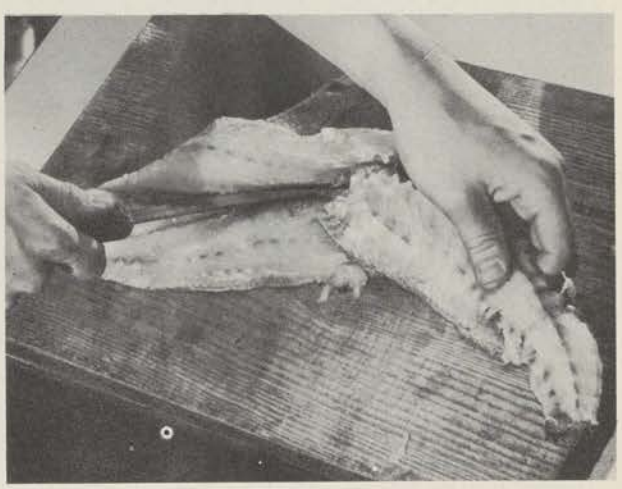
④ *Scrape scales from tail toward head.*



⑤ *Slit the belly.*



⑥ *Remove the guts.*



⑦ *Pull out backbone.*

(2) *Pan dressed fish.* These are the smaller sizes which have been cleaned. The tail, head, fins, and guts removed. They may be split open along the belly or the back, and sometimes the backbone is removed.

(3) *Steaks.* Steaks are crosscuts of the larger sizes of dressed fish. Each steak is $\frac{5}{8}$ inch thick or more and equals one or more servings.

(4) *Single fillets.* Single fillets are meaty slices of the fish, cut lengthwise away from the backbone.

(5) *Butterfly fillets.* Butterfly fillets are single fillets held together by the uncut belly of the fish.

e. Preparation of Finfish. Make a slit on each side of the fin, then grasp fin at rear and pull toward the head. Remove head and tail with a sharp knife. To remove scales, scrape with the back of the knife held at a 45° angle, beginning at the tail end and working toward the head, placing the knife firmly against the skin. Slit the belly and remove the guts, then with pliers or hand grasp the backbone at the top and pull out. To remove skin, cut between it and flesh with a sharp knife on each side of the backbone and carefully work the skin away from the flesh, moving from head to tail.

f. Cooking. Sea food is both an appetizing and healthful food. Sea food must be completely cooked but not overdone. Sea food prepared too far in advance, even though properly cooked, becomes dry and hard, and loses its flavor and taste. Fish is cooked sufficiently when the flesh separates easily.

Table XXI. Cooking sea food

Fish	Type	Baked	Boiled, steamed, poached	Broiled	Fried, sautéed	Seasons, months, inclusive
All fillets		*Good*	*Fair*		*Best*	
Barracuda	Fat	Best		Good	Fair	February to June
Bluefish	Fat	Best		Good	Fair	All year
Butterfish	Fat	Fair		Good	Best	April to December
Carp	Lean	Best		Good	Fair	All year
Clams	Lean		*Best*		Good	All year
Cod	Lean	Good	Fair	*Best*		All year
Flounder	Lean	Fair		Good	*Best*	All year
Haddock	Lean	Good	Fair	*Best*		All year
Hake	Lean	Best	Good	Fair		All year
Halibut	Fat	Good	Fair	*Best*		All year
Herring	Fat	Fair		*Best*	Good	All year
Lobster	Lean		Good	*Best*		All year
Mackerel	Fat	Good	Fair	*Best*		April to November
Oysters	Lean	Fair	Good		*Best*	September to April
Perch	Lean	Fair		Good	*Best*	All year
Pickerel	Lean	Good		Fair	*Best*	All year
Pike	Lean	Good		Fair	*Best*	All year
Pompano	Fat	Good		*Best*	Fair	All year
Porgies	Fat	Fair		Good	Best	All year
Salmon	Fat	*Best*	Fair	Good		All year
Scallops	Lean		Fair	Good	*Best*	All year
Sea bass	Fat	Fair		*Best*	Good	All year
Sea trout	Fat	Fair		*Best*	Good	November to May
Shad	Fat	*Best*		Good	Fair	December to July
Shrimp	Lean	Fair	*Best*		Good	All year
Smelts	Lean	Fair		Good	*Best*	September to May
Snappers	Lean	*Best*	Fair	Good		All year
Sole	Lean	Fair		*Best*	Good	All year
Spanish mackerel	Fat	Good		Good	Fair	November to April
Swordfish	Fat	Good		Good	Fair	July to September
Trout	Lean	Fair		Good	*Best*	April to November
Tuna	Fat	*Best*	Good	Fair		All year
Weakfish	Lean	Good		*Best*	Fair	April to December
Whitefish	Fat	*Best*		Good	Fair	April to December
Whiting	Lean		Fair	*Best*		All year

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SECTION IX. POULTRY

64. GENERAL. Poultry is one of the most popular kinds of meat in the Army diet. Poultry includes chickens, turkeys, ducks, geese, guinea fowl, and pigeons. Chickens are the most widely used in the Army, but turkeys and ducks are also used to some extent.

65. CHICKENS. a. Classes of Dressed Chickens. A cook should be able to recognize the different classes of birds in order that he may determine the best manner of cooking and serving. Before cooking, determine the class the birds are in. There are four classes of young chickens and three classes of old chickens. The young class includes: broilers, capons, fryers, and roasters. The old class includes: fowl, roosters, and stags.

(1) *Broilers* are the youngest and smallest chickens fit to eat. They may be of either sex, and are usually marketed from 8 to 15 weeks old.

(2) *Capons* are castrated cockerels. They are known for their large bodies and tender flesh.

(3) *Fryers*, sometimes known as "spring chickens," are young birds of either sex, a little larger than broilers. They are 3 to 4 months old.

(4) *Roasters* are quick-grown, large-sized cockerels. Their flesh is of a high quality.

(5) *Fowl or hens* are female birds more than 1 year old. They have more fat than any other class of chickens.

(6) *Roosters or cocks* are male chickens 1 year old or more. They are not desirable because of toughness and lack of quality.

(7) *Stags* are male birds that have begun to develop definite male characteristics. The flesh is usually dark and tough. Their age may be from 6 months to a year or over. Stags should never be included with roasters or fryers.

b. Age Characteristics. Age is determined by the size and development of the bird. Young birds are usually lankier and rangier than old birds. The head, comb, and wattles are undeveloped. The shanks (lower leg) of the young bird are smooth and bright. With increasing age the shanks become roughened, scaly, and dull colored. On broilers, spurs are hardly noticeable; on fryers a small rounded knob appears; on staggy birds the spur begins to lengthen and become hard; on cocks they are long, hard and pointed. The claws of young birds are short, slender and pointed. On old birds they are long, stubby and dull. In young birds the end of the breast bone is soft and pliable. As the bird grows older this soft bone becomes firm and hard.

c. Chickens Received in the Army Mess. Chickens are either dressed or drawn when received in the Army mess.

(1) *Dressed chickens.* Birds that have been bled and have had their feathers removed are known as dressed chickens.

(2) *Drawn chickens.* Chickens that are drawn have had the head, feet, crop, windpipe and guts removed. Most chickens received in the Army mess are dressed but not drawn and are either chilled or frozen.

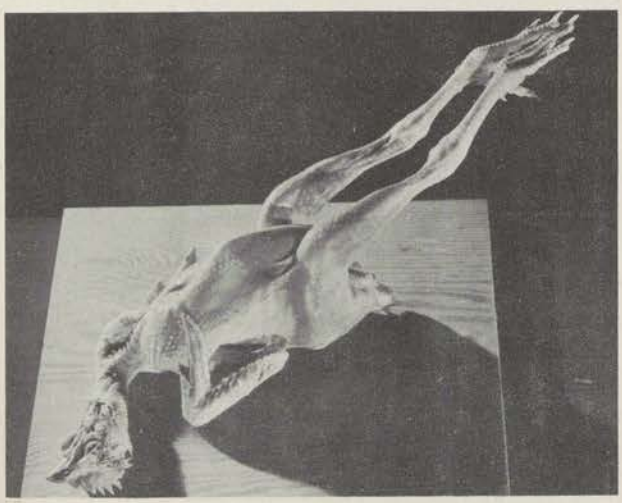


Figure 18. Dressed chicken.

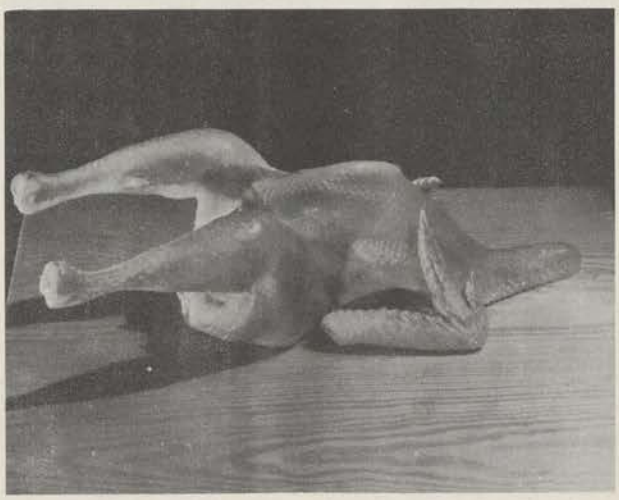


Figure 19. Drawn chicken.



Figure 20. Drawing poultry.
① *Remove pin feathers.*



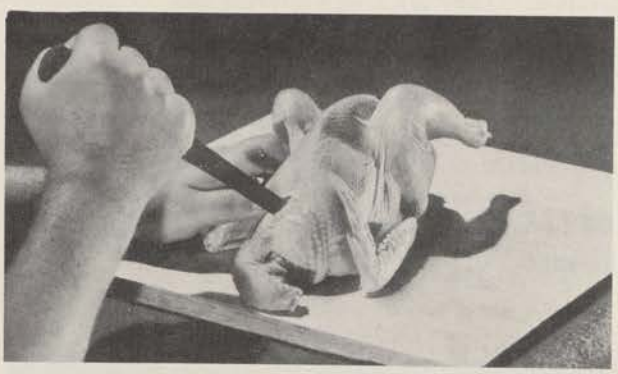
② *Cut off the head.*



③ *Cut off the legs.*



④ *Cut and open across the vent and remove intestines, heart, liver, and lungs.*



⑤ *Remove crop through neck opening.*



⑥ *Cut off the tail and oil bag.*



⑦ *Rinse in cold water and dry.*

d. To Draw or Clean Chickens. The following is the method of drawing poultry:

(1) Remove pin feathers by singeing or plucking.

(2) Remove the head.

(3) On large birds, the tendons must be removed. Scrape the skin below the hock joint (shank). The tendons (long, fibre-like, flexible bone) will be exposed. Pull each tendon until it is free of the drum stick. Then cut through the hock joint and remove the leg.

(4) Remove the crop or food bag from the neck opening.

(5) Make a small cross cut at the vent. Remove the guts, heart, and liver, being careful not to break the gall bag. The gall is attached to the liver. If broken, it spreads its bitter contents on every part of the bird it touches. If this should occur, wash the bird immediately in cold water.

(6) Remove the lungs which are closely attached to the rear side of the backbone.

(7) Turn the bird breast down and cut the oil bag which is found at the tip of the tail. This sac contains a thick yellow deposit, strong in both odor and taste.

(8) Rinse the bird in cold water and allow to dry.

e. How to Cook Young Chickens. (1) *Broiling.* The chicken is first split down the back or halved. Each half makes a serving. It is then broiled in a moderate oven for slow, even cooking. The larger type of broiler when served in the Army mess is generally disjointed and served as a fryer.

(2) *Frying.* (*a*) *Shallow frying.* To fry chicken, disjoint and cut into portions suitable for serving. This will depend upon the size of the bird. Wipe the pieces of chicken as dry as possible. Dredge pieces of chicken in flour, seasoned with salt and pepper. Have a pan ready with ½ inch of fat that is hot but not smoky. Leave space for the fat to come up around each piece. Do not crowd.

(*b*) *Deep fat.* Follow the same method of preparing the chicken for shallow frying. Have ready a pan of hot fat heated to 350° F. Lower the chicken carefully into the deep fat. Do not crowd the pieces. Some cooks prefer to take out the chicken when it is very lightly browned. The chicken is then placed on slices of leftover bread in a ration pan. After the bread is moistened with a little stock, the chicken is put in the oven and cooking is completed at a temperature of 325° F. This method of preparing fried chicken enables the cook to complete the cooking of all the chicken at one time. It also makes the chicken more tender and juicy.

(3) *Roasting.* For roasting a young bird, place it breast down in a shallow, *uncovered* pan with a rack in the bottom. In a shallow pan, a bird cooks more evenly than in a pan with high sides which retard the circulation of heat. The rack keeps the bird from sticking. Inverted pie tins can act as an improvised rack when using a 100 ration pan. Do not use a cover because it will steam the bird. Steaming is not necessary for young chickens.

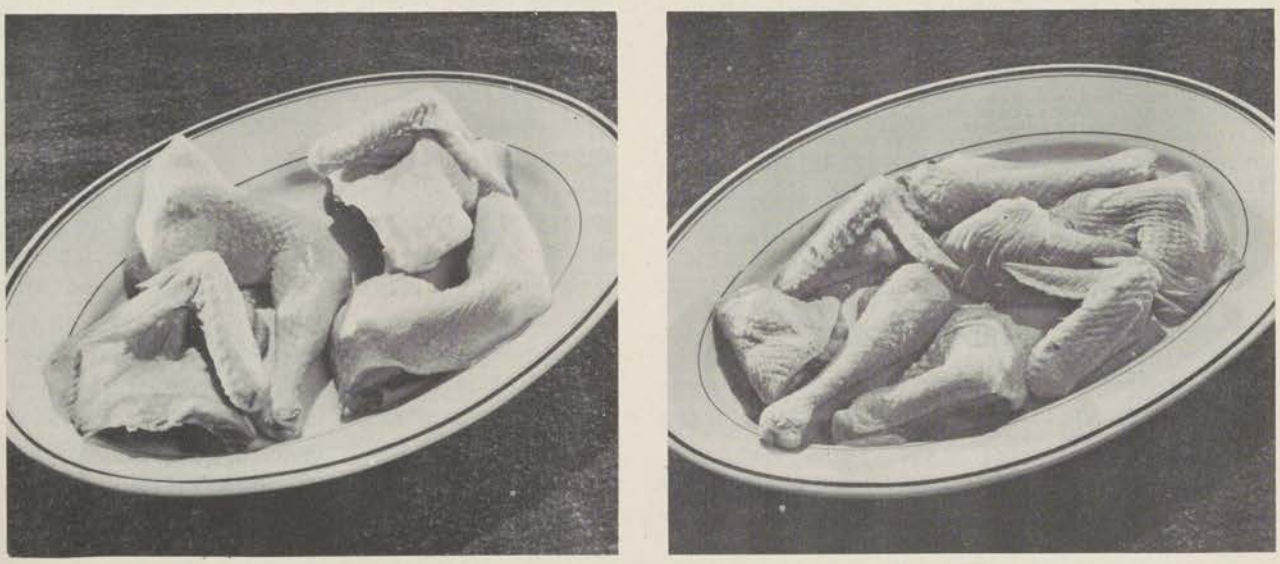


Figure 21. Cuts of chicken.

① *Cut for broiling and for frying.* ② *Cut for fricassee.*

Moreover, steaming breaks the skin, forces juices out of the meat, and results in loss of flavor and weight.

f. How to Cook Old Birds. (1) *Brown smothered chicken.* This is a good method of cooking well-fatted birds past their prime for roasting, but not necessarily in stewing class. An example is fowl from 1 year to 1½ years old. Place the chicken on a rack in a pan. Cover and cook at a temperature of 325° F. The cover makes the difference. A small amount of stock should be added for basting during cooking. After the bird has been three-quarters cooked, remove it and stuff. Coat the outside with fat and sprinkle a little paprika for coloring. Place in oven until browned.

(2) *Stewing.* Old birds need long, slow cooking in water or steam. This will soften the tissue and make it tender. Birds cooked in steam or water give off juices and flavor. These are saved in the broth, made into a savory gravy, and served with the meat. Chickens may be stewed either whole or in pieces. *Always simmer; do not boil.*

(3) *Fricassee.* Disjoint chicken. Make two pieces of each wing by cutting at the joint. Cut neck into two pieces, split breast in half and cut into eight pieces. Place in pot with onions, carrots, celery and seasoning. Cover with cold water. Place a tight cover on the boiler. Simmer 2½ hours. Skim fat and blend it into the flour. Strain the chicken stock and add it to the blended flour to make a sauce. Add the cooked chicken to the sauce, and serve.

Table XXII. Timetable for roasting turkey

Size of turkey	Weight of stuffed birds in pounds	Average total cooking time in hours	Average time per pound in minutes
Small	6 to 10	3 to 3½	20 to 25
Medium	10 to 16	3½ to 4½	18 to 20
Large	18 to 30	4½ to 8	16 to 18

66. TURKEYS. a. Classes. Army specifications prescribe the following classes of turkey for use in the mess:

(1) Classes I and II, young hens and toms, are soft-meated, with flexible breastbone, and less than 1 year old.

(2) Classes III and IV, old hens and toms, are mature turkeys, with toughened flesh, hardened breastbone, and more than 1 year old. It is the Army policy to buy class I and II type turkeys whenever possible. Classes III and IV are purchased only when the supply of class I and II is exhausted.

b. Age Characteristics. The age of turkeys is reflected by the same characteristics as chickens, except that the feet of turkeys indicate age. The feet of turkeys are dark or black up to about 1 year. From 1 year up to 3 years they are a pink color. Then they gradually turn gray and dull.

c. Method of Cooking Turkey. Turkey has become the number one Thanksgiving Day and Christmas Day requirement in the Army mess. It is always served stuffed and roasted. Table XXII gives the roasting time for turkeys. The time shown is the requirement for cooking stuffed turkeys at 300° F.

67. DUCKS. a. General. Ducks represent only a small fraction of the poultry grown in the U. S. They are marketed from 8 to 12 weeks of age and weigh from 4½ to 6 pounds.

b. Types. Ducks are divided into three types: Meat, egg, and ornamental.

c. Classes. Ducks may be purchased by the Army in the following classes:

(1) Class I, young ducks 8 to 13 weeks old, and specially fed, weighing not less than 4 pounds and not more than 6 with pliable cartilages (soft bone).

(2) Class II, ducks not included in the above, weighing not less than 4 pounds and not more than 7.

d. Age Characteristics. The age of ducks is indicated by the condition of the windpipe. In the young birds, the windpipe is flexible, while in the old birds it is hard and rigid. By grasping the windpipe between the thumb and forefinger and squeezing, the degree of softness or hardness can be determined.

e. Cleaning. Duck feathers are much harder to remove than chicken feathers, especially the small downy feathers next to the skin. In dry picking, they are usually removed by rubbing them with moistened hands or by shaving the skin with a sharp knife. Steaming, not scalding, makes plucking easier. It is accomplished by hanging the birds in a closed chamber (a GI can) and subjecting them to steam vapor for from ½ to 2 minutes. This loosens the feathers, and makes them easy to remove.

f. Method of Cooking Duck. Duck is roasted the same as chicken, except that a longer roasting time is required.

68. Frozen Poultry. Chickens, turkeys and ducks are often received frozen in the mess. It is best to thaw them completely in the refrigerator. If possible, they should be hung on a rack while defrosting to permit circulation of air. A frozen roasting chicken, for example, will require from 18 to 24 hours to thaw sufficiently in a refrigerator to permit it to be drawn. A quicker method of thawing is to place the frozen poultry in a receptacle containing cold water until defrosted. Hot water should *never* be used. After poultry is thawed, it may then be cooked in the same manner as freshly killed birds.

SECTION X. EGGS

69. CLASSES OF EGGS. a. *Fresh eggs* are not over 30 days old, have never been in cold storage, and are held at a temperature between 40° to 50° F. The term "eggs," when unqualified, means hens' eggs. Their quality may be determined by candling, which consists of holding an egg before an artificial light, so the condition of the contents may be seen.

b. Storage Eggs. Storage eggs are those placed in storage at 29° to 30° F. They keep well at this temperature for 9 months.

c. Processed Eggs. Processed eggs are dipped in hot mineral oil at 220°F. for 6 seconds to preserve the fresh quality. The hot oil seals the pores of the shell, retards shrinkage by evaporation, and destroys molds and bacteria, thus prolonging the keeping qualities.

d. Washed and Sandblasted Eggs. Washed eggs are undesirable in that they have limited keeping qualities. Water penetrates the pores of the shell and carries with it any bacteria which may be in the water or on the shell of the egg. Sandblasting wears away the outer shell of the egg. The shell becomes weakened and is less resistant to bacteria.

e. Frozen Eggs. Eggs that are broken, mixed, and then frozen at 10° to 15° below zero are called frozen eggs. Frozen eggs are also packed as whole eggs, as whites and as yolks.

f. Dried Eggs. There are several methods of drying eggs. Sometimes the yolks and whites are dried separately. It requires 3½ pounds of liquid whole eggs to produce 1 pound of whole dried eggs.

70. COOKING. a. Uses. Eggs are used in the mess in many ways, such as boiled, poached, fried, scrambled, or in cooked and baked dishes. They are also used in custards, meat loaf, croquettes, French toast, etc. Aside from their food value and flavor, eggs serve the following purposes:

(1) *Binding.* To avoid crumbling of muffins, cookies, and meat loaves.

(2) *Coating.* To give an attractive color to chops and other meats and the top of baked goods.

(3) *Coloring.* To give desirable yellow or white color to a product.

(4) *Decorating.* Used as a garnish.

(5) *Leavening.* To give lightness to cakes and pastry.

(6) *Separation of oils.* In mayonnaise, the eggs surround particles of oil, thus keeping them from joining. This makes the mixture smooth.

(7) *Texture.* Eliminates lumps in frozen mixtures.

(8) *Whites.* The whites may be whipped for sauces, pie fillings, and custards.

b. Eggs for Immediate Eating. These eggs present special problems to the cook. They can be served in as tempting and appetizing a condition in a mess hall as in any other place. Special care must be taken, however.

(1) Poached, fried, or scrambled eggs should be ready for serving *only* at the time the men are ready to eat them, *not* before. If a cafeteria line is used, keep the supply of freshly cooked eggs only a little ahead of the men who pass through the line and always serve the first-cooked eggs first. Do not let the eggs stand. If not eaten soon after cooking, they cool, harden, and lose their taste.

(2) Boiled eggs are easily served either too soft or too hard. Cooking small batches at frequent intervals makes it possible to serve boiled eggs at the right consistency.

c. Precaution. When eggs are used in a dish with other ingredients or when eggs are to be broken together, each egg should be broken separately in a small dish. If an egg has a bad odor or appearance, it can then be discarded without spoiling the remainder of the eggs.

71. GENERAL. a. Vegetables. Vegetables used in the Army are of two classes: leafy green and yellow, and other than leafy green and yellow. This does not mean that when two or more vegetables are classified together the same cooking methods are adaptable for each. Vegetables are of great importance in the diet because of their health protective value. Most vegetables are best in appearance and flavor and richest in vitamin value when freshly gathered. Vegetables are frequently left uneaten because they are poorly prepared and unattractive.

b. Types. There are five types of vegetables: leafy green and yellow, vegetables other than leafy green and yellow, tomatoes, potatoes and legumes. The vegetables in each type are listed in table in figure 1, chapter 2.

c. Waste. Most raw vegetables have waste. Certain portions are not edible. In taking off the waste, by peeling, scraping, brushing, or cutting, care must be exercised to prevent destroying edible portions. The table in figure 49 shows the percentage of waste and edible parts of certain vegetables. This will help the cook in estimating the average amount of waste to be expected with various vegetables. Efforts should be made to prevent waste beyond the percentage that is considered normal.

Table XXIII. Waste and edible portions of vegetables

Name of vegetable	Waste	Edible
Potatoes, fresh:	*Percent*	*Percent*
Potatoes, white	16	84
Potatoes, sweet	14	86
Vegetables, leafy, green and yellow, fresh:		
Asparagus	25	75
Beans, string	10	90
Broccoli	53	47
Brussel sprouts	23	77
Cabbage	27	73
Carrots, without tops	12	88
with tops	37	63
Greens:		
Collards, leaves only		100
with stalks	55	45
Kale, leaves only		100
with stalks, etc.	36	64
Mustard greens, leaves		100
with stalks	27	73
Spinach	18	82
Lettuce	31	69
Peas in shells	55	45
Pumpkin	31	69
Squash, summer	35	65
winter	26	74
Tomatoes, fresh:		
Tomatoes	2	98
Vegetables, other than leafy, green and yellow, fresh:		
Beans, lima in shells	60	40
Beets, without tops	25	75
with tops	47	53
Cauliflower, main stalks	43	57
with leaves and stalks	55	45
Celery	37	63
Corn, with husks	62	38
without husks	43	57
Onions, dry	6	94
young	59	41
Parsnips	22	78
Sauerkraut, canned		100
Turnips, roots only	13	87
with tops	34	66

72. COOKING VEGETABLES. Vegetables must be cooked in the shortest time possible, using a minimum of water. Vitamin and flavor loss increases with the amount of liquid used and the length of time cooked. A vegetable is sufficiently cooked when it is tender. Add vegetables to boiling water. Do not use soda to preserve the color because it destroys vitamins. Cook until just done. Undercook rather than overcook. Table in figure 50 will guide the cook in the preparation of vegetables and the cooking time under different methods of cooking. Press pieces between the thumb and forefinger to determine whether or not a vegetable is done. Do not let vegetables stand in water because soaking removes vitamins. Cover all vegetables while cooking, except those of the cabbage family, such as cabbage, cauliflower, brussels sprouts, and turnips. Never use too much water. Add soup stock, diced bacon or rinds, ham or pork bones for flavor. Taste before serving, and add more seasoning if necessary. Boil root vegetables whole with skins on unless they are too strong or tough. To keep beets from losing their bright red color, leave on the long taproot and an inch or more of the stems. A quick dip into cold water loosens the skin on a cooked beet so it will slip off very easily.

Table XXIV. Time required for cooking the more common vegetables by different methods

Vegetable	Preparation for cooking	Time of cooking when vegetables are—		
		Baked	Steamed	Boiled
		Hours	*Minutes*	*Minutes*
Artichokes, globe or French	Whole			35
Artichokes, Jerusalem	Pared, whole	2–1	35	30
	In bunches			15–20
Asparagus	1½ inch pieces		12	12–15
Beans, lima, dried	Soaked overnight	6–8		180
Beans, lima, fresh	Shelled			30
Beans, navy, dried	Soaked overnight	6–8		180
Beans, snap	In pieces		25–30	20–30
	With stems			15–20
Beet greens	No stems			10
Beets, mature	Whole			60–90
Beets, young	Whole		60	30–45
Broccoli	Cut in strips			20–45
Brussel sprouts	Whole			15–20
	Quartered		15	10–15
Cabbage	Shredded		10	5–10
Carrots, mature	Diced or sliced		25–30	20–25
Carrots, young	Whole		20–30	15–20
	Separated		10–15	10–15
Cauliflower	Whole		25–30	20–30
Celeriac	Diced		25	15–20
Celery	1½ inch pieces		25–30	15–20
Chayotes	Sliced		20	15
Collards			30	20
Corn	On cob		10	6–15
Dandelion greens				10–20
Eggplant	Diced		15	10
Fennell			25	15–20
Kale			30	20–25
Kohlrabi	Pared sliced		30	25–30
Lentils, dried	Soaked overnight	6–8		180–240
Mushrooms	Whole	¼		5 (in own juice)
Okra	Whole		20	10–20
Onions, Bermuda	Peeled, whole	1		30
Onions, Spanish	Peeled, cut in half	1		35–40
Parsnips	Whole	½–¾	30–40	20–30
Peas, dried	Soaked overnight	6–8		180
Peas, fresh	Shelled			10–20
Potatoes	Whole	¾	40	35
Rhubarb	1-inch pieces	¼	5	5
Rutabagas	Pared, quartered			20–30
	With stems		5–6	5–8
Spinach	No stems			10
Squash, summer	Pared, sliced		20	15
Squash, winter	2-inch pieces	¾–1	30–40	20
Sweet potatoes	Whole	¾	30–35	25–30
Swiss chard	Leaves alone			10
	With stems			20–30
Swiss chard	Stems alone			30
Tomatoes	Quartered	½–¾		10–20
Turnip greens				20–30
Turnips	Sliced or diced		20–25	15–20
Vegetable oyster, or salsify	Sliced		20	20

73. COOKING QUICK-FROZEN VEGETABLES. All quick-frozen vegetables, except spinach, kale, other leafy greens and corn, should be kept in a completely frozen condition up to the time of cooking. Spinach, kale, other leafy greens and corn should be thawed out prior to cooking. To cook other vegetables, remove from cartons and drop into boiling, salted water. If products are "solid packed" in the shape of "bricks," each brick should be broken into four or five pieces before it is placed in the water. This will hasten defrosting in the water. If they are "loose-packed" or "loose-frozen," they will separate readily. Vegetables should be stirred frequently while thawing in the water. Boiling will stop when frozen foods are placed in the water; therefore cooking time will start when water comes to a second boil. Approximate cooking times for frozen vegetables are shown in fig. 51, Table XXV. Quick-frozen vegetables cook in a much shorter time than "fresh." Cook each item only until just tender. Caution should be exercised to avoid overcooking. When cooking is completed, drain, season, and serve vegetables in the usual manner. Use cooking water for gravies, sauces and soups.

Table XXV. Cooking time for frozen vegetables

Item	Amount of water	Cooking time [1] [2]
	25 to 30 pounds of vegetables [1]	(from 2d boil)
Asparagus	2 gal.	6 to 9 min.
Asparagus cuts	2 gal.	6 to 9 min.
Beans, green	2 gal.	8 to 13 min.
Beans, lima	2 gal.	10 to 13 min.
Beans, wax	2 gal.	8 to 13 min.
Broccoli	Enough to cover	5 to 7 min.
Brussels sprouts	Enough to cover	½ min. or less
Cauliflower	Enough to cover	3 to 5 min.
Cut corn	2 gal.	½ min. or less
Peas	2 gal.	4 to 6 min.
Spinach	1 gal.	4 to 6 min.

[1] Use same proportion for larger or small quantities of vegetables.
[2] These are approximate cooking times and subject to considerable variation.

74. COOKING POTATOES. Potatoes are used more than any other vegetable, and generally form a part of every day's menu. They are one of the cheapest and most available vegetables on the market. They are valued chiefly as an energy food, but they also furnish vitamins and minerals. They may be served in many ways: baked, boiled, fried, mashed, creamed, au gratin, escalloped, in soups, and in combinations with other foods. In salads they are first boiled or steamed and then chilled. They may be added to fish cakes, meat loaf, and croquettes. They should be cooked in a variety of ways to be attractive and appetizing. Heat bursts the starch cells and gives them that mealy appetizing appearance. The best results require more heat than can be obtained by boiling. Baking in the oven or frying in hot fat will give the best results. When baked or boiled with the "jackets" on, there is little water. When they are boiled, care should be taken to pour off all the water as soon as they have been cooked. Then they should be placed on the back of the stove. This will make them mealy. In order that they will be uniformly cooked, they must be of uniform size. When paring, potato paring knives should be used to prevent waste.

75. MACARONI, SPAGHETTI AND NOODLES.

a. General. These products are shaped and dried dough. They are called "paste products." The paste from which all of the products are made is simply flour and water; sometimes salt is added. The flour is not the same as used for baking; it is semolina or farina. After the paste is processed, it is usually packaged in wooden or cardboard boxes. The four basic types of paste products are macaroni, spaghetti, egg noodles, and plain noodles. The finished product contains not more than 13 percent moisture. The various forms and sizes are merely a matter of using different molds in the machinery and cutting to different sizes. Noodles are made of the same kind of paste as macaroni and spaghetti except that eggs are sometimes added. The product is then known as egg noodles.

b. Cooking. When properly cooked, these products are enjoyable main dishes. They have eye appeal and are nutritious. They require no preparation before cooking. Regardless of the finished dish, paste products are always boiled first in water. Egg noodles are an exception to this rule; they may be boiled in stock or in a thin gravy instead of water. Due to the various sizes and shapes, there is no hard and fast rule for time required to cook paste. The degree of tenderness is the determining factor. Overcooking will produce an undesirable mushiness. After the pastes have been boiled to the desired degree of tenderness, blanch them. Pastes may then be prepared in many ways.

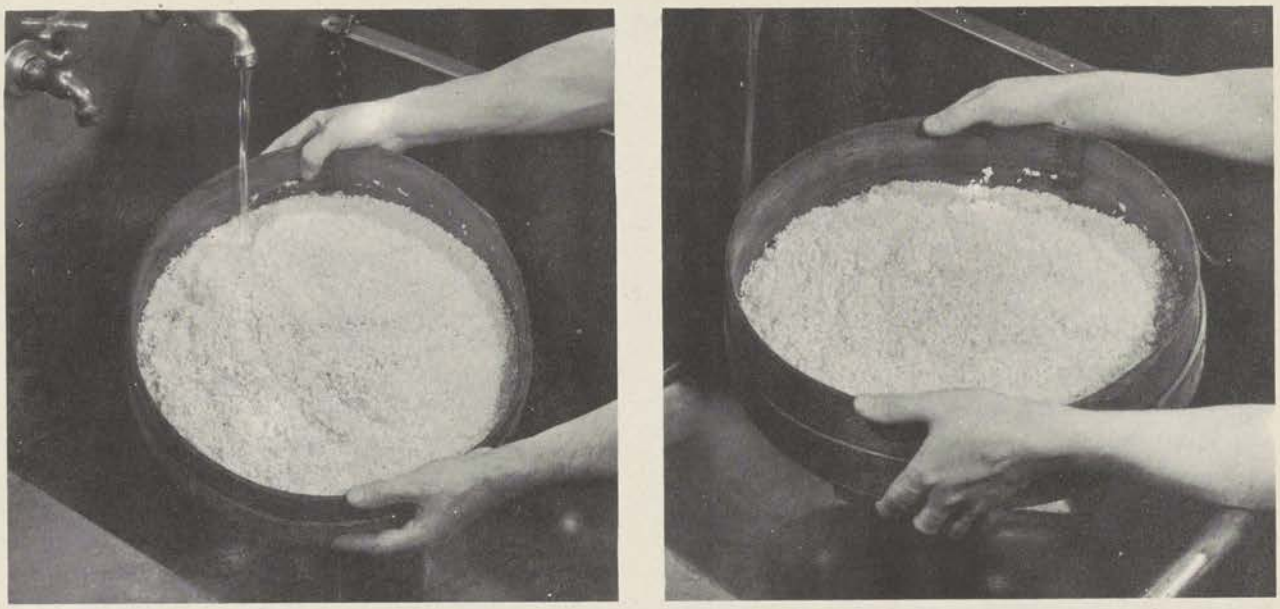


Figure 22. Preparation of rice for cooking.
① *Rinse until the water is clear.* ② *Drain thoroughly.*

(1) Buttered, salted, and served.
(2) Baked with diced or grated cheese and a white sauce.
(3) Baked in a cream sauce to which a cheese sauce is added.
(4) Creamed with hardboiled eggs.
(5) Served with Spanish or Italian sauce.
(6) Diced and served with a salad.
(7) Added to soup.
(8) Combined with tomato sauce and meat balls.

c. Tips on Cooking Pastes. The water must be boiling vigorously before placing the paste in the pot. If more water is needed, be sure it is boiling when used. Paste usually swells to twice the size during cooking and absorbs three times its weight. Allow plenty of water for cooking; the proper proportion is eight times more water than the original product. Adding salt to the water is optional, but is usually desirable. When baking paste, allow enough time to melt the ingredients and brown the top. Prolonged baking will cause toughness.

76. RICE. a. General. Rice is a grain product produced in warm climates, chiefly in the Orient and in southern United States. It is used extensively as a food. It is supplied to the Army in the milled or white form. Regulations require that brown or unpolished rice be issued to Phillipino scouts because it contains vitamin "B" which polished rice lacks. Polished rice simply means that the outer surface or bran is removed, and the result produced is white, milled or polished rice.

b. Cooking Rice. Rice requires rinsing or washing prior to cooking. This removes the thin coat of starch. Rice should be washed several times in water until the last rinse is clear. Then drain thoroughly before cooking. If rice is to be used as an ingredient for another dish, it should be cooked first. In cooking, rice is placed in rapidly boiling water, then it is allowed to simmer. If more water is needed, use only boiling water. One and one half times as much water as rice by volume is the proper proportion for cooking. Rice, like paste products, swells during cooking.

c. Serving Rice. Rice is an all-purpose food and can be served in any of the following forms:

(1) Served as a cereal with cream and sugar. A little cinnamon improves the taste and adds color.
(2) Base for such dishes as chop suey and stew.
(3) Added to soups.
(4) Rice pudding as a dessert.
(5) As a change in place of potatoes.
(6) Combined with meat and sauces.

77. BARLEY. a. General. Barley was probably the first grain crop produced by the human race. Wheat and rye have largely replaced it. As recently as the eighteenth century, it was the chief grain food of England and is still widely used

in northern Europe for bread making. The type of barley used in the mess may be compared to rice. It is the inner seed from which the outside husk has been removed. The seed is then polished by means of a mechanical process and is known as pearl barley.

b. Cooking Barley. Barley is limited in its use. It is used principally as an ingredient in soup. There are three methods of preparing barley:

(1) Barley is washed and cooked in boiling salted water until done. It is then strained and washed thoroughly in cold water. It is given a final hot water rinse to reheat it and then it is added to a broth or soup.

(2) The barley may be soaked in cold water, strained and then added to the soup and cooked in the soup.

(3) Barley may be cooked in the soup, without any previous preparation.

78. BEANS, PEAS AND LENTILS. a. General. There are several types of dry beans that are used in the Army mess. They may be used in place of meat or as a side dish. One of the most popular is the "Navy" or "Pea" bean. The cooking qualities of beans differ. Therefore, the issues should be of one variety, not mixed. If large navy beans are mixed with small pea beans, the small bean will be overcooked and the large bean undercooked.

b. Preparation for Cooking. In preparing beans for cooking it is necessary to remove all stones, sticks, dirt, or other foreign matter and wash thoroughly. They should be soaked overnight before cooking. This will shorten the cooking time. In hot weather it may become necessary to shorten the soaking time to prevent souring, unless they can be soaked under refrigeration.

c. Types. The various types of dried beans, peas, and lentils commonly used are:

(1) *Pea or navy bean.* The pea or navy bean is white in color and is the smallest in size of any of the beans. It is commonly used for baked beans or canned pork and beans. It is grown in California and Michigan; the California pea bean differs in flavor and cooking time from the Michigan variety.

(2) *White or great northern bean.* This is approximately twice as large as the pea bean and flatter. It is used like the pea bean, except that it is not canned commercially because of its tendency to lose shape when cooked.

(3) *Kidney bean.* This bean is kidney shaped and is larger than the pea bean. It is produced in different colors and sizes.

(*a*) The red kidney has a distinctive flavor and is commonly used for chili con carne and other Mexican dishes. It is also popular as a canned product.

(*b*) The mahogany kidney is especially popular in New England.

(*c*) The southern black or "turtle" is used for making an especially rich and excellent soup.

(*d*) Flageolots or haricots flageolots are shelled kidney beans of a special strain, generally put up in bottles or cans, but also sold dried.

(*e*) The red bean looks like the small red kidney and is difficult to handle because of its tender skin.

(*f*) The frijole or Mexican bean is popular in the South. It is a special strain of kidney bean. It is small and flat and is used as a string bean, shelled and cooked green, or dried. (With corn it forms the principal part of the Mexican diet.)

(*g*) The marrow bean is one of the larger varieties and may be either white or red in color.

d. Lima or Butter Bean. This bean is marketed fresh, dried or canned in "regular" or "baby" size. Fresh limas are picked from vines while young and green; limas for drying are allowed to mature on the vine. The color of the bean is lost as it ripens; hence, dried limas are white in color. "Speckled Cranberry" is a variety which has red spots, is cultivated in New England and is popular for succotash.

e. Pinto or Indian Bean. This bean is buff color, speckled with brown, and about the size of the navy bean. It cooks more easily than the navy bean and is more tender. It is especially popular in the Southwest.

f. Pink Bean. Its color is pink. It ranks between the pea bean and the white bean in size. It is closely related to the pinto bean. Sometimes it is used for chili con carne.

g. Blackeye Bean or Cowpea. This is a small bean with an oval of black around the "eye" or germ of the bean. It is especially popular in the South. It may be eaten as string, shelled, or dried. Its original use was as forage and soil enrichment.

h. Peas. Mature fresh peas are dried in evaporators, marketed whole or split, in green or yellow varieties, and used especially for soups and puree.

i. Lentil. The lentil is related to the bean family. They are smaller in size than beans. Their greatest use is in soups and stews.

j. Soy Bean. Soy beans vary in color according to varieties. There is much interest in developing it as a human food. It is only within the last decade that the soy beans have been used for food purposes in this country.

SECTION XII. SALADS AND SALAD DRESSINGS

79. GENERAL. Formerly salads were looked upon as only leafy greens. Dressings were plain, often containing just vinegar and sugar. Today, salads vary from simple foods to elaborate combinations. The more complicated salads are served on lettuce or some other salad green and are usually garnished with a fancy dressing. Many ingredients are used today in salad-making. They incude greens, vegetables, fruits, meat, poultry, eggs, fish, sea food, gelatin, nuts, cheeses, rice, and other raw, cooked, dried, salted or pickled foods. Salads used to be served following the main course as a general rule. More and more, however, they have come to take other forms, such as relishes or appetizers, hearty salads which are served as a main course, and salads which constitute a vegetable course.

a. General. Salads are desirable for the diet. Raw salad greens, raw vegetables, and raw fruits are very rich in vitamins. Salad dressings contain oil which furnishes heat and energy. Salads also include a large proportion of water and mild acid which are beneficial to the digestive tract. Salads are a means of serving a variety of greens, vegetables, fruits and other foods. If possible, a salad should be made and served at least once each day.

b. Hot Salads. A few hot salads are sometimes served but the greatest majority are cold. It is important to the success of a cold salad to have all ingredients well chilled and served from cold plates or utensils.

c. Salad Success. This depends on the judgment with which the salad is chosen. Among the requirements of a good salad are: freshness, crispness, appetizing flavor, pleasing color combinations, and a proper dressing.

80. SALAD AS A FIRST COURSE. A salad as a first course takes the salad out of its accustomed role. On holidays, a tart fruit, fish, or vegetable salad is most appropriate. Servings should be small and colorful. Sections of grapefruit or orange, or both; grapefruit sections and thin slices of pared avacado; small tomatoes stuffed with mixed vegetables; stuffed beets, avacado, mixed green salads, or tomato, any of these served with an appropriate dressing in cups of crisp lettuce make a tempting first course. One or two anchovies, shrimps, or sardines for each serving add a pleasing touch to a simple green salad. Serve with melba toast or crackers.

81. GREEN SALADS. a. General. A considerable variety of greens is available for salad use. They are seldom in perfect condition when received in the mess. It should be kept in mind that wilted greens have lost much of their vitamin content. If only the outer leaves are wilted or bruised, or the leaf tips sunburned or nipped by frost, the greens can still be made into perfect salads. Discard the soiled outer leaves. Cut away the blemished tips and other imperfections and freshen the heads by cutting off the root and plunging the cut end into ice-cold water for half an hour. Wilted greens may be more readily revived if ½ cup of vinegar is added for 1 gallon of water and the greens allowed to remain in the mixture until refreshed. If there are leaves which, after this treatment, still do not look good enough for the salad plate, save them to cook with spinach, for use in a vegetable soup or for a chopped salad if they are tender enough. If a variety of different ingredients, all crisp, are cut up neatly and uniformly, and lightly combined, a very attractive salad may be made of them.

b. Varieties of Green Salad. (1) *Lettuce.* The most frequently used and the most abundant salad green is lettuce, which can be used in a number of ways. The leaves may be separated, leaving the cupped heart leaves as a foundation of the salad. Other leaves may be shredded. The head, after trimming, may be cut in wedges or slices. For use in the salad bowl, breaking the leaves apart rather than cutting the head into chunks produces the best flavored salad. Lettuce has a very mild flavor of its own. There are various types of lettuce on the market.

(*a*) *Iceberg.* Probably the most widely used type of lettuce is iceberg. It is a large head variety and extremely crisp and brittle. Although it has a distinct lettuce flavor, it suggests cabbage in its formation.

(*b*) *Boston.* This lettuce has a greener and smoother leaf than the crisp head and varies from a semiformed to a tight cabbage-like head.

(*c*) *Leaf or bunch.* This is a form of lettuce that that is not allowed to come to a head, but is cut directly from the little lettuce plants. It has a crisp texture and either a much-curled or a smooth leaf.

(2) *Romaine.* Romaine differs from lettuce and is stronger in flavor. It has an elongated head of long, straight, upright leaves, generally inclined to spoon shape and with thick crisp midribs.

(3) *Cabbage.* While cabbage is a vegetable, it is so well adapted in varying forms to salad making that it is considered under this heading. The green, white, and red cabbage varieties are used as a salad.

(4) *Chinese cabbage.* Chinese cabbage forms a close, erect, elongated head, 10 to 16 inches in height, pale green to white in color, inclosed in outer leaves of cabbage style. Stripped of its cabbage-like wrapper, its length and general appearance suggest a cross between lettuce and celery. The inner leaves are crisp and delicate and are fully equal to the best lettuce as a salad.

(5) *Kohlrabi.* Kohlrabi is a variety of cabbage with a turnip-like root, growing just above the ground. The leaves, when green and tender, are eaten as a salad.

(6) *Savoy cabbage.* This is a kind of cabbage with rough, curly or crimpled leaves and generally loose-centered. The flavor is usually milder than that of the ordinary cabbage.

(7) *Some additional forms* of cabbage used for salads are broccoli, Brussels sprouts, and cauliflower.

(8) *Chicory or American endive.* The common salad chicory has narrow, curled, feathery leaves. The leaves around the base of the plant resemble dandelion greens. Chicory is obtainable in both summer and winter.

(9) *Escarole.* Escarole has broad leaves that are generally twisted and waved, with white midribs. Escarole is more highly considered as a winter than a summer salad. Both chicory and escarole are sandy plants and need careful soaking and cleaning.

(10) *French or Belgian endive.* French or Belgian endive consists typically of a number of thick, creamy-white leaves from 4 to 6 inches in length and 1 to 2 inches in width, tapering to a point. The leaves form into close and often tight heads like Chinese cabbage or celery. For many years this type of endive was imported from France and Belgium. Belgian or French endive is generally used alone as a salad and not as a foundation or part of a salad mixture.

(11) *Dandelion.* Dandelion is a common and familiar plant and is entitled to a higher place than it holds at present in salad use. Dandelion is gathered wild in the early spring. It is cultivated by some gardeners and is also raised in hot houses between seasons. For salad use, dandelion must be cut when the leaves are young and tender.

(12) *Water cress.* Water cress grows wild in many parts, flourishing best in running waters with sandy bottoms. Under cultivation it is generally raised in fields of slowly moving water. Water cress has a pungent and peppery taste and is especially suitable for salad use. Water cress is sometimes known as pepper grass.

(13) *Young spinach.* Only young leaves should be used for salads. Spinach needs very thorough cleansing as its round low-lying leaves generally collect sand and other soil particles. The French call spinach "belly broom" because of its value as "roughage."

(14) *Wild salads.* Under this heading can be mentioned sorrels and docks, purslane, mustard greens, and marsh marigold or cow slip.

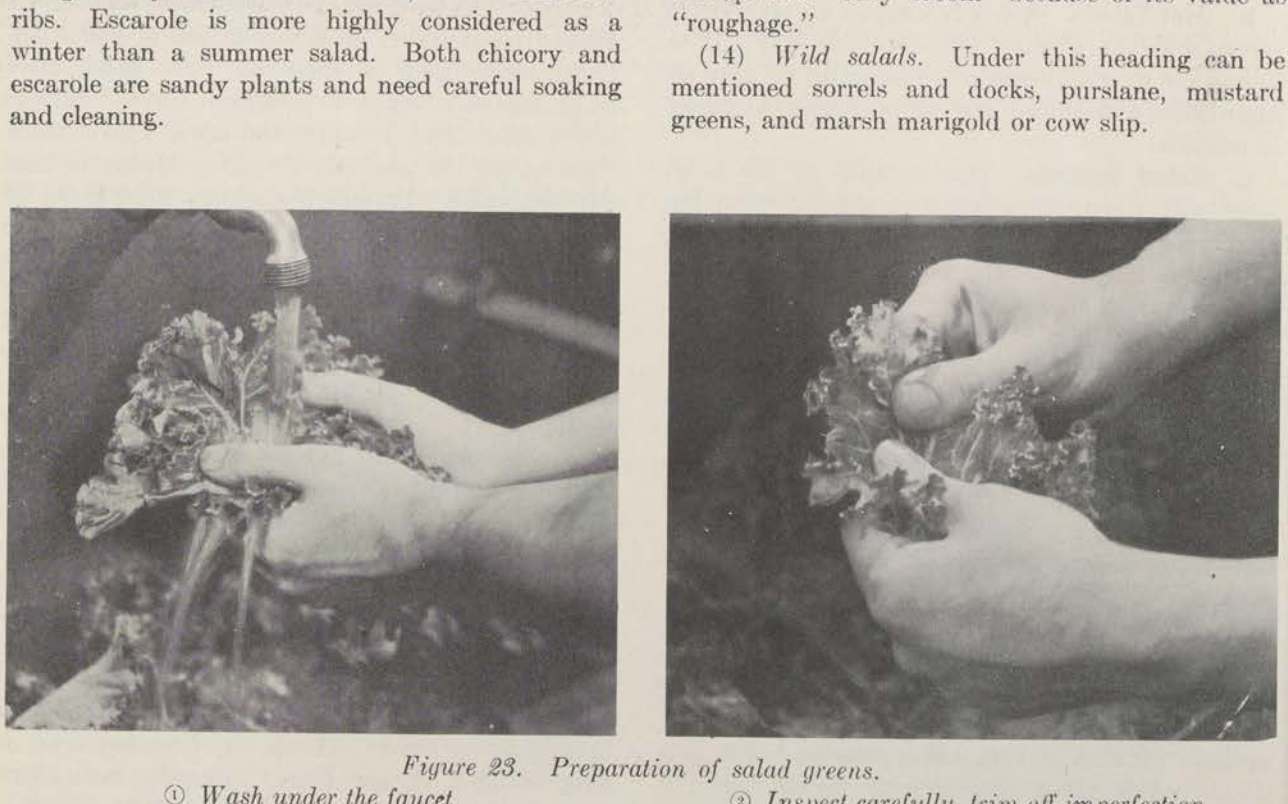


Figure 23. Preparation of salad greens.

① *Wash under the faucet.* ② *Inspect carefully, trim off imperfection.*





Figure 23. Preparation of salad greens—Continued

③ *Shake off excess water.* ④ *Place in hydrator in refrigerator.*

(15) *Other salad greens.* Other salad greens are young turnip tops, young onion tops, bean sprouts, young tender kale, salsify or oyster plant top and corn salad in its many varied forms. Tender celery tops may be used as a salad background. Whole celery, diced, shredded or introduced in other ways is a welcome addition to almost any other salad.

(*c*) *Preparation of salad greens for use.* Various kinds of salad greens may be used, either as a salad background or as the main part of a salad. A single green may be used or greens in combination. In every case, wash the plants carefully in cold water to remove dirt. Separate the bunch or head to facilitate washing. The simplest method of separating iceberg lettuce into leaves is to cut out the core with a pointed knife. After coring, hold the head downward under running water so that the water will force its way through the leaves and separate them. Romaine, endive, escarole, dandelion and other leaves may be separated leaf by leaf and then washed well. To clean water cress, untie the bunch, place into a generous-sized container of cold water and let it soak for at least 1 hour, when all the sand will have settled to the bottom. The large-leafed variety has as good a flavor as the small-leafed water cress and is much easier to clean. Cabbage may be cut on a kraut cutter to best advantage. All greens should be well inspected after washing to insure removal of any insects or worms. Trim off imperfect portions. Drain in a colander. Dry by shaking in a wire basket, if available, and, if not, shake by hand. Then place the greens in a refrigerator to chill and crisp. If there is no hydrator, the cleaned greens may be placed loosely in a mechanical refrigerator in a cheesecloth bag kept for the purpose. As an alternate method, they may be wrapped in a damp cloth, or the heads of leaves wrapped lightly in waxed paper. An improvised hydrator is a utensil with the cover slightly elevated to allow for air circulation, or the utensil is covered with a damp towel. Some measure of precaution is desirable to protect the greens against drying out during a short period of storage. If ice is present in the refrigerator, place the greens close to the ice, but avoid contact with it. If there is no refrigerator, place the greens in a utensil as described and let it stand in a current of cool air or in a cool cellar. Greens are extremely poor keepers. Care is necessary to insure their freshness, crispness, tenderness, and firmness. If it is necessary to hold original containers for a short time, keep them in a cool damp place, or spinkle crushed ice on the greens.

d. Making Salad Greens Attractive. Because salad greens are used frequently, care should be taken to guard against monotony. Varying the dressing, the method of service and the garnish also help to make the greens more interesting. A few combinations will illustrate some of the possibilities.

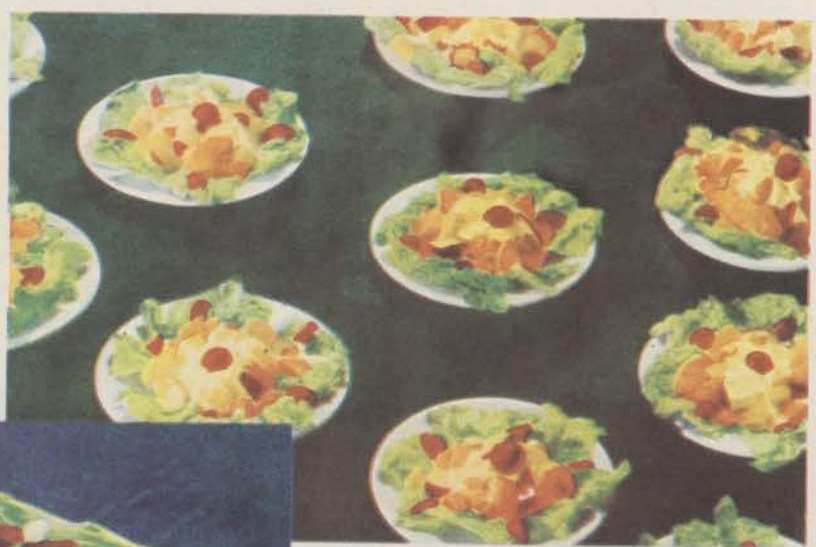
(1) *Iceberg lettuce.* Cut into quarters with horse-radish and mayonnaise.

(2) *Boston lettuce.* Cut crosswise in thick slices with cooked salad dressing.



Figure 24.
① Fresh vegetable salad

THESE SALADS ARE GOOD;
THEY TASTE GOOD;



② Fruit salad

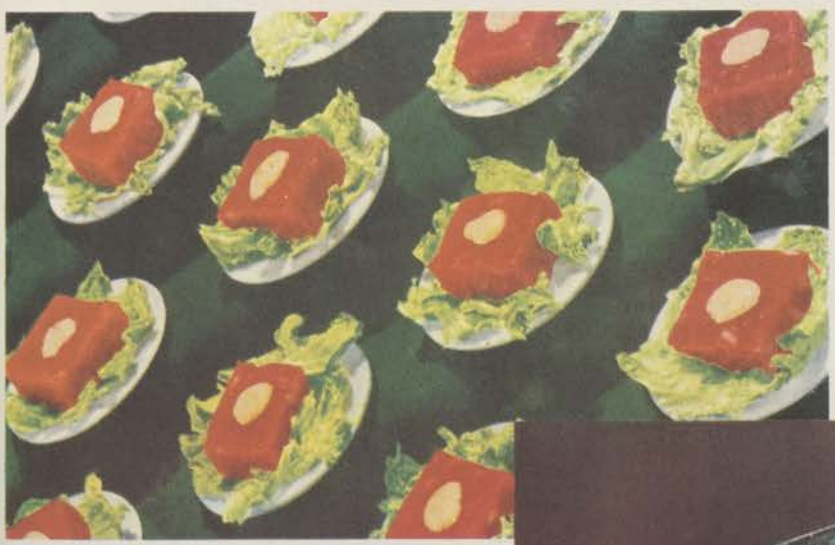


③ Cooked vegetable salad

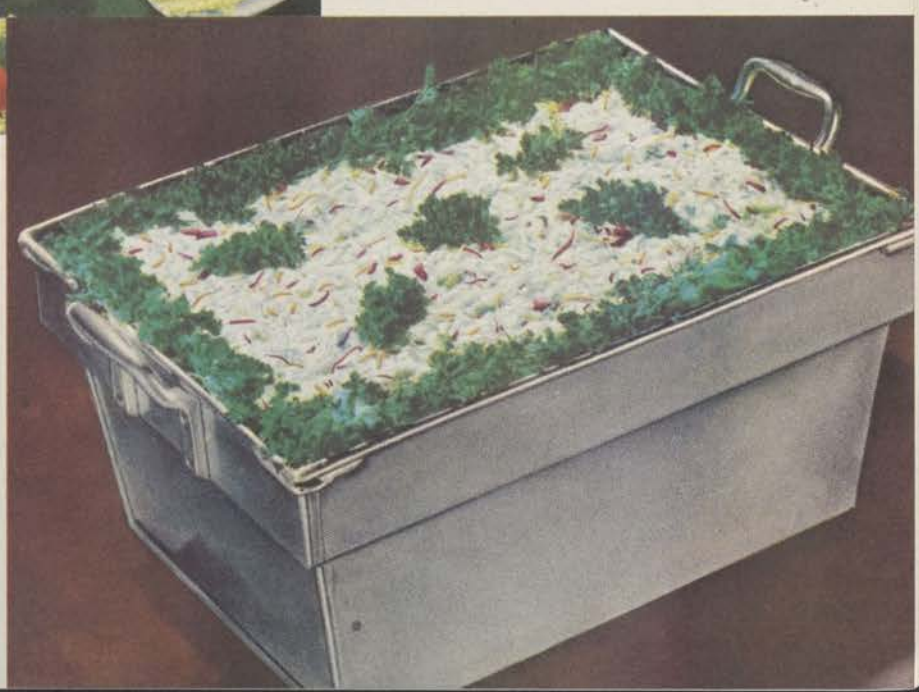


④ Salmon salad

THEY LOOK GOOD;
THEY ARE NUTRITIONALLY GOOD



⑤ Tomato aspic salad



⑥ Coleslaw

(3) *Leaf of bunch lettuce*, with bacon dressing.

(4) *Romaine*, with Thousand Island dressing.

(5) *Cole slaw*, with celery seed and cream cheese dressing.

(6) *Chinese cabbage*, with savory dressing.

(7) *Chicory*, with chiffonade dressing.

(8) *Escarole*, with grated yellow cheese and French dressing.

(9) *Water cress*, with India relish dressing.

(10) *Bowl salad.* Rub a wooden or china bowl with a cut clove of garlic. A typical bowl salad combination is made of lettuce, water cress and romaine. Have greens very crisp and separate leaf by leaf. Slice onions, radishes and cucumbers. Add to greens. Last, add tomatoes peeled and cut into quarters. Cover salad with crumbled cheese and toss lightly with French dressing at time of service.

e. Some Suitable Combinations for Mixed Greens are:

(1) Chicory, dandelion greens, garlic, diced bacon.

(2) Green peppers, green and ripe olives, diced pimiento, romaine.

(3) Dandelion greens, sliced radishes, romaine, chopped scallions, water cress.

(4) Cucumber slices, radish slices, romaine.

(5) Cucumber slices, garlic slices, green pepper slices, lettuce, sliced radishes, chopped scallions.

(6) Chicory, endive, tomato quarters.

(7) Chilled, cooked broccoli on mixed salad greens.

(8) Stuffed celery on salad greens.

(9) Chopped, cooked dandelion greens and scallions on tomato slices with lettuce.

(10) Cooked or canned asparagus tips and grated cheese on lettuce.

82. VEGETABLE SALAD. a. General. Vegetable salad for service with the main course consists of one or more vegetables in combination with salad green. Portions are moderate in size. The dressing is usually French dressing or one of its variations. The small salad offers a golden opportunity to use leftover vegetables, either raw or cooked. Raw vegetables for salad should be very fresh and crisp, not only because they are more attractive and appetizing that way, but because the fresher the foods are, the greater the vitamin content. Like salad greens, raw vegetables are a superior source of vitamins. When vegetables are cooked for a salad they are usually simmered or steamed. Cooked vegetables which have been mixed with butter or a sauce may be rinsed in hot water and then chilled for use as a salad. The flavor of all vegetables is improved by mixing them with French dressing and allowing them to stand for at least ½ hour. This process is called marinating.

b. Raw Vegetable Salad. Toss crisp salad greens or shredded raw cabbage with two or more of the following: carrot or turnip slices, cauliflower flowerets, celery (diced or slivered), cucumber (diced, sliced or slivered), white or purple onions (minced or in rings), radishes (white or red, sliced or whole), scallions (whole or sliced), leeks (sliced), raw tomatoes (skinned or not, diced, or in sections), green peppers (small red peppers, diced or in rings). Add one or two herbs, or crumbled or slivered cheese, as desired. Then add enough French dressing or one of its variations to moisten the salad, tossing lightly. Serve from a chilled bowl or platter, which may or may not be rubbed with garlic.

c. Cooked Vegetable Salad. Use one, two, or more of the following freshly cooked, canned, or leftover vegetables: peas, lima beans, string beans, kidney beans, beets (diced, julienne or sliced), carrots (sliced, diced or slivered), asparagus tips, Brussel sprouts, corn, canned mixed vegetables, cauliflower, potatoes (white or sweet, diced). Chill the vegetables well. Then toss them with crisp salad greens, raw vegetables and salad dressing. Serve from a bowl or platter, or in lettuce nests on individual plates. The cooked vegetables may be marinated in French dressing a few minutes before adding to the salad if preferred.

d. Combination Vegetable Salads. (1) *Asparagus tips*, cooked or canned, in a bundle with a band of green pepper or pimiento, or a thick slice of tomato with vinaigrette dressing.

(2) *Celery and raw carrot*, match-like strips of celery and raw carrot, piled on a base of leaves of romaine, with cream cheese dressing.

(3) *Cooked lima beans and cooked caluiflower*, on lettuce, chiffonade dressing.

(4) *Onion and pepper*, rings of mild onion, green pepper and sweet red pepper on lettuce with sour cream dressing.

(5) *Combination vegetable salads*, sliced tomatoes, sliced cucumbers, thinly sliced radishes, green pepper rings and diced celery and onion on lettuce with French dressing.

(6) *Vegetable macedoine salad.* Arrange a base of lettuce leaves. Marinate three or four vegetables separately with French dressing. Serve small mounds of each vegetable separately or mix together. Each portion of salad when served may be garnished with an asparagus tip, chopped egg

white, or sieved egg yolk and topped with mayonnaise. Some suitable vegetables are: cooked baby lima beans, chopped cooked beets, cooked cauliflower and strips of raw or cooked carrots.

(7) *Celeriac salad.* The roots of celery, when washed and pared, may be diced, chopped or cut into thin slices or strips and used as a salad.

(8) *Red and white cabbage salad.* Select firm red and white cabbage. Wash. Cut off wilted leaves, quarter and soak in cold water. Drain. Cut into thin slices and chop each kind separately. Prepare hot salad dressing and divide into two parts. Mix the red and the white cabbage separately with each part while the dressing is hot. Take ¾ of the white mixture and place it in the center of the platter. Make a border of the red all around the white. Reserve ¼ of the red, place in the center on top of white and place a ball of the reserved ¼ of the white on top of the whole.

(9) *Cabbage and corn slaw.* Shredded raw green or red cabbage, canned whole grain corn, onions finely sliced, stuffed olives, toss well and serve with French dressing.

83. FRUIT SALAD. a. Fruit is a daily must in meals, so do not overlook fruit salad as an appetizer, salad course, or dessert. Of course, oranges and grapefruit, lemons, tangerines, and strawberries are especially good vitamin C sources. However, bananas, apples, canned pineapple, peaches and pears, prunes, apricots—in fact, all fresh, canned and dried fruits—lend a helping hand, too.

b. *In selecting fruit* to combine in a mixed fruit salad, it is desirable to provide contrast in color, flavor and texture. Small whole fruits, as strawberries, raspberries and cherries, add an attractive touch. It is better, however, not to use too many fruits in any one fruit salad.

c. *Fruits of soft texture*, as bananas, peaches and grapes, should be combined with foods of firmer texture as apples and fresh pineapple, celery, nuts and crisp greens. Variety may be attained in cutting fruit by using fancy shaped cutters. Balls, cubes, and wedge-shaped pieces are always attractive. What pleases the eye helps to please the taste. Whatever form is used, the pieces should be uniform. In a mixed fruit salad there should be no large sections of oranges with small cubes of apple. Both should be of equal size. French dressing made with lemon juice or juices drained from the fruit is especially good with fruit salads.

d. Some Successful Fruit Salads are:

(1) Unpeeled apples sliced with grapefruit and orange segments on lettuce.

(2) Diced apple and celery with raisins and chopped walnuts on water cress.

(3) Fresh or canned apricot halves, filled with cream cheese and chopped nuts or celery, on lettuce.

(4) Cut bananas in thirds, crosswise and lengthwise, roll in minced peanuts and serve on lettuce with orange slices.

(5) Fresh or canned peach halves, filled with chopped celery or cream cheese and nuts, on salad greens.

(6) Sliced fresh peaches and oranges on water cress.

(7) Fresh pear halves filled with cut up grapefruit on salad greens.

(8) Pineapple and cheese. Sliced canned pineapple sprinkled with grated yellow cheese on lettuce.

(9) Pineapple, orange and grapefruit salad, arranged with alternate sections of grapefruit and orange like a dome on a slice of canned pineapple and topped with a cherry.

(10) Mixed fruit salad. Combinations of drained canned or fresh fruits, of soft and hard texture, uniform sizes, pleasing flavor and color harmony.

84. MAIN COURSE SALADS. a. General. The salad which is served as the main dish is usually built around meat, fish, sea food, and eggs. Vegetable and fruit salads may be suitable for main dish service with certain modifications. The portions for main dish salads are comparatively large. The dressing is usually mayonnaise rather than French dressing.

b. Meat Salads. Some meat salads are chicken, ham, beef, tongue, turkey, duck, sweetbread, veal, roast meat, and variations such as chicken and ham julienne, ham and Swiss cheese, ham and tomato salad, tongue and ham, veal, bacon and tomato salad.

c. Fish Salads. Some fish salads are sardine, anchovy, halibut, herring, fish flakes, shad roe and kippered herring.

d. Sea Food Salads. Some sea food salads are shrimp, crabmeat, lobster, salmon, tunafish, sea scallop, and mixed sea food salads. Accompaniments of fish and sea foods salads are cucumbers, cole slaw, green peppers, onions, avocado, tomato salad and rice salad.

e. Egg Salads. Some egg salads are egg and chopped bacon salad; egg, tomato, anchovy and sardine platter; egg and salmon platter; and egg and crabmeat platter. Eggs may take the form of slices, stuffed eggs, or whole cooked eggs with various garnishes and dressings.

85. MOLDED OR JELLIED SALADS. a. General. Molded salads are a convenience in that they can be made early in the day or the previous evening and the serving demands little attention at the last minute. They can be a medium for serving attractively various leftovers of vegetables, fruit, meat, poultry and combinations of foods. The salads may be made in individual molds, in a large mold, in muffin pans, or in a shallow pan to be cut into squares for serving. The time required for gelatin to set depends upon the size of the mold and the temperature of the refrigerator. Allow 2 hours as the minimum, but 4 hours is a safer time for the gelatin to congeal.

b. Jelly for Molded Salads. Jelly for molded salads is made of gelatin, lemon juice, water, salt, sugar, and vinegar. The gelatin is soaked in cold water for about 5 minutes. Boiling water is added and the mixture stirred until the gelatin is dissolved. Set aside and when the jelly begins to harden, add salad ingredients. Any sweet syrup may be used in place of boiling water.

c. Flavored Jelly Powder. With flavored jelly powder, follow directions on package as to quantities of powder and water to be used, as well as procedure. Fruit juices may be used in place of water, in part or entirely. When jelly powder and liquid are combined, let stand in a cool place. When the jelly begins to harden, add any mixture desired. Put in refrigerator to firm. Rinse molds or pans in cold water. Shake but do not dry. Fill evenly with gelatin and ingredients. Wipe outside of molds or pans with cloth wrung out of hot water to facilitate dishing up molded salad.

d. Jellied Vegetable Salad Combinations. Some jellied vegetable salad combinations are celery, cabbage and peppers, tomato aspic, cucumber jelly, jellied vegetable ring, and red and white cabbage in jelly.

e. Jellied Fruit Salad Combinations. Among jellied fruit salad combinations are grapefruit jelly salad, mixed fruit jelly salad, cranberry jelly salad, apples or cherries, celery, and nuts, and pineapple and carrots.

f. Other Jellied Salads. Other jellied salads are jellied salmon and celery salad, eggs in aspic, diced ham or tongue with pimientos, chicken salad mold, and shrimp aspic.

g. Aspic Jelly. Aspic jelly is made of clear strong soup stock or bouillon cubes, water, and granulated gelatin with various seasonings as salt, pepper, celery seed, herbs, lemon peel and wine. The utensil used as a mold is placed on ice or in a refrigerator and the jelly poured in to a depth of ½ inch. When hard, garnish with fancy vegetables of different colors, slices of hard cooked eggs and the like. When set, add enough jelly and additional ingredients to fill.

86. FROZEN SALADS. Frozen salad mixtures consist of whipped cream and mayonnaise, combined with diced fruits, fresh or canned, with occasional introduction of cream cheese, nuts, and a flavoring vegetable such as celery. Frozen salads are most easily prepared in the trays of a mechanical refrigerator or ice cube refrigerator with the metal grid in position. An alternative method is to use souffle cups as a mold. If the cups are used, the trays of the refrigerator should be wiped dry so that the cup will not stick. The paper cups are peeled from the frozen mixture at serving time. The time of freezing varies, but 4 hours should be allowed as a minimum. In the absence of mechanical refrigeration, frozen salads can be made by freezing a mold packed in ice and salt. A mold with a tightly fitting cover is essential. Baking powder cans, coffee cans, or similar cans will serve. After the chilling mixture has been poured into the mold and the cover adjusted, wipe off any moisture and seal the seam with adhesive tape, or with a thin strip of cloth which has been spread generously with softened fat. The greased side of the cloth should be next to the tin. When the outdoor temperature is 25° F. a frozen salad may be made merely by exposure to the cold air for about 4 hours. In a milder climate the mold must be buried in a mixture of salt and ice; one part of salt to three parts of ice. A good container for the salt and ice is a wooden butter tub or wooden barrel. The improvised container should be large enough to allow 3 inches of packing around the mold. Do not freeze so long that the fruits are frozen.

87. GARNISHES FOR SALADS. a. Various garnishes add to the attractive appearance of individual salads. If other relishes are to be served, such as olives, pickles or radishes, they may often be placed on the salad plate rather than on a separate plate or relish dish. If the plate for the salad is large enough, cheese sticks or salty crackers may be placed on the edge for garnish. A bit of mayonnaise on top of the salad, with a dash of paprika on top of the mayonnaise, adds pleasing color to many mixed salads. These are practical hints for boosting a desire for salads.

b. *Raw cranberries* chopped and mixed with chopped apples make an appetizing garnish for fowl, meat, fish or green salad.

c. *Radish roses* are easily and quickly made by cutting through the skin of red radishes to form petals. They add a decorative garnish to vegetable, fish and meat salads.

d. *Toppings for fruit salads* are chopped peanuts, raisins, shredded cocoanut, chopped candied fruit peels or shredded cherries.

e. *Vegetable salads* are more attractive with very thin slices of red or green peppers. Wash peppers, remove seeds, and slice crosswise.

f. *Canned fruits for fruit salads* can be improved by the aid of cubes or slices of fully ripe bananas.

g. *Crisp young carrots* cut into slivers dress up the plainest salad and make it more acceptable.

h. *Some crisp bits of bacon* or a few flaked sardines in the greens add variety to a green salad.

i. *A fruit gelatine,* cut into glistening cubes, gives an enticing effect.

j. *Sliced tomatoes,* cut into wedges, taste good, look good, and are good with greens, meat, fish, poultry, or vegetable salads.

k. *Vegetable salads* and cole slaw get into the preferred class by adding a few sliced stuffed olives. To flavor fish salads, add horseradish and chopped pimientos. Crisp, crunchy flowerets of raw cauliflower perk up a salad, especially a green one. All beans used for salads have a fuller flavor if allowed to stand in French dressing for a little while before serving.

l. *Try using warm potatoes* when making potato salad as the dressing penetrates and the flavor is better.

m. *The deep red color of canned beets* goes a long way toward satisfying the eye appeal that is so essential in food serving. Diced, sliced, whole and julienne style beets offer many salad color possibilities.

88. SALAD ACCOMPANIMENTS. For the salad served as an appetizer or with the main course, crisp crackers are the ideal accompaniment. The crackers should be crisp from a freshly opened package or from reheating in the oven. Spreading the crackers with butter and toasting in the oven makes the most commonplace variety appealing. Variety is afforded by using plain crackers, Boston or St. Johnsbury crackers split and toasted, the hard and dense water biscuits, rye crisps, round flaky wafers, and whole wheat wafers. Cheese balls and cheese straws are also appropriate. Cheese balls are formed by rolling softened cheese, such as cream cheese, between the palms of the hands. The cheese, unless very creamy, is softened by mixing with cream or a salad dressing. As a variation, the balls may be rolled in finely chopped nuts, minced parsley or paprika. Cheese straws are made by piling scraps of pastry in layers, rolled ¼ inch thick, sprinkled with grated yellow cheese and dusted very sparingly with cayenne pepper or more generously with paprika. Fold in halves, pinch the edges together, roll out, sprinkle with cheese, fold and repeat this process two more times. Cut in strips not more than ½ inch wide and of any length desired. Bake in a shallow pan in a hot oven, 450° F., for about 10 minutes or until golden brown. The list of other salad accompaniments which follows is suggestive rather than complete:

a. Hot breads, such as tiny muffins, baking powder biscuits, cheese biscuits, corn bread and spoon bread.

b. Reheated rolls, toasted rolls or toasted English muffins are also suitable.

c. Cold breads, such as hard water rolls, Italian bread sticks, and melba toast.

d. Fancy breads, as Boston brown bread, nut bread, orange bread, date bread.

e. Sandwiches, as bread and butter, brown bread, lettuce, water cress, celery, pimiento butter, parsley butter and sandwich sticks.

f. For the salad served as dessert a slightly sweet cracker or sandwich is appropriate. Thin sandwiches made from date bread, orange bread or Boston brown bread are especially good.

89. SOME SALAD HINTS. It is important to the success of a cold salad to have all the ingredients well chilled. The vegetables and salad greens must be crisp and well dried.

a. Mixing of salad ingredients should be done lightly. Fruit and vegetable salads especially are more attractive and more pleasing to eat if care is taken to keep the pieces whole and fairly good-sized, as well as the foods fresh and of good color.

b. With a few exceptions, such as potato salad, which should stand in the refrigerator long enough to absorb flavor from the dressing, and molded salads, which must be made several hours ahead of time in order to firm, salads should be served promptly after they are made and eaten as soon as they are served. A wilted-looking salad which has been standing for some time awaiting serving is not appetizing. This applies particularly to the green part of the salad. A fruit, vegetable, meat, or fish mixture may often be made up a little in advance and kept in a covered dish in the refrigerator, ready to be served on a salad green.

c. Salad dressing should not be added to any crisp green salad until just before serving, as it

tends to destroy the crispness. The amount of dressing should be just sufficient to coat all the ingredients with a thin film. Free dressing in the bottom of the dish is an indication that too much dressing was added.

d. Never wash a wooden salad bowl. Simply wipe it clean with a cold, damp cloth.

e. Many fruits turn dark when cut. Accordingly, slice them at the latest possible time or sprinkle them with lemon juice to preserve natural color.

f. Many standard salads can be varied by serving on shredded cabbage instead of lettuce.

g. Use taste and care in arranging salads. The appearance is almost as important as taste in keen enjoyment of food.

h. Use originality in the selection of dressings. The "same old salad" will give new pleasure with a different dressing.

i. Many green and vegetable salads and salad dressings gain new distinction with a sprinkling of such minced herbs as chervil, thyme, basil, tarragon, dill, etc.

j. Brighten up the borders of lettuce leaves or pineapple rings by dipping them in paprika. Pineapple looks tempting, too, when the edge is rolled in finely chopped parsley or chopped nut meat.

k. Grated walnuts are a pleasant surprise, either in the dressing or sprinkled on the salad.

l. Lettuce and greens of a similar nature should not be marinated as this will cause wilting.

m. All meat, vegetables or fish must be diced, not put through the food chopper.

n. Salads to be attractive must be varied. Try never to serve the same kind twice in the same week.

90. SALAD DRESSING. a. General. Salad dressings not only lubricate the greens and make them easier to eat, but they also add flavor. There are three principal types of salad dressing, each of the three having many variations.

b. French Dressing. (1) *Preparation.* French dressing is the simplest and most widely used of all salad dressings. It is a combination of oil, acid and seasoning. The seasonings always include salt and pepper and frequently paprika to give color, mustard, sugar, tabasco or other table sauce, cayenne pepper, and other condiments. French dressing is temporarily emulsified by shaking in a bottle or beating vigorously just before using. It must be shaken every time it is used if a quantity is made at one time. The oil may be olive oil, cottonseed oil, corn oil, peanut oil or any other edible salad oil. The acid may be plain vinegar, flavored vinegar, lemon juice, lime juice, or grapefruit juice, flavored vinegars include:

(*a*) Tarragon, mint and marjoram vinegars, which may be prepared by adding dried herbs to plain vinegar, usually the cider or wine type, and letting them stand until a definite flavor is imparted to the vinegar.

(*b*) Garlic vinegar, made by cutting a clove of garlic in crosswise slices and covering with vinegar, allowing the mixture to stand for at least 15 minutes before removing the garlic.

(*c*) Spiced vinegar drained from bottled pickles.

(2) *Kinds of French dressing.* Variations of French dressing are:

(*a*) *Sour cream dressing.* Add sour or sweet cream to French dressing.

(*b*) *Savory French dressing.* Add catsup or chutney or Worcestershire sauce to French dressing.

(*c*) *Relish dressing.* Add to French dressing any of the following relishes or a mixture of two or more: green peppers, pimientos, stuffed olives, parsley, chives, sweet or sour pickle, pickled beets, horseradish, catsup, chili sauce or tomato pickle. The relish should be finely chopped or minced.

(*d*) *Chiffonade dressing.* Add to French dressing chopped hard-cooked egg, chopped onion, finely chopped parsley or green pepper, chopped pimiento or pickled beets.

(*e*) *Cream cheese dressing.* Mash cream cheese. Stir in French dressing to form a smooth paste. Add this mixture to the remainder of the dressing.

(*f*) *Roquefort cheese dressing.* Mash Roquefort cheese and combine with French dressing as in the preceding recipe, or crumble the cheese into small bits and shake with the dressing.

(*g*) *Currant jelly dressing.* Make French dressing with lemon juice. Add beaten currant jelly.

(*h*) *Maraschino dressing.* Use lemon juice for acid in French dressing. Add maraschino juice to color. Sweeten with sugar.

(*i*) *Tomato dressing.* Peel and mash ripe tomatoes. Combine with French dressing.

c. Mayonnaise. True mayonnaise is an emulsion of salad oil, vinegar, water, seasoning and egg yolks as the emulsifying agent. Any change in these ingredients make a mayonnaise variation and there are many. Dressings on the market which do not meet these specifications are "salad dressings" or "whips." Some variations of mayonnaise dressing are: cream dressing, ham dressing, marmalade dressing, Thousand Island dressing, Russian dressing and many others. Recipes may be found in TM 10–412.

(1) *Mayonnaise*, unlike French dressing, is a stable or permanent emulsion. When appreciable amounts of oil and water alone are mixed, separate layers form. In making mayonnaise, it is necessary, therefore, to keep the tiny drops of oil suspended and separated from the water in the dressing. This is brought about by the use of egg yolks which coat and hold the oil droplets and prevent them from separating and forming layers of oil. "Salad dressings" or "whips" may contain gelatin, starch paste or gums as emulsifying agents and for this reason they are less expensive to make or buy.

(2) *In making mayonnaise*, an oil, as olive, cottonseed, corn or peanut, is preferred, but a solid fat may be used. The solid fat, if used, should be softened before it is added to the mixture.

(3) *Much beating* is required to secure a good mayonnaise. It is important at the beginning of the process that the mixture be emulsified with very little oil. As the volume of the emulsion increases, a larger volume of oil can be added each time without danger of breaking the emulsion. The bowl and beater should be of a shape and size that allow the mixture to be well beaten. The beater should be placed well down in the mixture. The beating of the mayonnaise may be continuous or intermittent. Pausing a short time during the process of making the mayonnaise is not harmful to the product.

(4) *There are various ways* of combining the egg and oil. The aim is to beat the oil in the liquid so as to separate it into fine droplets which become coated with the protein solution and the oil droplets are prevented from running together.

(5) *Chilled oil* does not emulsify as readily as oil at room temperature, since it is thinner at room temperature. After the emulsion is once made, however, chilling is helpful, in that the cold oil is thicker and the droplets will not run together so readily. Mayonnaise separates on freezing, and, therefore, should not be stored in the coldest part of the mechanical refrigerator.

d. Cooked Salad Dressings. Cooked salad dressings usually contain whole eggs or egg yolks, seasonings, flour, vinegar or lemon juice and sometimes milk or cream. Frequently no oil or other fat is used, but butter may be added for flavor and richness. Variations of cooked salad dressing:

(1) *Cole slaw dressing.* Add prepared mustard to cooled, cooked salad dressing.

(2) *Peanut butter dressing.* Add peanut butter to cooled, cooked salad dressing.

e. Some Salad Dressing Hints. (1) Ripe olives are good in salad dressing served with banana and orange salads. A tart French dressing should be used for the base.

(2) Use the fruit juices or salad fruits for fruit cocktail to thin mayonnaise and to mix with French dressing.

(3) Grated walnuts are a pleasant surprise in a salad dressing.

(4) To make sour cream, just add a little lemon juice or vinegar to sweet cream. It is good for salad dressings.

(5) Save all liquid from mustard pickles and add it to salad dressing in place of fresh vinegar and mustard.

(6) Bacon salad dressing is made by dicing bacon and cooking it until crisp and stirring in vinegar, salt and sugar. On reheating, the mixture is excellent poured over lettuce, spinach or any salad green.

(7) A simple vinaigrette dressing is made of oil, vinegar, riced-hard-cooked egg, paprika, minced chives or onion juice, salt, chopped parsley, chopped red pepper or canned pimiento mixed together and stirred well.

(8) Green mayonnaise is made by pressing cooked spinach through a sieve or by pounding chopped parsley leaves with a little lemon juice and squeezing through cheesecloth. Red mayonnaise is made by adding thick tomato sauce to mayonnaise and adding whipped cream.

(9) When a cook adds celery seed to finely chopped coleslaw, he creates an entirely different dish. When he adds certain sauces and chopped vegetables with hard-cooked eggs to a dressing, he produces an entirely new salad dressing, now widely accepted as Thousand Island dressing. It was no accident that a certain cook discovered that the addition of a little catsup to ordinary mayonnaise would alter the taste completely. The cook who made that discovery was constantly thinking of ways and means of improving even the simplest dishes. The preparation of food requires the cook to use his imagination and intelligence.

SECTION XIII. DESSERTS

91. GENERAL. Dessert is the topping that squares off a dinner or supper, fills in the crevices, tamps down the meal, and makes it complete. A good dessert may make an indifferent meal better and a good meal perfect. Dessert should not be considered as merely something extra which is added to a meal with no relation to the other foods. Dessert is a definite part of the menu, nutritionally and otherwise. In desserts are found the entire range of nutritional elements. With this in mind, one should always select the dessert according to the body of the meal. Never, for example, serve a heavy dessert, such as bread pudding or corn starch pudding, after a heavy, starchy meal. Neither should a fruit dessert be served in conjunction with a light meal featuring salads. Puddings should not appear on the menu with a sweet, heavy drink like chocolate. Since dessert is the last food that is eaten during the meal, it may leave the most vivid and lasting impression of the entire meal. Take at least as much care in the preparation of desserts as with other foods. There is a large variety of desserts to choose from and most of them are easily made. (See TM 10–412 for detailed recipes for all types of desserts.)

92. PUDDINGS. Puddings are one of the most economical and can be one of the most appetizing of desserts. Puddings make a particularly good way of using leftover canned fruits. By utilizing the juices in which the fruits are packed, especially if they come in a heavy syrup as do peaches and figs, less sugar is needed in the pudding and thus an important part of the ration is conserved. Fruit juices or syrups can make the pudding rich enough so that no sauce is needed. Puddings should be fairly rich, contain plenty of eggs, milk, and fruit or whatever the recipe may require. If puddings have a tendency to be dry, a well flavored sauce should be served with them. Puddings should be served at the temperature that is correct for each. Rice pudding, for example, should be cold or piping hot, but not lukewarm.

93. DESSERT POWDERS. a. Concentrated dessert powders are an item of issue. It is advisable to follow the directions that come with the packages. With experience, however, changes may be made to produce better results. Be especially careful in heating prepared chocolate, vanilla or butter scotch puddings. Too much heat will thicken the mixture to such an extent that when cooled it becomes hard and rubbery. If the first batch shows that the mixture needs "edge" on its flavor, blend in a little vanilla extract, fresh lemon juice or another flavoring.

b. Make any such pudding far enough before mealtime to give it a chance to cool or chill. This type of dessert is flat when served lukewarm.

c. Gelatin can be given more appeal by adding fruit after it has partially set, or by serving it with a topping of Army whipped cream made by whipping a few cans of chilled evaporated milk and mixing it with beaten egg whites, sugar and vanilla. The jello itself may be whipped in order to change the entire texture of the product, giving it a creamy consistency.

94. SWEET DOUGH. A sweet dough is an ordinary flour dough made rich and sweet by using large quantities of sugar and shortening and the addition of milk, eggs, spices and occasionally a little fruit. Some sweet dough products are cinnamon buns, hot cross buns, coffee cake, doughnuts. These represent the wide variety of tempting desserts that can be made from sweet dough. The variety of products that may be made from the basic sweet dough depends upon the resourcefulness of the cook. A variety of shapes and the use of additional flavors, ingredients, etc., will improve the finished product.

95. CAKE. The term cake means a sweetened mixture of flour, liquids and other ingredients, leavened without yeast. In general there are two classifications of cake: the first, cakes containing shortening such as the white or yellow layer cakes, fudge cakes and chocolate cakes; second, cakes without shortening, for example, sponge cake and angel food cake. All of the above mentioned cakes when finished with numerous kinds of icings and toppings are made into tasty, satisfying, eye-appealing desserts.

96. COOKIES. Cookies are easily prepared. The batter is mixed and then either rolled and cut and placed on pans or dropped on cookie sheets. Once the batter or mixture is prepared the finished product is easily produced. Cookies require short baking periods. Syrups are frequently used in

cookie making, because they add moisture which aids in preserving freshness. Molasses and malt syrup should be used extensively. There are many cookie formulas available, but these should not prevent the cook from inventing new formulas and designs.

97. PIE. Pie is a combination of two food products, the crust and filling. A high proportion of shortening is used in the crust and the dough is made up quickly. Overhandling produces a tough crust. The old fashioned homemade pie crust has a rough surface and flaky texture. This is obtained by mixing the fat and flour lightly. This type of crust is difficult to cut and serve to large numbers of men.

a. For Army purposes, the best crust is the short flaky crust. This is a cross between homemade and commercial pie crust. This quality is obtained by thoroughly mixing all of the flour with one-half the fat. Then mix lightly the remainder of the fat. The first mixing results in fat particles covered with flour which gives shortness. The second mixing incorporates in the dough many small, free fat-lumps which cause flakiness. The proper proportion of water is important. The water, when added, should produce a dough ball which is easy to handle, neither sticky nor crumbly. Too much water will cause the crust to shrink during baking. The shortening and water should be chilled in order to produce the flakiness.

b. The fruit used for pie filling may be fresh, canned or dried. Common fruit pies are apple, apricot, berry (all kinds), cherry, peach, mince, raisin, and rhubarb. Care should be exercised not to overthicken the filling.

98. OTHER DESSERTS. Other desserts with which the menu may be varied are fruit cobblers, baked apples, prune whips, stewed fruits, ice cream, and raw fruits such as grapes, pears, and apples. Shortcakes may be made with baking powder biscuits or sponge cake covered with crushed fruits. If sponge cake is used, part of the fruit juice should be drained off, otherwise the cake will be juice-soaked and unattractive.

a. Fruit sauces, such as apple sauce and rhubarb sauce, may be improved by combining with other fruits. For example, pineapple juice or crushed pineapple added to rhubarb sauce makes a delicious combination. A small amount of cinnamon-flavored hard candy improves apple sauce; lemon slices help out, too. Many such combinations are possible.

b. Dried fruits, if skillfully prepared and served in a variety of ways, may be made as popular as fresh or canned fruits. When dried fruits are served stewed, water and sugar are added to form a syrup. The fruit should soak and cook in the syrup sufficiently long to become tender and for the syrup to take up the flavor of the fruit.

SECTION XIV. SEASONING OF FOODS

99. GENERAL. The primary purpose of seasoning is to bring out the natural flavor of foods. Unseasoned food is tasteless and monotonous. Seasoning gives flavor and affords variety. The senses of taste and smell are pleasantly stimulated by the proper use of seasoning. It adds to the enjoyment of food. On the other hand, overseasoning spoils food. Inexperienced cooks usually overseason. The way to know if food is seasoned correctly is to taste it. Seasoning, once in food, cannot be removed. It is better to use too little than too much. As a general rule most food should be seasoned twice, once while cooking and then at the table by the soldier. Salt, spices, herbs, green condiments, vinegar, and extracts are used to season while cooking. Salt, pepper, and sauces are found on the table.

a. Use of Seasoning. Monotonous foods take on new zest when seasoning is discreetly added. The less experienced cook should master the use of salt, pepper, and onion before graduation into the higher school which calls for the expert use of all seasoning.

b. Seasoning Meats. Broiled steaks or chops and roasts should be seasoned after they are done. Pot roasts and stews should be seasoned while cooking. Ground meats should be seasoned in preparation.

c. Leftover Foods. Leftover foods usually have been previously seasoned. Taste to determine if added seasoning is necessary.

100. SPICES. a. From earliest times, appetite appeal has been given to food by the use of spices. Spices are aromatic seeds, buds, barks, roots and leaves of various plants. Every spice depends upon delicate volatile oils for its ability to give off aroma

and impart flavor. In no two spices are these oils exactly the same even when, as in nutmeg and mace, the aroma is almost identical. The oil can be chemically separated from its plant form, but it then loses its distinctive aroma and flavor. This is why untreated spices, either in whole form or powdered, are the most satisfactory for food seasoning.

b. In addition to the large number of spices which the cook may blend to suit his uses, spice mixtures are available that are particularly suited for certain types of cooking. Among such blends are cakespice, curry powder, chili powder, pumpkin-pie spice, and poultry seasoning.

c. For best results in flavor and aroma, spices should be strong and fresh. Do not open more than one box of a specific spice at a time. Spices should be kept tightly covered when not in actual use. Spices will lose their strength if exposed to the air because their oils will evaporate. Even in covered cans, spices eventually lose strength.

d. The cook should understand thoroughly the uses of spices. Table XXVI will assist the cook in the use of the proper spice.

101. HERBS. Herbs are usually dried seasoning products which add new taste thrills to everyday dishes. Add only a pinch of herbs at a time in cooking. Heat and moisture bring out their fragrance and flavor. If particles of herbs are objectionable in a finished dish, tie the herbs up in a cheese cloth before using and remove before serving. Herbs should improve, not hide the flavor of a dish Use them sparingly. The table in figure 56 will aid the cook in using dried herbs.

Table XXVI. Spices

Name	Description and source	Uses
Allspice (spice)	Dried berry of the pimiento tree, grown in West Indies. Named Allspice because flavor resembles blend of cinnamon, nutmeg and cloves.	Whole for pickling, spicing meats, seasoning gravies, boiling fish. Ground; in boiled foods, puddings, relishes, etc.
Cake spice (Blend)	A blend of spices	Useful in mince meat and dark spice cakes.
Caraway seed (Spice).	Dried seeds of plant grown in North Europe, notably Holland.	Used in rye bread; to season sauerkraut, new cabbage; on pork, liver, kidney before cooling. Also to season cream cheese and other soft mild cheese.
Cayenne (Spice)	Ground small hot red pepper. Grown in Africa.	Good with meat, fish, sauces, egg dishes, used in moderation as a stimulant for the stomach.
Celery seed (Spice).	A tiny, seed-like fruit. Grown in many countries, including France, India, Holland and the United States.	Good for fish, potato salad, tomato dishes, tomato soup. Used in pickling and salad dressing. Excellent for Irish stews. Gives variety to hamburgers.
Chili powder (Blend).	Ground Chili peppers (grown in Mexico, California, the east, Carolinas, Louisiana) and blended spices. Two varieties: mild, or "hot."	For such Mexican dishes as Chili con carne. Good in shell fish and oyster cocktail sauces; for boiled and scrambled eggs, gravy and stew seasoning, canned corn.
Cinnamon	Dried aromatic bark of cinnamon tree. Mostly from Ceylon.	Used whole in pickling, preserving, stewed fruits. Used ground in baked goods and to season mincemeat.
Cloves	Nail-shaped flower bud of the clove tree. From Dutch East Indies, Madagascar, Zanzibar.	Whole for roast ham garnish, pickling, preserving, spiced syrups and drinks. Ground in baked goods, puddings and stews.
Curry powder (Blend).	Blend of many spices, originating in India	In Currying meat, fish, eggs, chicken; to make Curry sauce. Try a dash in French dressing; fine in scalloped tomatoes, clam and fish chowder.
Ginger	Root of plant grown mainly in Jamaica, West Africa, India and the Orient.	Used ground in cakes, puddings, pumpkin pie, cookies, etc. Many canned fruits benefit by a dash of ginger, especially canned pears. Used also in preserved, candied or crystalized and dried forms.

102. GREEN CONDIMENTS OR FLAVOR VEGETABLES. The green condiments are strong-flavored fresh vegetables. Various parts of the plants are used; the bulbs, roots, fruit, and leafy upper part. Onions, garlic, chives, shallots, and leeks are bulbs. Radishes and horse-radish are roots. Peppers are fruit. Parsley, chervil, celery, sorrel, water cress, mustard and mint consist of most of the upper parts of plants.

103. SALT. a. Salt is an essential seasoning. Man must have salt to live. Nature has wisely implanted in man a craving for salt that must be satisfied.

b. Salts are of two kinds: common and free-running. Free-running salt is common salt kept in a finely divided state by the use of fillers and dryers. Salt is marketed in other forms such as iodized salt, celery salt, garlic salt, onion salt, and smoked salt.

c. The cook must be careful in adding salt, as a little excess will ruin a product. Salt can be put in food after it is prepared, but once added it cannot be removed.

d. Salt all vegetables just before they are removed from the fire. Never salt vegetables for salad, but use the salt in the sauce or dressing. Broiled or roasted meats should be salted after they are done. Salt added in advance will draw out the juices and toughen the fibres of the meat. Meat used in soup, stock or stews needs salt before cooking so that the meat juice will flavor the liquid.

e. Salt should be kept in a dry place. Its qualities are such that it will absorb moisture.

Table XXVI. Spices—Continued

Name	Description and source	Uses
Mace	Part of nutmeg between shell and outer husk, orange-red in color; flavor resembles nutmeg. From East and West Indies.	Blades used in pickling, preserving, fish sauces, Welsh rarebit. Used ground in pound cake and other yellow dishes, chocolate dishes; oyster stew. Use sparingly.
Mustard	Seed of mustard plant grown in England	Dry ground mustard used as flavoring for sauces and gravy. Prepared mustard, blended with other spices and vinegar, used in salad dressing, with ham, frankfurters, cheese, etc.
Nutmeg	Kernel of a fruit of that name, grown in Dutch East Indies and British West Indies.	Whole—to be grated as needed. Ground—used in baked sauces, puddings. Good sprinkled over certain vegetables, such as cauliflower. Merges well with spinach. Topping for eggnog and custards. Favorite spice for doughnuts.
Paprika	Ground sweet red pepper, grown chiefly in Spain and Hungary.	Used for color and mild flavor in, and sprinkled on, fish, shell fish, salad dressing. Used lavishly as a garnish, also with sweet corn on the cob. Mixed with butter to make paprika butter. Enriches the flavor and color of catsup and other tomato condiments, and tomato juice.
Pepper	Most generally used of all spices. A small round berry picked before ripe; grows on a climbing vine. Grown in Dutch East Indies and India. White pepper is the mature berry with hull removed.	Whole—(black and white)—used in pickling, soups and meats. Ground—(black and white)—used in meat sauces, gravies, vegetables and egg dishes.
Poppy Seed	Tiny seeds of poppy plant imported from Holland. About 900,000 seeds to the pound.	Used whole as topping for breads, rolls, cookies. Oil used in salad dressing and margarine.
Poultry seasoning	A mixture of several herbs and spices	Used in poultry, pork and veal stuffings, also for fish and to season meat loaf.
Pumpkin pie spice	Blend of spices	For pumpkin cookery and in spice cookies. Varies gingerbread, cookies and breakfast buns.
Sausage seasoning	A blend of herbs and spices	Used in sausage making and is good in meat loaf, veal, birds and similar dishes.

104. SEASONING SAUCES. Seasoning sauces are distinctively flavored, prepared sauces, usually placed on the table to be used by the individual soldier. Classified according to type, they are:

Tomato sauces	Mustard sauces
Worcestershire type sauces	Fruit sauces
	Chutney sauces
Chop suey sauces	Pepper sauces

In the Army mess these products are familiar as catsup, chili sauce, Worcestershire sauce, soy sauce, tobasco sauce, chow chow sauce, apple sauce, cranberry sauce, and similar preparations. All of these seasoning sauces have the same purpose: to enhance flavor and add zest to the enjoyment of food.

105. EXTRACTS. Extracts are flavoring agents, dissolved in alcohol, oils or glycerine. The cook who appreciates the importance of extracts in food preparation will, with other food knowledge and skills, add gratifying flavor touches to cooking. Extracts are grouped in three general classes:

a. *True extracts* are solutions obtained from aromatic plants and from fruits and flavors of fruits. A true extract contains a specific amount of the flavor from which it is named.

b. *Imitation extracts* are solutions of synthetic products that correspond to the flavors of the true product. The true extracts have a more delicate flavor and aroma than the imitation flavors.

c. *Compound extracts* are those containing a mixture of true and synthetic products.

d. *Vanilla and lemon* are the extracts most commonly used in the Army.

(1) *True vanilla* extract is made from cut vanilla beans steeped in alcohol. The imitation may contain an extract from the seed of a tropical South American tree, from coal tar, from oil of chives and other sources.

(2) *True lemon* extract is made from oil of lemon, obtained from lemon peel. Imitation lemon may be made from a grass grown in India called lemongrass or citral.

e. *Flavoring tablets* have come into use as a substitute for alcoholic or nonalcoholic extracts. The tablets are crushed into a fine powder and combined with other dry ingredients, or dissolved in a portion of the liquid, called for by the recipe, preferably the latter method.

Table XXVII. Herbs

Name	Description and source	Uses
Bay Leaves	Dried aromatic leaves of the laurel tree. Come from Eastern Mediterranean countries.	Used in pickling stews, spiced vinegar, soups. Combines well with fish, boiled or in chowder. Use with any tomato mixture.
Marjoram	Herb of the mint family. Imported mostly from France, Germany and Hungary.	Dried leaf used with lamb in poultry stuffing, sausage products, stews, soups, etc., usually in combination with others.
Rosemary	A spiky herb, rather sweetish. Grows in Southern Europe.	Sprinkle on roast before serving. Use in lamb dishes, in soups and stews. Flavor fish and meat stocks.
Sage	Dried leaf of a shrub of the mint family. Grows in United States, Jugoslavia and Greece.	Used in poultry and meat stuffings, pork, sausage, head cheese, etc.
Savory	Dried herb of the mint family. Grown in many climates. Often combined with other herbs as seasoning for mints.	Used in scrambled eggs, in salads and soups. Used in stews, soups, and stuffings for poultry, clam and fish chowders.
Thyme	Leaves and tender stems of the garden herb, grown in all temperate climates.	Often combined with other herbs.

106. VINEGAR. Vinegar appears on the market under names indicating the product from which it was made, as cider, grape or wine, malt, grain or spirit, white vinegar made from sugars, syrup and molasses, etc.

a. Tarragon, garlic, shallot and chili are added to flavor vinegar sold under these names and are used for salads where the special flavors add a distinctive note.

b. Vinegars are used in barbecue sauce, mint sauce, sweet-sour sauce, in marinating various foods, and as the base of most salad dressings.

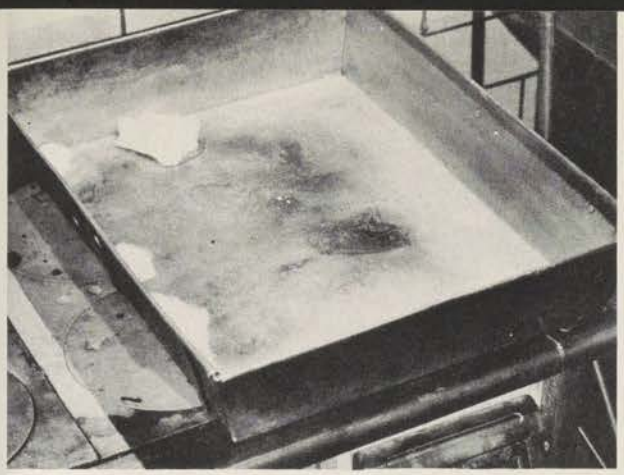




Figure 25. Mixing sauce.

① *Melt the fat preferably in a double boiler; blend in the flour.*

② *Add the liquid with the dish away from the direct heat.*





③ *Return to direct heat and stir until the sauce boils.*

④ *To keep until serving time, cover tightly and remove from direct heat.*

SECTION XV. ROUX, SAUCES, GRAVIES, DRESSINGS

107. ROUX. A roux is a cooked mixture of flour and fat used to thicken soups, sauces, and gravies. A good roux will result in a good product. The fat for roux may be fat drippings from meats, plain lard or lard substitute, butter, or a combination of any of these. The best proportion of the ingredients to use are 1 pound of flour to 2 pounds of fat, and this applies to all recipes whether it is for a thin cream soup or for a very thick cream sauce. The thickness of a sauce or gravy is determined by the quantity of roux combined with the liquid. When fat is not available in sufficient quantities, the ratio can be reduced to 1 pound of flour to 1 pound of fat but this makes a pastier type of product. If a ratio of fat higher than 1 pound of flour to 2 pounds of fat is used, the product will become separated and the fat will come to the top of the food. Such cooking is of poor quality as it makes greasy food. If the flour is browned (for making brown gravy), more of the browned flour will be required as the heat will cause the flour to lose some of its thickening qualities. The more the flour is browned, the more flour is required.

108. SAUCES. a. Utilization. Sauces go particularly well with meat, fish, vegetables, egg dishes and desserts. Sauces have several purposes:

(1) Sauces make food more attractive by adding color. (As creole sauce with an omelette.)

(2) Sauces add to the acceptance of an otherwise ordinary dish. (Barbecue sauce with spareribs.)

(3) Sauces add flavor to food: either the same flavor as brown gravy with pot roast; or a contrasting flavor as lemon sauce with raisin Betty pudding.

(4) Sauces add to the nutritive value of a dish. (As cheese sauce with asparagus.)

(5) Sauces make possible the converting of a single dish into a number of appetizing dishes. (As different sauces served with spaghetti.)

b. Special Sauces for Special Foods. (1) Barbecue sauce is served with spare ribs, pork chops, ham, boiled tongue and other cuts of beef and pork.

(2) Creole sauce is excellent served with frankfurters, meat loaf, boiled beef, croquettes, rice, macaroni or spaghetti and with fish.

(3) Tomato sauce is an accompaniment of meat balls, ravioli, spaghetti, meat loaf, fish, fish cakes, and any number of other dishes.

(4) Italian sauce is most commonly used for spaghetti, macaroni, meat balls and fish.

(5) Salmon sauce is ideal with fish or sea food, fish croquettes, fish balls, fish loaves and other preparations of a like nature.

(6) Raisin sauce is popular with tongue.

(7) Mint sauce with roast lamb or broiled lamb chops is considered an almost inseparable combination.

(8) Tartar sauce is served chilled, frequently in tiny lettuce leaves, with fish and sea food.

c. Making Sauces. (1) Almost all sauces require a gentle heat and the individual attention of the maker. They should never be left alone while cooking. They must be stirred almost constantly. Cooking vessels with thick bottoms to distribute the heat evenly are desirable. Double boilers are best in making all milk sauces as there is less danger of scorching. If a sauce has been thickened with eggs, avoid boiling.

(2) It is necessary to know something of the behavior of flour to understand the reasons for the steps in making sauces thickened with this cereal. When flour is heated with a liquid, the starch grains, making up a large part of the flour, burst, releasing minute particles which combine with the liquid and produce a thickened mixture. In order that the mixture will be smooth, that is, thickened evenly, it is necessary that the starch grains be evenly distributed through every part of the liquid.

(3) There are different methods of mixing sauces. This is a quick and easy one:

(*a*) Melt the fat in a pan or the top of a double boiler. Stir in the flour.

(*b*) Remove from direct heat and pour in the liquid. Cold liquids may be added all at once. Stir in hot liquids gradually in order to distribute the starch of the flour evenly.

(*c*) Stir slowly and steadily over direct heat until the sauce boils. Season to taste.

(*d*) If the sauce is not to be served immediately, keep it in a vessel over hot water. Cover it tightly to prevent a crust from forming on the surface. A crust will give the sauce a lumpy appearance when it is stirred into the liquid.

d. White Sauce. White sauce is made in varying degrees of thickness, depending upon the use for which it is needed. A good white sauce should be smooth and thoroughly cooked so that there will be no raw starch taste. Salting at the end of cooking helps to guard against curdling. White sauce serves as the base for cheese sauce, cream sauce, mustard sauce, curry sauce, mock hollandaise sauce, egg sauce, and many other sauces universally used in cooking.

(1) *Thin white sauce* is used as the base for most cream soups.

(2) *Medium white sauce* is used in preparing potatoes, vegetables, hard-cooked eggs, diced meat, and fish or sea food as creamed or scalloped dishes.

e. First Aid to Sauces. Fortunately there are ways of giving first aid to imperfect sauces to overcome minor faults, such as:

(1) *Sauce too thick.* Add more of the liquid used in the sauce, or add water if the supply of other liquid is exhausted. Since the flavoring is diluted, taste and reseason if necessary.

(2) *Sauce too thin.* Remember that sauces thicken very quickly on cooling and that a sauce served at the table will always be thicker than when it leaves the stove. If the sauce is too thin, it may be remedied in one of two ways:

(*a*) Additional flour mixed to a paste with cold liquid, and stirred into the thin sauce. Stirring must be continued until the sauce boils.

(*b*) Egg yolk may be beaten slightly, thinned with a little of the sauce, then stirred into the sauce and heated below the boiling point for not more than 1 minute. The egg yolk adds richness as well as body to the sauce.

(3) *Lumpy sauce.* Lumps sometimes may be disposed of by vigorous beating with a spoon or wire whip. Obstinate lumps should be removed by pouring the sauce through a strainer into another vessel for reheating.

f. Sauces with Leftovers. Sauces are an excellent means of using up leftovers, as well as extending foods. With the aid of cream sauce and curry,

leftover lamb becomes curried lamb, or with cream sauce and peas, it becomes creamed lamb and peas. Many more portions of chicken can be served as chicken a la king than can be obtained from the same chicken without a sauce.

g. Dessert Sauces. These sauces give the delightful finishing touches that raise dessert dishes above the average. They turn old recipes into something new, and their wide range of coloring, texture, and flavorings enable a cook to be clever in offering many surprises in serving puddings, cake, fruit and ice cream.

(1) Fruit sauces are made from juices, pulp, or whole canned, frozen or fresh fruits. The peelings of certain fresh fruits, such as apples, pears, and grapes, can be used by simmering the flavor out of them. Fruit and fruit juices are heated, sweetened, and thickened with cornstarch. Milk and beaten eggs may be added if a rich sauce is desired. Some fruit sauces are apricot sauce, cherry sauce, pineapple sauce, peach sauce, raspberry sauce, and strawberry sauce. Fruit sauces are served with cake, puddings, dumplings, and ice cream.

(2) Many dessert sauces get their name from their flavoring ingredient. Some examples are butterscotch sauce, lemon sauce, nutmeg sauce, orange sauce, and vanilla sauce. These sauces are principally made from cornstarch, sugar, water, butter, salt, and the flavoring agent implied by the name. Occasionally, milk and eggs are used in their preparation.

(3) Hard sauces are made of butter, sugar, vanilla or other extract, and salt. The butter is creamed until soft and the sugar and salt are gradually added. The flavoring is added last. All ingredients are mixed well. The mixture should be fairly stiff when finished and then pressed into shape and chilled in a mould, or chilled and sliced. Variations are creamy hard sauce, lemon hard sauce, molasses hard sauce, orange hard sauce, and berry hard sauce. Hard sauces go with fruit cake, plum pudding, steamed puddings, and other dishes of this type.

(4) Sauce for ice cream. Butterscotch, chocolate, caramel, and hot fudge sauces are used as toppings for ice cream. They are made without the addition of cornstarch, and milk is customarily used instead of water.

109. GRAVIES. a. Gravies are made in the same manner as white sauce, except that drippings of meats are substituted for fat or butter. These drippings are the fat and juices which escape from meat and poultry in cooking. Gravy is a most important addition to meat dishes.

b. Good gravy should have the definite flavor of the meat with which it is served, not of some other meat. Beef gravy is a natural service with roast beef, but with roast pork it is out of place. Every kind of meat has its own typical flavor. Its color varies according to the method of cooking, the cooking temperature, and the kind of liquid used. Most people like a rich brown gravy, except for chicken gravy which is characteristically a pale tan.

c. Whenever meat or poultry is roasted, there will be a considerable quantity of flavorful juices and fat in the bottom of the roasting pan. If there is too much fat for good gravy, the excess should be skimmed off and saved for other cooking purposes. Generally, some of the most savory brown residue sticks to the pan. It contains considerable flavor and will dissolve as the gravy is stirred after the liquid is added. If the gravy is not to be thickened, a small amount of water is added to the drippings in the pan. The pan is placed over heat and scraped lightly until the particles are loosened and dissolved. This liquid is cooked until it is sufficiently concentrated to have a good rich flavor. If it should be too strong in flavor, boiling water is added to dilute the gravy slightly. The juicy gravy may be served just as it is without seasoning or made pleasanter and more flavorful by the addition of appropriate seasonings.

(1) When the quantity of drippings is insufficient rendered beef fat, suet, or bacon drippings can be used.

(2) If too much liquid has been added, resulting in a too thin gravy, it can be thickened by simmering down or by adding a batter of flour and liquids slowly to the hot gravy.

(3) Lumpy gravy can be corrected by rubbing or straining through a sieve or colander.

(4) Variations of pan gravy are tomato gravy, spiced tomato gravy, and brown onion gravy, recipes for which are contained in TM 10–412.

d. If an unusually large amount of gravy is needed, extra broth made in advance to be used in place of other liquid will insure a good rich flavor. If a boned roast is being cooked, simmer the trimmed-out bones for several hours in water to obtain a well-flavored broth. If chicken is being prepared, the wingtips, backs, and feet may be cooked along with the neck and giblets to make a good broth. By using such broth, a much larger amount of flavorful gravy can be made than when plain water is used.

e. Pan-fried or pan-broiled meats like lamb chops, braised pork chops, or fried chicken call for the same method as roast meat. Pour off any excess

fat and blend the flour with the fat and juices in the pan; then slowly stir in the liquid.

f. There are a few meat dishes, such as meat loaf, which yield no juices for gravy making, and in these cases, the place of a gravy must be taken by sauces.

g. The seasoning of gravies has much to do with their success. When good rich drippings are used, little more than salt and pepper are required. Seasonings are often used, however, to create different flavors: gravy spice, worcestershire sauce, tabasco sauce, tomato sauces, horseradish, herbs, dried celery leaves, certain spices, and vinegar. Overseasoning must be avoided. The cook should follow tested recipes in TM 10–412.

h. Gravy should always be served piping hot. In the mess hall, gravy boats should be heated before the gravy is poured in them. A cook who knows his sauces and gravies is a cook who has largely eliminated plate waste and the leftover problem.

110. DRESSINGS. a. Many meats and all poultry can be extended by the use of the right stuffing or dressing, adding quantity to the serving, interest to the dish, and reducing the cost per portion. The stuffing for poultry, meat or fish is a matter of choice. It may be dry rather than moist, made of bread or crackers, stuffed with oysters or mushrooms, or seasoned with minced herbs or poultry seasoning.

b. An easily prepared dressing is made of bread, crackers or meal or other stuffing to be used, poultry seasoning or herbs, salt, pepper, and sauteed chopped celery, onions, and peppers. All ingredients are mixed together and placed in a greased baking pan. It should be covered with buttered parchment paper. Bake the dressing in a moderate oven (350° F.) about one to 1½ hours.

c. The bread for stuffing should be stale but not hard. Crusts should be removed. Cut the bread into thick and uniform slices, then crumble between the fingers, or cut into one-half to 1 inch cubes. For a drier stuffing, cut bread in small cubes and toast in the oven until delicately brown. Fine crumbs should not be used for stuffing, as they tend to produce sogginess and compactness.

d. Any savory fat (butter, bacon fat, drippings, or sausage fat) may be used for stuffing. Fat imparts a delicate flavor, adds to the richness of the stuffing, and helps to make a product of desirable texture. It prevents sogginess by resisting the flow of juices from the meat, poultry or fish into the dressing.

e. An important factor to bear in mind is that the stuffing will expand in the moist heat of cooking. The cavity should always be filled loosely without packing. Otherwise, the stuffing will emerge as a firm soggy mass. The amount of stuffing to be used cannot be definitely stated. In general, use:

(1) Three-fourths to 1 No. 56 dipper stuffing for a 4 to 5 pound chicken.

(2) Three No. 56 dippers or more stuffing for a 10 pound turkey.

(3) Three-fourth No. 56 dipper stuffing for a duck.

(4) One-fourth to ½ No. 56 dipper stuffing for a cavity made by removing the bone from meat.

(5) One-half No. 56 dipper stuffing for a 4 pound fish. It is better to have too much stuffing than not enough. Stuffing need not necessarily be cooked inside the food being prepared. It can be placed in a greased, shallow pan, covered with buttered parchment paper and baked separately.

f. Fruit in the form of apples, raisins, prunes, and oranges is used to give flavorful variations to stuffings, particularly for ducks and geese. Instead of bread, boiled rice is commonly used for stuffings. Cornbread, crackers, and sausage are other variations. With many herbs, spices, fruits, nuts, and sea foods to choose from, stuffings never lack variety or flavor in the hands of the imaginative cook.

SECTION XVI. GARNISHINGS AND ACCOMPANIMENTS OF FOOD

111. GENERAL. Garnish is a decoration added to food. It is designed primarily to improve appearance of food, but it usually has food value also. Garnishing is an appeal to sight and taste. By its clever use, the successful cook adds a final touch to food. However, even the best garnish will not cover up poor cooking. Few items of any menu will fail to respond to garnishing. However, the number of dishes garnished at a single meal should be limited. Right garnishing will enrich food and add to its enjoyment. A Waldorf salad in which the bright red skin is left on the apple is an example of a self-garnished dish. A contrasting garnish would be plain or fancy lemon sections, or a tiny lettuce cup of cucumbers with French dressing, served to add to the appearance of baked fish. Any

food garnish should be natural and simple. Food is not attractive when it is too "fixed-up." Some foods may get cold. Others may lose their freshness before reaching the table if the garnish is too elaborate. The size of the garnish is important to the whole effect and should always be in proportion to the size of the dish of food. A big loose branch of water cress is perfectly suitable for use with a large platter of broiled spare ribs, but scattered sprigs of parsley will set off a platter of short ribs of beef. Depending on both the character of the dish and that of the materials used, the garnish may be developed in the form of small clusters, in strips, or dotted over the entire surface. Sometimes the garnish belongs on top of the food and other times on the side of the dish. A pat of butter or a dash of paprika may be placed on top of a fluffy mound of mashed potatoes, while a row of slices of hard-cooked eggs would be better on the side of an individual serving of cold baked ham. A very sharp rigid paring knife with a sharp slender point, a pastry jagger, French vegetable cutters, or even sharp-edged cookie cutters are a few tools that have a wide range of creative possibilities in making garnishes. Garnishes ordinarily are devised from other foods. Such garnishes add nutritive value to the meal. Chop holders or frills for turkey or chicken legs, lamb chop bones, or rib ends of crown roast of lamb are an exception to the rule that garnishes should be edible. By selecting the appropriate ingredients an infinite variety of garnishes and accompaniments can be prepared to make food increasingly attractive. Attractive food digests more readily because the digestive juices flow more actively when the food appeals to the eye. This partial list of ingredient choices is set down by way of suggestion.

112. GARNISHINGS AND ACCESSORIES FOR SOUP. There are many trimmings and little food knickknacks which dress the service of soup. Among these are the popular squares, triangles, and dices of toasted bread, sprinkled over soup just before serving. If these are fried in bacon drippings or rendered fat, they are called "croutons." An alternate method of preparing croutons is to spread bread thinly with butter before cutting in cubes, arrange in a baking pan, and bake until delicately brown. Frankfurters cut into pieces add a last touch to lentil and bean soup. Soup can be given added appeal by garnishing with: barley, cheese straws, chopped or diced cooked meat or poultry, crackers (plain salted, oyster, butter wafers, cheese crackers, various whole grain wafers, etc.), bread sticks, chopped chives, croutons (plain or fried), crumbled blue cheese, herbs (fresh or dried), dumplings (flour, liver, meat or spinach), marrow balls, melba toast, macaroni, stauteed mushroom slices, paprika, pop corn, puffed cereals, sliced frankfurters, water cress, grated cheese, sliced or chopped hard cooked eggs, noodles, pimiento, finely chopped parsley, rice, shredded or flaked fish, spaghetti, vermicelli, shredded salami, julienne vegetables.

113. GARNISHING, DECORATING AND TRIMMING MEAT, FISH, EGG OR POULTRY DISHES. a. Garnishing and decorating meat, fish, egg, and poultry platters is a challenge to the Army cook who strives to create something tempting, edible and appetizing. Food must appeal to the appetite and food that has an attractive appearance is always the most satisfying. The appetite may be stimulated or a very common dish made appetizing by the use of a garnish which offers the interest of color and design as a relief to the monotony of a plain roast, simple serving of fish, or a pale flaked fish and cream sauce combination. A whole baked ham is imposing enough to deserve the best of attention in garnishing. A form of self garnishing is always done; that is, the fatty surface of the ham is scored in squares, diamonds, triangles or other shapes, to make the surface more interesting. Cloves are frequently stuck into the scored ham. Much variety is possible just in their placing. A clove in the center of each scored shape gives quite a different effect from a clove stuck in each angle, or a cluster of cloves in each center. Instead of cloves, sliced or whole maraschino cherries or fancy shapes cut from orange peel may be placed on the scored ham. One way these are held on is by cloves stuck through the pieces. The platter on which the ham is served may be garnished too. This is desirable because it helps to fill up the spaces around the ham, making it appear as though it belonged on the platter. The same is true of poultry and other meats. The platter garnish for ham should be some food which is especially pleasing as an accompaniment, such as small, whole baked or spiced apples, poached apple rings or wedges, and other fruits. Candied sweet potatoes, baked sections of hubbard squash, whole browned onions, or other suitable vegetable, carefully prepared, may be used in the same way. In general, the color should be bright, attractive and harmonious. The lack of color, flavor, and richness in fish can be supplied by garnishes and sauces. Some garnishes are: lemon to bring out flavor, cucumbers, cole slaw, and onion relish.

b. Parsley has long been the most popular garnish for meat, fish, eggs and poultry dishes. There are many more combinations that the skilled cook can use. Some of these are listed below:

(1) *Raw vegetables:* fans or curls of carrots, cauliflower buds, cucumber (finger or slices), celery or celery curls, celery tops, green pepper (straws or rings), radishes or radish fans, roses, or tulips, scallions, tomatoes, (whole, slices, wedges), cole slaw (white, green or red cabbage), horse-radish (prepared or freshly grated).

(2) *Fresh fruit:* apples (wedges, cubes, rings), avocados (halves, wedges, balls), grapefruit segments, halves and quarters of bananas, cubes and balls of melons, pineapple (sticks, cubes and wedges), grapes (clusters and singly), oranges (slices, segments, halves), peaches (halves, slices), pears (cubes, wedges, sticks).

(3) *Fresh herbs:* parsley, chives, mint, rosemary, sweet marjoram, sage, tarragon, basil, garlic, chervil.

(4) *Cooked vegetables:* asparagus tips, beets (tiny whole, slices, cubes), broccoli, carrots, cauliflower, tomatoes, yellow tomatoes, julienne vegetables, spinach, red cabbage.

(5) *Cooked fruits:* baked apples, cranberry jelly, stewed rhubarb, baked bananas, applesauce, pineapple (crushed, rings, cubes), cherries (whole, halves, roses), figs (whole, pieces, ground), apricots (halves, slices, pulp), prunes (whole, halves, pulp).

(6) *Salad greens:* dandelion greens, spinach (tender young leaves), lettuce, romaine, chicory and American endive, water cress, Belgium or French endive, escarole, Chinese or celery cabbage, celery.

(7) *Pickled foods:* tomato catsup, chili sauce, tomato relish, corn relish, green tomato pickles pickled crabapples, piccalilli, beet and horseradish pickle, English chutney sauce, India relish.

(8) *Dumpling garnishes:* plain dumpling, baking powder dumplings, yeast dumplings, bread dumplings, cracker dumplings, potato dumplings, liver dumplings, corn dumplings, butter dumplings, spinach dumplings.

(9) *Cheese garnishings:* blue cheese, cottage, cheddar, cream, pimiento, Parmesan, Roquefort, Swiss, American, processed.

(10) *Nuts:* peanuts, almonds, filberts, walnuts, (English), pecans, chestnuts, Brazil nuts, pistachio nuts, hazelnuts. In addition it should be remembered that all seasonings and sauces likewise partake of the nature of garnishes.

(11) *Green garnishes for meat, fish, or poultry:* asparagus tips, cooked with eggs; *Brussels sprouts,* cooked; *carrot* tops, young, raw and crisp; *chives,* minced; *dandelion,* young, tender and crisp, or with eggs; *dill pickles,* sliced, fan-shaped, or sticks, or with eggs; *gherkins,* sliced, fan-shaped or halved; *green cole slaw* with dressing; *green pepper rings,* lettuce, crisp with eggs; *mint,* sprigs, jelly, finely chopped or warm sauce, especially suitable with lamb; *spinach,* cooked, shaped into small balls, with eggs: *water cress,* crisp, green with eggs.

(12) *Red garnishes for meat, fish, or poultry:* beets, sliced, chopped, tiny balls, sticks, with eggs; *cranberries,* whole, cooked, in jelly, cubed, cut into fancy shapes; *currant jelly,* firm fancy-shaped, and placed over crisp lettuce leaves for contrast; *horse-radish,* beets, whole small beets scooped and then filled with dressed or prepared horse-radish, with eggs, *pimientos,* rings, strips, circles, fancy-shaped, with eggs; *radishes,* young and small, rose-shaped, or sliced when large, scooped and filled with horse-radish or other appropriate filling, with eggs; *raspberry gelatin,* (or any other kind of red berry gelatin) cubed, fancy-shaped, use as cranberries; *red cabbage,* in cole slaw or plain with or without dressing, finely shredded and very loose, with eggs; *red skinned apples,* peeled, sliced, broiled after being spread with paprika; *tomatoes,* red, sliced or whole, when small, broiled, fried, raw dressed, with eggs.

(13) *Yellow garnishes for meat, fish, or poultry:* apricots, canned or fresh halves, hot or cold, place in nest of contrasting color as finely shredded lettuce water cress or tomato slices, with eggs; *avocado,* cut into small balls and arrange same as apricots; *carrots,* raw, cooked, sliced, fancy shapes, sticks, with eggs; *grapefruit,* sliced, then halved, dipped in melted butter and broiled, suitable for dessert; *kumquats,* raw, seasoned with salt and pepper when halved, cook in water for 30 minutes drain, halve, seed then cook very slowly in medium sugar syrup until translucent (about 1 hour), suitable for dessert; *lemon,* sliced, quartered, halved, then scalloped on edge, with eggs, when sliced may be dipped half way into finely minced parsley or chives, and the other half into paprika or cinnamon or both; *melon balls,* sliced, iced, placed in nest of contrasting color, shredded lettuce, water cress, or placed on top of thinly sliced tomato, red cabbage; *orange,* sliced, then broiled as for grapefruit or orange rind, finely shredded, place on lettuce leaf or jumbled up with finely shredded lettuce or red cabbage or cooked beets or green pepper, with eggs; *pineapple,* sliced, plain, or halved, broiled after being dipped in melted butter, if whole slices, fill center with food material of contrasting color as green pepper finely minced, mint cubes, currant jelly, etc., with eggs, shredded or canned sticks can be used in same manner as sliced; *rutabagas* (yellow turnips), boiled, cut into

tiny balls with fancy cutter or cut into julienne then fried in deep fat, french fried, with eggs and cold plates; *yellow tomatoes*, sliced, raw, whole, peeled broiled, with eggs and cold plates.

(14) *White garnishes for meat, fish, or poultry:* celery curls, clean, cut into 2-inch length, fringe down each piece almost to edge, and drop in ice water to curl, or cut into thin strips, lengthwise, drop in ice water, serve with eggs; *chestnuts*, cooked, sieved, and placed into nests of finely shredded contrasting color as lettuce, red cabbage, green cabbage, spinach, cooked or raw; *cole slaw*, white cabbage, plain or mixed with contrasting food as green pepper, spinach, red cabbage, or topped upon tomato slices, with eggs; *cream cheese balls*, season to taste with salt and white pepper, roll into small balls, place in finely shredded lettuce or other greens; *cucumber*, peeled, scallop edges by drawing tines of fork over surface from end to end then slice or cube, with cold plates; *gelatin*, unsweetened granulated gelatin, soaked in cold water, dissolved over hot water, then spread over a cold shallow platter to congeal, then cubed or chopped finely or coarsely and placed upon crisp green, young water cress, with eggs or cold platters, (place upon dish just when ready to serve to avoid melting); *egg white*, hard cooked egg only, chopped, shredded or cut into tiny strips, place upon a crisp lettuce leaf and top with a few grains of paprika for contrast of color, with eggs and cold meat or fish platters; *horseradish*, prepared or freshly grated, plain or mixed with shredded or grated lettuce or green pepper, place on crisp lettuce, green pepper or lettuce nest, serve with cold platters; *onions*, small, pearl, peeled, slices, rings separated and placed on lettuce leaf or pickled, with cold meat or fish platters; *turnips*, tiny balls made with fancy cutters, strips, slices, cooked or raw, service with cold meat or fish platters.

c. Garnishing and Decorating the Lamb Platter. Even the very simplest garnish within the reach of the cook will have a decided effect upon the appetite. Following are suggestions to garnish and decorate lamb dishes to give them added appeal: apple and minted horse-radish, baked oranges, beet relish, beef and cabbage relish, broiled bananas, broiled fresh or canned peaches, candied baked apple slices, candied kumquats, cheese-filled pear, curried apples, sauce, or slices, curried peaches, French-fried green pepper rings, fried eggplant sticks, frozen relish (any kind), fluffy little dumplings (very appropriate for stew), guava jelly cubes, horse-radish on lettuce, hot slices pineapple and sprigs of mint, jellied minted applesauce, mint jelly in apple ring, mint sauce, mint jelly cubes, minted hot apple or pineapple rings, minted banana slices, pickles of any kind, pan-fried banana slices.

114. SALAD. Plain, crisp salad greens are garnished with a variety of familiar accompaniments such as: tomatoes, beets, cucumbers, carrots, hard boiled eggs and asparagus tips. Molded salads are most suitably garnished with crisp salad greens. Curly endive, slender-leaved romaine, and water cress with its peppery flavor are some of the types. Mint leaves are sometimes sparingly used with fruit salads. The molds themselves may also be garnished. This is usually done by neatly arranging pieces of the ingredients such as diced or sliced fruits, vegetables or hard-cooked eggs in the bottom of the mold or pan, letting them become set in the bottom before the rest of the salad mixture is poured in. When unmolded, these pieces, of course, appear on top of the mold. Some salad garnishes are: parsley, chives, green pepper, or pimiento, cut fine; sprays of water cress, mint or parsley; strips of pimiento or green pepper; grated raw carrots, cucumbers, diced or cut in thin slices; radishes, whole, in thin slices or cut to represent roses or tulips; stuffed olives, whole or sliced; ripe olives, whole or chopped; aspic cubes, plain or colored red or green; jelly cubes; red or green cherries, whole or cut in petal-shaped pieces; cream cheese or whipped cream put on with a pastry bag; candied orange peel, chopped fine.

115. DESSERTS. a. Pies. Pies are often self garnished by elaborating the edge of the crust or by cutting steam vents in the upper crust in a decorative design. Open-faced pies are garnished with meringue, whipped cream, or lattice strips of pie dough. Ungarnished pies may be served with side garnishes of cheese or hard sauce.

b. Cakes. All cake icings are garnishes in themselves and may be further garnished by piping or additional frosting in contrasting colors or in f ncy designs. A frosting skillfully applied with quick, full swirls produces an attractive uneven appearance and is much more appealing than a frosting which has the look of having been worked over and smoothed to a solid plaster-like surface.

c. Puddings. The garnishes for puddings and fancy desserts cover a wide range from the simple to the elaborate. A working knowledge of plain sauces, jelly toppings, and icings is soon gained by the beginner. With time and practice, he becomes skillful with the more elaborate garnishes. With whipped cream, meringue or plain icings as a foundation, any desired tint may be produced by adding



Figure 26
① Potato salad



② Baked macaroni



③ Custard pudding, bread pudding with lemon sauce and rice pudding with mint jelly

UP THE DISH



④ Baked ham



⑤ Baked fish



⑥ Ham steak

vegetable coloring (red, pink, green or yellow). Cherry juice, beet juice, blueberry juice, caramel, and cocoa are other sources of color. For contrast and pattern, these garnishing aids will be helpful:

(1) *Red garnishes for puddings and fancy desserts:* Cherries (fresh, canned, frozen, stewed, maraschino, candied), cinnamon drops, cranberries (cooked whole), cranberry jelly (canned, cut into fancy shapes with fancy cutters, or cut into cubes), currant jelly, raspberries (fresh, canned, frozen, or raspberry jam), strawberries (fresh, frozen, jelly, preserves, candied).

(2) *Yellow garnishes for puddings and fancy desserts:* Apricots (canned, frozen, stewed, sliced, halved, candied), ginger (crystallized, cookies), orange marmalade, orange jelly, candied orange peel, fresh orange sections, pineapple (fresh, sliced, canned, cubes, crushed, candied), candied lemon peel.

(3) *Green garnishes for puddings and fancy desserts:* angelica (chopped, slivered), mint jelly (cubed, chopped, molded, or cut into fancy shapes), plums (candied, green gage).

(4) *Black or brown garnishes for puddings and fancy desserts:* blackberries, chocolate, cocoa, black currants, stuffed dates, shredded figs, whole kernels or chopped nut meats, seedless raisins.

(5) *Lavender, pink and white garnishes for puddings and fancy desserts:* candied violets, crystallized pink rose petals, white coconut, whole or cubes of white marshmallows.

SECTION XVII. BEVERAGES

116. GENERAL. Beverages are necessary for the full enjoyment of a meal. The cook who serves a well-prepared meal followed by a satisfactory beverage is doing a complete job. The preparation of a satisfactory beverage demands as much care as any other part of the meal. It is essential to serve the correct beverage with each meal, and it is essential, also, to prepare that beverage properly. Beverages may be served hot or iced depending upon the season of the year, the meal being served, and the type of work the men are doing. The beverages most used in the Army are coffee, tea, milk, cocoa, and fruit drinks. Beverages are of two types—stimulating and nutritious. Coffee and tea are the stimulating type. Milk is nutritious. Cocoa is both stimulating and nutritious. In addition to their stimulating or nutritious character, beverages serve two other useful purposes: first, they take the dryness out of a meal, and, second, they add necessary liquids to help regulate the body.

117. GENERAL RULES FOR COFFEE BREWING.

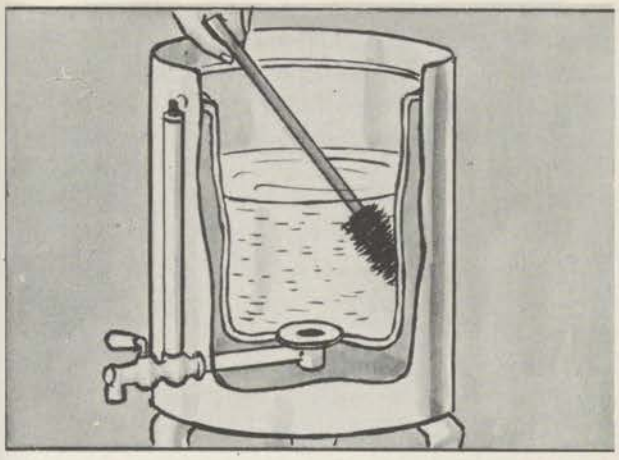
a. The correct proportions for 100 men are 3 pounds of ground coffee (3 No. 56 dippers heaping full) and 7½ gallons water. Always use the proportion of 1 pound of coffee to 2½ gallons of water, no matter what method of preparation is used. Never use any foreign substance in coffee. It does not improve the quality of the finished brew.

b. Fresh ground coffee must be added to freshly boiling water. Water that has boiled a long time has a flat taste which will be imparted to the brew. Carefully measure quantities of both coffee and water used in preparing the brew.

c. Make only the amount needed to serve the number of men for each meal. Warmed-over coffee is bitter and has lost its aroma. Never add old coffee to new brew, as this will ruin the flavor of the fresh coffee. Coffee grounds cannot be used a second time. Once coffee grounds have been used for brewing coffee the maximum amount of coffee has been derived from them. Accurately time the preparation of coffee so that the brew can be served as soon as made. If it cannot be served immediately, have it ready not more than 15 minutes before it is to be served. Maintain the brew at a

Table XXVIII. Proportions

Number of men to be served	Required amount of coffee brew	Necessary amount of ground coffee
	Gallons	*Pounds*
33	2½	1
66	5	2
100	7½	3
133	10	4
166	12½	5
200	15	6
233	17½	7
266	20	8
300	22½	9
333	25	10
366	27½	11
400	30	12
433	32½	13
466	35	14
500	37½	15
533	40	16



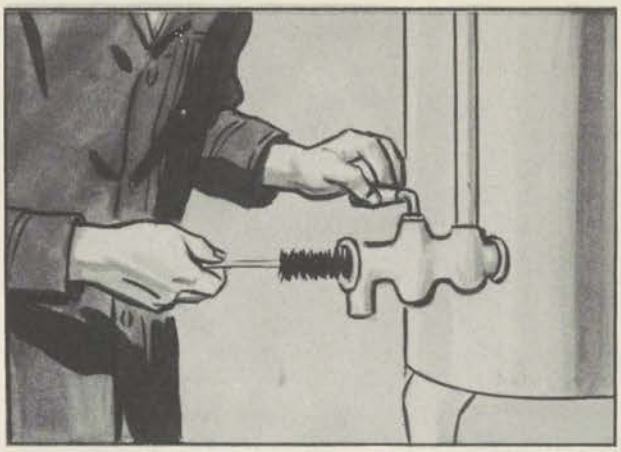


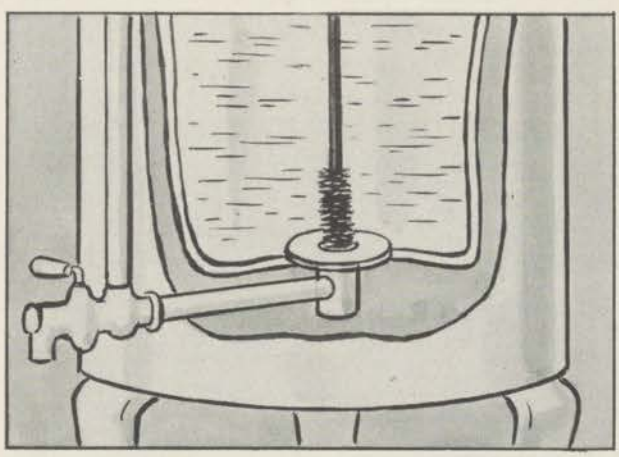
Figure 27. Cleaning the crock.

① *Scrubbing inside of crock.* ② *Scrubbing inside of faucet.*

uniform temperature below the boiling point (175° to 185° F.) until and during the time required for actual service. Coffee loses both flavor and aroma when allowed to stand for long periods after it is brewed. The cook who makes the coffee should follow a timetable indicating specific times when steps in coffee making are to be taken. (See table XXIX.) When this is done, coffee can be ready for serving at exactly the proper time.

118. CARE OF COFFEE MAKING EQUIPMENT. a. General. All coffee-making equipment must be cleaned carefully, immediately after it is used. Coffee contains certain elements which attach themselves to brewing devices. These elements develop a rancid taste upon contact with the oxygen in the air. Within 24 hours they will have an objectionable odor and taste that will be apparent in the next brew, if the equipment is not carefully cleaned. If a filter cloth, bag, or sack is used in making the coffee, it must be washed out in clear, cold water immediately after use and left submerged in cold water until time to use it again. This keeps the filter sweet. If the filter cloth, bag, or sack is allowed to dry, it will sour and ruin the flavor of the next brew. Never use soap or other cleaners on a cloth filter. Discoloration of the filter cloth, bag, or sack does not affect its utility, provided the cloth has been properly cared for. It is recommended that sacks be replaced at least once a week.

b. Care of Coffee Urns. After all brewed coffee has been drawn from the urn, fill the crock with 2 gallons of fresh, hot water, and thoroughly brush it out with a long-handled, stiff-bristled, urn brush.



③ *Cleaning plug at bottom of crock.*

Drain the water off and again fill the crock with 2 gallons of fresh hot water; brush it out and drain it again. If urn is not going to be used again immediately, leave several gallons of water in the crock. Do not drain this water off until just before making

Table XXIX. Timetable for preparing coffee, dunking method
(To be served at 0700)

0630	Water reaches boiling point.
0630	Lower bag containing required amount of ground coffee into water and shut off heat. Be sure to forcefully submerge bag. Otherwise it will float.
0635	Repeatedly dunk the bag with a wooden spatula.
0640	Repeat dunking.
0645	Raise and drain bag.
0700	Serve.



Figure 28. Measure ground coffee and place in sack. Tie the sack allowing slack in it and allowing long ends.

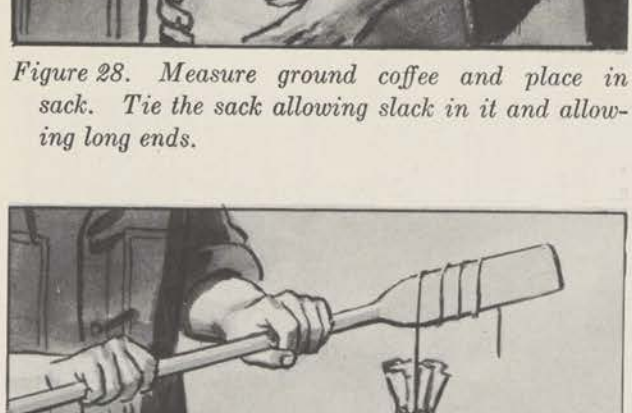


Figure 29. Lift sack out. Empty the sack.

the next coffee brew. Coffee urns must have a special scouring at least twice a week. Fill outer jacket ¾ full of water and turn on heat under urn. Fill crock with several gallons of water and ¼ cup of coffee-urn-cleaning compound. If special urn-cleaning compound is not available, use trisodium phosphate. Allow this solution to remain in the crock for approximately 30 minutes. During this time, heat should be on in full. Scrub inside of crock and inside of cover with long-handled, stiff-bristled urn brush. (See figure 27①.) Drain water off. Remove clean-out cap at end of the coffee faucet and scrub thoroughly with long, thin brush. (See figure 27②.) Run brush through coffee gauge glass. Use long, thin brush to clean plug, at bottom of crock, leading to pipe connected to coffee faucet. (See figure 27③.) Rinse crock three or four times with fresh hot water, again brushing inside of crock, faucet, pipes, gauges, etc. Taste the last rinsing water to make certain that all foreign taste has been cleaned out. If the water does not taste clean, the crock must be scrubbed out and rinsed again until until it does.

119. METHODS OF COFFEE MAKING. a. General. It takes no great skill to make coffee, but good coffee is not a matter of chance. For satisfactory results, it must be made carefully, by persons who are familiar with the product and the brewing equipment. If proper care is taken, good coffee can be made in any one of several ways, depending upon the equipment available. Different types of coffee-brewing equipment are now in use by the Army. The cook must know how to brew coffee in all types. (See TM 10–412 for recipes.)





Figure 30.

① *Wash sack thoroughly in cold water.*

② *Keep sack submerged in cold water.*

b. Making Coffee in an Open Kettle. (1) Stock pots vary in size. If possible choose a pot that most nearly approximates the amount of coffee to be brewed for each. If a pot with a draw-off faucet at the bottom is available, the faucet will be very helpful in serving the coffee. The stock pot selected for brewing coffee should be reserved exclusively for this purpose. If possible, use the 50-pound muslin sack in which coffee is shipped from the roasting plant to the camp. If sacks of this type are not available, a 100-pound sugar sack may be used. In the event that neither coffee nor sugar sacks are available, flour, bean, rice, or any sacks or similar material can be used. Never use a burlap sack. Sacks must be thoroughly washed and rinsed before being used.

(2) Measure carefully the required amount of freshly drawn water into stock pot. Consult table for proportions. Bring water to a boil. Measure ground coffee and place in sack. Tie top of sack securely with a cord long enough to be fastened to handle of container to facilitate removal. (See figure 28.) Leave as much slack as possible. Tying the sack in this manner makes it easier to empty. No more than 15 pounds of ground coffee should be placed in any one sack. Sufficient room must be allowed in the sack to permit the water to circulate freely through it and to allow for expansion of the coffee. By allowing sufficient room in the sack, extraction is obtained from all the grounds. Water-soaked bags of used grounds are more easily removed after the completion of the brew when they are not overfilled. As soon as the water in the stock pot comes to a boil, push the pot away from direct heat to reduce the temperature of the water to just below the boiling point. Immediately insert the sack containing the grounds into the water. Using a stick or paddle, push sack up and down into the water, forcing water to pass through the grounds. Do this frequently during brewing period, otherwise full extraction cannot be reached and a weak brew results. In 12 to 15 minutes, lift sack out of the brew, permitting all water to drain into pot. (See fig. 29.) Then remove sack entirely. Serve coffee at once. Do not allow brewed coffee to boil as boiling destroys flavor. Empty sack containing grounds immediately after it is removed from the pot. See paragraph 118 for care of sack after removal from pot.

c. Emergency Method. If in any emergency no filter sack is available, coffee can be made in a stock pot by the following procedure: As in regular kettle method, measure required quantity of freshly drawn cold water into stock pot and bring to a vigorous boil. As soon as water comes to a vigorous boil, push the pot away from direct heat, to reduce temperature of the water to just below the boiling point. Immediately add measured amount of ground coffee in correct proportion to amount of water used. Allow coffee to brew for 10 to 12 minutes, stirring occasionally. Do not permit the brew to boil. After the brewing period, if the grounds have not settled, sprinkle a small quantity of cold water (not to exceed one cup for each pound of coffee) into the brew to settle the grounds. Serve the coffee as soon as it is made, carefully ladling it out without stirring up the grounds. This method prohibits the use of a faucet for drawing the coffee.

d. Making Coffee in Urns. A coffee urn is a device designed for making coffee, and keeping the

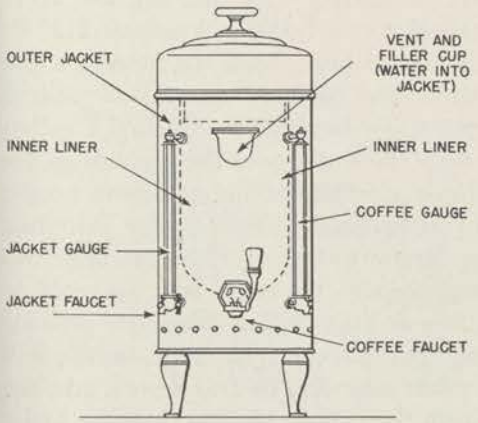


Figure 31. Parts of the coffee urn.

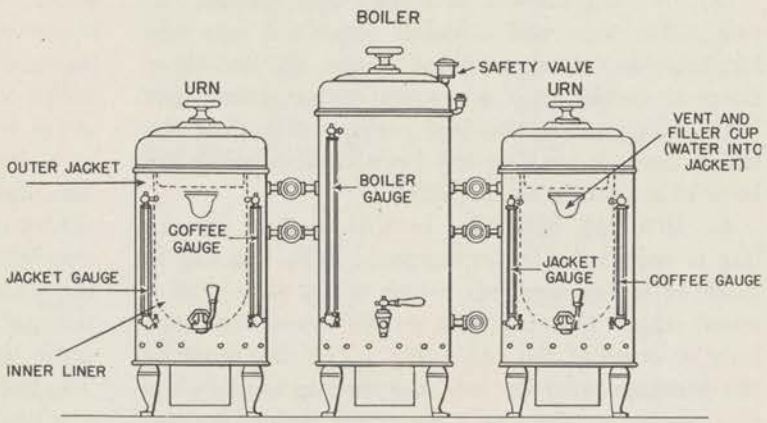


Figure 32. Battery of coffee urns, pressure type.

coffee brew at a uniform temperature while it is being served. A coffee urn consists of an inner liner or crock, where coffee is brewed and kept hot until served; an outer jacket, which is filled with hot water to keep the coffee in the crock hot; two draw-off faucets, one for drawing coffee from the crock, one for drawing water from the outer jacket; two gauge glasses, one registering the amount of brewed coffee in the crock, one registering the amount of water in the outer jacket.

(1) A battery of coffee urns (pressure type) (fig. 32), consists of two coffee urns, one on each side of a large hot water boiler in which the water for making coffee is boiled. This boiler has a gauge glass registering the amount of water it contains. It is connected to the general water supply by a valve to facilitate filling. In a three-piece battery of this type, there are two connecting pipes from the boiler to each urn. The top pipe or syphon transfers the water from the boiler into the inner crock of the adjacent coffee urn. The lower pipe or syphon transfers water from boiler into the outer jacket of the urn. In this equipment, water is transferred from boiler to urn when the water in the boiler reaches the boiling point and is forced over by pressure.

(2) A battery of coffee urns (gravity type) (fig. 33), is built like a pressure type battery except that the center boiler is elevated above the two urns and only one pipe connects the boiler to each urn. The pipe leads from the boiler to the inner crock of each urn and water is transferred from the boiler by gravity. The outer jackets of the urns are filled through valves connected with the cold water supply. All boilers in gravity type batteries are equipped with thermometers to determine the temperature of water in the boiler. Do not open connecting valves between boiler and urns to allow transfer of water until water in boiler is actually boiling.

(3) A combination urn (fig. 34), consists of two coffee urns and a boiler combined into one large device. In a combination urn, the two inner liners or crocks have a common water jacket, and tank, which serves the dual purpose of boiling the water used in making the brew, and holding the brew at a uniform temperature.

e. Urn Bag Method. In this method an urn bag is used with the equipment. The urn bag is made of muslin and has a hem which slips over a metal ring. The ring rests on the top of the inner liner or crock of the coffee urn. The ring must be the correct size for the urn, and the bag must be the correct size for the ring. Bag sizes are determined by the diameter of the ring. If the diameter of the ring is 16 inches, a 16-inch urn bag should be used. An urn must not be used to more than 80 percent of its capacity. If urn is used to full capacity, the bottom of the bag will be submerged in the brew, and cause the brew to become bitter. Follow this utilization table:

Table XXX. Utilization of coffee urns

Capacity of urn	Maximum amount of coffee that can be brewed
5 gallons	4 gallons
10 gallons	8 gallons
15 gallons	12 gallons
20 gallons	16 gallons
30 gallons	24 gallons
40 gallons	32 gallons

After closing all other valves and faucets, fill the boiler with freshly drawn water by opening the valve from the cold water supply. When gauge glass on boiler registers that the boiler is full, close inlet valve and turn on heat. Do not turn on heat under the boiler before it contains water. By opening valves on lower pipes connecting boiler to runs, fill urn outer jackets ¾ full of water. (In gravity type battery fill outer jackets by opening water inlet valves.) Turn on heat so that inner liners will be well heated when coffee is ready to be brewed. Do not fill urn jackets to capacity; expansion from the heat will cause the water to overflow. Rest the ring with urn bag attached (seam side in) on top of crock of coffee urn, making certain crock is clean and contains no water. Measure proper amount of ground coffee into the bag. When the water in the boiler comes to a vigorous boil, the safety valve in the pressure type battery will blow steam, or in the gravity type battery the thermometer attached to the boiler will register 212° F. As soon as the water boils, open the faucet on the boiler and draw the required amount of boiling water from the boiler in a gallon measure, 1 gallon at a time. Pour the water over the grounds in the urn bag, using a circular motion to insure proper saturation of all grounds. Pour water into bag slowly, being careful not to overflow the bag. As the water drips through the coffee into the crock of the urn, continue to pour boiling water over grounds until the required amount has been transferred. The boiling water may also be transferred into the urn bag through the syphon leading from the boiler to the top of the crock of the urn. The operator

measures the amount of water transferred by watching the gauge glass on the boiler. The level of water and grounds, in the urn bag must also be watched to avoid an overflow of the bag. An overflow would cause some of the grounds to fall into the brew. When the correct amount of boiling water has been transferred from boiler to urn bag by either method, repour 50 percent of the brewed coffee through the grounds. Care must be taken to prevent an overflow of the bag. When all the coffee has dripped through the grounds into urn, remove urn bag and ring immediately. Empty urn bag containing used grounds immediately after it is removed from urn. It is not necessary to remove the bag from the ring after each use. Wash the bag thoroughly in cold water. Serve the coffee at once. Coffee urns must be cleaned thoroughly after each use, according to instructions given in paragraph 118.

f. Metal Basket Drip Method. In this method of brewing coffee in an urn, a metal basket and filter papers are supplied with the equipment. The metal basket is a separate device which fits down into the upper part of the coffee urn. The filter paper is of a special type and must be the exact size of the bottom of the metal basket. Some devices are equipped with a fine mesh sieve instead of filter paper. If this is the case, follow the same procedure of brewing outlined below omitting the use of the filter paper. Do not omit use of filter paper in equipment designed for use with paper. If filter paper is omitted in this equipment, coffee grounds will seep through into the finished brew. After closing the other valves and faucets, fill the boiler with freshly-drawn water by opening the valve from the cold water supply. When gauge glass on boiler registers that the boiler is full, close inlet valve and turn on heat. Do not turn on heat under the boiler before it contains water. By opening valves on lower pipes connecting boiler to urns, fill urn outer jackets ¾ full of water. (In gravity type battery, fill outer jackets by opening water inlet valve.) Turn on heat so that the inner liners will be well heated when coffee is ready to be brewed. Do not fill urn jackets to capacity; expansion from heat will cause the water to overflow. Place the filter paper inside thoroughly dry metal basket on top of the metal sieve. If a ring is provided for locking the filter paper in place, insert the ring carefully and lock it. Measure the proper amount of ground coffee into the metal basket on top of the filter paper. A small quantity of coffee cannot be made by this method in large equipment. For example: 5 gallons of coffee cannot be made in equipment designed to make 20 or 40 gallons. In such cases the insufficient quantity of ground coffee in relation to the diameter of the basket allows the water to go through the grounds too quickly, resulting in a weak brew. Likewise an extra large quantity of coffee cannot be made by this method in a small equipment. The depth of grounds in the metal device retards the free flow of water through the grounds. This results in over-extraction and bitter coffee. Also, the brewing time is prolonged for an unreasonable period. In some cases, filtration may be stopped altogether, and the water will overflow from the device into the crock without having passed through the grounds. Insert water spreader, which is another metal sieve that locks in place just above

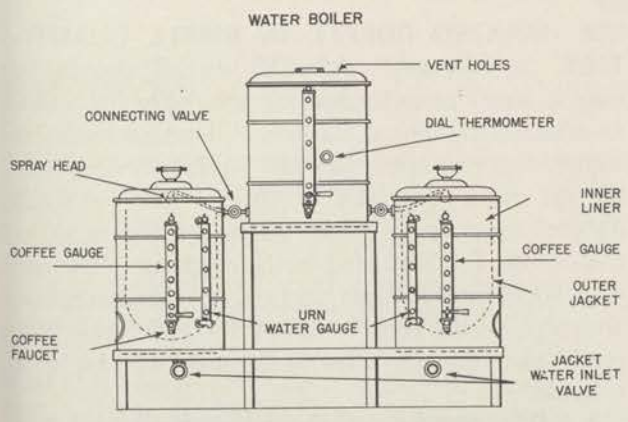


Figure 33. Battery of coffee urns, gravity type.

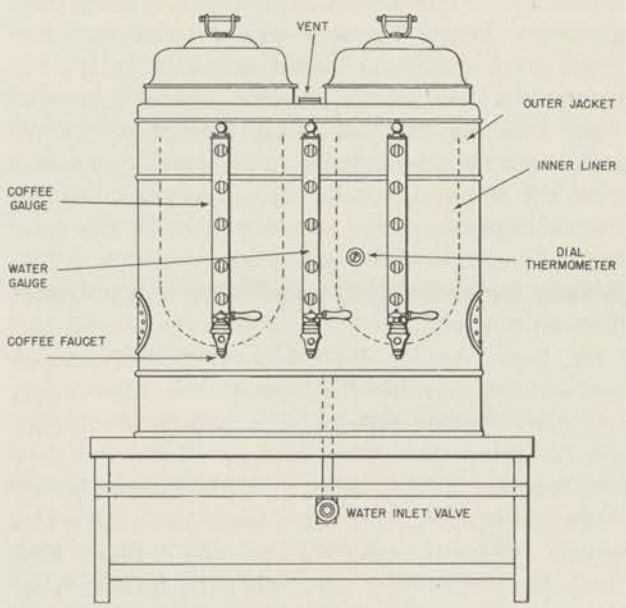


Figure 34. Combination urn.

the coffee grounds in the basket. Fit the metal basket containing the grounds into the top of the crock, making certain the crock is clean and contains no water. When the water in the boiler comes to a vigorous boil, the safety valve in the pressure type battery will blow steam, or in the gravity type battery, the thermometer attached to the boiler will register 212° F. As soon as the water boils, open the faucet on the boiler and draw the required amount of boiling water from the boiler in a gallon measure, 1 gallon at a time. Pour the water into the metal basket slowly, being careful not to overflow the basket. Water should not be transferred into the metal basket through the syphon that leads from the boiler to the top of the crock of the urn, unless there is an extension on this pipe allowing the water to flow into the center of the basket. If the equipment is provided with such an extension, the operator may transfer the water by opening the valve on this pipe. Amount of water transferred is measured by watching the gauge glass on the boiler. The level of water and grounds in the metal basket must be watched to avoid an overflow of the basket. When the correct amount of water has been transferred from the boiler to the metal basket, and all of the water has dripped through the grounds, remove the basket entirely from the urn. Draw off ¼ of the brewed coffee and repour this amount directly into the crock. This serves to equalize the strength of the finished brew. Use a circulatory pump if the coffee-making device is so equipped. Be certain to remove the basket before repouring. In this method of brewing it is not necessary to repour any coffee back through the grounds. Empty the used grounds and the filter paper from the metal basket immediately after it is removed from the urn. Serve coffee at once.

g. Dunking Method. In this method, a filter sack is part of the equipment. If possible, use as a filter the 50-pound muslin sack in which coffee has been shipped from the roasting plant to the mess hall. If sacks of this type are not available, a 100-pound sugar sack may be substituted. In the event that neither coffee nor sugar sacks are available, flour, bean, rice or any sacks of similar material can be used. Sacks must be thoroughly washed and rinsed before coffee is put into them. Never use burlap sacks. After closing all other valves and faucets, fill the boiler with freshly drawn cold water by opening the valve from the cold water supply. When gauge glass on boiler registers that the boiler is full, close inlet valve and turn on heat. Do not turn on heat under the boiler before it contains water. By opening valves on lower pipes connecting boiler to urns, fill urn jackets ¾ full of water. (In gravity type battery fill outer jackets by opening inlet valves.) Turn on heat so that inner liners of the urns will be well heated when coffee is ready to be brewed. Do not fill urn jackets to capacity; expansion from the heat will cause the water to overflow. Measure ground coffee and place in filter sack. Tie top of sack securely with a cord long enough to facilitate removal. (See fig. 28.) When the water in the boiler comes to a vigorous boil, the safety valve in the pressure type battery will blow steam, or in the gravity type battery the thermometer attached to the boiler will register 212° F. As soon as this happens, insert the sack containing the grounds into the inner liner or crock of the urn, making certain the crock contains no water and is clean. Open the faucet on the boiler and draw the required amount of boiling water from the boiler in a gallon measure, 1 gallon at a time. Pour the water into the crock of the urn. The boiling water may also be transferred into the crock through the syphon leading from the boiler to the top of the crock of the urn. In this method, the operator measures the amount of water transferred by watching the gauge glass on the boiler. As the water is being transferred into the crock, dunk the sack containing the grounds up and down in the water. Use a stick or paddle, forcing the water through the grounds. Do this frequently during the brewing period, otherwise full extraction cannot be reached and a weak brew results. In 12 to 15 minutes, raise sack out of the brew, permitting all water to drain off. Then remove sack entirely. Serve coffee at once. Empty sack containing the grounds immediately after it is removed from the crock. Wash the sack thoroughly in cold water and keep it submerged in cold water until the next time it is used.

120. MAKING COFFEE IN SMALL QUANTITIES. a. General. A small utensil should be used in every mess for making hot coffee for cooks, members of the guard, and small details who desire coffee earlier or later than the regular serving time for the mess. In order to insure coffee for small details, some cooks make coffee for the mess as soon as the fire is started in the morning. The use of a small utensil does away with this necessity, and permits the cook to follow the time table correctly and to serve coffee to the mess as soon as it is made.

b. Drip Method. Preheat the device with hot water. Measure drip grind coffee into the upper

chamber, using 1 heaping tablespoonful of coffee for each cup of water, and 1 extra tablespoonful. Pour proper quantity of briskly boiling water over the grounds. When dripping is completed, remove the upper chamber, dispose of the coffee grounds, and serve the brew at once. The coffee-brewing device must be cleaned thoroughly and rinsed after each brew. If this is not done, the next brew will have a disagreeable taste.

c. Vacuum Glass Method. Fill lower bowl with fresh cold water to within 1 inch of the neck and place on heat. Insert filter cloth into upper bowl and add measured quantity of finely ground coffee, using 1 heaping tablespoonful of coffee for each cup of water, and 1 extra tablespoonful of coffee. When water in the lower bowl boils (bubbles briskly), insert upper bowl with a slight twist to insure tight connection. When half the water has risen into upper bowl, reduce heat, stir water and grounds in upper bowl. Remove from heat when all but about 1 inch of water has risen into upper bowl. Remove upper bowl as soon as all the coffee has been drawn into lower bowl. Serve coffee at once.

d. Percolator Method. Fill device with proper quantity of fresh cold water and place on heat. Measure regular grind coffee into the basket, using 1 heaping tablespoonful of coffee for each cup of water, and 1 extra tablespoonful. When water boils, insert basket into percolator and allow brew to percolate for 6 minutes.

e. Coffee Pot Method. Measure proper quantity of ground coffee into preheated coffee pot. Use 1 heaping tablespoonful of coffee for each cup of water, and 1 extra tablespoonful. Pour on measured quantity of fresh, briskly-boiling water. Stir contents for 1 minute. Allow to settle 3 minutes, then pour the brew through a filter into a preheated container. Serve coffee at once.

Table XXXI. Proportions for iced coffee

Hot coffee	Water	Iced coffee
1 lb.	2½ gal.	2 lb.
2 lb.	5 gal.	4 lb.
3 lb.	7½ gal.	6 lb.

Remove coffee brew from urn or kettle and place in a dispenser with sufficient ice to keep coffee well chilled until served.

121. ICED COFFEE. Iced coffee is made exactly like hot coffee, but twice as strong. For making iced coffee, use twice as much ground coffee to the same amount of water as is used for hot coffee. Making coffee double strength for iced coffee is to compensate for the dilution caused by melting ice.

122. TEA. a. Kinds of tea. There are three classes of tea:

(1) Black tea
(2) Green tea
(3) Oolong tea

Each of these is further subdivided according to the portion of the plant that is used and the part of the world it grows in. The kind of tea—black, green, or oolong—is made in the process of treating the tea leaves. Green tea has more of its own flavor, black tea is changed considerably in its processing and oolong is a cross between the two.

b. Color of Brew. The color of the finished brew is no indication of the strength. It may vary from pale green or amber to a dark mahogany red, depending upon the variety of tea being used.

123. GENERAL RULES FOR MAKING TEA. a. Proper Measurement. The proper quantities of both water and tea should always be measured carefully. Do not guess at the correct amounts but stick rigidly to the formula. One ounce of tea to 1 gallon of boiling water should be used in making hot tea. Seven gallons of tea are sufficient for one hundred servings.

b. Prepare Only Amount Needed. First determine the the number of men to be served and govern the preparation accordingly. Leftover tea should never be held to be served hot for the next meal. Leftover tea can be served as iced tea, however, provided it is chilled without adding ice to it, because ice weakens the tea too much when it melts. A new brew should never be mixed with a leftover brew.

c. Timely Preparation. Time preparation of the tea accurately so that it will be ready not more than fifteen minutes before it is served. Maintain a temperature of between 175° and 185° F. throughout the entire period of service.

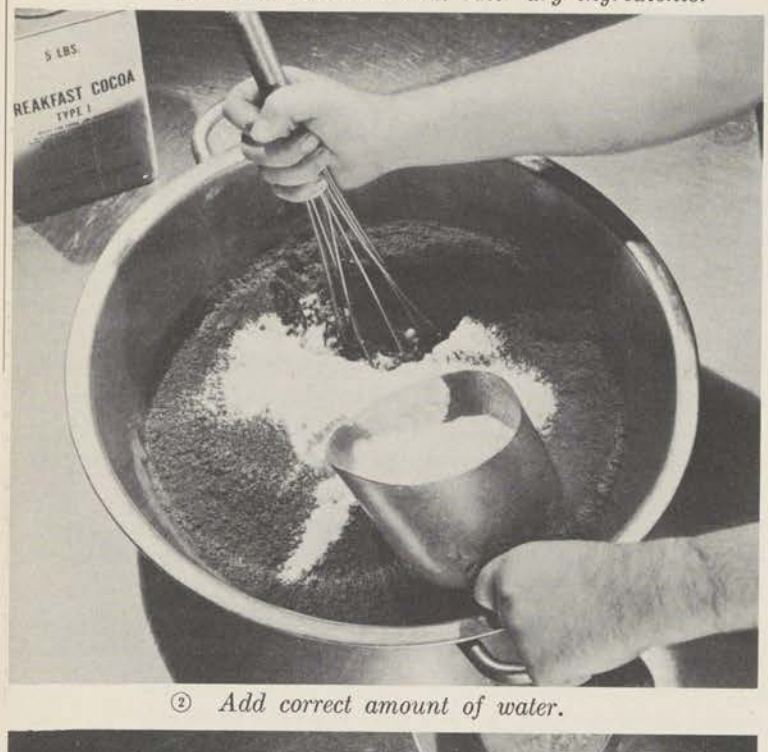
d. Keep Equipment Clean. All tea-making equipment must be cleaned carefully immediately after it is used. If a filter cloth, bag, or sack is used in making the brew, it must be washed out in clear, cold water immediately after use. The sack should then be stored in cold water until it is used again. This keeps the filter sweet. Never use soap or other cleaning agents when cleaning the filter.

e. Avoid Iron Receptacles. A very annoying chemical change takes place when the tea is brewed

in iron utensils or ir agate or porcelain utensils which have become chipped and which cause the tea solution to come in contact with the iron. Where the tannin in the tea comes in contact with the iron, it forms a blackish liquid that is nothing more than ordinary ink.. The chemical action that occurs gives the brew a very undesirable appearance and taste. Therefore, under no conditions should tea be brewed in an iron receptacle or a container where part of the iron surface is exposed.

Figure 35. Making cocoa.

① *Mix the cocoa with other dry ingredients.*



② *Add correct amount of water.*



124. METHODS OF BREWING TEA. a. General. Tea must never be boiled. It is the process of water circulating through the tea leaves that makes the tea. If it is boiled, it becomes bitter. The water that is used for making the tea should be boiling, but as soon as the tea has been added, the boiling must stop.

b. Making Tea in an Urn. In making tea in an urn, the boiling water from the tank is poured over the bag containing the tea. During the brewing, the bag is dipped in the water to force the water through the leaves. In this process, the water works through the tea leaves thoroughly.

c. Making Tea in a Kettle. Tea may be made with a bag to hold the tea leaves or without it. If a bag, is used, it is plunged into the kettle of boiling water and the boiling is stopped immediately. If the bag is not used, and the tea is put directly into the boiling water, the liquid must be strained as soon as the brewing is completed.

d. Making Iced Tea. In making iced tea the brew should be stronger to allow for subsequent dilution, either by ice or iced water. It is important to know before starting whether the tea will be cooled by adding ice or iced water, because that makes a difference in the amount of cooling water that is added. When tea is cooled down, in making iced tea, it frequently becomes cloudy. The substances that make this cloudiness are in the tea before it is cooled. Therefore, it is just as harmless in the iced tea as in the hot brew. The cloudiness is unsightly, however, and it detracts from the appearance of the beverage when served. That is the only reason to be concerned about it. This clouding is most likely to occur when the tea is very strong and then cooled down. It occurs most frequently in teas that have a heavy body and are especially desirable for hot tea. Any cloudiness occurring in teas when they are cooled down can be dispersed immediately by a dash of hot water or by slightly reheating the tea. Teas that are brewed for a very short length of time and then cooled generally do not show the cloudiness.

125. COCOA. a. General. Cocoa may be served either hot or cold. The liquid used is milk with a small proportion of water. Cocoa is considered a heavy drink and for this reason should not be served with heavy meals.

b. Preparation. Whether cocoa is prepared iced or hot, it must be cooked because of its starch content. Some cooks make cocoa by placing it in a pot, then adding hot water. The mixture is brought to a boil and milk and sugar are added. The more acceptable method which produces a smoother, richer effect is to mix the cocoa with other dry ingredients, add the correct amount of water, bring the mixture to the boiling point and cook for five minutes. Then hot or cold milk may be added. Never boil cocoa after the milk has been added.

126. ICED FRUIT DRINKS. a. General. Oranges, grapefruit, lemons, and limes make excellent fruit drinks, used individually or in combinations. The added juices or syrups from canned fruits improve the flavor and taste. The amount of effort put forth by the cook in preparing iced fruit drinks will be *clearly* shown. The word clearly is used because that is the way an iced fruit drink should be served.

b. Preparing Iced Fruit Drinks. The following steps will produce a clear, cool drink.

(1) Dissolve sugar in hot water and allow to cool.

(2) Extract the juice from the fruit; then strain to remove pulp and seeds.

(3) Combine the juice and cold water in proper proportions.

(4) Add the cooled syrup obtained by dissolving sugar in hot water.

(5) Use two-thirds of the ice required, chopped in small pieces.

(6) Add the last one-third of ice in large pieces.

(7) Stir frequently while serving.

(8) A few pieces of the fruit cut lengthwise floating across the top will give eye appeal.

127. USE OF ICE. a. Method. If there is any scarcity of ice, do not pour hot liquids over it. This practice uses up the ice too quickly without making the drink actually cold. A better method follows:

(1) Prepare the liquid in advance to allow for cooling.

(2) When the beverage has cooled, crack about two-thirds of the ice and drop it into the liquid. Cracked ice will lower the temperature of the liquid more quickly than large chunks.

(3) Stir the beverage.

(4) Drop in the remaining one-third of ice, but don't chop it. Leave it in several large chunks. This will keep the beverage cold until the last man is served, without making the drink watery.

b. Preventing Dilution. The drink will become watery, if a few precautions are not followed:

(1) Ice weakens any drink. Allow extra strength to make up for the melting ice.

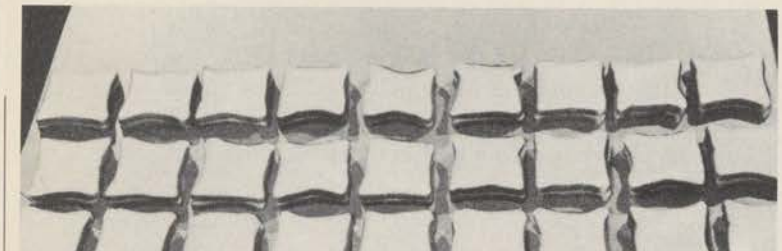
(2) Eight pounds of ice equals 1 gallon of water since all the ice will not melt, a safe figure is 12 pounds of ice is equal to a gallon of water in an iced beverage.

Figure 35. Making cocoa (continued).
③ *Bring to boil and cook for 5 minutes.*



④ *Add milk.*









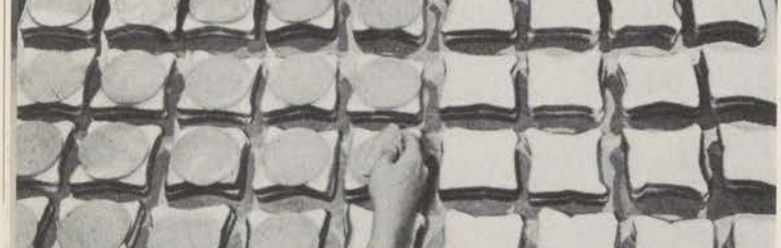


Figure 36. Sandwich making.

① *First step: Four rows, nine stacks to a row, two slices to a stack.*

② *Second step: Put the butter and filler on top slice of each stack.*

③ *Third step: Lay the first stack in the front row on top of the stack directly behind it.*

④ *When fourth row is reached, take bottom slice, place it on top. Result: Four sandwiches.*

SECTION XVIII. SANDWICHES

128. GENERAL. a. Sandwich Making. Sandwich making is an important function in the Army mess. It often becomes necessary to serve sandwiches to personnel in the field, on troop trains, and to small detachments of personnel isolated from regular messing facilities. Sandwiches may be served as a change to regular meals. In making sandwiches, consider the people who will eat them. The cook's best efforts and skill are required. Make sandwiches attractive, nourishing and appetizing. Do not prepare further in advance than is absolutely necessary. Never regard their preparation as a troublesome chore to be done hastily and carelessly. Remember, sandwiches constitute the main part of the meal, and, therefore, the same care and skill are required in their preparation as in a regular meal. Be on the alert to find new ways to prepare sandwiches. Variety is essential.

b. Types of Sandwiches. Sandwiches are generally classed in two groups as follows:

(1) *Sweet.* These are made from jellies, jams, preserves, marmalades, or mixtures of any of the above with peanut butter, cheese, etc.

(2) *Nonsweet.* Nonsweet sandwiches may be made from meats, cheeses, fish, chicken, eggs, and vegetables or a combination of any of the above, such as, bacon and celery, ham and carrots, fish salad and egg.

PRECAUTION. Ground meat and egg or cheese spreads are dangerous as sandwich fillers unless prepared just prior to serving. Sandwiches to be issued to troops in the field for future consumption should be generally of nonprotein foods unless generous amounts of ground pickle mixture containing vinegar are used as a filler with them. No mayonnaise or other cooked dressing should be used.

129. PREPARING SANDWICHES. The following are important rules to apply in sandwich preparation:

a. Seek new ways to prepare sandwiches by using combinations that are both appetizing and pleasing to the eye.

b. Do not prepare any sooner than is absolutely necessary.

c. Use fresh ingredients.

d. When using butter, soften and spread both slices of bread, if possible.

e. Use fresh bread, slice it evenly and not more than $\frac{3}{8}$ inch thick.

f. Season the fillings so they will be ready to eat.

g. Do not be stingy with the filling. Spread the filler evenly and generously.

h. Leaves of leafy vegetables should be fresh and crisp.

i. Wrap each sandwich individually in waxed paper.

130. QUANTITY PRODUCTION. When the cook is faced with an order for a large number of sandwiches, he must use the most efficient means possible to prepare them. Quantity production of sandwiches can be accomplished in the following manner:

a. Lay the bread on the table to form stacks two slices high. Place nine of these stacks in a row across the table directly in front of the sandwich maker. Then lay down three more rows exactly like the first one, and directly behind the first row. This will enable the cook to make thirty-six sandwiches at one time.

b. If butter is used, butter each top slice before the filler is spread on. In using butter in the quantity production of sandwiches, only one slice of each sandwich is spread with butter. Then cover the top slice of each stack with the sandwich filler.

c. Now put the stacks together in such a way that there will be nine piles of sandwiches with four sandwiches to each pile. In order to do this, lift the first stack in the front row and lay it on the stack directly behind it; then lift the two stacks squarely on the fourth. When the fourth stack is reached, there will be one unused slice of bread on the bottom of the pile and one-filler-covered slice on top of the pile. Take out the bottom slice, place it on the top, and there will be four sandwiches.

d. Slide the pile of four sandwiches along the table to the man who is doing the cutting and wrapping. He will cut the sandwiches diagonally. Pile up all of the other sandwiches in the same way. The sandwich maker may alter this procedure in any way that will operate more efficiently for him.

CHAPTER 6

PASTRY BAKING

131. BASIC DOUGH. No great amount of skill is required in making hot rolls. With the aid of recipes, any cook with a reasonable amount of practice can produce tasty rolls. Proper planning is essential. For best results it is desirable to have the hot rolls coming from the oven just prior to service. The amount of labor actually expended in making rolls is small, but the time required to ferment and proof the dough is lengthy; therefore, it is necessary to set up a timetable or schedule to assure rolls being ready to serve at the proper time. In the following table only 45 minutes are allowed for the actual labor of mixing and make-up. The remainder of the time is for fermentation, proofing and baking. A typical timetable of operations for services at 1800 hours follows:

132. INGREDIENTS. The ingredients used for breads and rolls of nearly all types are available in every kitchen. Sugar, salt, yeast, shortening, flour and water are the materials required. Milk can be used to increase the food value, although its use is optional. One gallon of liquid, either water or milk will make enough rolls for 100 men.

133. MIXING THE BASIC DOUGH. First, dissolve the yeast in portions of water; mix salt and sugar in remaining portions of water. Second, add milk, lard and one half of flour and mix. The shortening should be in a soft or semisolid condition. Add the dissolved yeast and water. Then add the remaining half of flour, and mix either by hand or machine until it is smooth and pliable. If undermixed, it will be short and appear lumpy. A properly mixed dough will not be sticky and adhere to the surface of the mixing bowl. The temperature of the dough is important. If too hot, the dough will ferment too rapidly, and the rolls will be sour or yeasty. If too cold, the rolls will be heavy and tough. A temperature of 78° to 82° F. is recommended.

Table XXXII. Timetable for pastry baking

Operations	Hours
Assembling of ingredients	1345–1400
Mixing dough	1400–1540
Punching of dough	1540–1600
Dividing and make-up	1600–1630
Rising or proofing	1630–1700
Place in oven	1700–1725
Remove from oven	1725
Serve	1800

134. FERMENTING THE DOUGH. After the dough has been mixed, a fermentation or aging period is required. The amount of time needed is determined by:

a. Amount of yeast used.
b. The temperature of the dough.
c. The type of flour used.

An old dough will make a pale, sour-tasting roll. Keep the dough on the young side for the best results. Average fermentation time is 1¾ hours.

135. TESTING FOR PUNCHING TIME. Insert the fingers into the dough to a depth of about 3 inches. If the dough puckers or starts falling at the point of insertion, it is ready for punching. If the dough is tight and does not fall, but tends to come back, longer fermentation should be given.

a. Recovery Period After Punching. After the punching process let dough stand about 15 to 20 minutes. The dough is then ready for the make-up bench, where it may be made into the desired type of roll.

b. Dividing the Dough. After the recovery period, the dough is ready for division into pieces. The best method for dividing the dough is to cut into pieces of about 3 to 4 pounds each and then roll each piece into elongated strips 1½ inches in diameter. The strips may then be divided into portions by cutting with a knife or dough scraper into pieces about one inch thick. A piece of about 1¼ to 1½ ounces is suitable for the average roll.

136. MAKE-UP PERIOD. Round the pieces of dough into smooth-surfaced balls by the simple process of rolling them with a circular motion in the cupped palm of the hands against the workbench.





Figure 37. Mixing the dough.

① *Handling the dough.* ② *Properly mixed dough.*

These rounded pieces of dough can be shaped into various forms for rolls such as Parker House rolls, finger rolls, sandwich buns, plain rolls, and butter biscuits. These are shown in figures 38, 39, 40, 41 and 42.

137. PROOFING AND BAKING. All rolls should be proofed until doubled in size, then baked for about 15 to 20 minutes in a hot oven (425° to 450° F.) or to a golden brown. If overproofed the rolls will appear blistered and will fall when placed in the oven. The rolls should be carefully handled after proofing because jarring or rough treatment will cause them to fall. They should be protected from drafts during the proofing period to prevent the formation of an unsightly crust.



③ *Testing for the punching time.*



④ *Basic dough ready for make-up.*

138. BASIC SWEET DOUGH. Contrary to popular belief, the making of sweet dough does not require unusual skill. Sweet rolls of almost any kind may be easily prepared in the average Army kitchen. The richness of the dough used for sweet rolls, coffee cakes, etc., makes these products very desirable as a concentrated energy food. This richness gives the finished product a taste palatability far superior to that from the average basic roll dough formula. The sweet dough is adaptable to many baked items. Dozens of assorted rolls, coffee cakes, etc. can be prepared from a basic sweet dough formula. Fruits, nuts, and spices can be used in various types of sweet rolls and coffee cakes.

139. INGREDIENTS. All ingredients necessary for preparation of the sweet dough products are available in the Army kitchen. Sweet yeast-raised doughs contain more sugar and lard than plain



Figure 38. Making up dough. Rounding the rolls.

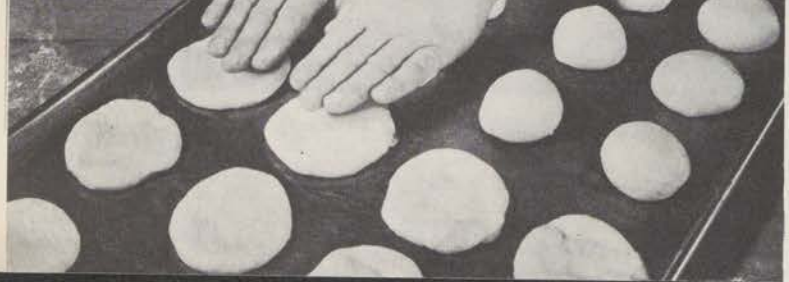


Figure 39. Parker House rolls. Greasing to form Parker House rolls.



Figure 40. Sandwich buns.
① Forming sandwich buns.

② Flattening the buns.



doughs. Eggs are also used when available. Eggs add richness and produce superior texture and volume in the finished product. Dried or dehydrated whole eggs, in proportion, may be substituted for fresh eggs. One-half ounce (two mess kit spoons) of dehydrated whole eggs is equivalent to one fresh egg.

140. MIXING THE BASIC SWEET DOUGH. Dissolve the yeast in a portion of water. Cream the lard, sugar and salt to a smooth paste. Be sure that all lumps have been worked out of both lard and sugar. Add the eggs a few at a time and mix with creamed lard and sugar. After the eggs have been thoroughly mixed, add the milk, water and dissolved yeast, and mix thoroughly. Flavors such as vanilla and lemon extract, mace and nutmeg should be added at this time. Add the flour all at one time, and mix or knead until a smooth dough is obtained. The consistency of the dough should be soft and slightly sticky, making it easy to roll out during make-up. The dough temperature should be from 78° to 82° F. Fermentation time will be about 1½ to 2 hours. Test for punching time is the same as described for the basic dough. After punching allow dough to rest for 15 to 20 minutes before making up. Following are shown sugar twists, cinnamon rolls, sugared snails, butterfly rolls, fruit coffee cake, Streussel coffee



Figure 41. Finger rolls. Shaping finger rolls.

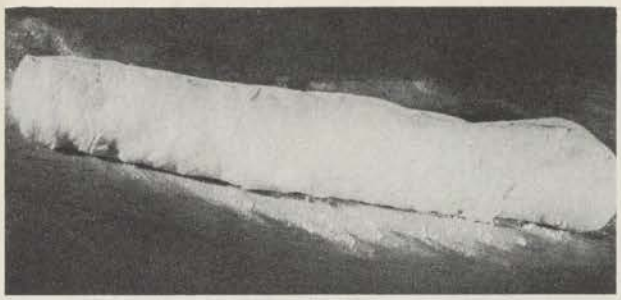
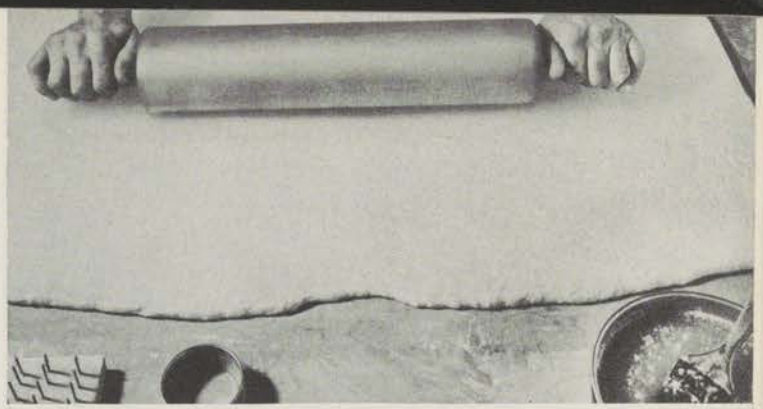


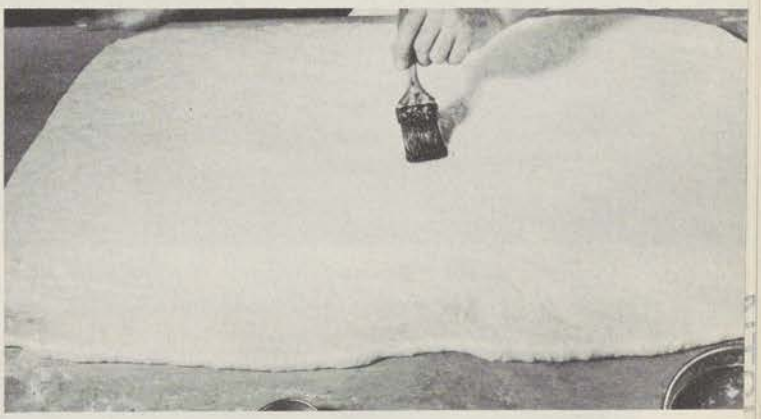
Figure 42. Butter biscuits.
① *Divide the basic dough into four pieces and form each into an elongated shape; allow to stand 15 to 20 minutes.*

cake, old fashioned cake, and butter-cinnamon coffee cake. These are all made with basic sweet dough. The principles are illustrated here; the recipes appear in TM 10–412.

141. QUICK BREADS. There is a wide variety of baked products in which baking powder and baking soda are the leavening agents. These are commonly called quick breads. They include biscuits, corn bread, and muffins. The batters and doughs from which they are made are mixtures of flour and liquids with other ingredients, such as lard, eggs, salt, sugar, and flavoring to provide tenderness, texture, and distinctive flavor. A batter is a mixture of such consistency that it can be beaten or stirred. Batters are designated as pour or drop batters. A pour batter is thin enough to pour; a drop batter is slightly thicker than a pour batter and is generally dropped from a spoon or pastry bag. A dough contains a greater portion of flour than liquid and is of such consistency that it can be kneaded or handled. There are both soft and stiff doughs. Biscuits usually are made from soft doughs. Blending flour and baking powder is always necessary to insure an equal distribution of the leavening agent in the batter or dough. These two ingredients should be sifted together two or three times. This will avoid excessive mixing of the dough. Quick bread doughs should not be mixed too much after liquid is added, as over-mixing will tend to make a heavy and tough product.



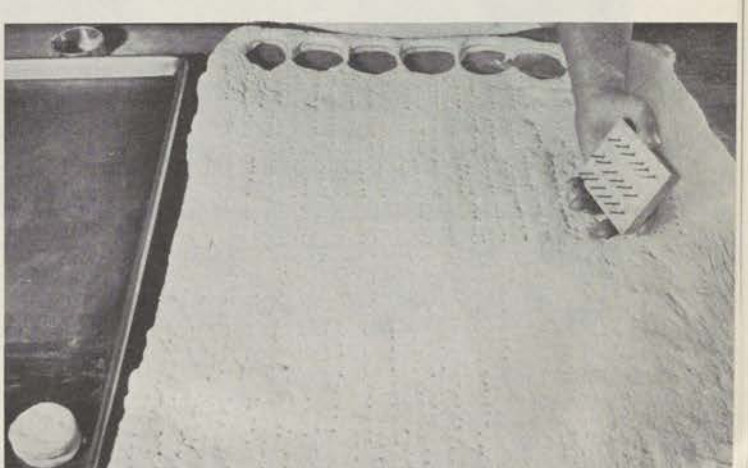
② *Roll the dough to a thickness of about ¼ inch.*



③ *Grease the dough.*



④ *Fold the greased dough to make two layers.*



⑤ *Dock the dough with a fork or a regular docker.*



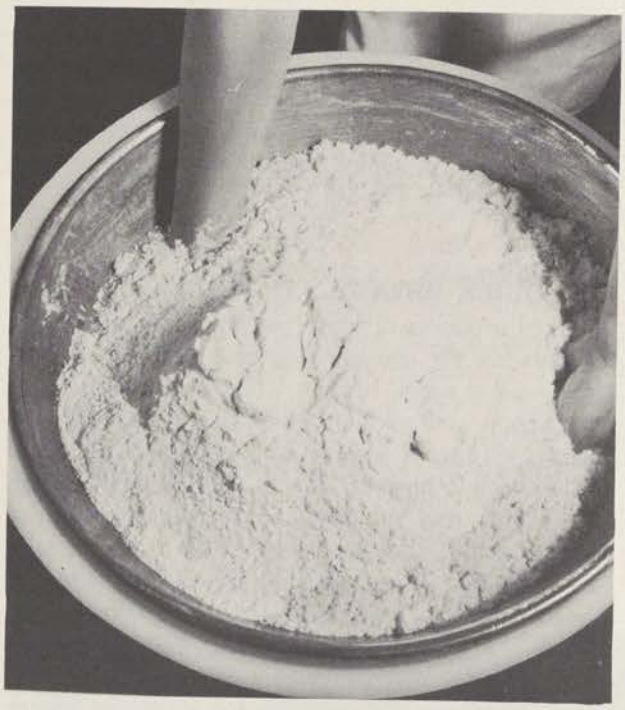
Figure 43. Mixing the basic sweet dough.
① *Cream lard, sugar and salt.*



② *Adding eggs.*



③ *Mixing milk, water and yeast.*



④ *Mixing in flour.*



⑤ *Ready for fermentation.*



⑥ *Punching the sweet dough.*





Figure 44. Sugar twists.

① *Form dough into oblong pieces; allow 10 to 15 minutes recovery; roll out and fold the dough, forming three layers.*

② *Then cut the folded dough strips crosswise into pieces about one inch wide and twist them.*

③ *Complete the sugar twists by rolling the dough in one direction with the left hand and in the opposite direction with the right hand.*



Figure 45. Cinnamon rolls.

① *Brush with butter, add sugar, cinnamon and raisins.*



② *Coil the dough into a fairly tight roll and cut off pieces about 3/4 inch thick.*





Figure 46. Sugared snails. Sugar one side and place in the pan with the sugar side up.





Figure 47. Butterfly rolls.
① *Roll out into a wide sheet and coil into a dough strip.*
② *Cut into pieces 1¼ inches thick and crease each roll across the center.*

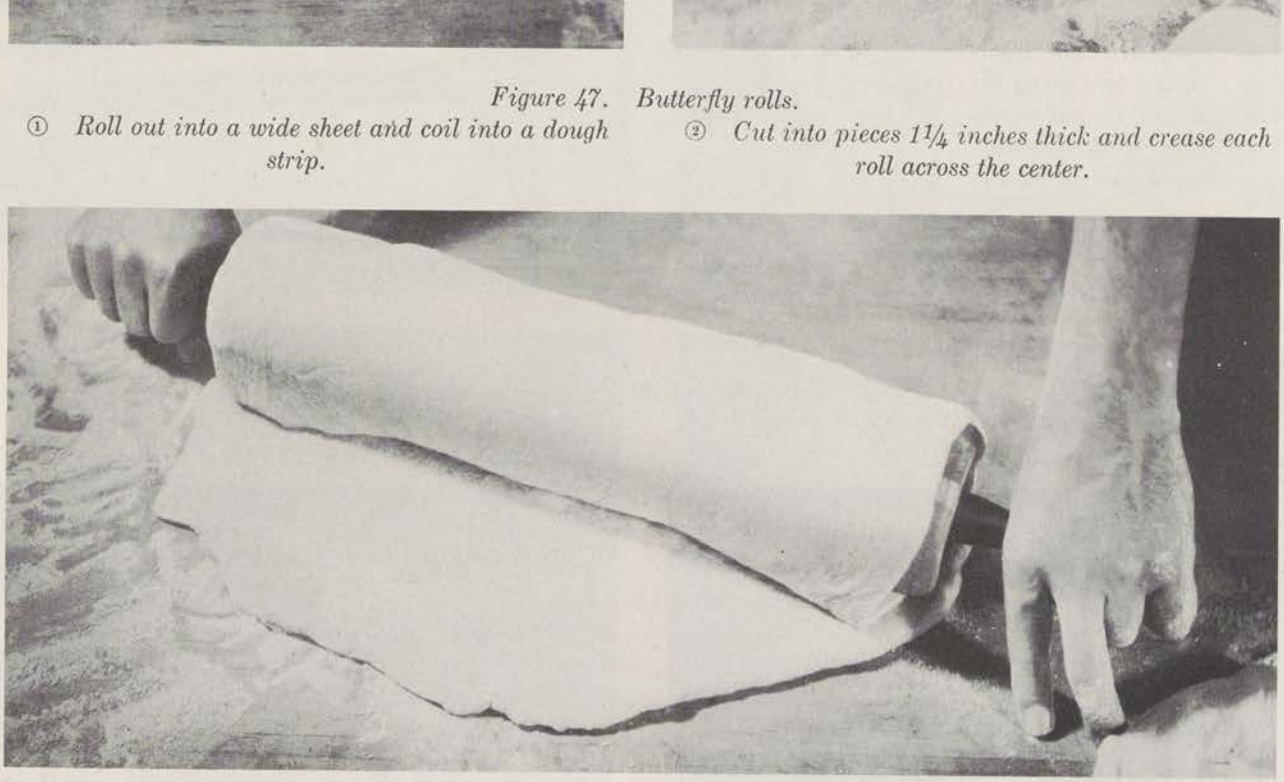
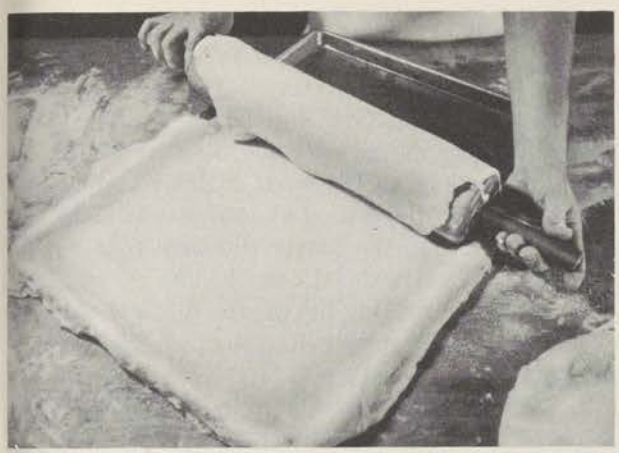


Figure 48. Fruit coffee cake. ① *Roll out 4 pounds of dough to ½ inch thickness, large enough for the sheet pan; coil the dough on the rolling pin.*



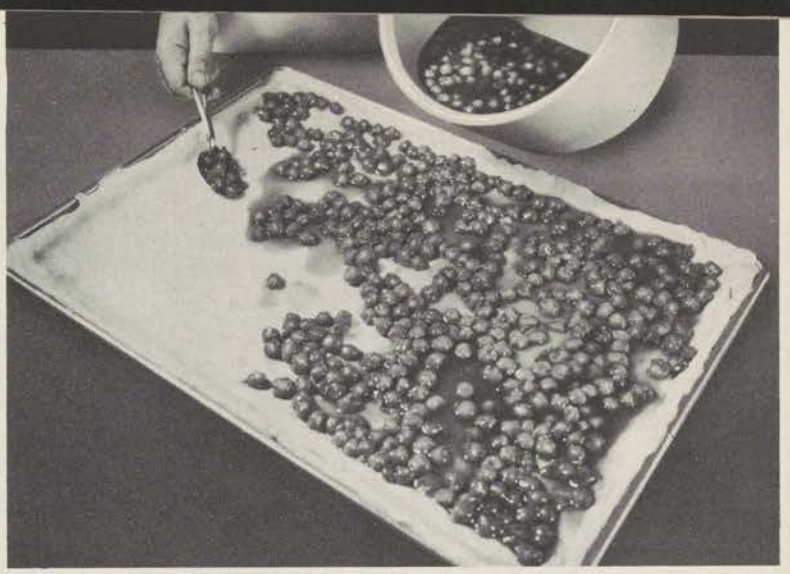


Figure 48—(Continued)

② *Uncoil the dough, laying it in the pan.*

③ *Place fruit over the dough.*

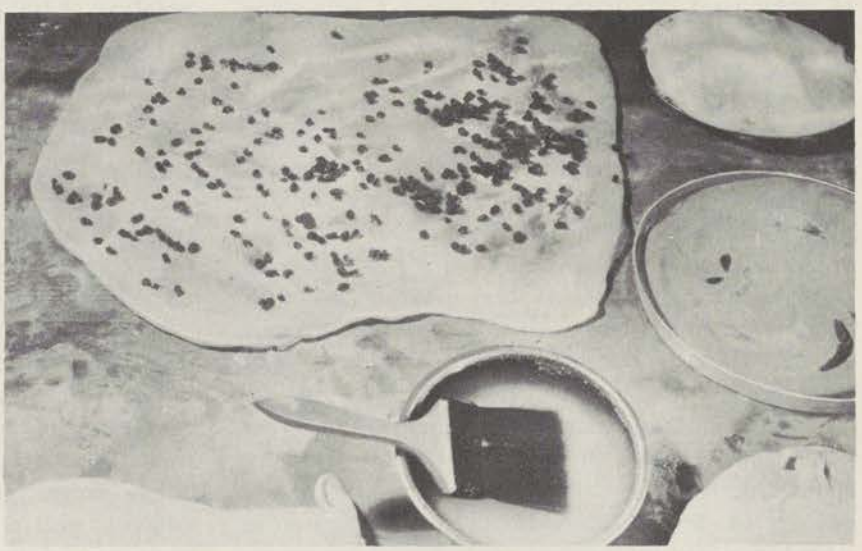


Figure 49. Old fashioned coffee cake. ① *Form the dough into oblong shapes; allow for recovery; then roll each piece into a sheet 1/4 inch thick and 16 inches wide; grease thoroughly, cover with sugar and dried fruit.*





② *Coil the dough into a loose roll.*

③ *Cut the strip into pieces 8 inches long.*

142. PIE CRUSTS AND FILLINGS. A pie is a combination of crust and filling. The quality of the finished pie will depend on these two component parts; the pie will be good only if the crust and filling are properly prepared. Many of the difficulties encountered in making good pies may be overcome by careful handling in mixing and by following a few simple rules in baking the pie. The information given below tells how to correct the common faults in pie making.

a. Shrinkage of Pie Crust During Baking. One of the principal causes of shrinkage is the improper coating of the flour with lard or shortening. When the flour is improperly coated, it takes on or absorbs water during the mixing period. This allows the gluten of the flour to develop and results in shrinkage of the crust in the oven. An excessively hot oven also causes the crust to shrink. Excessive amounts of water used in mixing dough causes a separation of the flour and water which, in turn, will cause shrinkage during baking.

b. Tough Crusts. A tough crust will result if an insufficient amount of shortening is used in the pie dough. A tough crust may be due to improper coating of the lard with flour. Excessive mixing after the water has been added to the flour and shortening will cause a tough crust. Toughness can be caused by using excessive amounts of water. A "strong" flour or flour with a high tolerance tends to make the crust tough; a "strong" flour has a high protein content. As a general rule, all the factors that cause shrinkage also cause toughness of crust.

c. Doughy Spots on Bottom of Crusts. Doughy spots will result if the pie dough is not mixed enough to develop smoothness. If the water is added in a streaky manner, spots containing excessive amounts of moisture will appear. This will bake more slowly and be doughy when the rest of the pie is baked. Mixing cold dough with warm dough often results in doughy spots. Doughy spots can be caused, also, by water spots remaining on the pie pan from improper drying.

d. Underbaked Bottom Crusts. The lack of heat in the lower part of the oven is a common cause of underbaked bottom crust. If the oven is too hot, the top crust will bake much faster than the bottom crust. If a hot filling is used, there is a marked tendency for the filling to boil more quickly, and the pie is often removed from the oven too soon on the assumption that it is done. Underbaked bottom crust will result if wet pie pans are used. Excessive moisture in the dough prolongs the baking period and will cause the filling to boil out before the crust is baked.

e. Fillings Boiling Out. The boiling point of pie fillings is determined by the percentage of sugar in the finished fruit mixture. The more sugar in the mixture, the higher will be the boiling point. Consequently, the sweeter the pie, the longer the time it can stay in the oven without boiling out. Boiling out may be caused by too hot a filling. The colder the filling, the longer the time required for the filling to be heated to the boiling point before the crust is thoroughly baked; the filling should not reach the boiling point before the pie crust is properly baked.

f. Control of Temperatures in Pie-baking. The importance of the right oven temperature in pie-baking cannot be overemphasized.

(1) Pie crust browns at a lower temperature if sugar or a carmelizing ingredient is added.

(2) Two-crust pies should be baked at a temperature of 400° to 450° F.

(3) Custard type pies should be baked at 400° to 425° F.

(4) Pie shells should be baked at 400° to 425° F.

(5) An excessively hot oven causes the pie crust to shrink.

(6) Underbaked bottom crust results from insufficient heat in bottom of oven.

(7) Low oven temperatures will cause the filling to boil out.

g. Ingredients. A good pie crust can be made from flour, shortening, water and salt. Other ingredients may be added to impart desirable characteristics to the crust. Baking powder sometimes is used to make a lighter and more tender crust. Sugar, syrup, honey, or dried milk may be added to give a crust more color. In other words, when any of these materials are added, the crust browns at a much lower temperature. Lard produces a tender crust. If the pie dough is mixed properly, the tenderness of the crust will depend on the amount of shortening used. The amount of shortening varies from ½ to ¾ pound to each pound of flour; ¾ pound of lard per pound of flour makes a very rich pie crust. Flour is the principal ingredient of pie dough. In the listing of ingredients below, the amount of flour is called 100 percent. The percents given for the other ingredients show their range in relation to the total quantity of flour. Thus, the amount of shortening is 50 percent to 75 percent of the amount of flour.

143. MIXING THE DOUGH. a. Weigh or measure the flour and shortening and place in a mixing bowl. Rub the shortening into the flour, by rubbing between the fingers and palms of the

Table XXXIII. Pie crust ingredients

Ingredients	Percent
Flour	100
Shortening	50 to 75
Salt	3 to 4
Water	20 to 50
Baking powder	0 to 1
One of the following (optional):	
Dried milk	1 to 5
Invert sugar or honey	1 to 5
White corn syrup	5 to 10
Granulated sugar	5 to 10

hands until all the shortening particles are reduced to the size of a small pea. The way the flour and shortening are mixed determines the tenderness of the finished pie crust and the way it will shrink when placed in the oven. If a mealy crust is desired, the flour and shortening will require more thorough mixing than for a flaky crust.

b. Weigh or measure the water and salt, and dissolve the salt in the water. If sugar is used it, also, should be dissolved in the water. This is then added to the flour and shortening mixture. It may be necessary to vary the amount of water due to the difference in flour absorption. Mix together with the hands just enough to make a smooth dough. The liquid must be incorporated into the flour and shortening mixture evenly. The most satisfactory results will be obtained if the dough is used as soon as it is mixed. Divide it, roll it, and place it in the pan. Then wash the rim with water or egg wash.

144. PIE FILLINGS. There are essentially three types of pie fillings. These are:

a. Fruit fillings, cooked or fresh.

b. Custard fillings which are placed in the unbaked pie shell and the two baked together.

c. Soft filling or creams which are cooked separately and are poured into the baked shell.

145. PREPARATION OF FRUIT FILLINGS. Fruit filling is prepared in the following manner:

a. Separate the juice from the fruit.

b. Thicken the juice with cornstarch.

c. Add sugar and salt to the thickened juice.

d. Add the fruit.

e. As a general rule, 2 to 3 pounds of sugar are needed for each No. 10 can of fruit, depending on its acidity. More starch is required for the juicier fruits. When more sugar is used more starch is required.

f. If the filling is to be held for any length of time, it is best to place it in a crock or wooden container. Fillings tend to pick up metallic flavors if stored in metal containers.

g. The amount of starch necessary to produce the desired thickening depends on several factors:

(1) The amount of acid in the fruit. All fruits are acid, and acid tends to liquify the starch; therefore, the more acid in the fruit, the more starch required to thicken the juice.

(2) All fruit fillings should be chilled in the refrigerator before they are placed in the pie. They should be chilled as rapidly as possible. Chilling helps to preserve the natural color of the fruit and a cool filling increases the time before the filling boils in the oven.

146. CUSTARD PIE FILLINGS. Custard type pie fillings usually are made by placing sugar, salt, and spice in a mixing bowl, adding the eggs and stirring briskly with a wire whip to dissolve the sugar and cut up stringiness of the eggs. The milk is then added and stirred well; and, finally, the melted butter or fat is added. The filling should be allowed to set long enough to permit the foam that has been developed by mixing to settle. Otherwise, if the pie shells are filled and baked right away, an undesirable surface will result on the finished product. In making pumpkin pie, the pumpkin is added after the eggs have been mixed with the sugar. Soft pies are not recommended for hot summer months, as they are more apt to sour and cause food poisoning.

147. COBBLERS. A cobbler is nothing more than a large pie. The same crust and fillings which are used in ordinary pies are used to make cobblers. The cook or baker quite often finds himself in a situation where it is impossible to make small pies, but he can make cobblers without difficulty.

a. Use a regular sheet pan or other shallow pan. Roll out 3½ pounds of pie dough to a size slightly larger than the size of the pan to be used. Roll the dough around the rolling pin and place on the pan. Wash the edges of the dough, as when making ordinary pies.

b. Place 6 to 6½ No. 56 dippers of filling in the pan.

c. Roll out the top crust and dock with a fork before placing over filling. This is necessary to allow vapors to escape.

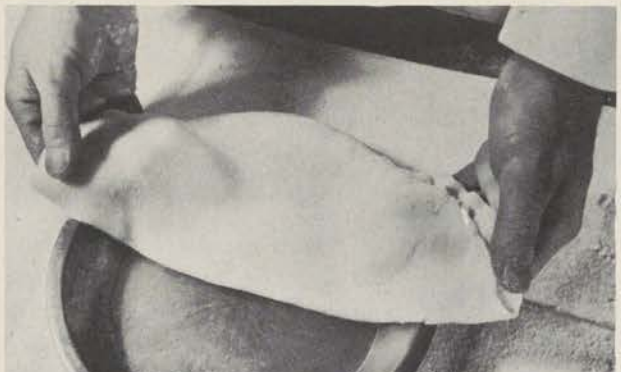


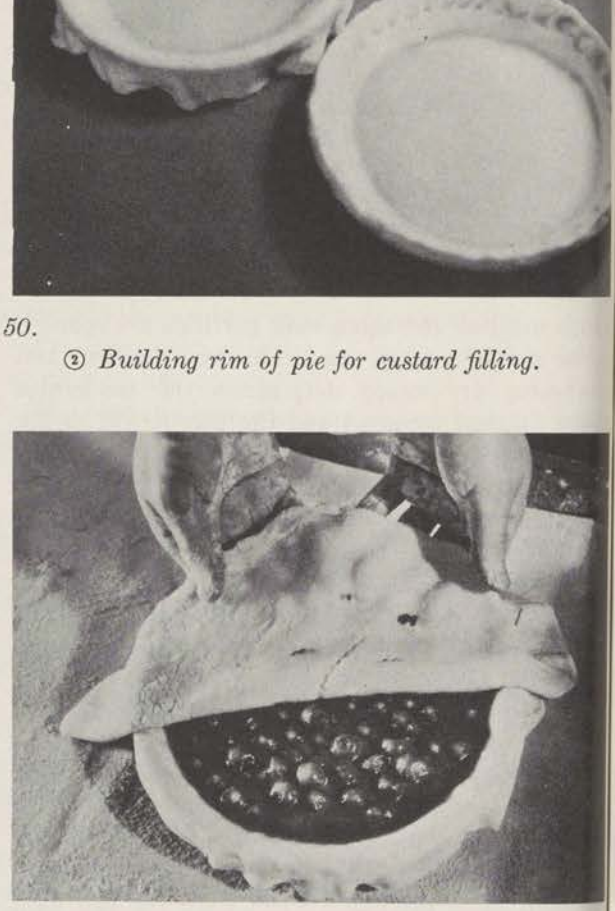


Figure 50.

① *Placing dough in pan.*

② *Building rim of pie for custard filling.*





③ *Washing the rim.*

④ *Placing top crust.*

d. The top crust may be a full crust or a series of two inch strips placed lengthwise and crosswise on top of the filling.

e. The cobbler is baked in a hot oven (400° to 425° F.) from 50 to 60 minutes.

148. CAKES AND ICINGS. Cake is baked batter made from sugar, eggs, shortening, milk, flour, and chemical leavening mixed together in such a way as to produce a fluffy, fine-grained baked product. In order to make cakes satisfactorily it is first essential that the action of the ingredients be known. A brief discussion of the ingredients follows:

a. Sugar in Batter and in Baked Cake. There are two sources of sugar commonly used in cake one, the sugar cane; two, the sugar beet. Either cane or beet sugar works equally well in cake making. Several different granulations are used as well as powdered sugars. A fine granulated sugar is best for making cakes because the sugar must be dissolved completely. Sugar has several functions in cake making:

(1) It sweetens the cake.

(2) Since sugar crystals are perfect cubes, the sharp corners of these cubes have a tendency to help cut air into the cake batter during the mixing period, thus helping to make the cake light.

(3) Sugar controls the consistency of the batter, the more sugar used, the softer the batter will be.

(4) Sugar has a tenderizing effect on the gluten developed in the flour, and thus should be classified as a tenderizing ingredient.

(5) Sugar helps retain the moisture in the finished cake.

(6) Sugar helps control the color of the crust in the finished cake.

(7) Sugar adds food value.

b. Shortening. Lard may be used with excellent results as the shortening in cake making. It contains a considerable amount of low-melting-point fatty acids which help produce very moist, tender cakes of good flavor and keeping qualities. Shortening performs several functions in cake batter:

(1) It makes the cake tender because it has a softening action on the gluten developed in the flour during mixing of the cake batter.

(2) Shortening helps to incorporate air in the batter by taking on air during the mixing period. The amount of air in the batter governs the fineness of grain, as well as the tenderness, and helps to control the volume of the finished cake.

(3) Shortening helps to emulsify the liquids added to the cake batter.

(4) Keeping qualities of the finished cake are increased by shortening.

(5) If shortening such as butter or lard is used, flavor is added. A neutral shortening does not affect the flavor.

(6) Food values of the finished cake are strengthened by shortening.

c. Eggs Add Structure to the Finished Cake. Contrary to the common belief, eggs do not cause a cake to rise—the air that has been whipped into them causes that action. The function of eggs in cake is:

(1) To help build the structure of the cake; this structure helps to carry the tenderizing ingredients, such as sugar and shortening and chemical leavening.

(2) To add moisture to the finished cake.

(3) To add color. Whole eggs and yolks definitely add color to the finished cake.

(4) To help bind the other ingredients together, causing an even distribution of the ingredients. An even distribution produces the smooth batter essential for a good cake; if the batter separates, the results obtained in the finished cake will not be satisfactory.

(5) To add food value to the cake.

d. Liquid milk. Liquid milk has a prominent part in cake making, especially in white and yellow layer cakes. In devil's food cake, the milk solids are not desirable, due to the fact that they lower the caramelization point of the cake batter, and have a tendency to affect the crust color of the finished cake. If the color of the finished cake is not important, then milk can be used very satisfactorily, but it is much easier to obtain a red color in devil's food cake without the use of milk solids. The following are the functions of milk in cake making:

(1) To control the consistency of the finished cake batter.

(2) To dissolve the sugar which is added to the cake. If the sugar is not dissolved, a spreading action from the sugar results during the baking period, causing the structure of the cake to overstretch and the finished cake to collapse in the center. When too little milk is used in the cake batter, there is not enough liquid to develop properly the gluten in the flour and thus obtain the desired structure. Based on the flour as 100 percent, the combined weight of the eggs and liquid milk in white and yellow layer or sheet cake should be 20 to 30 percent more than the sugar. In devil's food cake, it should be 40 to 60 percent more than the sugar.

(3) To impart color to the crust. By regulating the amount of milk solids in the cake batter, the crust can be controlled, because milk solids contain a high percentage of lactose (milk sugar) which caramelizes at approximately 270° to 275° F. The caramelizing temperature is well below that required to bake the cake.

(4) To improve the keeping qualities of the finished cake, because the milk solids help to retain moisture.

(5) To add food value to the cake.

(6) To add flavor to the cake.

e. Flour Helps to Furnish the Cell Structure of the Finished Cake. This is brought about by mixing the flour with the liquids in the cake. This develops the gluten or protein in the flour.

f. Salt and Flavoring. (1) Salt is used in cake to bring out the flavors which are added to the batter. If a cake seems too sweet, a slight addition of salt will tone down sweetness.

(2) Flavoring materials are added to give the cake a predominant flavor. Often a blend of flavors produces a very desirable finished flavor.

g. Leavening. (1) A chemical leavening controls the volume of the finished cake. The chemical leavening agents may be baking powder, baking soda and buttermilk, or baking soda and some acid-reacting material common to baking powder. During the baking period, the baking powder gives off carbon dioxide gas and the gelatinous material in the cake, such as the egg and the gluten developed

in the flour, holds this gas and causes the cake to rise. When baking is done at high altitudes the amount of leavening should be reduced because of decreased atmospheric pressure.

(2) Air which is incorporated in the batter has a leavening effect. When the air is warm, it has a tendency to expand, and this expansion causes the cake to rise. The air mixed into the cake batter carries the vapor which is developed during the baking period and allows it to circulate through the top crust. If the cake batter does not contain enough air and does not rise properly, this vapor cannot work out through the cake properly during the baking period. It finally will work out through the bottom of the cake and build up pressure, forcing the cake up and forming a pocket on the bottom. It is apparent, therefore, that a certain amount of air in the cake batter is necessary. The air in layer cake is responsible for 40 to 50 percent of the finished cake volume.

(3) Vapor pressure also causes the cake to rise. The reason this is called vapor pressure, rather than steam is that during the baking period the inside of a cake never reaches a temperature higher than 210° F., and steam is developed at 212° F.

149. CAKE FAULTS AND REMEDIES. The inexperienced cook may encounter certain difficulties in making cake. These may be overcome, however, with practice and by using a good formula, good ingredients and care in mixing and baking. Some of the causes for cake failures and suggestions for avoiding them follow:

a. Factors Responsible for Cakes Falling in the Center:

(1) Too much baking powder will cause a cake to dip in the center. To guard against this, check the formula to be sure that the amount of baking powder is correct. In the average layer cake the baking powder should be 5 to 6 percent, based on the weight of the flour as 100 percent. If over 7 percent is used, the cake will collapse in the center. Decrease the baking powder if the amount called for is found to be excessive. Too much baking powder may be detected by tasting the cake, if one is experienced in cake work.

(2) An excess of sugar will cause the cake to dip in the center. The combined percentage of egg and milk should exceed the percentage of sugar by 20 to 30 percent in white and yellow cake, and by 40 to 60 percent in devil's food cake. Even the proper amount of sugar will be excessive if too little liquid is used. Too much sugar shows in the form of white spots on the top of the cake, and on tasting the cake will be very sweet.

(3) Too much air in the batter will cause a cake to dip in the center, however, this will happen very rarely. In this case, the grain will be very compact, especially tight on the bottom and open on the top, and the cells of the cake will be very fine.

b. Why Cakes Peak in the Center. (1) An excessive amount of structure-building material such as eggs.

(2) Too little sugar in the batter. Based on flour as 100 percent, the sugar may vary from 100 to 120 percent.

(3) Too little baking powder. The baking powder may vary from 5 to 6 percent, based on flour as 100 percent.

(4) Oven too hot. This can be detected by looking at the bottom of the cake to see if it is too brown. Darkness around the edges of the cake and the smoothness with which it lets go or shrinks away from the pan during the baking period are other signs of too hot an oven.

c. A Cake Which is Too Tender Will be Very Flat on Top. It will rise excessively in the oven and will tend to break away from the sides of the pan, leaving considerable crust hanging to the sides. This will give a rough finished side to the cake. Furthermore, the cake usually has a coarse grain. This can be corrected.

(1) Check the oven temperature. Most layer or sheet cake formulas are for baking at 380° F. A low oven temperature will cause a cake to be too tender.

(2) If the oven temperature is correct, check the percentage of baking powder. Excessive baking powder will cause the cake to be too tender. The baking powder should be 5 to 6 percent, based on flour as 100 percent. In the case of devil's food cake, the combined percentage of baking powder and soda should be approximately this figure.

(3) Excess of sugar will cause the cake to be too tender. Check the ratio of sugar to moisture to see that there is enough moisture to dissolve the sugar. The combined eggs and milk should be 20 to 30 percent more than the sugar in the case of yellow and white layer cakes, and 40 to 60 percent in the case of devil's food cake.

(4) Check the ratio of eggs to shortening. There should be at least 10 percent more eggs than shortening. This percentage may be as high as 35 percent more eggs than shortening. If fewer eggs than this are used, very crumbly, tender cake will be produced.

d. Shrinkage of the Cake. This shrinkage may occur in the oven or after removal from the oven.

The following factors affect the shrinkage of cake in the oven:

(1) If the percentage of milk added to the batter is too high, shrinkage will result. When the cake is cut, heavy streaks usually will appear along the bottom.

(2) The temperature of the oven is important. An excessively hot oven will cause the cake to peak and crack on top, and can be verified by examining the bottom crust which will be dark. A hot oven produces very smooth edges on the finished cake. Too low an oven temperature will cause the cake to flatten out, being very flat on top and with ragged edges where the crust has clung to the edge of the pan as the shrinkage has occurred.

(3) Certain characteristics of a cake during baking indicate that it may shrink after removal from the oven. These include excessive puffing, entire lack of structure and an underbaked appearance at all times. The two principal causes of shrinkage in a cake after it is removed from the oven are:

(*a*) Too high a percentage of shortening. All flours have certain shortening-carrying properties. An excessive amount of shortening, which makes the gluten in the flour elastic, causes it to overstretch during the baking period. On removing the cake from the oven the vapor escapes, causing an almost complete collapse of the structure of the cake. This will occur within the first 3 or 4 minutes after the cake is out of the oven. Less shortening may be used in making cake when the flour contains a poor quality gluten.

(*b*) The type of flour used. Short patent flours produce the finest cakes, straight flours the next best, and clear flours the least desirable. A bleached flour has greater moisture and shortening-carrying properties. A poorly bleached or an unbleached flour will carry only about two-thirds the amount of shortening of a well-bleached flour. A green flour (one which has not had the proper aging) also will cause shrinkage. The baking properties of a cake flour can be measured by its performance in yellow layer cake which contains high percentages of sugar, liquid and shortening.

e. Pockets in the Bottom of a Cake. Pockets in the bottom of a cake are the result of several conditions.

(1) Lack of air in a cake batter prevents the vapor from working out properly and it collects at the bottom of the cake, forming a pocket. This can be corrected by increasing the leavening or by incorporating more air into the batter. The latter may be accomplished by longer creaming or by whipping the egg whites with some of the sugar to increase the lightness of the finished product.

(2) An excessive amount of milk in the batter may cause a pocket to form, even though the correct amount of chemical leavening has been used and sufficient air incorporated in the batter.

(3) A pocket may be caused by too much heat in the bottom of the oven. If it is not possible to adjust the baking conditions of the oven, the cake may be double-panned (first pan placed in a second). A slight increase in baking powder also will help under these conditions.

f. Several Factors are Responsible for a Cake being too Dry. (1) A dry cake results when there is too little moisture in the batter. The percentage of baking loss is the same in cakes which are scaled the same weight, baked in the same size pans for the same period of time and at the same temperature. In other words, the baking loss is in the crust of the exposed surface. The inside of the cake after baking will test within 1 percent of the actual moisture content of the cake batter. The ratio of the eggs and milk to sugar should be studied in the formula to be sure that the amounts given are the same as specified in this section.

(2) Excessive baking powder will produce a cake with a coarse grain, which will have a tendency to dry out rapidly. This may be corrected by reducing the baking powder slightly or by increasing the milk slightly.

(3) The type of shortening will influence the degree of dryness. A cake made with lard usually is moist and tender.

g. Control of Temperature. (1) If the oven temperature is too low, the cake will be excessively tender.

(2) If the oven is too hot, the cake may pack in the center.

(3) Shrinkage is caused by an excessively hot oven.

(4) Too low a temperature also causes shrinkage.

(5) Too hot an oven causes very smooth edges on the finished cake.

(6) Too low a temperature causes the cake to flatten out on top.

(7) Too low a temperature causes ragged edges on the finished cake.

(8) Too much oven heat may cause pockets in bottom of cake.

150. ICINGS. Icings bring out the fine flavors developed in the cake. A good icing can improve a poor cake. When the cake is cool, it is ready for icing. Place a paper over the top of the cake,

put the bottom of a pan over the paper and turn the cake completely over and onto the second pan. Lift off the original pan and remove the paper sticking to the bottom of cake. Place 3 pounds, or 1 No. 56 dipper, of icing on each cake. Spread evenly. By dipping a sharp knife into hot water, a clean cut can be made. To obtain pieces 3 inches square, make 12 cuts lengthwise and 9 crosswise of the cake; the yield will be 108 pieces per sheet cake. If larger pieces of cake are desired, make 6 cuts in length and 6 cuts in width. This gives a serving 4 inches long by 3 inches wide, or 36 pieces per cake.

151. COOKIES. Cookies are always popular and should be very satisfactory as summer desserts for the Army. Unlike most other desserts, cookies will keep almost indefinitely and can be made ahead of time and used as needed. This is a decided advantage to the Army cook. Cookies fall into two general classifications—the soft type and the hard, brittle type. The proportion of sugar and moisture determines whether the cookies will be soft or brittle; the more sugar and the less moisture, the more brittle the cookie. Soft batter cookies may be dropped by hand in pieces the size of a walnut on a greased and flour-dusted pan. Stiff batter cookies may be rolled out in long strips and cut into pieces of about the same size. Then these pieces are placed on the pan and flattened before baking.

Table XXXIV. Cookie ingredients

Item	*Percent*
Sugar	40 to 70
Lard	20 to 40
Salt	1½ to 2
Soda	0 to 1½
Baking powder	0 to 5
Molasses	0 to 40
Eggs	0 to 25
Liquid milk	0 to 40
Oatmeal	0 to 30
Fruit-raisins	0 to 100
Spices	(to taste)
Flavor	(to taste)
Flour	100

152. INGREDIENTS FOR COOKIES. A study of cookie-making shows that the ingredients used will vary as follows, based on the flour as 100 percent: For the brittle type cookies made by hand, the combined percentage of eggs and milk should be 25 to 35 percent, with the sugar varying from 50 to 60 percent under normal conditions. In the soft type cookies, the sugar will run approximately 40 percent and the moisture (eggs and milk) will be approximately 60 to 65 percent.



Figure 51. Making molasses cookies. Place the small pieces of dough in the pan and flatten until each is about 3 inches in diameter.

153. FAULTS AND REMEDIES. a. Why cookies stick to pan. (1) Cookies will stick if pans are not greased sufficiently.

(2) If the pans are not properly cleaned the cookies may stick.

(3) When materials which caramelize excessively such as milk solids, milk or sugars, are used, the cookies brown (caramelize) at a low temperature, causing them to stick.

(4) Excessive heat in bottom of oven causes the cookies to burn on the bottom, with the result that they will stick.

b. Why Cookies Spread. (1) When the formula contains a high percentage of sugar and the cookies are baked at a high temperature, excessive spreading will result. Cookies of this type usually contain very little moisture and most of the sugar is in the crystalline state (has not been dissolved) in the cookies. When it heats in the oven, the sugar melts and produces a spreading action.

(2) Too much baking soda will cause excessive spreading.

(3) Greasing the pans too heavily also will cause spreading. This will result in thin edges on the cookies.

c. Illustrations. *The following illustrations* show the manner of placing dough in pans for baking cookies and fruit bars.

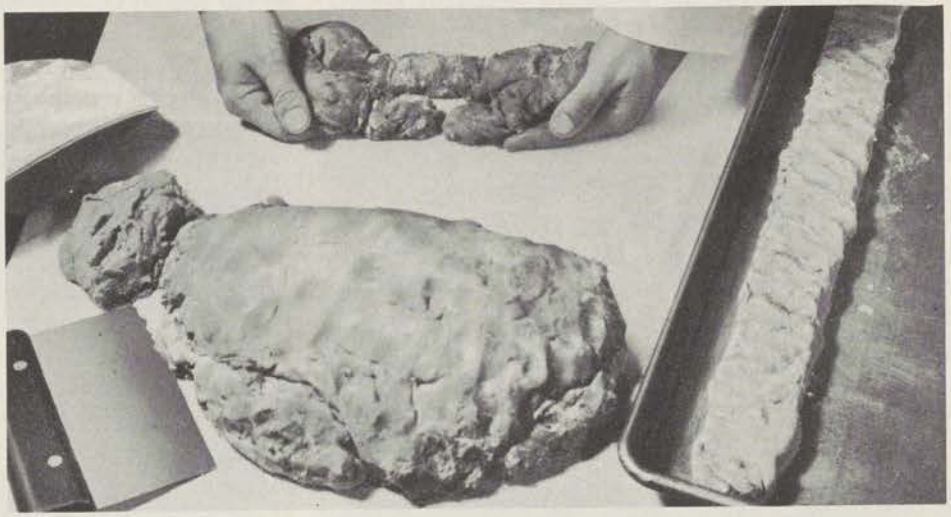


Figure 52. Fruit bars.
① Placing strips in pan.



② Flattening the bars.

CHAPTER 7

SERVICE OF PREPARED FOODS

154. GENERAL. Time and exacting care spent in making food nutritious and appetizing can be wasted by indifferent service and careless handling on the part of mess personnel. Good service plays an important part in the proper enjoyment of food. Food served at the right time, at correct temperatures, and displayed and garnished to convey appetite appeal are elements of service to be remembered. Pleasant surroundings also contribute to an appreciation of well prepared food. Attractive mess hall decorations, window curtains, flowers, good ventilation and cleanliness, improve the atmosphere. A cheerful and obliging attitude on the part of food servers contributes to the enjoyment of a meal. Serving personnel should be pleasant, respectful and quiet of voice. A constant desire to provide better service should be the goal of all soldiers engaged in messing activities.



Figure 53. Plate waste segregation stand.

155. BASIC STANDARDS. a. Food handlers should always present a neat appearance. Hands and fingernails should be clean. Cooks' caps should be worn. When it is necessary to use a handkerchief turn away from the food. Any mannerism which might be objectionable to persons being served should be avoided.

b. Dishes and condiments, placed on tables, should be aligned in an orderly manner. They should be checked daily for cleanliness and should be refilled or replaced when necessary.

c. Food service should be coordinated with food preparation to eliminate any unnecessary lapse of time between the preparation of the food and the serving of the meal. Many foods, cooked too far in advance of serving, will lose a large part of their nutritional value before being consumed. They will be less attractive, and will lose flavor. Concerted efforts should be made to eliminate servings of "early chow" to a few, substituting "late chow" where necessary. The serving of "early chow" for about 5 percent of the organization means that about 95 percent of the men must eat meals prepared long in advance to accommodate only a few men.

d. In garrison mess halls, a dining room orderly (DRO) should be on duty at each meal to see that the soldiers are seated properly to avoid wasting table space.

e. When finished eating, the men should scrape their own plates into the proper containers. Plate scraping should be conducted in a clean and sightly manner, out of view of persons eating. Figure 53 illustrates a stand with suitable containers for the various garbage scrapings from plates. The stand has several advantages:

(1) It permits two lines of men for scraping plates.

(2) It gives the cook a quick way of noting the food preferences of the men.

(3) It makes it possible to weigh various types of garbage more readily.

(4) It will assure keeping edible garbage segregated from inedible.

156. RULES FOR SERVING. There are certain practices that apply to any style of serving. These are:

a. Vegetables should be drained before serving.

b. Soft foods, as mush, mashed potatoes, and turnips, should be neatly rounded off, not merely thrown into the dish.

c. Roast meats, as beef, veal, pork, and lamb, should be of uniform thickness and the slices should be laid evenly and neatly on the dish or platter. If gravy is spilled on the edges of the platter, it should be wiped away.

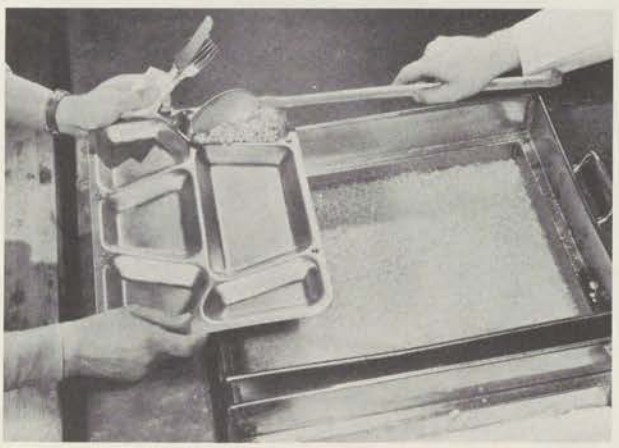
d. If possible, provide a stock or gravy for meat and potatoes.

e. Foods intended to be served hot, as soups, meats, vegetables and beverages should be actually hot. Nothing is so disappointing as lukewarm soup or coffee. Serving dishes should be kept warm, either by being placed on the range mantel or by other means. Cold food should be thoroughly chilled and the cook must use foresight to chill them sufficiently in advance of serving to accomplish this. Hot or cold foods should not be placed on the tables until just before the men are seated; other foods may be set out earlier.

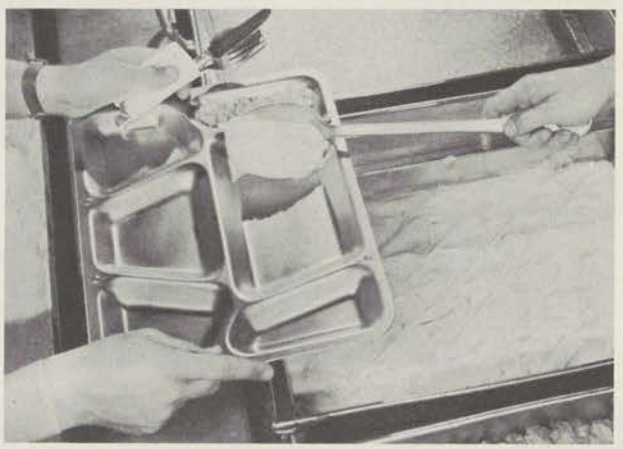
f. Pies and cakes should be cut neatly. Pieces of cake should be arranged neatly on the serving dish without excess loose crumbs.

g. A little cracked ice added to butter, olives, etc., and to fresh raw vegetables, as radishes, green onions, lettuce, celery and sliced tomatoes, before they are sent to the tables makes these foods much more appetizing.

h. Fresh fruits, as apples, oranges, pears, grapes and bananas, are much tastier when cold, and therefore, should be thoroughly chilled before serving.



① *Vegetable drained properly before serving.*

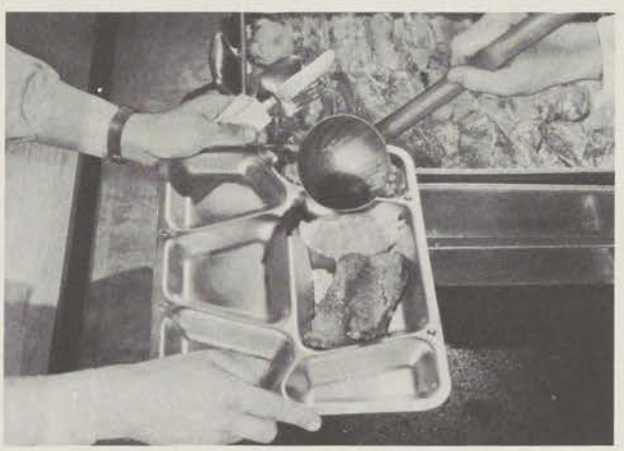


② *Mashed potatoes, appetizing in the serving dish and well rounded off for the individual portion.*

Figure 54.



③ *Meat laid evenly on the serving dish and served carefully.*



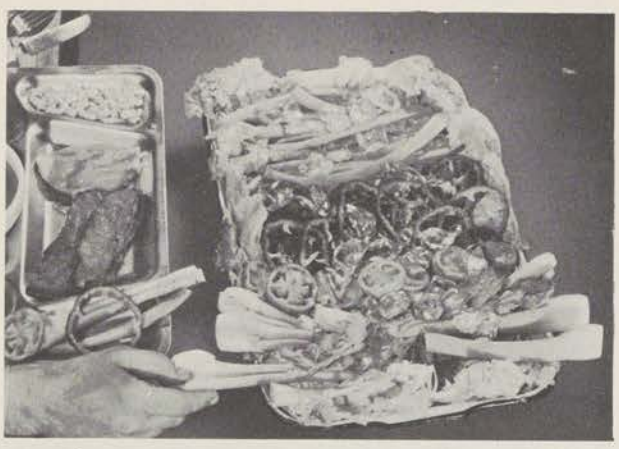
④ *Gravy served skillfully and in the right amount.*



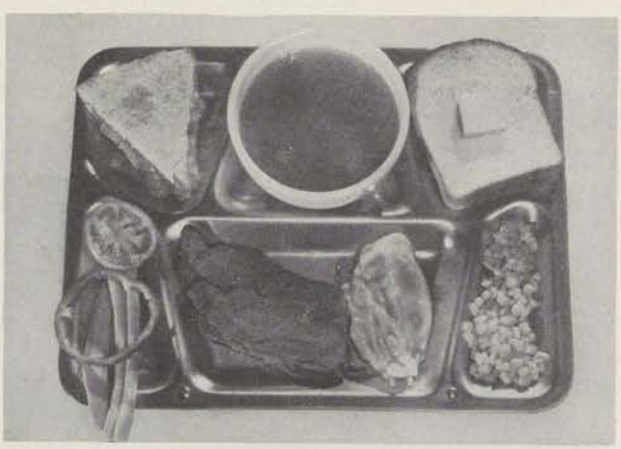
⑤ *Soup intended to be hot is served hot.*



⑥ *Pie that has been cut with care is served in the same way.*



⑦ *Cracked ice makes these fresh, raw vegetables more pleasing.*



⑧ *A tray with food properly arranged and well served.*

Some fresh fruits require a little further preparation; large bunches of grapes, for example, should be cut into smaller portions; fruit should be washed.

157. CARVING. a. General. Food carving is an important part of the appearance of a meal. Carving affects both the appearance and the texture of meat. Poor carving can seriously damage fine meat. Carving is a skill that every cook should develop. To become skillful, a few principles must be mastered. Carving requires practice and a knowledge of muscle structure and the location of the bones and joints. Good carving depends to a great degree on good cooking. If meat is underdone it is difficult to carve it; if it is overdone, the slices fall apart. Carving in the Army mess is largely a matter of slicing.

b. Slicing. To make good slices of meat, the carver must use the proper knife, have it well sharpened, and follow his knowledge of slicing. Knowing the direction in which the muscles run is essential, because, in making a slice, the carver should cut *across* the grain, for this shortens the fibers and makes better slices. In carving most cuts, such as roasts and pot roasts, carving across the grain may be accomplished by making the slices parallel to the cut surface because the meat was originally prepared by cutting across the grain. Steaks, however, are carved with the grain.

c. Procedure. Slicing must be done on a wood surface because metal will turn the cutting edge of the knife. Use a carving board placed in a sheet pan to catch the meat drippings. The meat should be held firmly with a large fork. After the

first cut is made, the angle at which the knife is held should never be changed, or a jagged, uneven slice will result. In all slicing, each stroke with the knife should be drawn the full length of the blade, eliminating the sawing motion. This gives a smooth slice. The most attractive slice is the one cut just the right thickness for the particular kind of meat. A paper-thin slice seems ungenerous; too thick a slice is unappetizing. Good carving, then, means knowing where to make the first cut, and continuing to make parallel cuts until enough portions have been secured to serve everyone.

158. STYLES OF SERVICE. There are two types of service in general use in the garrison mess hall: "cafeteria" service and "family style" service. Each type has its value. The cafeteria service usually is preferred because of the ease and speed of serving, the control of portions and the reduction of waste. There are conditions, however, under which the family style service, or a combination of the two, is advisable.

159. CAFETERIA SERVICE. In cafeteria style service, the men form a line by the serving counter. They pick up trays or plates, and the servers at the counter dish out the portions to them.

a. Menu Displays. The soldier should know what is being served before he arrives at the items in the line. A good practice is to post a legible menu over the serving line or in front of the line. This may be in the form of a small blackboard or a new sheet of paper for each meal, with the menu neatly lettered on it. Another form is a menu board. This is a board with grooves that will hold cards bearing the names of various dishes for the meal. Any method gives the soldier time to decide on the size of portions he desires, or to refuse a food that he will not eat. It is found, too, that service is speeded up when the soldier knows what food is being served before he reaches it.

b. Preparation for Service. After making sure that the steam table is clean, see that it is filled with hot water to the right level and that the proper temperature is maintained. Remember, the purpose of a steam table is to keep food hot but not to cook it. Foods should remain on the steam table as short a time as possible. If the mess hall does not have a steam table, foods should not be brought to the serving counter until the time they are to be served. See that the dishes and equipment required for the day's menu are placed before serving time. Compartment trays, plates and silverware should be carefully inspected for dirt and for stains. A man receiving a dirty fork or tray is inclined to feel that his food is dirty. Stack plates and trays neatly. Place the silverware so that the handles will be grasped first. A plan for construction of silver boxes is shown in figure 56. See that the food is arranged on the serving counter in proper order. An ideal order of food on the serving line is: vegetables, potatoes, meat, gravy, salads, bread and butter, desserts, soups and beverage. An important part of the preparation for service is deciding where each food item will be placed on the tray or plate. Each server should know where to place the food he is serving. This knowledge speeds up the service and gives a better appearance to the tray or plate.

c. Heating Dishes. Whenever chinaware is used for the service of hot foods, meal satisfaction will be increased if the dishes are heated before the service of foods. Warming to insure against foods being unduly cooled before consumption is all that is needed. Compartment trays that are unusually cold should be warmed to about room temperature. Since both cold and hot foods are served on the same tray, the trays should not be excessively hot or cold.

d. Duties of the Server. The main duty and responsibility of the server at the counter is to serve standard portions of hot and cold foods, neatly, quickly, and quietly. This can be done if he will plan his work in advance and make every effort to

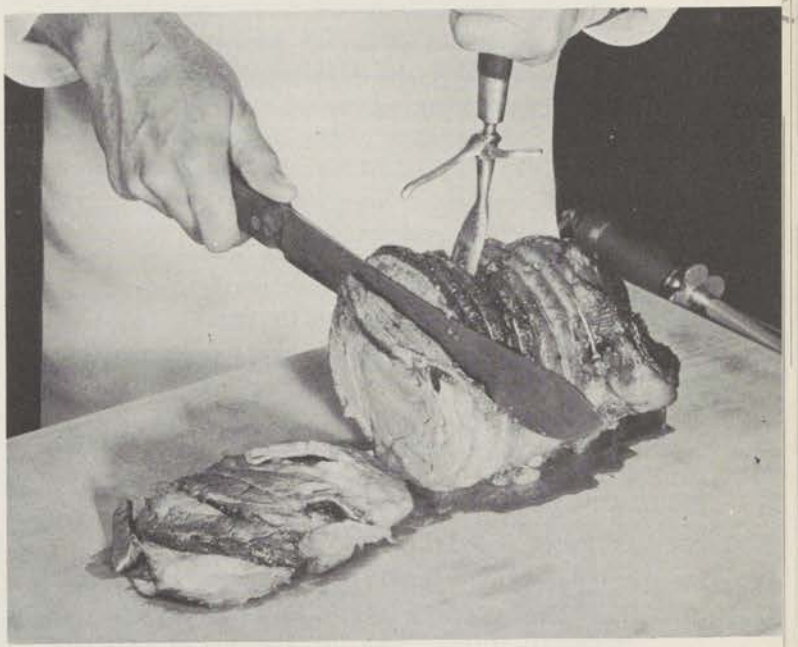


Figure 55. Slicing roast beef.

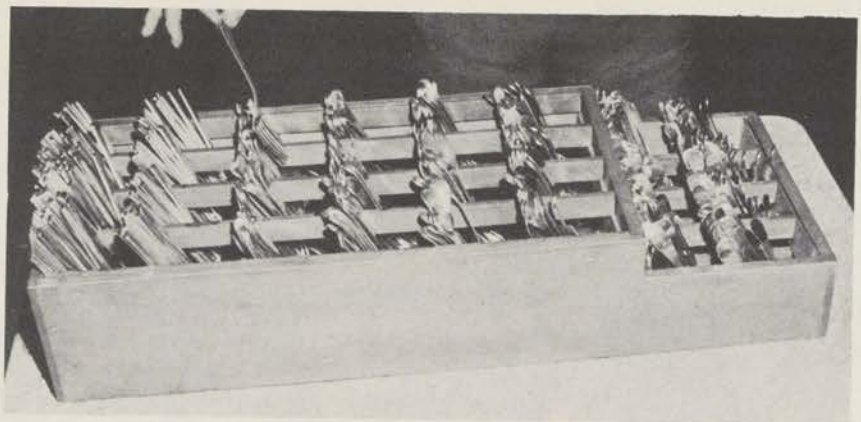
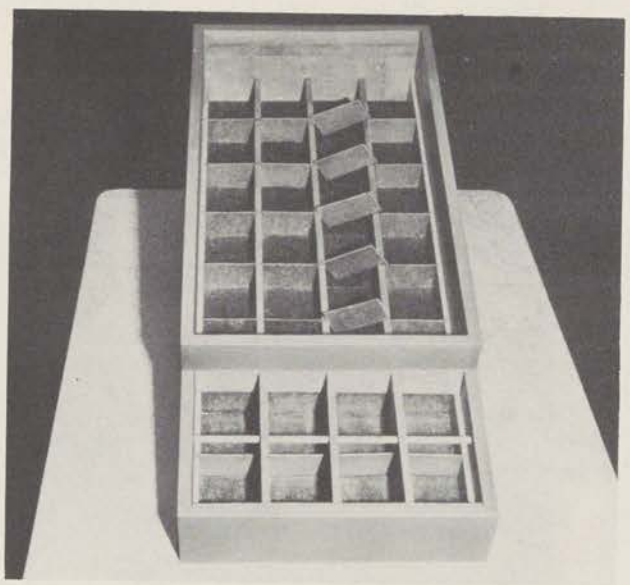
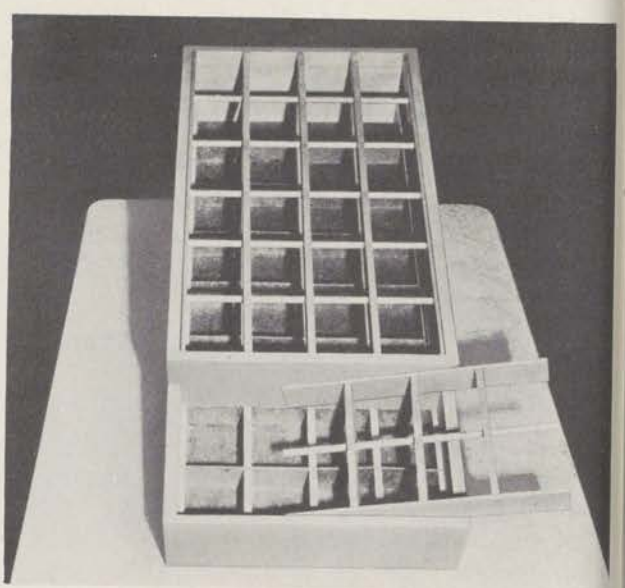


Figure 56. Compartmented silverware box. ① *Silver so placed that the handles are grasped first. The box is thirty-four and three-quarters (34¾) inches long by fourteen and three-quarters (14¾) inches wide. It consists of eight compartments for knives, sixteen for forks, and eight for spoons. The section for spoons is at the front of the box and is four inches. The section for knives and forks is six and one-eighth (6⅛) inches high.*



② *In the bottom of the box are removable partitions, two (2) inches high, which fit together like the parts of an egg carton.*



③ *On top of the box is a crosswork of dowels which holds the handles in place. Partitions and top crosswork are removable for cleaning.*

serve as well as he can. The server can profit by observing the following directions:

(1) Check the food on the serving counter with the menu to insure that nothing has been omitted.

(2) Never touch food with the hands; use fork, knife, or spoon or combinations of these.

(3) Serve vegetables with a spoon that will drain juices. Place the helping on the plate carefully. Spinach and other greens should be served with tongs and the excess water squeezed out.

(4) Do not mash foods in serving them.

(5) In serving meat, use a fork, spatula, or pancake turner, and lift the pieces carefully to prevent their breaking up. Arrange the meat in the pan so it is attractive in appearance. Beware of stacking.

(6) If meat is dry, a small amount of stock should be poured over it.

(7) Roasts will have a greater appeal if they are sliced on the serving line. A good meat slicing man can begin 10 minutes before the line starts, and keep up with it.

(8) When necessary to replenish trays of food, the small amount remaining should be combined with the new supply.

(9) Refills should never be dumped into the old serving pan on the serving counter. This detracts from the appearance of the food.

(10) Do not dish up hot foods ahead of time, as the soldier wishes to see his food served and does not like to find that it has been standing. By serving food only when the soldier reaches it in the line, portions can be adjusted better to satisfy the individual.

(11) When serving foods that are browned on top, such as baked macaroni, the server should see that some of the brown remains on the top of each portion.

(12) In serving soup, make sure that the grease has been skimmed off the top and the soup stirred before serving; stir it frequently during the process of serving.

(13) To avoid spilling, do not fill a bowl or cup too full.

(14) Never serve a food that has a questionable odor or appearance. If there is doubt about its being good or appetizing, report it to a superior.

(15) Do not lean on the counter. Maintain good posture.

(16) If there is a lull in serving, use this time for checking and replenishing food supplies and wiping up any spots on the serving counter caused by food dropping, spilling, etc. A clean towel should be kept handy for this purpose. It is the server's responsibility to keep his station clean.

(17) Never stir food when not busy, or handle the food unnecessarily.

(18) Do not taste food at the counter.

e. Portion Control. With a little figuring, a mess sergeant can make sure that portions are properly controlled in his mess. He takes the amount of each food allotted for the number of men eating, subtracts the wastage or shrinkage caused by peeling and cooking, and converts the quantity into slices, ounces, or other easy serving measures.

Table XXXV. Portion control table

(1) *Bacon*—for 100 men:	
Quantity issued per 100 men	15 lb.
No. of slices per lb (machine)	25
No. of slices per 100 men	375
Each man's share (375 ÷ 100)	3¾ slices
(2) *Roast beef*—for 100 men:	
Quantity issued per 100 men	55 lb.
Shrinkage in preparation and cooking	40% (22 lb.)
Each man's share (33 ÷ 100)	.33 lb or 5 oz.
(3) *Canned corn*—for 100 men:	
Quantity issued per 100 men	3 No. 10 cans
1 can	6⅔ lb.
Total weight	20 lb.
Each man's share (20 ÷ 100)	0.2 lb or 3⅓ oz.

This figure is divided by the number of men, and the result is the size of an average portion. This method is illustrated in table XXXV. With such dishes as canned corn, the mess sergeant will help the server determine how large a spoonful will give the required number of ounces for the average portion; the server may increase or decrease this amount to suit individual requirements, but he must always keep in mind the size of the average portion in order to give everyone in line a fair serving.

160. FAMILY STYLE SERVICE. In family style service, the men are seated at the dining tables and the food is placed on each table in serving dishes or platters. The men help themselves to the dishes. Family style service requires closer attention to timing than is necessary in cafeteria service. If foods are placed in serving dishes on mess hall tables too early, they will cool rapidly with consequent loss of appearance and nutritive value.

161. SERVICE TO TABLES. The following rules should be followed in supplying food to tables:

a. Prewarm dishes to be used for the service of hot foods.

b. Hold cold foods in refrigerators until serving time. Place on tables just prior to meal period.

c. Arrange food neatly on serving dishes. Garnish as appropriate.

d. Do not fill service dishes excessively on initial dish-up. Supply enough for a good portion for each man, but hold back sufficient food in the kitchen to supply "seconds."

e. The following procedure should be used in the service of hot foods: As the men are entering the dining room, the soup should be carried from the kitchen in serving dishes provided for that purpose. After everyone has been served soup, proceed to the kitchen and bring in the rest of the food in the following sequence vegetables, potatoes, meat, gravy and beverage. This procedure should increase the consumption of soup and provide the men with important vitamins and minerals.

f. When dishes come back for refilling, clean off the edges and replenish with reasonably small servings.

g. If trouble is experienced with "chow hounds," arrange to seat a noncommissioned officer at each table for the control of helpings. To make this system work, the noncommissioned officer should serve himself last.

h. Immediately after meal periods, all food left in serving dishes should be segregated, and returned to the kitchen for use as leftovers.

CHAPTER 8

KITCHEN EQUIPMENT

162. GENERAL. Kitchen utensils and equipment are the tools that make it possible for the cook to do his work efficiently. Each implement has a particular purpose and requires special care. The good cook knows his equipment; he knows what he can do with it, how he should use it, and how to keep it in the best working condition.

163. UTENSILS. a. Pots and Pans. Pots and pans include kettles, measures, pans of all varieties, and pots. To be in good working order they must be cleaned thoroughly after each use, and stored properly.

(1) Wash thoroughly with plenty of hot, soapy water; rinse with clear, scalding water and then air-dry.

(2) Remove burned food or grease that sticks to the pot by putting water in the pot, covering it, and boiling hard for a few minutes. Then, leave a little hot water in the pot and scour the inside with a stiff-bristle brush.

(3) Store pots and pans in a dry place, bottoms up. Don't put one utensil inside the other.

(4) Never scour blued pots and pans with abrasives except as a last resort. If the blueing is removed, reblue.

b. Woodenware. Wooden bowls, spatulas and other wooden utensils require special attention.

(1) Clean wooden utensils with warm, soapy water and a brush, and rinse with clean water. After they have been dried thoroughly, wipe with an oiled cloth to preserve the finish.

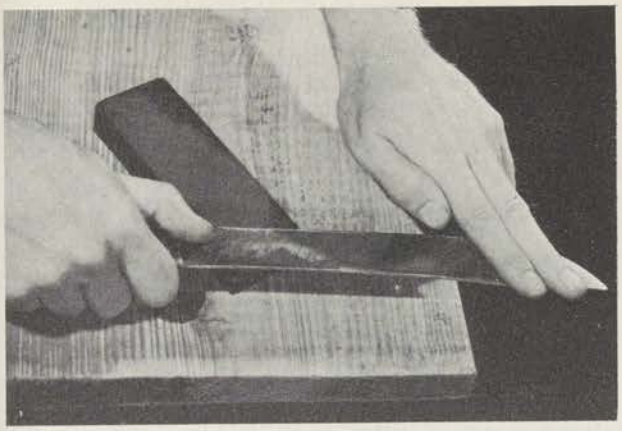
(2) Never soak wooden utensils in water.

164. KNIVES, CLEAVERS, MEAT HOOKS, SAWS. a. General. Different sizes and shapes of these tools are required for different uses. Be sure to understand them. Do not use them for purposes for which they are not intended. Pay special attention to bladed tools (knives and cleavers) to prevent their being used in work that will ruin their edges. Keep in mind that each piece of cutlery was designed to do a certain job. For example, the short, narrow, stiff blades of boning knives were designed especially for cutting through joints and for cutting close around bones in order to separate them from the meat. Steak knives with long, wide blades were designed to cut steaks and roasts. Knives with thin blades, such as the roast beef slicer, are best suited for carving cooked meat.

b. Handles of Tools. The wooden handles found on many of these tools can be easily abused by standing in water. The seams where the handle is joined to the steel are ready resting places for dirt. Hot water soaks into the wood, causing it to expand. As the wood dries, it shrinks. In a short time the handles are loose and the seams are enlarged. There is no need for leaving a wooden handled implement in water. It can be cleaned properly without soaking.

c. Knives. Sharp knives are essential for efficient work. One way to keep them sharp is to use them only for the work they were intended to do. For instance, a boning knife has a comparatively narrow bevel along the edge. It will stand much more abuse and hard work than a properly ground steak knife, which has a wide bevel and a thin edge. Rule number one should be: "Never use a steak knife for boning meat." A good job of cutting cannot be done with dull tools. Saws, knives, and cleavers should be sharp. A butcher's steel is used only to keep the edges of knives straight, not to sharpen them. Saws are sharpened by filing. Frequently the teeth of the saw need setting to give them the proper angle. This requires special equipment. Unless he is properly trained, the average person is not competent to set and sharpen meat saws.

(1) *Sharpening.* Knives should never be sharpened on a power or hand driven dry stone since this will remove the temper from the cutting edge. A water stone or carborundum oilstone is best. Both of these make good sharpening units. The knife is first put on a rough stone, then on a smoother one. Use the entire stone for sharpening the knife. In this manner, the stone will not "hollow out" at a particular point. It is best to draw the full blade, from heel to tip, across the full length of the stone in each movement. Turn the knife over and pull back in the same manner from the opposite end of the stone. In this fashion, the knife is sharpened



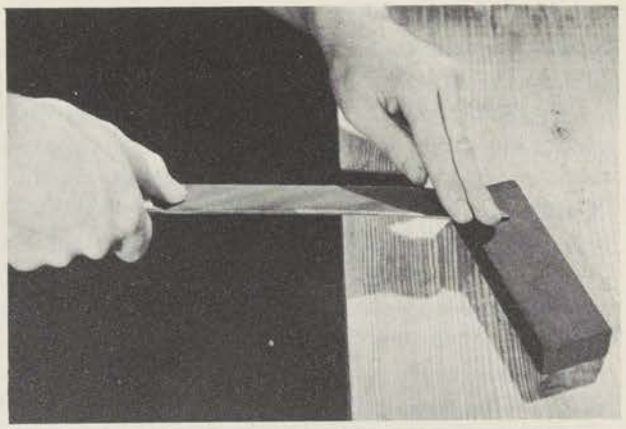
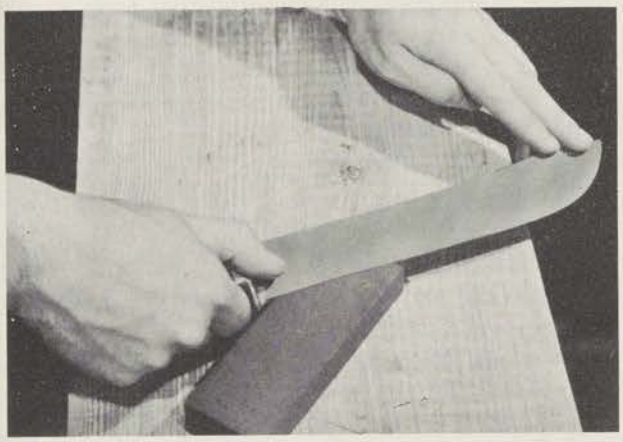


Figure 57. Sharpening.

① *Place the heel of the knife at the upper end of the stone*

② *Draw the full blade from heel to tip across the full length of the stone*



③ *Turn the knife over and repeat starting with the heel at the opposite end of the stone.*

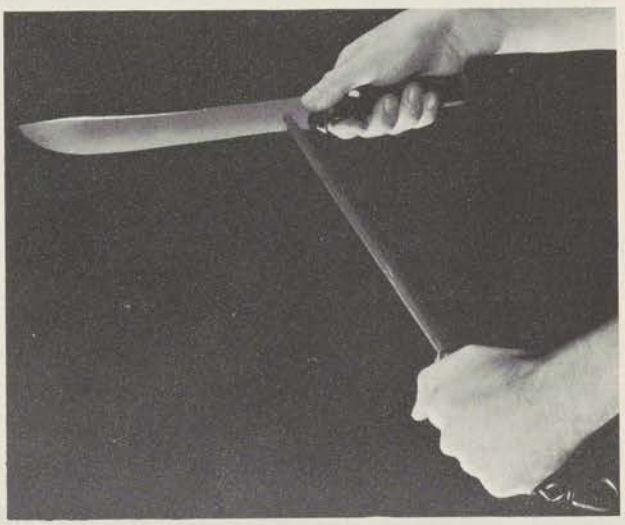
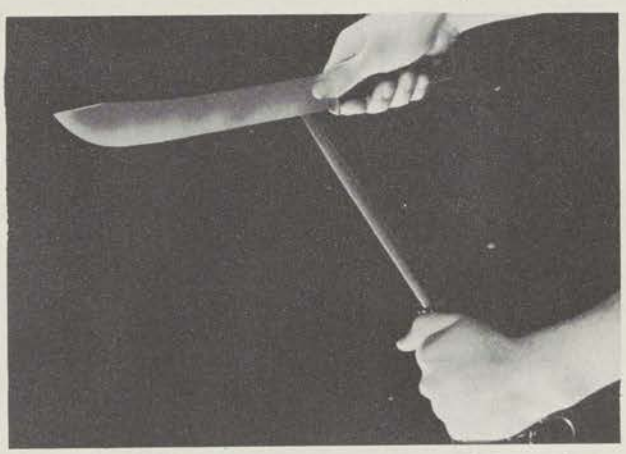


Figure 58 Steeling. ① *The heel against the far side of the tip of the steel.*



② *Bring entire blade edge down across the steel.*



③ *Repeat with the other edge of the blade against the near side of the steel.*

evenly and smoothly and the stone is worn uniformly. When the knife has sufficient edge, clean the blade and handle thoroughly before using.

(2) *Steeling.* After the knife has been sharpened on a stone, true the edge with the standard issue steel. Do not use a rough steel for this purpose. Imagine putting a razor on a rough steel and you will realize why a smooth steel is better than a coarse one for keeping a keen edge on a knife blade. The steel is used to true the blade and keep the edge in perfect condition. Although there is a technique to handling the steel, it is easily mastered with practice. The following shows the easiest and most effective method of steeling a knife:

(*a*) Hold the steel firmly in the left hand, thumb on top of the handle, with the point upward and slightly away from the body.

(*b*) Place the heel of the blade against the far side of the tip of the steel, (See figure 58①.) The steel and the blade should meet at a slight angle, about 25°.

(*c*) Bring the blade down across the steel toward the left hand with a quick swinging motion of the right wrist and forearm. The entire blade edge should pass lightly over the steel (figure 58②).

(*d*) Bring the knife into position again but with the blade against the near side of the steel (See figure 58③.) Repeat the same motion, passing the blade over the steel.

(*e*) Alternating from side to side, a dozen strokes will true the edge.

(*f*) Put the knife on the steel as often as the edge needs it. Aim to have the blade sharp always.

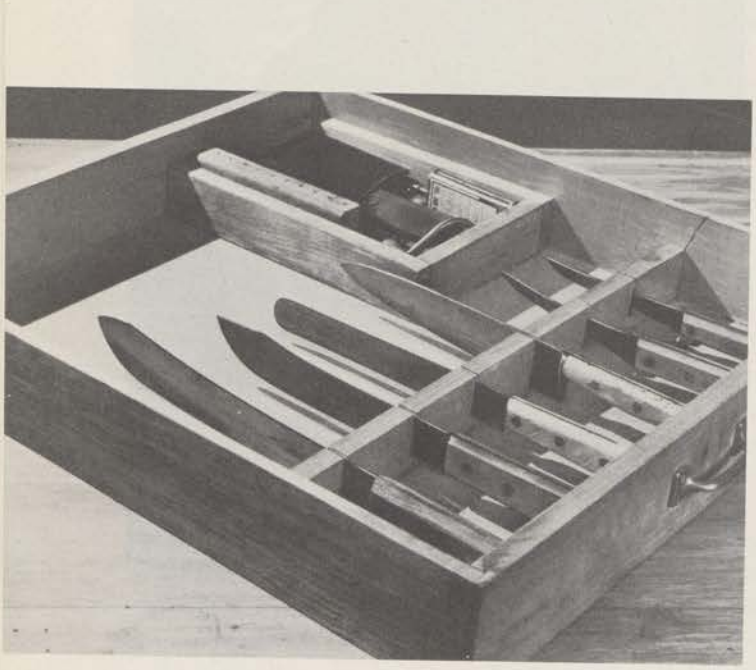


Figure 59. A wood strip to hold knives.

(3) *Care of knives.* Every first-class meat cutter takes a personal interest in keeping his equipment in number one condition at all times. The sharp edge of a knife, like a razor, can be dulled easily. Knives should never be thrown into a drawer with other tools. A wood strip (1 by 2 by 12 to 20 inches long) can be made secure to the bottom of a table drawer, first sawing slots into it at intervals of 2 to 3 inches. (See fig. 59.) These cuts (slots) should be made about 1¼ inches deep and of such width that a knife blade will fit easily into them. Arranged in order in these slots, the knives are readily available and at the same time the edges are protected. A knife holder may be fastened to the side of the meat block with the knife handles below the edge of the block, or a holder may be put up in some other convenient place in the kitchen. Whatever method is followed, it is essential that tools should receive the care and attention they deserve. Government specifications provide good knives. If cared for, they will give satisfactory service for a long time.

d. Cleaver. Use this piece of cutlery as little as possible. Unless it is very sharp and used properly, the cleaver will shatter the bone and fill the surrounding meat with tiny bone splinters. These splinters not only cause inconvenience in eating but they are dangerous.

e. Meat Hand-hook. Although a meathook is inconvenient to one not accustomed to its use, it is in reality a valuable aid in boning meat. It not only saves time but it eliminates most of the danger of cutting fingers in the boning operation, since it enables one to get a firm grip on slippery meat.

f. Metal Mesh Glove. When meat is cut on a mass production scale, as in central meat-cutting plants, workers will wear a metal mesh glove on the left hand, as a protection against fingers being cut while boning meat. The glove is made of a fine metal mesh which is flexible and interferes in no way with the action of the fingers. It covers the thumb and the first and second fingers. A strap on the wrist holds the glove in place. It is a practical safeguard for anyone who is boning meat. This item is issued only to Central Meat-Cutting Plants.

g. Saws. A saw with a dull blade will not do satisfactory work. Three blades should be available at all times for each saw, one in use and two in reserve. When a blade loses its edge and set, it should be replaced with a sharp one.

165. MISCELLANEOUS ITEMS. Egg whips, potato mashers, vegetable graters, butter cutters, sieves, can openers, and colanders gather food particles very easily. A brush and free-running water will help in cleaning them.

166. SPECIAL TREATMENT FOR VARIOUS METALS. Different kinds of metals require different care. Be sure to know the kind of metal with which you are working, and follow the tips on cleaning that are listed below.

a. Stainless Steel. Harsh scouring powders should not be used on these utensils. If there is a mild discoloration, remove it with vinegar and salt or with lemon juice. More severe discolorations call for the use of very fine, uniform scouring powders. But use these only as a last resort.

b. Tin. Never use sharp implements to aid in scraping food from tin equipment. It is too easy to scrape off some of the tin and expose the base metal. Using coarse scouring powder has the same effect. The result is rusted utensils (which you should replace or have retinned.) Tin should have the following care:

(1) If food has stuck to a tin pan, remove it by heating the pan a few minutes in a solution of baking soda.

(2) If tin utensils are to be stored for periods of time without use, they should be coated with a thin film of unsalted fat or oil to prevent rusting.

c. Aluminum. Do not use soda, lye, or washing powders containing strong alkalies when washing aluminum utensils.

d. Chromium Plate. Do not use steel wool, coarse scouring powder, or any other abrasive material on chromium-plated equipment.

e. Cast Iron. Heat cast iron utensils to dry.

f. Sheet Iron. Do not expose sheet iron utensils to extreme heat.

167. BLUEING UTENSILS. a. General. The purpose of blueing is to prevent rust. When new, black iron roasting and baking pans are received for use, wash them in warm, soapy water, with a little soda added, to remove the manufacturer's protective coating. Then blue them. Never blue aluminum utensils; just keep them clean. Never grease heavy tinned sheet pans and bake pans before they are burned out. After utensils have been put into use, they should be reblued whenever the blueing wears off and bright spots of rust show through.

b. Method of Blueing. (1) To blue a utensil, wash and dry it thoroughly, removing any food or grease deposited under rolled rims or in any crevices. Then place the pans over a wood fire that has both flames and live coals. This burns out the remaining residue and opens the tiny pores of the metal. Quench the utensil in hot water and again scrub and dry thoroughly. Coat the utensil inside and out with a thin film of pure grease; the film must be very thin; rub the grease in rather than leave any residue. The best grease to use is lard; never use rendered bacon fat, for it contains salt that will corrode the metal. Then place the utensil for about 1 hour in a hot oven at 325° to 400° F. If no oven is available, the utensil may be placed upside down over an M1937 fire unit at a very low flame. Be careful not to burn away the film of grease.

(2) The metal will slowly turn blue as the heat does its work. The spread of color is a guide in judging the progress of blueing. This heat treatment melts the lard into the surface, closes the tiny pores, and gives the utensils a smooth, glazed surface which resists rust.

(3) Blueing should not be confused with "burning out." Burning out is a process for preparing utensils such as new bake pans for baking bread. Bake pans for bread are made of iron covered with tin. To improve the baking process, the pans must be burned out. In burning out the bake pans, first wipe with a clean cloth and then place in an oven with a hearth temperature from 375° to 425° F. for 3 to 4 hours. Never place bake pans in an oven above 425° F. or the tin will melt. Never grease

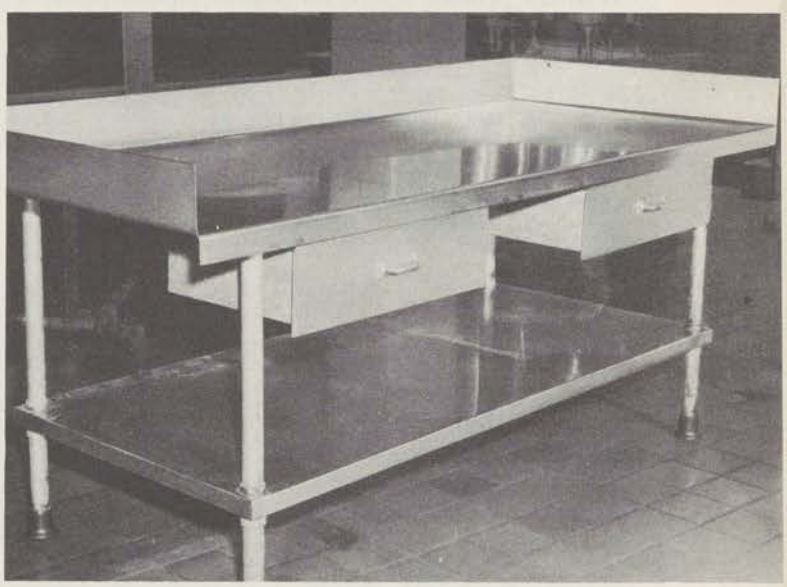


Figure 60. Work or cook's table.

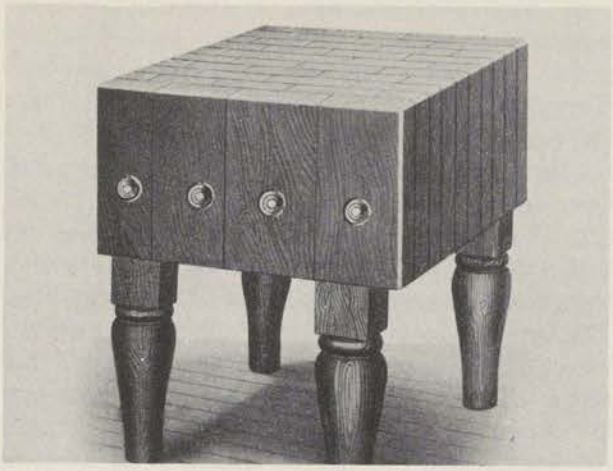


Figure 61. Butcher block.

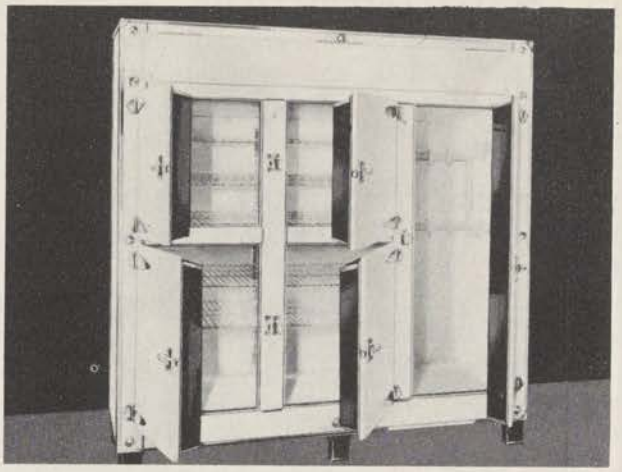


Figure 62. Refrigerator.

tin coated pans before placing in oven. Grease after they have been taken from the oven and are still warm.

168. EQUIPMENT. A description of each piece of kitchen equipment follows. This includes its method of operation, the proper cleaning process and special pointers on operation, care and maintenance that are important for the cook to know.

169. WORK OR COOK'S TABLE. a. Description. (1) Work or cook's table is constructed of wood or steel. If made of wood, the top is planed and sanded and except for top, finished with waterproof filler. The tops of some work tables are constructed of steel. The shelf below table top is used for pots and large pans too heavy to hang. Drawers provide space for knives, spoons, ladles, etc. This table is 3 feet wide and may be 4, 6 or 8 feet long.

(2) Cook's table and pan rack is the same table as the work table with the addition of a wooden rack running lengthwise of the table about four feet above table top. Hardwood pegs, malleable or cast iron hooks are provided for suspending pots and pans.

b. Cleaning. The table top should be washed with hot, soapy water after each using. Do not allow water to stand on the table.

170. BUTCHER BLOCKS. a. Description. Butcher blocks are used for cutting meat. The standard size used in messes is 30″ x 30″ x 10″. It has a working height of 34 inches. The block is constructed of hard wood either white hard maple, beech, hackberry, sycamore or ash. Only one species is used in any one block. The block consists of kiln dried strips ranging in thickness from 1⅜ to 3 inches which are assembled with the end grain exposed on top and are fastened together with at least 3 bolts. It is finished with a saturated coat of waterproof sealer, applied to all surfaces except the top, which is sanded smooth and left untreated.

b. Operation. To prevent an uneven surface, give the block one quarter turn each week and try to use entire cutting surface as much as possible.

c. Cleaning. (1) Before placing meat on block, brush or wipe off the top.

(2) After each using, clean the top with a steel scraper and wire brush. Never wash or bleach top of block or wash tools on the block.

d. Care and Maintenance. (1) Do not use salt or cornmeal to cover block.

(2) Maintaining a bevel on top edge of the block will keep the edges from chipping or splintering.

(3) Never use block for storage space.

(4) Excessive drying and cracking will occur if block is kept close to any heating device.

(5) If cutting has badly pitted or dished top of block, have the post engineer saw it down to a smooth level.

(6) Use special board, not the meat block when cleaning and cutting poultry, liver, fish, hot meats, fruits and vegetables.

(7) Never allow fresh meat to lay on block longer than necessary and never thaw frozen meat on the block.

171. REFRIGERATOR. a. Description. There are two types of kitchen refrigerators—walk-in and reach-in.

(1) The *walk-in* type is usually installed in consolidated messes. It consists of one or more compartments maintained at different temperatures depending upon the product stored.

(2) The *reach-in* type refrigerator is found in unit messes. Its normal capacity ranges from 20 to 65 cubic feet.

b. Operation—Automatic.

c. Cleaning. (1) Clean the outside daily with hot, soapy water.

(2) Daily remove food and clean the inside by starting at the top and working downward with hot, soapy water. A little soda added to the water imparts sweetness.

(3) When cleaning, do not open all doors. Open only the door of the compartment being cleaned.

d. Care and Maintenance. (1) Keep doors closed when not placing or removing food.

(2) Store foods so that the cold circulating air will reach each article. Pieces of fresh meat should be hung and should not touch each other.

(3) Foods that are most perishable should be placed in coldest part of refrigerator.

(4) Defrost when the fan coils are covered ¼ inch with frost and the bare pipe coils are covered ½ inch.

(5) Have refrigerator inspected periodically by post engineer.

172. BAIN MARIE. a. Description. A bain marie is an open rectangular tank containing hot water. It is used to hold utensils containing cooked food at a proper temperature until they are ready to be placed in the serving table. The only difference between a bain marie and a steam table is that the steam table has fixed openings of a specified size which require inserts to fit.

b. Operation. Three types of heating units are used—steam, electricity and gas.

c. Cleaning. (1) After each using remove food particles from the water before draining.

(2) After each using, drain the water and wash the pan with soapy water. Clean and polish the outside of the pan.

d. Care and Maintenance. (1) Keep dry when not in use.

(2) Do not use for storage.

(3) Never turn on heating unit unless bain marie is partially full of water.

(4) Always turn off heat before removing water.

(5) Inspect joints and connections frequently for leaks.

(6) If heating units are faulty, call the post engineer.

173. SINK. a. Description. (1) *Cook's sink* has a single compartment without drain boards and is fitted with hot and cold water faucets, overflow pipe and drain. Since this is placed close to the cook's work table, it provides the cook with either hot or cold water for adding to food. No grease interceptor is necessary.

(2) *Glass washing sink* has two compartments without drain boards. Fittings, faucets, overflow pipe, etc. are the same as cook's sink. This sink is used for washing glasses only.

(3) *Scullery sink* may have one or two compartments, with or without drain boards. Fittings vary



Figure 63. Bain marie.



Figure 64. The sink.

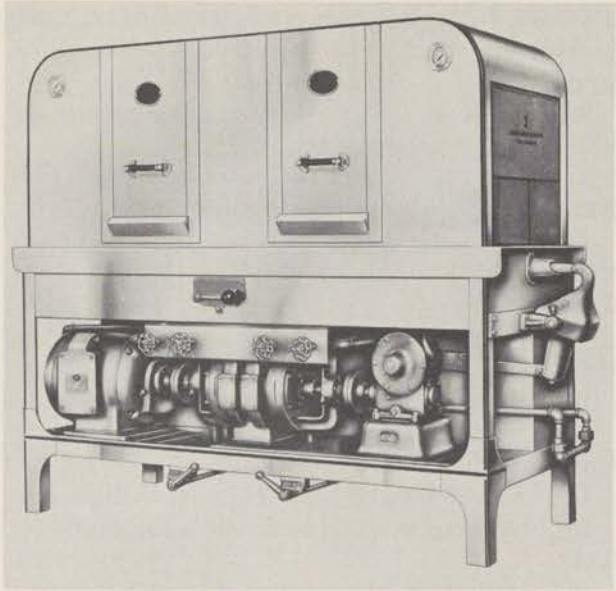


Figure 65. Dishwasher.

according to type of sink. Scullery sinks are used both for preparation of vegetables and dishwashing.

b. Cleaning. (1) After each using remove all food particles.

(2) After each using wash dirty and greasy compartment and drain board with soap and water. Rinse thoroughly.

c. Care and Maintenance. When preparing vegetables, be sure all soap is thoroughly rinsed off sides of sink.

174. DISHWASHING MACHINE. a. Description. Dishwashing machines wash and rinse dishes, silverware and other items. Proper temperature of water is maintained by gas, electricity or steam. There are two types—immersion and spray.

(1) *Immersion type* consists of two tanks into which the racks of dishes are placed. Water pumped at a rapid rate, washes the dishes. After washing is completed, racks are transferred to rinse and sterilizing tank by the operator, then removed to drain and air dry. This type is not practicable for Army use.

(2) *Spray type.* Dishwashers have wash and rinse tanks. Hot water is pumped into wash arms and sprayed through the nozzles located above and below the tracks which guide the racks of dishes through the machine. Automatic controls convey racks from wash tank into rinse tank, then out of machine on the opposite side. Dishes are air dried. Never dry dishes with towel.

b. Operation. *Spray type.* Put the strainer pans in place and add correct amount of washing compound. To fill wash tank, close the drain valve and open fill valve until the water level in the tank reaches the overflow slot. Turn on heat. Turn on motor switch when ready to wash dishes. After scraping dishes clean, place edgewise in rack. Place glasses, cups and bowls bottom up and never stack them one on top of another. Silverware and small articles may be scattered loosely over the bottom of a similar rack. When rack is loaded, slide it into the machine. In automatic machines, each rack moves through the wash chambers and into the rinse chamber and then past a final rinse arm which sprays clean hot water drawn directly from the hot water supply of the building. When there are no automatic controls, each rack must be put in and taken out of the tanks by the operator. When dishwashing is completed, turn off heat, stop motor and drain wash tank by moving drain handle to "OPEN."

c. Cleaning. (1) After each meal, remove refuse in strainer pans. Remove pans carefully so as not to spill anything into tank. Clean thoroughly.

(2) Scrub, rinse, and air dry the curtains after each meal.

(3) After each meal, wash the interior of machine with hose if possible. Leave the hood open so that the interior will dry.

(4) Clean the inside of the pipes with wire brush after each meal. To do this, remove the wash arms or the caps at the ends of the arms. Flush out scale or sediment.

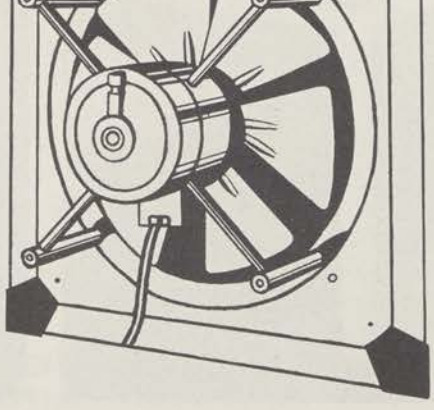


Figure 66. Exhaust fan.

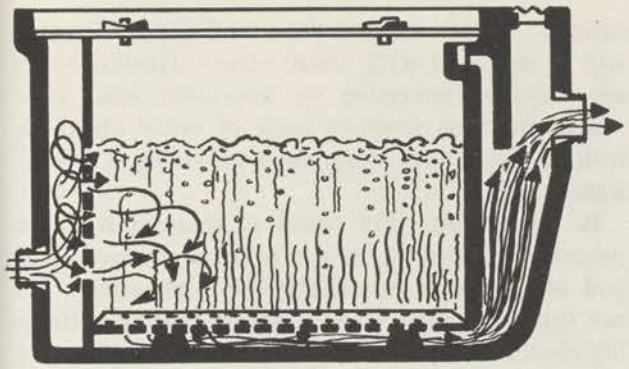


Figure 67. Grease trap.

d. Care and Maintenance. (1) Watch thermometers for correct temperature of water. Wash water should not be below 120° F. or higher than 140° F. Rinse water should be 180° F. or more. Final rinse must also be 180° F. or higher.

(2) Remove all food scraps from dishes. Rack correctly. Do not mix glasses and dishes together.

(3) Never overload rack.

(4) Use correct amount of dishwashing compound. Do not use soap. Compound must be added from time to time depending on condition and number of dishes, hardness of water and strength of compound.

(5) If sprayers stop up frequently due to sediment in water supply, a strainer can be installed in the water supply line to machine.

(6) Never allow wash or rinse water to remain in tanks. Empty machines when finished. Always turn off heat before emptying tank.

(7) Clean curtains insure sanitation and materially lengthen life of curtains.

(8) Inspect periodically for leaks in valves, squeaks, and packings.

(9) Keep motors dry and clean.

(10) When using gas for heating water, be sure tank is full before turning on gas.

(11) Have motors serviced periodically by post engineer.

175. EXHAUST FAN. a. Description. The exhaust fan is part of the ventilating system. It draws cooking odors and smoke through a vent to the outside of the kitchen.

b. Operation. Turn on when cooking.

c. Cleaning. (1) Weekly, clean the hood with hot, soapy water.

(2) Once a week, turn the switch off and clean the vent.

(3) Dust thoroughly every week.

d. Care and Maintenance. The post engineer should be called when the fan needs repair. It is dangerous for mess personnel to attempt any minor repairs. The ventilating system is a very great fire hazard if grease is allowed to collect in it. Keep it clean.

176. GREASE TRAP. a. Description. A grease trap is a porcelain or cast iron box containing baffles to trap grease. Grease traps are attached to the drain of pot washing and prewashing sinks to prevent clogging of plumbing by trapping grease and food particles before they reach sewer pipes. The top is removable to allow the skimming of trapped grease and the cleaning of baffle plates.

b. Operation. Automatic.

c. Cleaning. (1) Check daily to make sure grease is not escaping into sewer. The entire purpose of the trap will be defeated unless the baffles when removed are replaced in their proper position.

(2) Remove cover and scrub thoroughly once a week with hot, soapy water.

(3) Every other day skim grease and place in salvage container.

(4) Remove and scrub baffles with hot, soapy water as often as necessary.

d. Care and Maintenance. The outlet orifice should be inspected occasionally for partial closure. If the clean-out plug is removed, replace it by hand, never use a wrench.



Figure 68. Toaster.

177. TOASTERS. a. Description. A toaster is a machine either electrically or gas heated for toasting bread. It is equipped with a motor driven conveyor. The oven heat is controlled by a thermostat. The sliced bread is placed on the conveyor, carried through the toasting zone and is dropped from the conveyor when toasted.

b. Operation. Set thermostat to desired degree of heat, light oven, turn on conveyor switch and place bread on conveyor rack.

c. Cleaning. (1) Use a small brush to remove crumbs from toaster.

(2) Wipe off daily with a damp cloth.

d. Care and Maintenance. (1) Turn off heat when toaster is not in use.

(2) Do not turn heat up or down by hand if heat is controlled by a thermostat.

(3) Do not use knife, fork or other metal object to dislodge jammed toast.

(4) Disconnect electric plug before working on conveyor or other parts. If conveyor becomes jammed, free it with cardboard or other pliable material to prevent damage to toaster.

(5) Have toaster checked periodically by post engineer.

178. FRYERS. a. Description. Deep fat fryers, consist of a deep vessel for holding the melted fat, a wire basket, or baskets depending on size, gas or electric heating units, automatic heat controls, splash back. It is mounted on legs or in a cabinet. The bottom of the vessel slopes to center and is equipped with drain valve. Heating units are tubular immersion or insertable steel type which run from front to back of vessel about an inch or two above drain thus providing a "cool" zone.



Figure 69. Fryer.

b. Operation. Fill vessel so that fat is up to proper level; turn thermostat to temperature desired and allow about 10 minutes for preheating. Do not turn to highest point when preheating. Heating elements should not be turned on until they are covered with fat or liquid. Turn off thermostat about 10 minutes before fat is drained from fry kettle.

c. Cleaning. (1) Once a day drain fat and loosen crumbs by pressing blade of spatula along sides and bottom.

(2) With types that have a drain at the bottom, open valve and remove crumbs from valve seat with stiff wire, bent **L**-shaped at one end. Types with drain in front may be cleaned by unscrewing handle of valve until it comes completely out. Watch for film of fat deposited on sides and tubes and remove this daily.

(3) Clean fryer thoroughly. Strain fat. Use a grease filter if it is an authorized item of issue, otherwise use a cloth.

(4) Once a week boil out kettle with caustic or cleaning compound for about 25 minutes. Let stand over night if possible. Drain and refill with water, boil and drain again. Add 1 to 2 ounces of vinegar to final cold rinse. Wipe dry.

(5) Remove any black carbon stain left after cleaning by a suitable abrasive.

d. Care and Maintenance. (1) "Cool" zone below heating units prevents scorching of loose food particles which fall to the bottom.

(2) Turning thermostat to highest position when preheating does not increase speed but definitely decreases life of fat. Frying range is generally between 350° and 375° F.

(3) Have fryer inspected periodically by post engineers.

179. RANGE NO. 5. a. Description. The outside of the range is made of open hearth range steel. The entire exterior including bottom of range body and metal is painted with black baking japan. It is fired through the fire door and may be fired with coal or wood. There are eight eyes on the cooking surface of the range. It is equipped with a bake oven and a warming chamber directly below the bake oven.

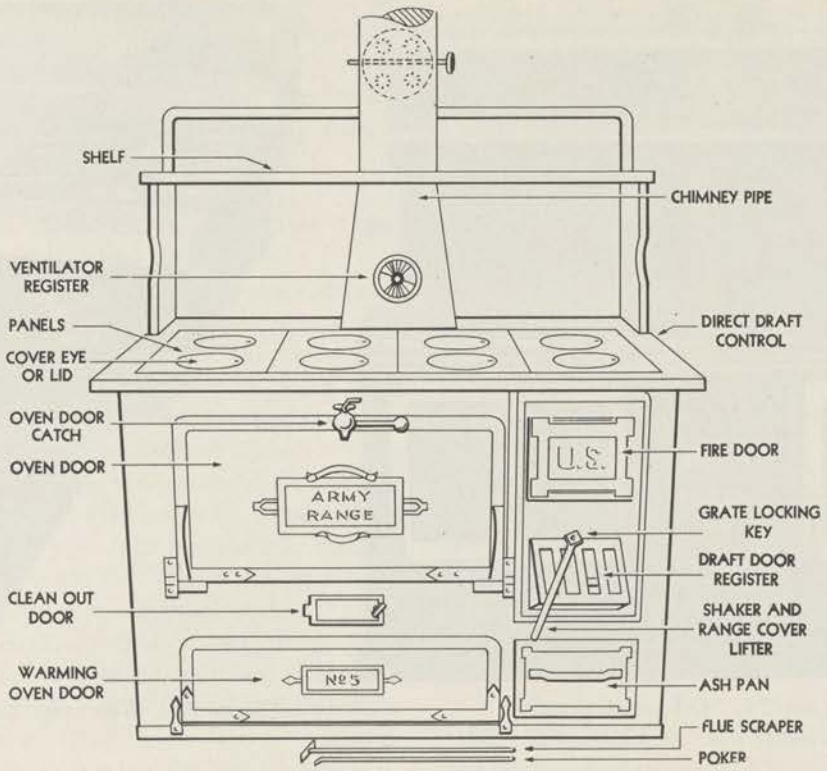


Figure 70. Army field range No. 5.

b. Operation. Open draft-door register in the draft door in front of the range, open the direct-draft damper at end of range. See that ventilator register directly below mantel is closed. The flue damper should be open. Fill the hot water system before starting fire. Start the fire by laying crumpled paper on the grate and add enough dry kindling to hold the fire for several minutes. Then open the draft door register, the direct draft damper, and the flue stopper, and close the ventilator register. Ignite the paper and replace the range panels and covers. When the wood is ignited and holding fire, about one small shovelful of coal should be added. After this coal has ignited, more coal should be added to build up the fire. When fire burns briskly, close the direct-draft damper at the end of range and leave it closed; this damper is opened only when starting the fire. If it is left opened, heat will not circulate around the oven. The fire bed should be maintained at 45° angle sloping downward towards the front of the fire box. Hot coals should be kept 2 or 3 inches below the top of the fire bricks. Small amounts of coal should be fed to the range at one time and should be added frequently. Fuel should be added only through the fire door. This method of firing produces an efficient fire bed and lengthens the life of fire bricks, grates and top plates. Smoke and soot are eliminated from the range top and from the bottom and sides of cooking utensils. Never fire through the eyes.

c. Care and Maintenance. (1) Point grates down for coal and up for wood.

(2) After each firing remove ashes and clinkers from grate. Unburned coal in ashes means poor firing.

(3) Twice each week inspect fire box lining. If fire bricks need replacement, call post engineer.

(4) A warped top indicates improper firing. Eyes should be rotated daily to prevent warping.

(5) Clean daily. Remove eyes and top to scrape out ashes, dirt and soot.

(6) Uneven heat usually means improper firing.

(7) Clean away food as soon as spilled.

(8) Wash exterior when cool with hot, soapy water. Then rub the range with a greased rag then wipe off excess grease with a dry rag. Grease containing salt should not be used.

(9) Do not stand with your head over the range top or door when starting fire.

(10) Do not try to start fire by throwing burning waste paper into vapor-filled fire box. This practice is dangerous.

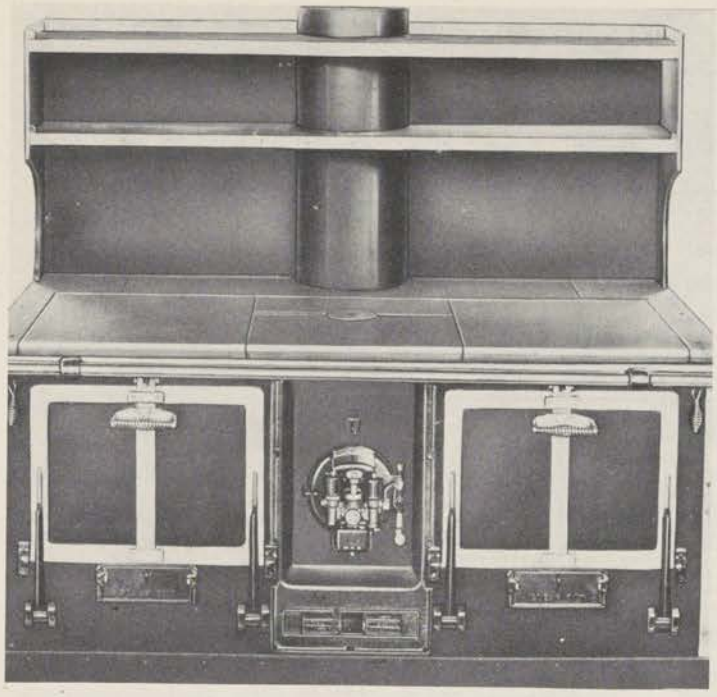


Figure 71. Oil burning range.

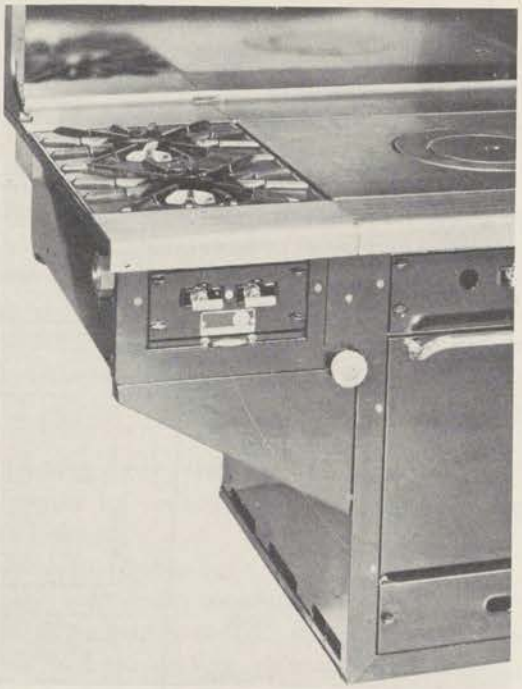


Figure 72. Gas range with attachment.

(11) Do not attempt to burn rubbish. Never allow ashes to accumulate and come in contact with the grates as this will cause grates to warp and sag.

(12) Never place heavy objects on the oven doors. The weight will warp the door allowing heat to escape.

180. OIL BURNER ATTACHMENT. a. Description. An oil burner attached to the No. 5 range is a unit installed on the right front panel which converts the range from a coal to oil burner. It is a permanent attachment. The fire box is equipped with a special lining to reflect the heat. The unit consists of a pump to draw oil from a storage tank outside the mess hall, an ignition system which ignites the oil when it is forced through the spray nozzle. This same type of unit may be attached to bake ovens. An oil burner range is more efficient than the converted coal range.

b. Operation. (1) *Manual lighting.* Open the valve in the oil line, start motor by turning on switch, ignite a good sized piece of paper or use a kerosene torch, next turn on oil regulation valve to proper fuel burning ratio for the cooking temperature desired. Adjust the flame for red orange color.

(2) *Automatic lighting.* Turn on switch.

c. Cleaning. (1) Clean spray nozzle of all soot accumulation at regular intervals.

(2) If oil leaks occur, if fire box smokes, or if faulty mechanism occurs, call post engineer.

d. Care and Maintenance. Oil burners generally require little maintenance provided the proper fuel and the proper mixture of oil and air is obtained.

181. GAS RANGE. a. Description. There are three types of gas ranges—open top, griddle top, and closed top. Ranges are heated by two types of gas burner—the luminous flame burner and the more widely used blue flame or Bunsen burner. Each burner has a separate control gas cock. When the gas cock is opened the pressure of the gas forces it through an orifice into the mixing tube, creates a suction, and draws air through the front opening. This mixture is then forced through the small holes or ports in the burner.

b. Operation. When the range is not equipped with a pilot light, hold a burning match with one hand over the burner while with the other hand, slowly open the control or gas cock until the burner is ignited.

c. Cleaning. (1) If food is spilled in burner, remove the burner, clean in hot, soapy water. Air dry.

(2) Inspect air intake for clogging or burning with yellow flame. If it cannot be readily cleaned, call the post engineer.

d. Ignition. If the gas does not ignite at the instant it is turned on, it is because the mixing tube and burner are full of air. The pressure of the gas should force the air through the tube. The burner will then ignite. This delay is particularly noticeable if the burners have long mixing tubes.

182. OVENS. a. Description. The two types of bake ovens are cabinet and sectional.

(1) *A cabinet oven* is a series of baking compartments placed one above the other with a coal, gas or oil heating unit in bottom of the cabinet.

(2) *A sectional oven* is complete in itself with gas or electric heating units. Oven sections may be placed one above the other—cabinet style.

(3) *Broiler and roasting oven* consists of a roasting oven, and a broiler oven with grease pan and adjustable 2-piece sliding grid, gas or electric heating unit and automatic controls. The roasting oven is located above broiler oven—cabinet style.

(4) *Roasting oven* consists of an oven, oven shelves, gas or electric heating unit and automatic control. Oven sections can be placed one above the other as bake ovens. Roasting ovens are approximately 6 inches higher inside than bake ovens.

b. Operation. (1) Preheat oven to desired temperature. Set automatic controls (if gas or electric).

(2) Inspect dampers if using coal or oil and watch thermometer for proper temperature.

c. Cleaning. (1) Remove boil-overs and spill-overs before material has time to carbonize.

(2) Wipe interior with damp cloth daily, when oven is cool. Scrape bottom if necessary. Never throw water on oven decks to cool them. Swab with damp cloth.

(3) Wipe the exterior daily with damp cloth.

(4) After each using remove grid, wash thoroughly, rinse and air dry.

(5) After each using, empty broiler grease pan, wash, rinse and air dry.

d. Care and Maintenance. (1) Learn exact time required to preheat.

(2) Schedule roasting and baking to take full advantages of "receding" heat. Bake first, then roast meats.

(3) If possible, plan baking so that oven is not brought to full heat more than twice a day.

(4) Have ovens checked periodically by post engineer.

183. GRIDDLES. a. Description. Griddles are made of cast metal. They are equipped with handles. The electric or gas heated griddle has a three or four sided gutter which drains to a grease container.



Figure 73. Bake oven.

Figure 74. Roasting and baking oven.





Figure 75. Griddle.

b. Operation. (1) The griddle used on the No. 5 range is placed over the eyes of the range and is heated by contact with the stove. The electric or gas griddle must be preheated gradually before using.

(2) Always turn off heat on electric or gas griddles, when not in use.

c. Cleaning. (1) When encrusted matter is found on surface, scrape off with a dough scraper.

(2) Wipe greasy surface with heavy, grease absorbent cloth.

(3) Wipe body and legs with damp cloth after each using.

(4) After each using remove grease container, empty contents into fat container.

d. Care and Maintenance. (1) Do not overheat.

(2) Do not allow grease receptacle to overflow.

184. PRESSURE COOKER. a. Description. Vegetable steamers or pressure cookers are specially made devices principally employed for cooking vegetables. The steamer consists of an insulated body equipped with shelves to hold several perforated baskets in which the food is placed. Tight fitting doors retain pressure and prevent the escape of cooking odors.

b. Operation. Insert perforated basket into compartment. Close door. In most cookers the steam pressure automatically goes on when the door is sealed. Opening the door shuts off the pressure. To remove vegetables from the cooker, open the door slowly in order to allow the pressure to escape gradually.

c. Cleaning. Clean the interior and exterior with hot, soapy water after each using.

d. Care and Maintenance. Vegetable steamers should be inspected periodically by the post engineer.

185. STEAM JACKETED KETTLE. a. Description. In a steam jacketed kettle, the steam circulates between an inner and outer shell or jacket. A full jacketed kettle has a steam shell the same height as the kettle, while the other type has a shell running ⅔ the height of the kettle. A vent collar is fitted to stationary portion of the cover. Safety valves are set at proper operating pressure to insure safety of operation. Pressure per square inch is registered on pressure gauge. A removable strainer in bottom of kettle prevents particles of food from draining into draw-off pipe. This kettle is stationary and supported by three stationary steel legs. Sizes are determined by number of gallons capacity—20, 40, 60, 80 and 100.

b. Operation. Place required amount of food in the kettle. Turn on steam. Operate on correct pressure. When food is cooked, remove. Turn off steam. Open valves at steam outlet and drain. With the diversified proportions of water in different vegetables and the varying weights per No. 56 dipper, it can be readily understood that no one rule can be applied for the reconstitution of all dehydrated vegetables. The table should be consulted for proper amount of water for each reconstitution.

c. Cleaning. (1) After each using, remove carefully the clogged strainer, empty, wash and rinse thoroughly. Air dry.

(2) After each using wash the interior of kettle well with soap and water, dry thoroughly, heat empty kettle for five or ten minutes with covers

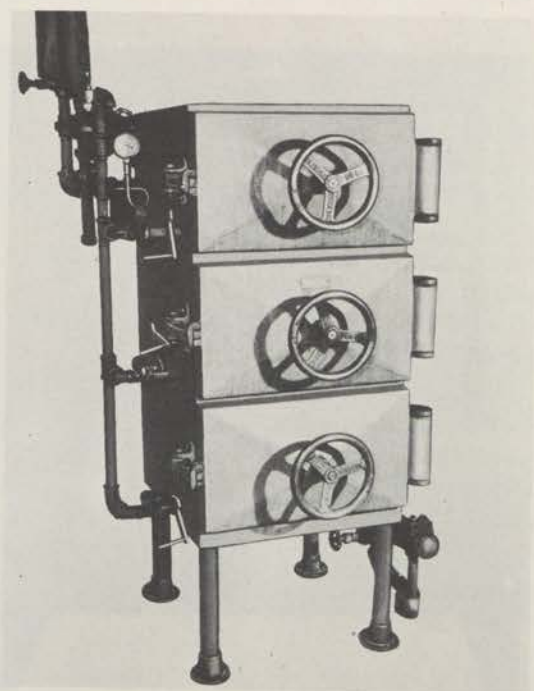


Figure 76. Pressure cooker.

Table XXXVI. Weight of several dehydrated vegetables by No. 56 dippers

Dehydrated product	Approximate weight per No. 56 Dipper	
	Pounds	*Ounces*
Beets	0	14
Cabbage	0	4
Carrots	1	0
Onions	0	10
Potatoes, white	0	11
Potatoes, white, precooked shreds.	0	10
Potatoes, sweet	0	12
Turnips	0	10

down, dry thoroughly. Use soap and a stiff brush if spots appear on cover or kettle wall.

(3) After each using, wipe exterior of kettle wall and legs, with damp cloth.

(4) After each using, remove any food particles from draw-off pipe and valves with a rod that has a flexible wire brush.

(5) Remove and clean valve if possible.

d. Care and Maintenance. (1) Leave cover open when not in use.

(2) Inspect steam pressure and see that there are no steam leaks in the fittings, piping and valves.

(3) Lift safety valve regularly in order to make certain that the disk is not sticking to its seat.

186. MIXER. a. Description. Mixer consists of a one piece casting frame with a three or four speed inclosed electric motor, a bowl, bowl holder and various attachments. Bowls are usually made of tinned steel and have handles and lugs. Each mixer has a bowl holder of two metal arms that extend outward from the frame and upon which the bowl rests. The bowl holder can be raised or lowered easily and gradually by means of a hand operated lever. A list of attachments include: wire whip, dough arm, heavy beater, meat and food chopper, vegetable and fruit slicer, coffee and spice grinder, juice extractor, poppy seed grinder.

b. Operation. Place bowl on holder and lock in position, put correct attachment in hub, put ingredients in bowl, raise bowl to correct level, select speed and start motor. When shifting to different speeds use care to avoid slipping gears. When through, turn off motor, lower bowl.

c. Cleaning. (1) After each using, remove bowl and attachments, wash in soap and water, rinse thoroughly and air dry.

(2) After each using, wipe off exterior of unit with damp cloth.

d. Care and Maintenance. (1) Mixers can operate at capacity continuously for one hour without overheating or damaging mixer.

(2) Do not overload or overheat motor.

(3) Mixing bowl is either turned upside down or covered with a cloth when not in use.

(4) Avoid excess lubrication but see that all parts are properly lubricated.

(5) Certain bowls are interchangeable and it may prove convenient to have several.

(6) Raise and lower bowl holder gradually. Never spin handwheel rapidly. Don't allow bowls to become dented.

(7) Do not drop bowls on floor.

187. MEAT GRINDER. a. Description. Each meat grinder consists of a metal body with a hopper. A feed worm is provided within the body, which, when rotated, will force meat fed into the hopper against the blades of a knife. The blades rotate against a perforated end plate. The small grinder has a capacity of approximately eight pounds of meat per minute. Twenty pounds per minute is the approximate capacity of the medium mixer. The large size has a capacity of 50 pounds per minute. Each grinder is run by a motor which is mounted on the grinder and has a readily accessible manually operated controller. Various kinds of knives or attachments can be used.



Figure 77. Steam jacketed kettle.

b. Operation. Always put a drop of oil in the oil cup at the hub before starting motor. Turn on motor. Drop strips of meat into hopper using stomper to force meat into worm. Never try to force meat into the hopper with your fingers.

c. Cleaning. (1) After each grinding job, wash all parts in warm, not boiling, soapy water. Rinse thoroughly and air dry. Be sure to remove dirt and grease in hopper, plate, feed worm and/or knives.

(2) After each grinding job, wipe all stationary parts with damp cloth.

d. Care and Maintenance. (1) Keep hands away from hopper as much as possible.

(2) Better results are obtained if meat is cut into strips instead of squares or cubes.

(3) Never let parts stand in boiling water as it is injurious to their plating.

188. MEAT SLICER. a. Description. A meat slicer is a machine used for slicing raw, cooked, and prepared meat and other food items. It is either electrically or manually operated. On mechanical feed slicers, the meat is placed on a platform and then pushed towards the slicing knife by hand or by pusher plate. On gravity type meat slicers the meat is placed in a **V**-shaped holder and fed to the cutting knife by gravity. The slicing is accomplished by the second action of the platform or **V**-shaped holder moving from front to rear passing the revolving blade. A tray receives the cut meat.

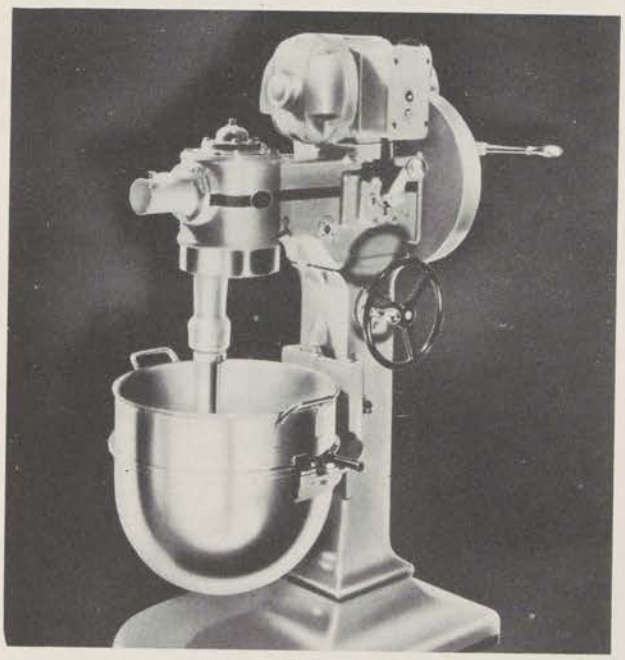


Figure 78. Mixer.

b. Operation. Place the product to be cut on the platform or in the chute of the gravity type slicer. Set gauge for desired thickness of slices. Turn on motor or crank flywheel and start slicing. End cuts should not be fed by hand, use the feed grip.

c. Cleaning. (1) After each using, if electrically operated, disconnect plug, remove all parts and wash them with damp cloth and mild soap.

(2) Area around slicer must be kept clean.

d. Care and Maintenance. (1) All guards should be in proper repair to protect the operator from the blade and other moving parts.

(2) Do not allow water to come in contact with motor. Keep electric cord dry and free from grease.

(3) Keep blade sharp. Remove all grease from blade before sharpening.

(4) Keep slide rods oiled with a mineral oil.

189. MEAT SAW. a. Description. The electric meat saw is designed to cut both carcass and frozen boneless meat. Carcass meat may be cut into sizes convenient for boning as well as cut into final cooking sizes as chops, roast, etc.

b. Operation. Turn on motor. Place the meat on the table against the guide and feed it past the saw blade until the cutting has been completed.

c. Cleaning. After each using clean with damp cloth and mild soap.

d. Care and maintenance. Operators of this equipment should use all safety devices. Carelessness may result in the loss of a finger, hand, or arm.

190. POTATO PEELER. a. Description. Potato peeler consists of a hopper, disk, peel trap, and motor. The smallest size, 15 pound capacity, is



Figure 79. Meat grinder.

table mounted while the other two sizes, 25 pound and 45 pound, are pedestal mounted. The hopper is round in shape and has a funnel shaped top opening to permit dumping vegetables without spilling. Entire inner surface is covered with an abrasive substance. Outlet for removal of vegetables has hinged door with locking device and chute for discharging vegetables. Potatoes are peeled by the action of a revolving abrasive disk. Peel traps are either built-in or portable. The strainer in peel traps collects sediment and peelings.

b. Operation. Start motor. Close outlet doors and lock before pouring in vegetables. Turn on water. Open outlet door to discharge vegetables when peeling is completed. If peel trap is not provided, place a pail under drain plug and draw off peeling refuse from time to time. Replace plug after each emptying. If removable strainer is used, remove and empty waste. Empty peel traps after every three or four charges.

c. Cleaning. (1) After each using, wash and rinse disk. Dash hot water into peeler until no sediment or peelings drain through outlet pipe.

(2) After each using wipe all exterior surfaces with damp cloth.

(3) After each using empty peel trap and rinse thoroughly. Wash and rinse strainer.

d. Care and Maintenance. (1) Watch for stones when pouring vegetables into hopper.

(2) Running water cleans vegetables as they are being peeled and helps to prevent the sewer from becoming clogged.

(3) Peeler must be level for proper results.

(4) If the revolving disk becomes smooth call the post engineer to change the wiring in order to renew the cutting surface.

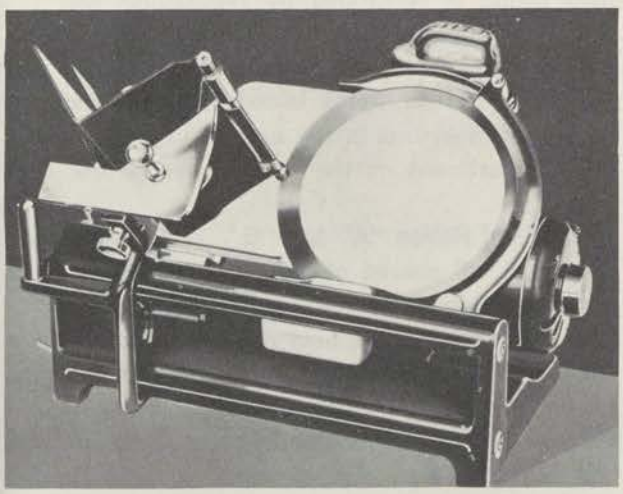


Figure 80. Meat slicer.

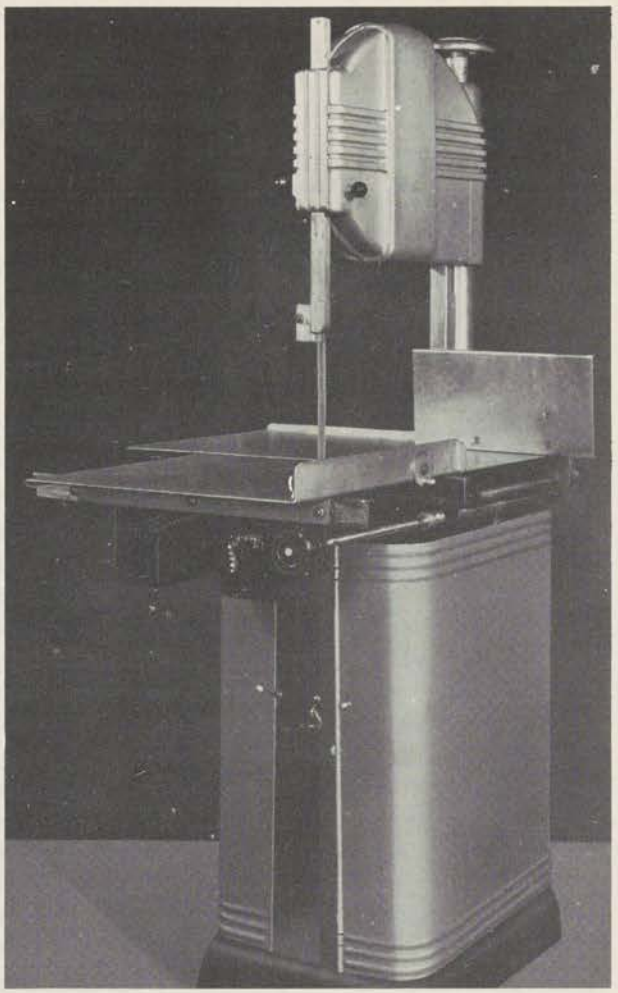


Figure 81. Meat saw.

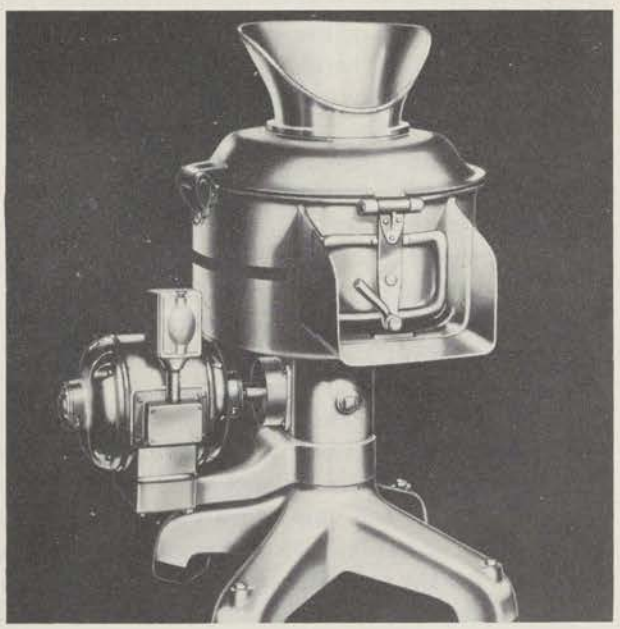


Figure 82. Potato peeler.

CHAPTER 9

RATIONS

191. DEFINITION OF RATION. A ration is the allowance of food for the subsistence of one person for 1 day. The following kinds of rations are provided for the Army:

a. Garrison ration.
b. Field rations
c. Troop train ration

192. GARRISON RATION. The garrison ration is prescribed in time of peace for all persons entitled to a ration, except under specific conditions for which other rations are prescribed. In time of war or national emergency the garrison ration may be prescribed for hospitals and other units as directed by the War Department from time to time or under special circumstances.

(a) The garrison ration is issued as a money allowance and not as a quantity of food for a given day or meal. A company, battery, troop or similar unit authorized to subsist on the garrison ration is credited with the value of the ration for each man messing with the unit. The mess officer of the unit makes his own menu and purchases from the sales officer (commissary) such foods as he deems necessary to feed the men of his unit. For example: The ration strength of the unit on the 1st of July is 200 men and the value of the garrison ration for that month is $ .50. Therefore, the unit will receive a cash credit of 200 multiplied by $ .50, or $100.00 for that day. If the ration strength of the unit remains the same throughout the month of July, the unit will have a credit of $3,100 for the month. It is found in this way:

200 (number of men each day) multiplied by 31 (number of days in July) = 6200
6200 multiplied by $ .50 (value of ration for July) = $3,100.

The $3,100 is called the "Ration Credit" for July. During that month the company may purchase $3,100 worth of food from the sales officer. If this amount is not spent, the balance will be paid to the unit in cash and the unit will keep it as "Ration Savings." The ration savings may be spent at a later date for the purchase of food. If the unit in this example purchases food during July that costs more than $3,100, the difference is paid out of the ration savings from earlier months. For convenience, ration accounts are settled monthly.

(b) To control and establish the value of the garrison ration, or the money allowance, given to the unit to feed the men, the War Department has published in AR 30–2210 a list of foods, known as the components of the garrison ration. The cost of this list of foods is figured monthly, and this cost is the value of the garrison ration, or the money allowance, given to the unit for the purchase of foods. This list of foods, common everyday food items, serves as a measure of the cost of feeding. When the market value of these items rises, the value of the garrison ration goes up; when the market value goes down, the value of the garrison ration goes down. The items are not issued to the mess; they are used only to determine the value of the garrison ration.

193. FIELD RATIONS. a. Field Ration. The field ration is prescribed for use only in time of war, national emergency, or for training purposes when the garrison ration is not used. It will be issued in kind. That is, a menu is compiled and the food items required to feed men from this menu are issued by the quartermaster through the ration breakdown officer to the company, troop, or battery. There is no money credit established for the unit as in the case of the garrison ration. The cost of the field ration is controlled by regulations and the unit is not burdened with the tasks of making menus, requisitioning foods or maintaining accounts. The components, food items issued, and their substitutes are prescribed in the menus prepared by the War Department or the commander of the field forces.

b. Field Ration "A" and "B." (1) *Field Ration "A"* will consist of fresh and processed foods and will be issued as often as the circumstances permit. The issue of the field ration "A" is based on the master menu. In the preparation of this menu, forecasts of market conditions, availability of subsistence items, and troop preferences are considered. This menu is then adjusted to meet local market conditions.

(2) *Field Ration "B"* will correspond as practicable to field ration "A" with the exception that nonperishable processed or canned products will replace perishable items. The issue of field ration "B" is based on the expeditionary forces menu. Theater commanders frequently change field ration "B" by substituting fresh items for canned and processed components. This modification is dependent upon the availability of refrigeration shipping, storage space, and local supplies. Troops stationed in food producing areas outside of the United States are often supplied with a modified field ration "B". Every effort is directed toward providing the Armed Forces with the best food available under prevailing circumstances.

c. Emergency Rations. (1) In addition to the regular field ration, whether perishable or nonperishable, there has always existed in war a need for one or more special types of rations for troops temporarily cut off from their normal source of supply and under conditions of combat. The tremendously increased mobility of modern warfare, with its tactics of penetration, encirclement, and infiltration, has made the satisfactory solution of the problem of special rations a matter of prime importance.

(2) Special rations must meet certain standards and requirements. Although standards are set, it must be borne in mind that special rations are not intended for use over long periods of time. Among the factors to consider for a satisfactory ration are:

1. Taste.
2. Nutritional value.
3. Stability under severe conditions of transportation and storage.
4. Size and weight.
5. Ease of preparation in the field.
6. Availability.

(3) Normally, emergency rations are issued to the soldiers for their own preparation and use. However, under extreme circumstances it may be desirable for these rations to be prepared as meals in the unit kitchen. In this event the utmost skill and initiative must be utilized. The recipes in TM 10–412, Army Recipes, will be helpful.

194. TROOP TRAIN RATION. The troop train ration is issued to detachments or larger units of enlisted men directed to travel on trains provided with kitchen car facilities. The troop train rations are issued in kind (that is, the actual food is issued), based on an allowance of one ration per man per day, plus an additional allowance of a special nonperishable ration to provide subsistence for unforseen delays en route. The allowance of the special ration is one-third ration per man for each day's travel time up to 3 days. The maximum issue of the nonperishable ration, therefore, is one full ration per man regardless of the number of days planned for the journey. The components of both the regular and the special troop train rations are prescribed by The Quartermaster General. The cost of the ration is established by the War Department. Seven menus are furnished for use with the troop train rations. Any nonperishable items that are not consumed during the troop train movement are turned in at destination for reissue.

CHAPTER 10

CONSERVATION OF FATS

195. WHY SAVE FATS. Fat should be conserved because of its essential use in cooking for frying, baking, and browning and because all fat saved in the kitchen releases other fats for making glycerine for munitions in wartime. For cooking save fat from uncooked meat of beef, lamb, veal, fresh pork and smoked hams. Fat drippings from bacon and ham, roast drippings from beef, lamb, pork and veal, steak and chops are also suitable for cooking use. For salvage fat, save grease from stock pot, sausage drippings, frying fat no longer suitable for cooking, fat-trimmings and trap grease.

196. RENDERING FAT. It is necessary that only fresh fat be used for rendering. It should be rendered daily but if it must be kept overnight it must be stored in large pieces in the refrigerator. Ground fat and small pieces of fat are highly perishable and should be rendered promptly. To prepare for rendering, remove all lean meat, tough membranes, bones, cartilages, blood, and dirt. Only sweet fat is suitable for rendering. Cut into strips as strips feed more easily through the grinder. Do not cut until ready to use. Then grind through coarse plate. Ground fat will render more quickly, more uniformly and provide 10 to 15 percent more rendered fat. Small quantities of fat should be rendered on top of any range. For large quantities of fat it is best to render in steam kettle with lid off and steam valve wide open. Fat may be rendered in roast pan on top rack while food is being prepared in cook pot on bottom rack in the M1937 field range.

197. HOW TO RENDER FAT. Place fat loosely in container. Do not pack as loose fat renders more quickly. Beef, lamb, pork and veal fat may be rendered separately or together in any proportions available. Avoid hot spots on stove where fat would be likely to scorch. Low temperature, not over 250° F. provides a high-quality rendered fat. Stirring while cooking prevents fat from sticking, shortens time required for rendering and assures a higher quality product. When completely rendered, the cracklings (which are a crisp residue that rises to the surface) have separated, are a mixture of grayish white and light brown and will gradually sink to the bottom. Do not overcook as this will impair the flavor and lower the smoking point of the rendered fat. Pour off immediately after using. The rendered fat may take a roast meat flavor if allowed to remain with the cracklings too long after rendering. Strain the fat through a cloth in a colander over broiler. Press crackling to remove fat. When two or more kinds of fat are poured into the same container, they should be mixed thoroughly. Allow fat to cool at room temperature in boiler or other clean container. Stir rendered fat a few times while hardening to improve its texture. If there is water in the fat it will settle to the bottom. The straight fat can then be removed. Be careful to avoid accidents and painful burns when handling hot fat. Cover fat to keep out light and air. Store in a cool place. Fat can be kept for short periods at room temperature below 75° F., but for long periods it must be kept in refrigerator. Use kitchen rendered fat as soon as possible to prevent accumulation of old stock. Keep salvage fat separate from kitchen rendered fat. Do not add water. Put in proper container to insure delivery.

198. ADDITIONAL AIDS IN RENDERING FAT. Prime the rendering container with a little water to prevent fat from sticking or burning. A few whole peeled white potatoes placed in the container during rendering will help to remove impurities. Each batch of fat to be rendered should be heated separately. After rendered fat has cooled to room temperature, whip-up fat in a mixer, with the bowl two-thirds full. Continue the mixing process until the product is white, clear and fluffy. Then put it in ration pans and stow it in the refrigerator.

199. SOAP MAKING. a. Boiled Hard Soap. Dissolve 1 pound of soda lye (sodium hydroxide, ordinary issue lye) in 2 quarts of water. In another container (5-gallon capacity) melt 5 pounds of clean fat or tallow, scraps or drippings, in 2 gallons of water. As soon as all the fat is melted add about one quarter pint of the dissolved lye. Boil over a slow fire. Add water to replace that boiled

away. Add another ¼ pint of lye as before and continue boiling and adding lye and water in the same manner until the lye is consumed. Experience will tell a person the right consistency by feeling it between the fingers. The liquid will then become like honey in consistency and will be transparent as it drops from a spoon. Add about ½ pound of salt. Boil until the soap separates from the lye water, has lost its honeylike appearance, and drops off a spoon or wooden paddle like greasy water. A small quantity pressed between the thumb and first finger will not feel greasy but will flatten into thin scales if the soap is finished. Simmer about ten minutes and the process is complete. When soap is ready for pouring, it should be of the consistency of softened jelly. It will not pour like a liquid nor will it stay in the pot. Skim off the soap which floats on the surface, place in a suitable mold or molds, and set aside to harden.

b. Soft Soap. Use 1 quart of the soap made according to the above formula but not hardened. Boil in a large kettle with four gallons of water until clear and uniform in appearance. Cool.

c. Inspection of Soap. (1) Cut a piece of soap in two and touch the tongue to the fresh surface.

(*a*) If the soap is very sharp to the taste, not enough grease has been used.

(*b*) If the soap feels very greasy, too much grease has been used.

(*c*) If the soap tastes sharp and also feels greasy, it has not been mixed or boiled properly.

(2) A soap that is sharp to the taste and makes a good lather is much preferred for scrubbing purposes.

d. Harden Soap with Steam. If the hard soap in process of setting is slightly soft and it appears that it will not harden, this difficulty may be overcome by attaching a short piece of rubber hose to the spout of an ordinary teakettle and placing the other end of the hose in the bottom of the soap kettle, thus introducing steam. In this way, heat is obtained by using wet steam instead of the heat being applied to the bottom of the kettle. Available steam may also be drawn from boilers in lieu of the kettle method. A drier mixture and a harder soap result.

CHAPTER II

DEHYDRATED FOODS

Section I. Importance and Preparation

200. GENERAL. a. Dehydrated Foods are fresh foods scientifically preserved under precisely controlled methods of drying. All inedible portions are removed. The finished product is powdered, or subdivided into slices, cubes, strips, flakes, shreds or other forms. By dehydration, the preponderance of water in fresh foods is reduced to an extremely low content. Present-day dehydrated foods retain much of the natural flavor, color and texture of the fresh food.

b. Nutritive Value. As a result of the principles of manufacture and exacting procurement specifications, the dehydrated vegetables, fruits, milk, eggs, and other dehydrated products used by the Army retain most of their nutritive value. If stored for long periods, appreciable amounts of certain of the vitamins will be lost, especially if the temperature exceeds 68° F. The actual length of time depends upon the particular food, its processing and moisture content. Further vitamin loss can occur during the cooking procedure in the same manner that fresh foods lose vitamins. Maximum vitamin retention is obtained when best cooking precedures are followed as:

(1) By cooking in a minimum amount of water.

(2) By completely utilizing cooking liquids.

(3) By preventing a long holding period following cooking.

c. Advantages. (1) *Weight and bulk reduced.* Marked reductions in weight and bulk are accomplished by dehydration of fresh foods.

(2) *Preparation time lessened.* Dehydrated foods need no washing, peeling or other preliminary treatment. The only preparation required is a soaking and cooking period, and in some formulas, the soaking and cooking are combined. This saving in time can release many men from KP assignments for other duties.

(3) *Keeping qualities.* If held in airtight and insect-proof containers and stored at moderate temperatures, dehydrated foods will keep for extended periods of time. Many foods will keep up to 2 years. Dehydrated foods remain in a state of preservation primarily because of their low moisture content. The micro-organisms responsible for spoilage (yeast, molds and bacteria) commonly present in foods are unable to carry on their usual activities when the water residue is sufficiently low. Some of these organisms are killed by the dehydrating processes, but the others remain dormant in the dehydrated foods, only to renew their activities at a later time when water is restored.

(4) *Convenience in storing.* Foods must be stored. Food preserved by dehydration has an advantage over other preserved foods because it can be stored in a minimum of space.

(5) *Reduced shipping weight.* The final shipping weight of a dehydrated food is only a fraction of that of the original article. This is of particular advantage during periods of war, when shipping tonnage and space must be conserved.

(6) *Elimination of food loss variation.* Everyone who has prepared fresh foods for cooking knows that peeling, trimming and spoilage losses are exceedingly

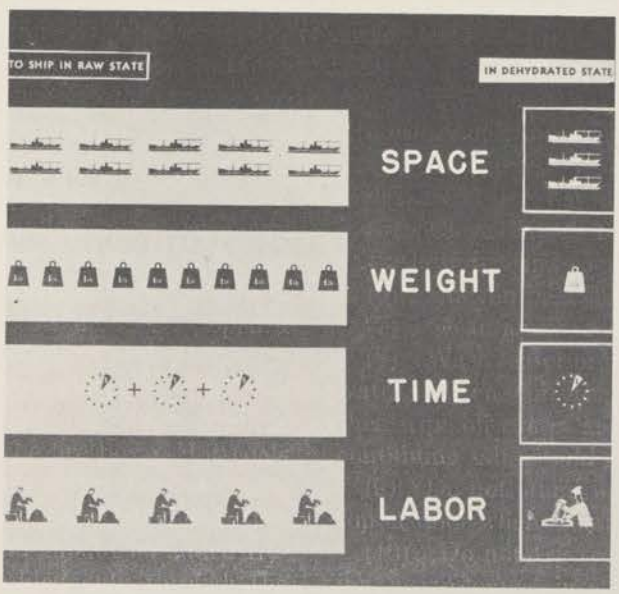


Figure 83. Savings by the use of dehydrated foods.

variable. Size irregularities alone make tremendous differences in the yield of the final product. The trimming, peeling and spoilage losses are often abnormally high and relatively unpredictable of small apples, potatoes and eggs. Dehydrated foods do not cause such difficulties because the manufacturer has accounted for peeling, trimming and spoilage losses.

(7) *Other advantages.* Some other advantages of dehydrated foods are:

(*a*) No refrigeration required for practically all items.

(*b*) No protection needed against freezing.

(*c*) May be used as needed.

(*d*) Minimum of critical metals required for packaging.

(*e*) Handling of waste eliminated.

201. RECONSTITUTION OF DEHYDRATED FOODS. a. General. All methods of reconstitution should be designed to secure the maximum soakage of moisture within a necessarily limited length of time. Several methods of reconstitution of dehydrated foods are as follows:

(1) Soaking the dehydrated product in cool water, as with vegetables.

(2) Making a paste with a portion of the cool water and all the product, gradually adding the remaining water, as with eggs.

(3) Sprinkling the product on the surface of water and reconstituting by vigorous whipping, as with milk.

(4) Mixing boiling water with the product, as with precooked potato shreds.

(5) Combining the product and water and cooking without a preliminary soaking period, as with cranberry sauce.

(6) Combining several dehydrated products, with or without a preliminary soaking period, and cooking, as with vegetable soup (made with dehydrated vegetables and beef shank).

b. Program of Reconstitution. (1) *Water and product.* Before reconstituting any dehydrated product, measurement of the water and the product must be made very accurately. All measurements should be level. Guesswork as to measures or weight results in mistakes and waste. An insufficient quantity of water will not permit the product to absorb the maximum amount of moisture, and the finished product will be of poor texture. Too much water will result in a loss of nutritive value through the necessity of pouring off the surplus water. Large quantities of surplus water should not be used when reconstituting dehydrated foods. For proper reconstitution, only a small amount is necessary. A little surplus water has the advantage of protecting against scorching during the simmering-to-a boil process. Keep the surplus water to a minimum. A good rule to follow is *"Keep the water at a minimum but never skimp."* The water should be either cool or normal room temperature. Hot water should never be used unless so stipulated in a specific recipe. *Attempts to force reconstitution by the use of boiling water generally results in an unsatisfactory product.*

(2) *Soaking step.* A soaking period of 20 to 45 minutes at room temperature is the approximate range for most dehydrated foods. Vegetables should be soaked for such limited periods of time as will cause the product to swell and reach the desired degree of moisture absorption. In those rare circumstances when conditions are of such urgency that a soaking period presents a serious time problem, the soaking step may be eliminated. In this case, the water with the product should be put on a slow heat and allowance made for a somewhat longer cooking time. After the addition of water it is important to handle dehydrated foods rapidly. Prolonged cookings should be avoided. The practice may result in off flavors, and in some instances complete spoilage is possible. *Do not soak overnight.*

(3) *Simmering.* After the soaking time, the product should be brought slowly to a boil. Strong-flavored vegetables such as cabbage, turnips and rutabagas should be cooked without a cover; others, in a covered vessel. If the time factor is controlled so that when cooking a 100-portion recipe, 35 to 45 minutes will elapse before the boiling point is reached, maximum water absorption will be effected. Smaller portions require less time. After products requiring cooking in water have reached the boiling point, they should then be slowly simmered until they become soft and tender. Most vegetables become tender when simmered ten to fifteen minutes after being brought to a boil. Sweet potatoes, however, require 45 to 50 minutes simmering to reach a tender and moist stage. *Vigorous boiling is not recommended at any time.* If a dehydrated product is overcooked, it will become mushy and disintegrate into the water. This is especially apt to happen when it is boiled vigorously or too long, because dehydrated materials are already cut into the small sizes in which they are to be finally used. The cooking of dehydrated foods may be handled satisfactory inside the Army Field Range. A temperature of 180° to 210° F., or just below the boiling point is required.

202. FINISHED PRODUCT. a. Testing with Fork. The finished reconstituted product should be tested for tenderness by cutting with a fork. If the product is firm and rubbery, additional simmering is required. When it becomes tender and moist, a satisfactory reconstitution has been accomplished. The food must be completely reconstituted and cooked before it is used as an ingredient of other dishes, as in the example of potatoes for use in potato salad.

b. Use of Left-over Water. Use left-over water after reconstitution; it contains valuable nutrients in the form of water-soluble mineral salts and vitamins, which would be lost if the water should be discarded. The small surplus should be concentrated during the cooking so that it can be served as a natural juice such as would accompany cooked fresh vegetables under normal circumstances. Any surplus can be drained from vegetables and used as stock in the preparation of soups, gravies, meat loaves, and croquettes, or as the water ingredient for other cooked foods. Surplus water from potatoes can be used to reconstitute the milk for whipping mashed potatoes. Do not discard vegetable juices. However, avoid holding them overnight as souring may result.

c. Reconstitution of Precooked Dehydrated Foods. (1) *Difference in procedure.* Some dehydrated foods are completely cooked before dehydration. These are called "precooked" dehydrated foods. The method of reconstitution for this class of dehydrated materials is different from that for a food that has not been cooked before dehydration. An example is potatoes. A julienne-style potato has been blanched and then dehydrated. This product is soaked in cold water, simmered slowly to a boil and then simmered until tender. Precooked potato shreds, however, are precooked and do not require all of this procedure. It is only necessary to add boiling water to the potato shreds, cover, let stand over slow heat for 10 to 15 minutes and then whip with hot, reconstituted milk and melted butter until all lumps have been removed.

(2) *Other precooked products.* Other precooked products are dehydrated precooked corned-beef hash and dehydrated precooked soups. The method of reconstitution differs with each of these articles. Therefore, general rules will not apply. Specific instructions are necessary for each product. Packages for the Army carry printed directions on the containers.

(3) *Dehydrated foods not precooked that require no cooking.* There are other dehydrated foods that cannot be classified as precooked products, but, nevertheless, require no cooking. These products are usually in the form of powders or flakes. Dehydrated milk and dehydrated cabbage used for cole slaw are examples. These items are reconstituted with a designated quantity of cold water and may then be used as the fresh food in cooking.

SECTION II. DEHYDRATED EGGS AND MILK

203. DEHYDRATED WHOLE EGGS. a. General. Whole eggs in dried form for the armed forces are high-quality, carefully inspected and dehydrated under the most exacting standards. "Dried" and "powdered" are two terms for dehydrated eggs, and they mean the same. Cans of dried whole egg powder are hermetically sealed, gas-packed and under a partial vacuum.

b. Advantages. Dried whole eggs are exported without refrigeration or special handling in transit. They do not require the low storage temperatures necessary with shell eggs. After removal from the shell, an egg contains approximately 73.5 percent of water. Dried whole eggs contain only 2 percent of water. The space conservation and weight reduction effected by the use of dehydrated eggs are important considerations.

c. Reconstitution. The directions for reconstituting powdered eggs should be followed exactly. Flavorful, wholesome and acceptable egg dishes will be obtained if directions are followed carefully. Careless preparation, however, will result in a poor product.

(1) The dried egg powder should be sifted before being measured. If no sifter is available and improvising one is impossible the powder should be stirred with a fork or wire whip. This makes the product fluffy and easier to reconstitute. Just one lump of unreconstituted egg powder may spoil an entire meal for a particular man.

(2) Pour one-third of the required amount of water in a suitable, deep container. Add the powdered eggs. Stir vigorously with a whip or slit spoon until all lumps are eliminated.



Figure 84. Fluff up the powder with a wire whip or put it through a sieve.



Figure 85. Pour one-third of the water into a container.



Figure 86. Add the powdered eggs.



Figure 87. Stir vigorously, keeping utensil tipped.



Figure 88. Add remaining water and seasoning.



Figure 89. Swirl the mixture.



Figure 90. Dehydrated eggs properly reconstituted, well cooked and attractively served.

(3) Tip the utensil while stirring in order to obtain a smooth mix. When the mix is perfectly smooth, add slowly the remaining two-thirds of the water and the seasoning. Keep the container tilted and stir the contents until the egg powder is completely in suspension in the water and the liquid is a smooth consistency. Pouring the reconstituted eggs through a fine mesh wire will assist in breaking up any obstinate lumps.

(4) Complete the reconstitution by swirling the pot containing the egg mixture.

d. Use. (1) *Prompt use after reconstitution.* Use eggs within a very short time after they have been reconstituted. Do not hold them longer than several hours after reconstitution, and then only if under refrigeration. If refrigerated, vigorously stir the cold eggs when taken out for use. If refrigeration is not available, use reconstituted eggs within 1 hour after mixing the powder with the water. Never hold liquid eggs overnight.

(2) *Dehydrated egg dishes.* Men who like fresh eggs will likewise relish the dehydrated product if it is properly handled by the cook. Powdered eggs may be scrambled, made into omelettes, used in preparing French toast, fritters, croquettes, hot cakes and generally in cooking in place of fresh eggs. Powdered eggs may be substituted for fresh eggs in making pastries, cakes, cookies, pudding and other baked goods.

(3) *Scrambled eggs and omelettes.* Scrambled eggs and omelettes made from powdered eggs should always be prepared in batches to serve not more than 25 men. Large amounts are difficult to reconstitute and cook satisfactorily. A recipe for 25 men will yield a good-tasting, tender and moist product. Remove egg preparations from the heat while the eggs are still soft as they will continue to thicken due to the retained heat. To allow eggs to cook completely over heat will result in serving an overcooked product of inferior flavor and texture. *Serve dehydrated eggs in a soft and moist state.* Reconstituted powdered whole milk or evaporated milk may be used instead of all or part of the water in the recipes for scrambled eggs and omelettes, and will give a superior product. Seasonings, meats, cheese, tomatoes, onions or Spanish sauce add flavor and variety to egg dishes, and lend variety.

e. Egg Dehydration. Shell eggs for dehydration are held under refrigeration at least 4 days before they are candled. In the candling, any objectionable eggs are rejected. The eggs are broken out by hand and placed in a cup. After every two or three eggs are opened they are smelled to make sure no bad eggs get by. Before going to the dehy-

drator, the eggs are homogenized and clarified. The liquid eggs are sprayed into the dehydrator under pressure which atomizes the product into finely divided particles. Inside the dehydrator, the particles encounter a stream of heated air, rapidly evaporating their moisture, leaving a dry powder which falls to the bottom of the chamber. The powder is removed from the drier without delay, quickly cooled and sifted.

f. Storage. Dried whole egg powder is PERISHABLE. Keep stored as cool as possible for best results, but it need not be stored under the exacting conditions of fresh eggs.

204. DEHYDRATED WHOLE MILK. a. General. Dehydrated whole milk is the product resulting from the removal of water from milk. It contains not less than 26 percent milk fat. "Premium" and "extra" are the two grades of dry whole milk procured by the Army. "Premium" contains not more than 2.25 percent and "extra" not more than 2.50 percent moisture. "Dry," "dried," and "powdered" are the three terms for "dehydrated" in their application to whole milk. Cans of powdered dry whole milk are hermetically sealed, gas-packed and under a partial vacuum.

b. Advantages. Liquid whole milk consists of approximately 87.3 percent water and 12.7 percent of solids in the form of lactose, casein, fat, albumen and ash. By dehydration, the 87.3 percent of water content of liquid whole milk is reduced to two and a fraction percent. It is evident that great savings are possible in transportation, storage, man hours and critical packaging materials by the use of powdered dry whole milk. The product will not freeze and can withstand heat better than fresh or canned milk.

c. Nutritional Properties. (1) So far as food value is concerned, reconstituted dehydrated whole milk compares favorably with pasteurized liquid whole milk. Milk powder made by the spray process retains practically the whole vitamin content of fresh milk. Reconstituted dry whole milk is easily and completely digestible.

(2) There are general calculations that can be followed in reconstituting milk as:

(*a*) Volume or quantity ratio:
1 part whole milk powder to 4 parts water, by measure.

(*b*) Weight ratio:
1 part whole milk powder to 8 parts water, by use of scales.

d. Reconstitution. When reconstituting dehydrated milk, water is added in quantity so that the resulting product is equivalent to fresh milk. The reconstituted liquid may then be used exactly as fresh milk. The water should be cold, or normal room temperature and not hot.

(1) The dried milk powder should be stirred with a fork or wire whip before being measured. This makes the product fluffy and easier to reconstitute.

(2) To the previously measured or weighed water, add the measured or weighed dehydrated whole milk powder, slowly sprinkling the powder over the surface of the water. Mix vigorously with a wire whip. Scrape the caked powder from the wire whip occasionally. As additional quantities of milk powder are gradually added, continue the mixing until the dried milk is thoroughly dissolved. If a mechanical mixer is available, add the powdered milk gradually to the water in the mixing bowl and mix at low speed. When completely in solution, the reconstituted product will have the flavor and appearance of fresh milk. Keep the reconstituted milk cold.

(3) Dehydrated whole milk may also be reconstituted by following the paste procedure described for reconstituting eggs.

(4) When dehydrated milk is reconstituted for drinking, the addition of salt and vanilla will improve the flavor. Add ½ level mess kit spoon of vanilla and ¼ level mess kit spoon of salt for every gallon of reconstituted milk.

(5) In reconstituting dehydrated whole milk for use with coffee, tea or cereal, double the quantity

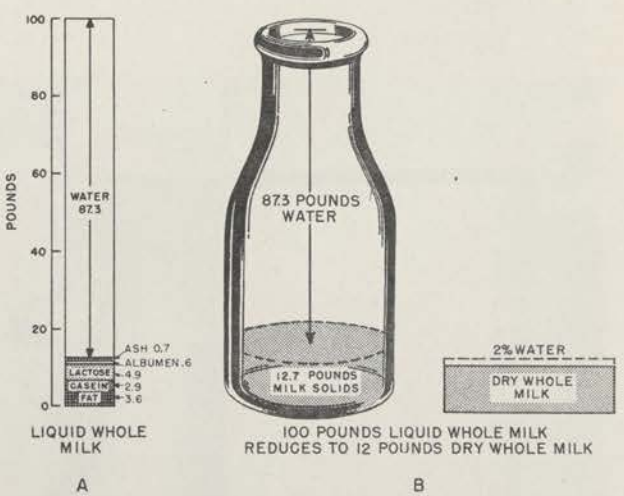


Figure 91. How milk is processed.
① *Component parts of liquid whole milk.*
② *Reduction of 100 pounds of liquid whole milk by dehydration.*



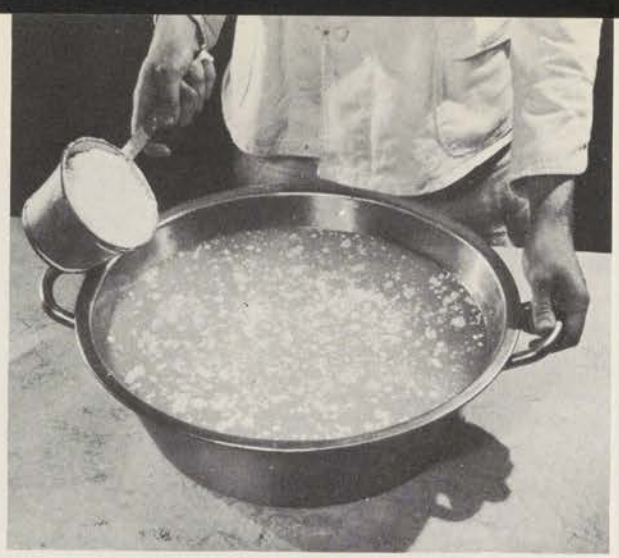
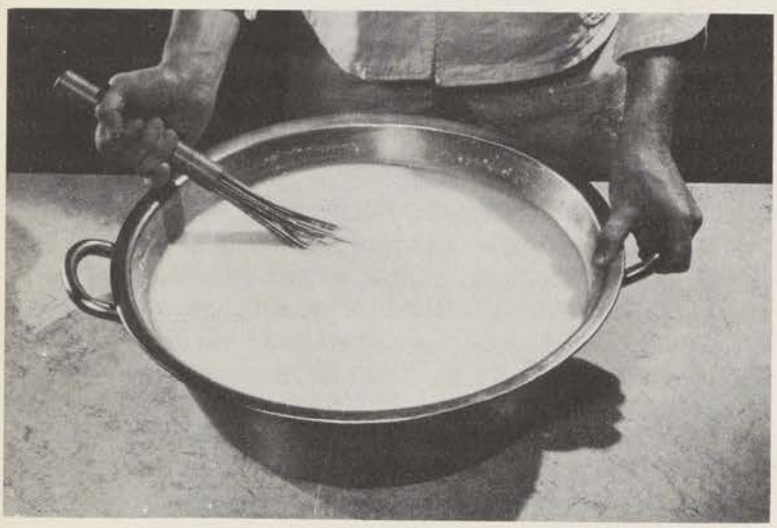


Figure 92. Reconstitution of milk.

① *Stir the milk powder.*

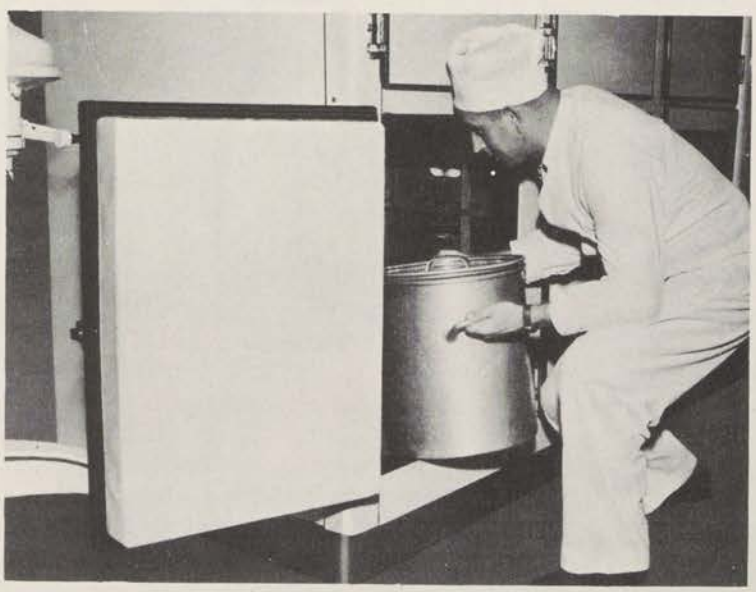
② *Sprinkle the milk powder over the surface of the water.*





③ *Mix vigorously.*

④ *Continue to add milk powder and stir until completely reconstituted.*



⑤ *Store under refrigeration.*

of dry whole milk to the same amount of water as contained in the dehydrated whole milk conversion table in TM 10–412.

e. Advance Preparation. Different from all other dehydrated products, it is practical to reconstitute milk in advance, but only if refrigeration is available. Previous reconstitution gives the minute particles of powder time to dissolve or become fully suspended in the water. With good refrigeration, milk powder may be reconstituted the night before and given time to chill thoroughly before use the next day. The flavor of the product is improved by refrigeration. Without refrigeration, milk should not be reconstituted ahead.

f. Use of Dehydrated Milk. Dehydrated whole milk may be used in the kitchen for cooking in many ways; in au gratins, mashed potatoes, cream soups, chowders, white sauce, scrambled eggs, fritters, French toast and other dishes exactly as fresh milk. Dehydrated whole milk may be used in the preparation of various milk drinks, examples of which are chocolate milk, pineapple milk and eggnog. Dehydrated whole milk may be substituted for fresh milk or reconstituted evaporated milk in any recipe for making pies, puddings, cakes, cookies and other baked goods.

g. Storage. Milk powder will absorb moisture and, therefore, must be protected from the atmosphere. It is also susceptible to air, sunlight and heat. Milk powder should be stored in a cool, dry place and open containers protected from direct sunlight.

h. Dehydrated Skim Milk. "Nonfat dry milk solids" is the term for dehydrated skim milk. This item is used for baking or cooking. The moisture content is 3 percent. Three-fourths milk to four parts water is the volume ratio, and one part milk to nine parts water the *weight* ratio for reconstituting dehydrated skim milk powder into the equivalent of fresh skim milk. For each ¾ of a No. 56 dipper (1 lb. 1 oz.) of skim milk powder, use 4½ No. 56 dippers (9 lb.) of cool water, yielding in excess of 1 gallon of reconstituted skim milk. Dehydrated skim milk is one of the formula ingredients for baking Army breads. It can also be used in baking rolls and sweet dough products. The processes of manufacture of dehydrated skim milk are the same as those for dehydrated whole milk.

SECTION III. DEHYDRATED VEGETABLES AND THEIR RECONSTITUTION

205. GENERAL. a. Techniques of Reconstitution and Cooking. Different dehydrated vegetables are less involved than the preparation of fresh vegetables. Fresh vegetables are generally prepared for eating by one of four methods: simmering-to-a-boil, baking, frying and pickling. Most dehydrated vegetables, after they have been properly reconstituted (soaked), are adaptable to each of these methods. For example, dehydrated white potatoes in the form of cubes or julienne strips can be simmered-to-a-boil (cooked) and made into mashed potatoes, baked as au gratin, fried or hashed browned, or combined with vinegar and other ingredients and made into potato salad. Certain persons like cabbage seasoned with bacon; some like a trace of vinegar; others prefer it seasoned with butter, and still others favor just salt and pepper as an accompaniment. Numerous variations of seasoning can be used with dehydrated vegetables, just as with fresh ones.

b. Weight and Bulk Reduction of Several Dehydrated Vegetables. The weight and bulk of fresh vegetables are materially reduced by the elimination of almost the entire water content during the process of dehydration.

206. BEETS. One pound of dehydrated beets equals 8 pounds of canned beets, complete with juice. Dehydrated beets can readily be reconstituted and cooked to a tender, flavorful product. They can be served plain, buttered, sweet-sour, pickled, hot spiced, chilled as a salad or as an ingredient of a salad, used in soup and in other accustomed styles of preparation of fresh beets.

207. CABBAGE. One pound of dehydrated cabbage equals 8½ pounds cooked cabbage, drained free from surplus water. Dehydrated cabbage is easily reconstituted and cooked. It can be served boiled, buttered, sweet-sour, with bacon, fried, as a hot slaw, chilled as a coleslaw or as an ingredient of a salad, used in soups or stews or in other accustomed styles of preparation of fresh cabbage. If it is for cole slaw, the dehydrated cabbage should be soaked for 3 or 4 hours in ice water or under refrigeration, but not cooked. After soaking or cooking, dehydrated cabbage should not be allowed to stand for prolonged periods of time, since it can become discolored and can develop unsatisfactory flavor. Dehydrated cabbage will readily absorb moisture from the atmosphere. It

Table XXXVII. Reconstitution ratios of several dehydrated vegetables

Dehydrated product	Approximately by measure	Approximately by weight
	Portions of product (lb.) to portions of water (lb.)	Product (lb.) to water (lb.)
Beets	1 to 3	1 to 7
Cabbage	⅞ to 1	1 to 9
Carrots	1 to 3	1 to 6
Onions	1 to 2	1 to 7
Potatoes, white	1 to 1¾ to 2	1 to 5 to 5½
Potatoes, white, precooked shreds.	1 to 1	1 to 3½
Potatoes, sweet	1 to 1½	1 to 4¼
Turnips (rutabagas)	1 to 2	1 to 6

must be held in an airtight container at all times, since the absorption of moisture can result in the development of unsatisfactory flavors and exposure to the air will cause undesirable changes in color.

208. CARROTS. One pound of dehydrated carrots equals 6 pounds of cooked and drained fresh carrots or 7½ pounds canned carrots with juice. Dehydrated carrots are simply reconstituted and cooked. They can be served plain, buttered, sweet-sour, lyonnaise, creamed, baked, chilled as a salad ingredient, used in soups and stews and in other styles of preparation of fresh carrots. When served with roasts or braised meats, carrots should be reconstituted in a normal manner before they are added to the meat.

209. ONIONS. One pound of dehydrated onions equals 6½ to 7 pounds of reconstituted and cooked onions. During reconstitution much of the onion flavor is absorbed by the water. If surplus water exists after the reconstitution process is complete, it should be used with the onions. Otherwise the discard of surplus water will result in the loss of the onion flavor. Onions are principally used for flavoring other foods. Meat dishes, stews, hashes, gravies, soups, salads and many vegetables are immeasurably improved by their use. In soups and stews, dehydrated onions will be reconstituted during the normal cooking process, even when added in dry form. In dishes of low water content, however, such as roasts, gravies, eggs, potatoes, etc., the use of dehydrated onions without preliminary reconstitution will result in the complete failure of the finished product. Onions can be fried, scalloped, combined with tomatoes or with grated cheese, made into onion soup and used in many other appetizing forms.

210. WHITE POTATOES. One pound of dehydrated potatoes equals 4½ pounds of peeled potatoes or 3 pounds, 10 ounces reconstituted and cooked potatoes. The potato is one of the most popular foods of both soldiers and civilians. The right reconstitution and preparation of this vegetable in its dehydrated form is of especial importance. The Army cook should strive for the production of a final product which has the tender texture of properly cooked fresh potatoes. *Do not stint either time or water when reconstituting dehydrated potatoes.* The cubed and julienne forms of dehydrated potatoes are an ideal size for fried, hashed browned, hashed in cream, au gratin and lyonnaise styles of preparing potatoes and for meat hashes, stews, soups and salads. Cubed and julienne forms may also be used for mashed potatoes and potato cakes. *They are not recommended for French fried potatoes. A rapid release of water occurs during deep-fat frying, resulting in troublesome boiling over of the fat, plus a tough, unsatisfactory finished dish. Dehydrated product are not adaptable to this form of cooking, and French fried potatoes should be prepared from fresh potatoes only. After potatoes have been reconstituted, place in a colander and drain thoroughly.* Wet potatoes will not brown satisfactorily and will have a pale, unappetizing appearance.

211. PRECOOKED WHITE POTATOES. One pound of precooked potato shreds equals 6 pounds of reconstituted and finished mashed potatoes. Precooked shredded white potatoes are ideal for the preparation of mashed potatoes, potato cakes and potato soups. Since the shredded dehydrated potato has been cooked before dehydrating, it is reconstituted and prepared for serving by direct mixing with the proper quantity of vigorously boiling water. *The water must be boiling. The potatoes are heated and reconstituted at the same time.* After reconstitution, the addition of hot, reconstituted milk and hot, melted butter results in an excellent mashed potato. For simplicity and speed of preparation, the dehydrated potato shred offers advantages not obtainable in other forms of potatoes. In making cream of potato soup, shredded potatoes, salt, pepper and onions are combined and placed in water and brought to a boil The mixture is simmered, evaporated or reconstituted milk and butter are added, and the mixture is further simmered until done.



Figure 93. Dehydrated foods ready for eating.

① *Coffee, apple pie, carrots, hash and O'Brien potatoes*

② *Lemon drink, applesauce, julienne potatoes, carrots, beets and coleslaw*

③ *Orange drink, tapioca, applesauce, meat balls, beets and candied yams*

④ *Milk, rice pudding, baked beans, coleslaw and carrots*

212. SWEET POTATOES. One pound dehydrated sweet potatoes equals 2 pounds 12 ounces to 3 pounds drained reconstituted sweet potatoes. Dehydrated sweet potatoes are adapted to many forms of cooking. They may be mashed, buttered, candied, fried, baked with dehydrated apples or with pineapple, prepared as croquettes, or used as a pie filling. *When cooking dehydrated sweet potatoes, AVOID DRYNESS. It is essential that* sweet potatoes be reconstituted to maximum moisture content to obtain a tasty, moist finished product.

213. TURNIPS (RUTABAGAS). One pound dehydrated turnips equals 6 pounds drained, reconstituted turnips. The turnip is particularly high in food value and is quite adaptable to dehydration. It is easily reconstituted and cooked and adds variety to the menu. The rutabaga turnip, if properly cooked and seasoned, will be enjoyed mashed, creamed, seasoned with bacon, combined with dehydrated potatoes and baked, served au gratin, used in mixed vegetables or used in the preparation of soup and stews.

214. VEGETABLE DEHYDRATION. When the vegetables arrive at the dehydration plant they are washed as thoroughly as vegetables that are prepared for cooking in the kitchen. The water used for this washing is cool and potable. Beets and carrots are topped, cabbage trimmed and cored, onions have tops, root bases, and discolored scales removed. All vegetables are peeled. After peeling, the vegetables are further inspected and washed. These operations permit discovery and rejection of any decaying, immature or woody vegetable stocks. Vegetables are blanched in order to preserve vitamins during dehydration, improve the color of pigmented vegetables, decrease the bacterial population, inactivate enzymes and provide a better quality dehydrated vegetable. Practically all dehydrated vegetables for the armed forces are packaged in 5-gallon metal cans and shipped in strong wooden boxes to protect against water, water vapor, odors, insect infestation and rodents.

SECTION IV. MISCELLANEOUS DEHYDRATED PRODUCTS AND THEIR RECONSTITUTION

215. ARMY SPREAD. Army spread is a mixture of butter, fresh cheese curd, skim milk powder and salt. It also contains small amounts of emulsifying and preserving agents. It is prepared by heating the components together from 160° to 180° F. under agitation and filling the cans hot. The product is fortified with vitamin A. Army spread has unusual keeping and spreading qualities under extreme climatic conditions. Army spread undergoes no exposure to heat in manufacture to reduce the moisture content, and it requires no addition of water or other liquid to reconstitute. Army spread is not a dehydrated product, but it is preserved butter. Army spread can be used in the preparation of sauces, in buttering vegetables, in scrambling eggs and as the fat ingredient in many recipes, if properly handled. When direct heat is applied, Army spread will stick to the pan and burn very easily. To melt it properly, add one part water to three parts Army spread and place over low heat. The resulting mixture resembles a thin sauce. White sauce made with Army spread is especially good if the sauce is to be used in a macaroni and cheese dish, potatoes au gratin, or for creamed vegetables. The method of preparation, however, must be modified so that the Army spread is added after the flour and milk have been combined.

216. BOUILLONS. a. Approximate equivalents are as follows:

(1) Twenty-four cubes dissolved in 1 gallon water equals 1 gallon liquid bouillon or stock.

(2) Three ounces granulated bouillon dissolved in 1 gallon water equals 1 gallon liquid bouillon or stock.

b. Vegetable and beef extract are two types of bouillon used by the armed forces, and both are produced in cubed and granulated forms.

(1) Vegetable bouillon is prepared from a mixture of common salt, celery salt, vegetables or vegetable extractives and concentrates, plant protein derivatives, sugar, vegetable oil, spices and seasoning, and if desired gelatin or other stiffening material.

(2) Beef extract bouillon is a similar preparation to vegetable bouillon with the addition of beef extract. Beef extract is made by concentrating the water in which fresh beef, corned beef, beef hearts, and like products have been soaked and cooked, thereby utilizing for food purposes those meat extractives and bases which otherwise would be wasted.

(3) Either type bouillon can be used in the preparation of soups, gravies, stews, hashes and other meat and vegetable dishes. The salt content of bouillon is high. When bouillon is used in cooking, the other seasoning called for by the complete recipe should be reduced accordingly.

c. Expeditionary force menu No. 1 for tropical and temperate areas provides for issue of 240 bouillon cubes per 100 men for any 10 day period.

d. The moisture content limit of bouillon is 4 percent by weight.

217. CORNED BEEF HASH, DEHYDRATED. a. Ingredients of dehydrated corned beef hash are beef that has been cooked in its own fats and juices, precooked shredded potatoes and onions, flavoring and spices. These products are prepared, cooked and dehydrated separately as the commodity in its final form retains the original color and composition of the meat and potatoes.

b. Dehydrated corned beef hash ratio for 100 men is as follows: 10 No. 56 dippers of corned beef hash to 15 No. 56 dippers of hot water is the correct ratio for reconstitution of corned beef hash. The product may also be reconstituted with cold water for cold corned beef hash service.

c. Dehydrated corned beef hash can be reconstituted and served as a wet hash, fried to a golden brown or prepared as baked hash. A favorite form of service is with fried, scrambled or poached eggs. When cooked to a crusty brown, it is a very popular dish. Other variations of preparation are corned beef and rice load, tamali meat pie or loaf, corned beef, cutlets, corned beef hash with macaroni, cabbage roll, corned beef hash meat balls and other accustomed dishes calling for meat in ground form. The fat content of corned beef hash is 20 percent.

d. Reconstitution of corned beef hash consists simply of adding the product to the hot water and letting the mixture soak for at least ten minutes, stirring occasionally. No seasoning is required.

e. The moisture content of dehydrated corned beef hash is 9 percent by weight.

218. FRUITS, DEHYDRATED. a. General. Fruits for dehydration are harvested at a higher degree of maturity than canned or fresh fruits, with a resultant higher proportion of nutrient value. In the modern, improved methods of preparation all of these nutritient constitutents can be preserved.

b. Apple nuggets. (1) Approximate equivalents are: 1 pound of apple nuggets equals 10 pounds of fresh apples or 8 pounds reconstituted and cooked apple sauce.

(2) When reconstituted and cooked, apple nuggets provide a pie or cobbler filling or an apple sauce superior in quality to that obtained by canning or cooking dried apples and comparable to that obtained from fresh apples.

(3) Apple nugget ratio for 100 men is as follows:

(*a*) For apple pie or cobbler, 7 No. 56 dippers apple nuggets to 13 No. 56 dippers cool water.

(*b*) For apple sauce, 6 No. 56 dippers apple nuggets to 12½ No. 56 dippers cool water.

(4) The moisture content of dehydrated apples is 3 percent by weight.

c. Apricots, Peaches, Clingstone (peeled) and Prunes. (1) Approximate equivalents are as follows: (*a*) One pound of dehydrated apricots equals 2 pounds 2 ounces reconstituted and cooked apricots.

(*b*) One pound of dehydrated peaches equals 2 pounds 12 ounces reconstituted and cooked peaches.

(*c*) One pound of dehydrated prunes equals 2 pounds 2 ounces reconstituted and cooked prunes.

(2) All dried fruits are rich in minerals and are useful in establishing an alkaline reserve in the body. Prunes are known for their laxative properties. Dehydrated apricots, peaches and prunes are adapted for serving alone or in pies, cobblers or other desserts in places where other fruits may not be available. When desired, these fruits are acceptable with no reconstitution whatsoever.

(3) Dehydrated apricots, peaches and prunes should be rinsed, soaked 2 to 3 hours to reconstitute and cooked 20 to 30 minutes, or until tender. Avoid a long cooking period with these products, as the practice produces a watery, tasteless fruit and is particularly unnecessary with apricots and peaches that have been blanched before dehydration.

(4) Dehydrated apricots, peaches, and prunes ratio for 100 men is 7 No. 56 dippers of dehydrated apricots, peaches, or prunes to 14 No. 56 dippers water.

d. Cranberries. (1) Approximate equivalents are: 1 pound of dehydrated sliced cranberries or dehydrated cranberry powder equals 100 2-ounce servings.

(2) Cranberries are produced in powdered, sliced-compressed and whole-compressed forms for the armed forces. They are principally produced, however, in the form of a powder, sometimes called crystals.

(3) Dehydrated cranberries varying with their different forms, are adaptable for use in making cranberry juice cocktail, cranberry jelly, cranberry sauce, apple-cranberry pies, cobblers, tarts or turnovers, cranberry ice, cranberry-apple relish and cranberry orange relish. The flavor and color of reconstituted and cooked dehydrated cranberries as a cranberry dish, or when used in combination with other foods, provides a product difficult to identify from that produced from fresh cranberries. Since cranberries absorb water, opened containers should be used as soon as possible, or carefully protected against moisture or odor absorption.

(4) Dehydrated cranberry powder ratios for 100 men are as follows: For cranberry juice, use 1 No. 56 dipper powder to 20 No. 56 dippers cool water; for cranberry sauce, 1 No. 56 dipper powder to 7 No. 56 dippers cool water.

(5) Sliced-compresed cranberry ratio for 100 men is as follow: For cranberry sauce, 1¾ No. 56 dippers product to 6 No. 56 dippers cool water.

(6) Whole-compressed cranberries ratio for 100 men is as follows: For cranberry sauce, 1½ No. 56 dippers product to 6 No. 56 dippers boiling water.

(7) The moisture content of the cranberry powder is 5 percent, and of the sliced and whole cranberries, 7 percent by weight.

219. SOUPS. Dehydrated foods can furnish a basis for a wide variety of soups and chowders. Among the possible products are vegetable soup, borsch, cabbage soup, vegetable chowder, French onion soup, cream of potato soup, and beet, carrot and rutabaga soup. Soup as a hot, savory liquid puts the stomach in good humor immediately, but soups are more than just appetizers. Soups are undeniably rich in food value. Dehydration has been applied to the production for the armed forces of yellow pea soup in plain and curried forms, green pea soup and bean soups prepared from navy beans and other varieties, such as lima, pinto and pink beans. These are instant-cooking, already seasoned soups and they save time and effort in preparation. Six No. 56 dippers dehydrated precooked soup to 24 No. 56 dippers cool water, yielding 100 8-ounce servings, is the proper ratio for 100 men. Preparation of dehydrated precooked soup consists of gradually stirring the product into cool water, continuing stirring frequently while bringing the mixture to a boil and then simmering for not more than three minutes after reaching the boiling point. A thicker or thinner soup can be produced by decreasing or increasing the water proportion. Cream soups can be produced by the use of reconstituted dehydrated milk or evaporated milk. The moisture content of dehydrated precooked soups is 9 percent by weight.

220. VINEGAR, 250 GRAIN. The vinegar which is issued overseas as a B ration component is 250 grain. This is five times as strong as the vinegar garrison cooks are accustomed to using. Caution should be observed when using this vinegar. It must be diluted with either four parts water, or used in one-fourth the quantity. Two-hundred-and-fifty grain vinegar is concentrated by a process of distillation.

221. YEASTS, DEHYDRATED. Outside the United States two types of dry yeast are used: active dry yeast and a mixture of yeast and cereals. Because of their lower moisture content, they have more than double the number of yeast cells found in compressed yeast. Dehydrated yeasts function in doughs exactly as compressed yeast. Half as much as the specified amount of compressed yeast is used.

a. It is advantageous to reactivate or revive dehydrated yeasts before adding to the dough left. This is accomplished as follows:

(1) Dissolve required quantity of yeast in lukewarm water 70° to 80° F.

(2) Add small amount of sugar to furnish food for yeast cells.

(3) Allow mixture to stand at temperatures of 70° to 75° F. (45 to 60 minutes for active dry yeast and 1 to 2 hours for the mixture of yeast and cereals.)

b. Quantities of sugar and water used in pretreatment are subtracted from the dough formula.

(1) Usual quantities for pretreatment are:

Yeast	5 parts by weight
Sugar	1 part by weight
Water	35 parts by weight

(2) *Example:* Bread formula calls for two pounds compressed yeast.

Active dry yeast	1 pound
Sugar	3 ounces
Water, warm	7 pounds

c. Moisture content of active dry yeast is 8 percent, and of mixture of yeast and cereals 10 percent.

222. DESSERTS, DEHYDRATED. This pleasing last course is one part of the meal that few soldiers have to be coaxed to like. Dessert contributes to a sense of complete dining satisfaction, and adds to the nutritional requirements. Desserts give a further opportunity to include milk, eggs, fruit and other foods essential for vigorous health in the daily diet. Dessert should be selected to round out a meal. If the food preceding the dessert is light, a substantial dessert, such as pie, will round out the meal. If the meal is heavy in starches, choose a dessert with fruits. By finishing off the meal with a dessert that fits into the total meal, the men will feel that they have had a complete meal and will acquire the nutrients they need.

223. COOK'S RESOURCES, DEHYDRATED FOODS. The cook whose resources are dehydrated foods need not fear that he is handicapped in the desserts he can serve. The possibilities are great. An extensive variety of desserts of popular acceptance is possible with dehydrated products. The recipes for pies, cakes, cookies, puddings and miscellaneous desserts are included in TM 10–412. Dehydrated products in the form of milk and eggs enter into their recipe requirements. By using the conversion tables in TM 10–412 where the recipes call for fresh eggs and milk, the cook can readily substitute dried eggs and dried milk. Accurate

Table XXXVIII. Reconstitution and cooking table—Based on 100 man recipe

Dehydrated product	Forms	Soak in cool water to reconstitute approximately	Slowly simmer to a boil approximately	Additional simmering time approximately	Total reconstitution and cooking time approximately
Beets	Sliced, diced (cubed), stripped, (julienne).	40–60 min.	40–50 min. covered.	10–15 min. covered or until tender. Drain off surplus water. Use in cooking.	1 hr. and 40 min. to 2 hr. and 5 min.
Cabbage	Shreds (flakes)	20–40 min.	40–50 min. uncovered.	10–15 min. uncovered or until tender. Drain off surplus water. Use in cooking.	1 hr. and 10 min. to 1 hr. and 45 min.
Carrots	Sliced, sliced, compressed, diced (cubed), diced (cubed) compressed, stripped (julienne), stripped, (julienne) compressed.	45–60 min.	45 min. covered.	10 min. covered or until tender. Drain off surplus water. Use in cooking.	1 hr. and 40 min. to 1 hr. and 55 min.
Onions	Sliced (flakes or chips), powder.	20–40 min.	35 min. uncovered.	20–30 min. uncovered or until tender. Drain off surplus water. Use in cooking.	1 hr. and 15 min. to 1 hr. and 35 min.
Potatoes, white	Sliced, diced (cubed), stripped (julienne).	40–60 min.	40–50 min. covered.	10 min. covered or until tender. Drain off surplus water. Use in cooking.	1 hr. and 30 min. to 2 hr.
Potatoes, sweet	Sliced, diced (cubed), stripped (julienne).	40–60 min.	40–50 min. covered.	35–45 min. covered or until tender. Drain off surplus water. Use in cooking.	1 hr. 55 min. to 2 hr. 35 min.
Rutabagas	Sliced, diced (cubed), stripped (julienne).	40–60 min.	40–50 min. uncovered.	10 min. uncovered or until tender.	1 hr. and 30 min. to 2 hr.

Pre-cooked white potatoes

Potatoes, white, precooked.	Shreds (also powder for soup).	Reconstitute with boiling water.	Pour boiling water over potato shreds. Let stand in an uncovered container on back of stove for fifteen (15) minutes, or over a low flame for ten (10) minutes. Add salt. Stir vigorously 15–20 minutes to work out lumps. Add reconstituted milk and hot, melted butter. Whip until fluffy.

measurements are always essential. The measurement tables in TM 10–412 should be consulted.

224. UNLIMITED RESOURCES. The resources for dehydrated desserts are not limited to milk and eggs. Dehydrated fruits and vegetables lend themselves very well to pie fillings. Pie is the "All American" dessert. Apple pie is the favorite of them all. With the use of dehydrated apples, an apple pie or apple sauce pie can be baked to rival a pie made from fresh fruit. Dehydrated sweet potatoes also make a very good pie.

225. CAKES. Cakes are considered next in popularity to pies in the list of Army desserts. Here, too, by combining the staple items of issue with dehydrated eggs, milk and fruits, delicious desserts can be made.

226. DESSERTS. Many other desserts can be made from a combination of dehydrated products and staple issues familiar to all Army mess personnel. By making frequent reference to TM 10–412, any cook with a lively imagination can turn out desserts that will please the taste of even the most critical.

Table XXXIX. Dehydrated products used in special rations

Product	Used in rations	Individual units	Other units	Moisture content	Special characteristics	Reconstitution and cooking, how eaten
				Percent		
Bouillon cubes	Parachute, emergency.	2 cubes		4	Vegetable type or beef bouillons. Ingredients: salt, celery salt, vegetables or vegetable extractives and concentrates, plant proteins, sugar, vegetable oil, spices, with or without beef extract.	Dissolve 2 cubes in 6 oz. boiling water. Eaten hot or cold, preferably hot.
	Ex F. menus No. 1 and 2.	100-cube cans				Dissolve 24 cubes in each gallon of boiling water. Can be used as a beverage, or in soups, gravies, stews, and meat or vegetable dishes.
Bouillon, granulated or powdered.	K	10-gram envelope		4	Vegetable type or beef bouillon. Ingredients: salt, celery salt, vegetables or vegetable extractives and concentrates, plant proteins, sugar, vegetable oil, spices, with or without beef extract.	Dissolve contents of individual envelope in ⅔ canteen cup, 1 pint, hot or cold water. Eaten hot or cold, preferably hot.
	Lunch, combat AAF.	10-gram envelope				
Candy, hard, class I.	Liferaft	1⅜ oz. pkg		1.5	Ingredients: sugar, salt, butter, flavoring oils and vegetable color. Ascorbic acid (Vitamin C) fortified.	Eaten as issued.
	C	In ration can				
	10-in-1	1⅜ oz. pkg				
Cereal, premixed	C	2 oz. compd. dish	5, 8 or 10 oz. bags or cartons.	8	Mixture of one or more cereals or cereal products, with sugar, dehydrated skim milk powder, salt.	Ready to eat with sugar and milk already added. Eat dry or crumble in ration can, and add hot or cold water. Eaten hot or cold, preferably hot.
	K	2 oz. compd. block				
	10-in-1	2 oz. carton				
	Hospital	2 oz. compd. disk				
Cheese and cracker bar, dehydrated.	Parachute, emergency.	1 oz. bar		4	Ingredients: dehydrated cheese and ground bread biscuit.	Eaten as issued.
Cocoa, beverage powder.	C	2-oz. compd. disk			Ingredients: sugar, dehydrated skim milk powder, Dutch processed cocoa, malt extract, salt, natural and artificial coloring.	Crumble compressed disk thoroughly in palm before opening package. Empty contents of disk package into canteen cup. Add small amount of water and stir to make a smooth paste. Add hot or cold water slowly and stir well while filling canteen cup ⅓ to ½ full.
	Hospital		16-oz. cans			Mix contents of 10-oz. container and ½ canteen cup water in suitable container. Stir to make a smooth paste. Gradually add 2 canteen cups hot or cold water to mixture. Stir until thoroughly mixed. Eaten hot or cold, preferably hot.
	10-in-1		10-oz. bags in cartons.			

Corned beef hash, dehydrated.	10-in-1 Lunch, combat, AAF.	13-oz. can 13-oz. can		9	Ingredients: dehydrated beef, dehydrated onion powder, ground white pepper, salt and nitrate, dehydrated cooked potato shreds.	Individual use. Place ⅕ of contents into individual mess kit. Add about ⅕ canteen cup hot or cold water. Let soak at least 10 minutes, with occasional stirring before eating. Group use. Empty contents into a large container. Add approximately 1½ ration cans hot or cold water, hot water preferred. Let soak at least 10 minutes with occasional stirring, may be eaten in this form, or if preferred, fried to a brown color in a slightly greased skillet. Shake the skillet to prevent sticking.
Coffee product, soluble.	C K Parachute, emergency 10-in-1 Hospital lunch, combat, AAF.	5 gram envelope 5 gram envelope 5 gram envelope 1-oz. can 4-oz. can	8, 16-oz. 20-oz. cans	4	Made from brew of freshly roasted coffee, dehydrated to powdered form.	Dissolve contents of individual envelope in ⅓ canteen cup, 8 ounces, hot or cold water. Stir well. Add sugar if desired. One oz. cans. Place ½ mess-kit spoonful in canteen cup. Fill ½ full of hot or cold water and stir. Contents of can make 4 pints of coffee or 5 canteen cups ½ full.
D Type ration	D K 10-in-1	4-oz. bar 2-oz. bar 2-oz. bar			Ingredients: Chocolate, dehydrated skim-milk powder, sucrose, added cocoa butter, oat flour, vanilla flavoring, salt optional, vitamin B_1 fortified. Will not adhere to wrapper at temperature up to 120° F.	Bar should be eaten slowly, or may be used for making a beverage by breaking and dissolving in about 1 pint of boiling water.
Dessert powder with starch, butterscotch, chocolate and vanilla.	EF menu Nos. 1 and 2		5-lb. cans 10-lb. cans or spiral wound metal and fibre cans.	5	Ingredients: starch, sugar, salt, flavoring, vegetable colors, cocoa optional.	For 100 servings, mix 5 pounds dessert powder with 10 quarts fresh milk. Milk may also be 2 No. 56 dippers dehydrated milk powder properly reconstituted with 8 No. 56 dippers cool water. It may be 5 No. 56 dippers evaporated milk reconstituted with 5 No. 56 dippers cool water. Heat slowly with constant stirring until mixture thickens. To make a richer pudding, add 8 mess-kit spoons shortening. May be served hot or cold.

Table XXXIX. Dehydrated products used in special ration —Continued

Product	Used in rations	Individual units	Other units	Moisture content	Special characteristics	Reconstitution and cooking, how eaten
				Percent		
Dessert powder with gelatin.	EF menu Nos. 1 and 2		5-lb. cans 10-lb. cans or spiral wound metal and fibre cans.	3	Ingredients: gelatin, sugar, salt, citric acid, lemon and orange oils, flavoring, buffering agents, vegetable colors.	For small amount, use 1 part powder to 5 parts water. For 100 servings, add 5 pounds dessert powder to 12 No. 56 dippers hot water. Stir until thoroughly dissolved. Pour into shallow pans and place in refrigerator or on crushed ice. Will set in ¾ hour. When adding fruit, replace 1 dipper water with the fruit juice from a No. 10 can. Add drained fruit to dessert just before it begins to thicken.
Dextrose tablets, flavored.	K	2-oz. pkg		1.7	Ingredients: dextrose mixture, cocoa butter, stearic acid, citric acid, oil of lemon, oil of orange.	Eaten as issued.
Grape beverage crystals, synthetic (oversea types).	K 10-in-1	7-gram envelope 7-gram envelope	12-oz. cans	1.5	Ingredients: citric acid, dextrose, imitation grape flavor, ascorbic acid (vitamin C), tricalcium phosphate (optional).	Dissolve contents of individual envelope in ½ canteen cup, 12 ounces cold water. Add sugar and stir well. To make 14 gallons beverage, dissolve contents of 12-ounce can and 14 pounds sugar in the required amount of cold water. If ice is to be added, add before bringing up to the 14 gallon volume. Allow water just chemically purified to stand 30 minutes before adding crystals.
Hominy, dehydrated, white (or yellow).	EF menu No. 1		5-gal. cans	6	May be served plain, or seasoned with pepper and chopped bacon and fried.	For 100 servings, soak 5½ No. 56 dippers dehydrated hominy in 12 No. 56 dippers cool water for 20–30 minutes. Add 8 mess-kit spoons salt and slowly bring to a boil. This requires about 45 minutes. Simmer 20–30 minutes more, or until tender.
Lemon juice powder, synthetic.	C K 10-in-1 Lunch, combat AAF.	7-gram envelope 7-gram envelope 7-gram envelope 7-gram envelope	12-oz. cans	1.5	Ingredients: dried, pure lemon juice with corn syrup, citric acid, dextrose, ascorbic acid (vitamin C), lemon oil and tricalcium phosphate (optional).	Dissolve contents of individual envelope in ⅔ canteen cup, 1 pint, hot or cold water. Add sugar and stir well. Mix 1 12-ounce can with 5 pounds sugar and dissolve in 6 gallons cold water. Allow water just chemically purified to stand 30 minutes before adding powder.
Malted milk dextrose tablets.	Hospital parachute.	2-oz. pkg	14-oz. cans	3	Ingredients: dextrose, cocoa, malt-	Eaten as issued.

Malted milk dextrose tablets.	Hospital parachute. K	2-oz. pkg 2-oz pkg	14-oz. cans	3	Ingredients: dextrose, cocoa, malted milk, citric acid, salt.	Eaten as issued
Meat and rice dehydrated.	10-in-1 Lunch, combat, AAF.	13-oz. cans 13-oz. cans		9	Ingredients: 50/50 mixture dehydrated beef and pork, dehydrated cooked rice, dehydrated onions, salt and spices.	Individual use. Place ⅛ of contents into individual mess kit. Add about ⅛ canteen cup hot or cold water. Let soak at least 10 minutes, with occasional stirring. May be eaten in this form, or if preferred, fried to a brown color in a slightly greased skillet. Shake the skillet to prevent sticking.
Malted milk, dry	EF menus, No. 1.		16-oz. lots or tins, 4½ lb. tins.	3.5	Ingredients: dehydrated whole milk powder, dehydrated liquid separated from mash of ground barley and wheat, with or without the addition of sodium chloride, sodium bicarbonate and potassium bicarbonate.	Reconstitute same as dehydrated whole milk.
Orange juice powder, synthetic.	C K 10-in-1 Lunch, combat, AAF.	7-gram envelope 7-gram envelope 7-gram envelope 7-gram envelope	12-oz. can	1.5	Ingredients: dried pure orange juice with corn syrup, citric acid, dried pure lemon juice with corn syrup, ascorbic acid (vitamin C), oil of orange, coloring, tricalcium phosphate (optional).	Dissolve contents of individual envelope in ⅔ canteen cup, 1 pint, hot or cold water, add sugar and stir well. Mix 1 12-ounce can with 5 pounds sugar and dissolve in 6 gallons cold water. Allow water just chemically purified to stand 30 minutes before adding powder.

Table XL. Dehydrated products as components of special rations

Component dehydrated product	Ration product	Used in ration	Individual units	Other units	Special characteristics	How eaten
Dehydrated APPLE NUGGETS are a component of.	Corned pork loaf.	K	4-oz. cans		Processed ready to eat.	Hot or cold
		Lifeboat, air-borne.				
	Pork and apple sauce.	10-in-1	6-oz. cans		Ready to eat. Already seasoned.	Do.
	Pork sausage, patties, apples.	do	do		do	Do.
Dehydrated POWDERED ONIONS are a component of.	Meat and noodles.	C	12-oz. cans		do	Do.
		Lifeboat, air-borne.	do		do	Do.
	Frankfurters and beans.	C	do	34-oz. cans	do	Do.
		Lifeboat, air-borne.	do		do	Do.
	Pork and rice	C	do		do	Do.
	Meat, ground, and spaghetti.	C	do		Processed ready to eat.	Do.
		Lifeboat, air-borne.	do		Already seasoned. (Powdered dehydrated garlic may be used in product.)	
	Pork and corn	10-in-1	6-oz. cans		Ready to eat. Already seasoned.	Do.
	Pork and gravy	do		34-oz. cans	do	Do.
	Meat balls and spaghetti.	do		do	do	Do.
Dehydrated POTATO CUBES are a component of (Optional for fresh white potatoes).	Stew meat and vegetable.	C	12-oz. cans		do	Do.
		Lifeboat, air-borne.	do		do	
		EF menus, Nos. 1, 2.		30-oz. cans		
Dehydrated POTATO CUBES (optional for fresh white potatoes) and dehydrated POWDERED ONIONS (optional for fresh or storage onions) are components of.	Hash, corned beef.	EF menus, Nos. 1 and 2.		5-lb. 12-oz. cans.	Processed ready to eat. Already seasoned.	Do.
	Hash, meat and vegetable.	EF menus, Nos. 1 and 2.		do	do	Do.
	Stew, English style.	10-in-1		34-oz. cans	do	Do.
Dehydrated SKIM MILK POWDER is a component of.	Fruit bars and caramel confection.	K	2-oz. pkg.		Eaten as issued	
		10-in-1	do			
		Lunch, combat, AAF.	do			
			do			
	Fig pudding	do	3½ oz. can		Eaten as issued	Do.
	Fruit pudding	do	do		do	Do.
	Plum pudding	do	do		do	Do.
Dehydrated SKIM MILK POWDER and POWDERED DEHYDRATED ONIONS (optional for fresh or storage onions) are components of.	Ham and eggs with potatoes.	C	12-oz. cans		Processed ready to eat. Already seasoned.	Do.
Dehydrated WHOLE MILK POWDER is a component of.	Pineapple and rice pudding.	10-in-1	3¾ oz. cans		Eaten as issued	Do.
Dehydrated SWEET POTATO SLICES are a component of.	Ham and sweet potato slices.	do		34-oz. cans	Processed ready to eat. Already seasoned.	Do.

CHAPTER 12

MESS OPERATION IN FIELD

SECTION I. METHODS OF FIELD MESSING

227. GENERAL. The cook who has learned to do his job well in the garrison mess hall has learned the first lesson in successful field operations. He has gained the knowledge and skills necessary for the preparation of food and the use of garrison equipment. When he is transferred to field duty, he will find that the basic principles remain the same. However, it will be necessary for him to apply his knowledge and skills to new situations. He will have different equipment. He will find different problems of operation. This is the greatest test of the Army cook, and he must call upon his imagination and initiative to meet every problem as it confronts him. If he is to complete his mission under varying combat conditions, he must become familiar with the use and care of field equipment and learn to make and use field expedients. While he will later improvise and develop ideas of his own, there is much he can learn beforehand from the practical experience of other mess personnel in active theaters of operations.

228. METHODS OF MESS OPERATION IN THE FIELD. There are three distinct types of mess operations in the field.

a. The first type is the mess in areas far enough to the rear to be relatively safe from ground attack. This type of installation is called a semipermanent installation. (See fig. 94.) While it will be moved from time to time as the areas of battle change, it may stay in one place for days or even weeks or months, depending upon the conditions and progress of battle. Mess operations here will be relatively permanent when compared with the forward area operation. Men are served in the semipermanent mess with little difficulty, because there is usually sufficient time for improving facilities in the kitchen area. They are not concerned with conditions of continuous combat, but only with the immediate possibility of occasional air attack. At times it is practicable here to have a combined mess for two or more companies.

b. A new and more difficult situation arises close to the front lines. Here, nothing is permanent; all kitchen units are continually on the move. The regiment or other comparable administrative unit picks up supplies from truckheads or supply points and the rations are distributed to each company. Positions are likely to be in a state of constant change, and mess personnel must make adjustments daily in order to serve the men in their outfits. Under such circumstances food is prepared during the later afternoon at some point to the rear of the combat troops. Meals are then transported under cover of darkness to the men at the front. For this purpose, a kitchen truck is the best piece of equipment. The cook should know kitchen truck equipment thoroughly. Although he will not always have such equipment available, nevertheless he will be able to improvise if he understands it. Valuable time can be saved if cooks are skilled in preparing meals en route. The conditions of roads will limit this activity, but often there are jobs that can be done while the truck is moving. When the truck arrives at the forward areas, a chow line is usually set up as well as circumstances permit. In some cases it may be best to serve directly from the truck. In any event, the men will be sent to the mess in groups, usually by platoons or sections, to avoid congestion and to facilitate serving. Sometimes it may be necessary for the truck to make two or more stops, if the company is deployed in widely separated groups. A detail of two or three men may be served by sending hot food up to their advanced position by other men in the company. In this case, food can be delivered in cans or other closed containers, and these men will not have to go without their hot meals. The important thing here is to get hot coffee to the men in the fox holes at least twice each day. If they are using "C" rations, the meat components should be heated before they are sent up.

c. The third type of operation is best illustrated by the usual mess procedure in the jungle areas. The lack of roads and the necessity for slow movement often make the use of kitchen trucks impracticable close to the front. Under such circumstances, the kitchen must be set up for operations

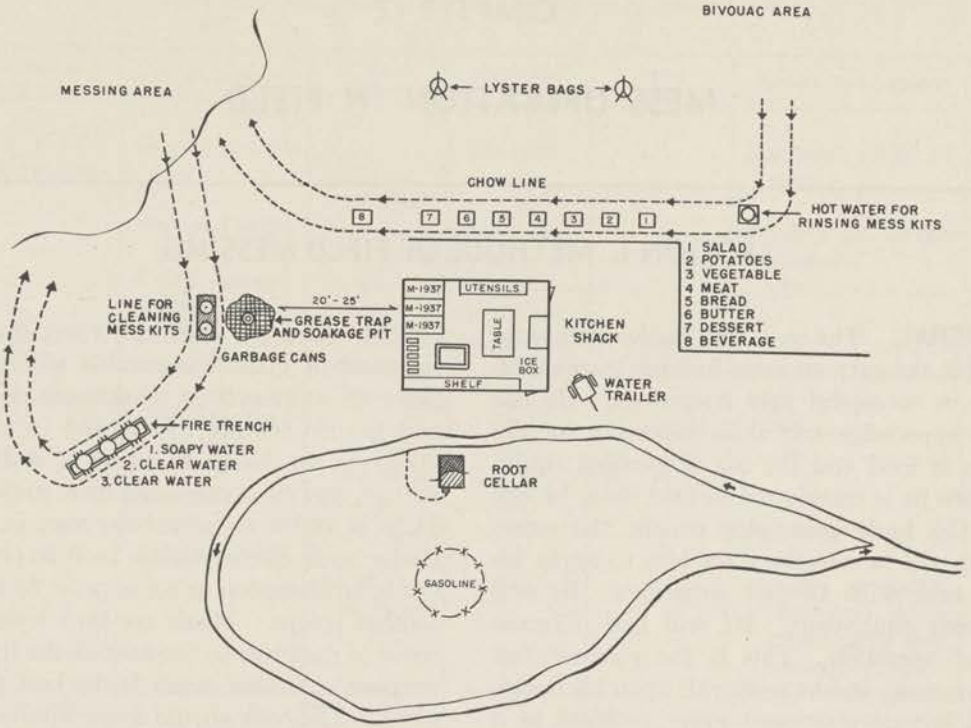


Figure 94. Layout for semipermanent mess area.

near enough to the front lines to serve the troops on the spot. Tent flys are erected or temporary shacks are hurriedly constructed even though they may be used for only a few days before moving on to an advanced position. The principles involved are much the same as those which apply to the semipermanent kitchen, except that the extremely temporary nature of these set-ups require the use of hastily improvised expedients. Special problems involved in this type of area will be discussed in connection with different kinds of equipment for the field.

d. The ration cycle used in these advanced sectors normally is supper, breakfast, and dinner. Supper will be prepared in the late afternoon, if practicable, so that it can be brought up and served after dark. When the supper has been served and the details of clean-up completed, the kitchen prepares for the next meal. Breakfast is served early in the morning in time for the mess personnel to finish their job and retire before daylight. At breakfast time, box dinners, or one of the emergency type field rations are issued to the troops. This dinner meal is eaten individually or in small groups whenever it is convenient during the day.

e. In studying the various types of equipment issued and recommended for expedients in the field, it is well to recognize the special problem involved. All of the equipment discussed in this chapter has been tried and has proven effective in meeting the conditions of field operations.

229. SERVING IN THE FIELD. Rules outlined for cafeteria service are generally applicable to mess kit feeding in the field. The equipment in the field is not as convenient as in the garrison mess hall, but most of the basic practices of serving remain the same. The following differences should be observed in the field:

a. A large container of boiling water should be available at the head of the serving line for the predipping of mess kits. Predipping partially sterilizes the mess kits and in cold weather it gives them a desirable warmth.

b. If soup is served, it should be of a thin variety and served before the other hot foods in order to allow the soldier to consume his soup before being served his beverage. Facilities must be provided for him to wash his cup before having the beverage served.

c. Coffee should be served black. A table may be placed a little distance beyond the serving line for the service of cream, sugar and condiments.

d. In areas where flies are prevalent, especial care is required. Only the bottom of the mess kit should be used for food. The top must cover the food even between mouthfuls. Therefore, if dessert is served, the men must go through the serving line twice.

e. A very important part of the mess service in the field is the care of mess kits after the soldiers have finished eating. Arrange the receptacles, for washing the mess equipment so that two lines may be formed, one on each side of the receptacles. This permits two men to use each container at the same time. Three large containers (32 gal. GI cans are the best) must be provided for washing and rinsing the mess kits, and at least one other receptacle must be furnished for garbage. The soldiers should reach the garbage receptacle first, in order to scrape their equipment as clean as possible before washing. The three large containers should follow in this order:

(1) In the first, have hot, soapy water for washing the mess gear. Provide clean GI brushes to help the soldiers in washing their mess kits thoroughly.

(2) In the second, have clear, boiling water and keep it boiling until all of the men have finished their washing. This is the first rinse.

(3) In the third can, keep clear, boiling water to serve as the final rinse. Do not permit the men to dry their equipment with cloths of any kind. The mess equipment must be air-dried. In cases where water cannot be boiled, a sterilizing agent will be provided.

f. In the field, care must be exercised to prevent scraps from being left on the ground. Refuse on the ground in a kitchen area can quickly become unpleasant and unsanitary. By giving proper instructions to the men, and by having the line for washing and waste disposal efficiently operated, this can be largely prevented.

230. SELECTION OF A SEMIPERMANENT SITE. Units far enough to the rear to be fairly safe from enemy ground attack can take advantage of their favorable positions by setting up semipermanent kitchen areas. While the general area for such an installation will be determined by the commanding officer on the basis of the current tactical situation, the job of arranging the various elements of the installation will usually fall to mess personnel. Every mess sergeant and every cook must be prepared to carry out this mission when the occasion arises. These are the important things to look for when picking out a site:

a. It should have good natural cover in a defiladed, wooded section, well-shielded from observation.

b. It should have sufficient road network to accommodate the free movement and use of mess vehicles.

c. It should be on high, dry ground near a slope that provides good drainage.

d. It should be as near to the troops to be served as local conditions will permit.

e. It should be near a natural water supply, such as a lake, stream or spring.

SECTION II. ORGANIZATION AND MAINTENANCE OF KITCHEN AREA

231. GENERAL. No definite rules are established for the detailed lay-out of a kitchen area. However, there are three main requirements which must be met: there must be plenty of good storage space for food, rules of sanitation must be enforced, and the chow line must be handled efficiently.

232. STORAGE OF FOOD. Under all circumstances, in a semipermanent kitchen, means must be provided for the safe storage of food. Although the turnover will be rapid, it will be necessary to keep supplies in good condition for at least 24 hours and some food will be stored for several days. A limited quantity of reserve must be kept on hand. If mechanical refrigeration is available, and if sufficient space is provided, little difficulty will be involved. However, provision should be made for taking care of supplies in case of the failure of the equipment. In the absence of mechanical refrigeration, food can be safely stored in underground food boxes and in root cellars.

a. Underground Food Box. (1) Figure 95 shows the underground type food box which, if properly built, will serve well for storage of perishables. The simplest type is made by digging a pit the size of a packing box and lowering the box into the pit. If well covered, this will be a cool box. If frozen meats are stored in the box, they will give sufficient refrigeration, since they are about 20° colder than ice when received. During the 24 hours required for these meats to thaw, other perishables can be kept at suitable temperatures in the food box.

(2) Another type can be constructed from a large packing box. Punch a number of holes in the bottom of the box. Cover the outer sides with waterproof paper or other waterproofing material. Dig a pit slightly larger than the box and fill the bottom with loose rocks and gravel. Sink the box in the pit, with the top of the box several inches below the level of the ground. Inside this box, place a smaller box which will allow a space of 3 or 4 inches between the two boxes, place straw, grass, saw dust or similar material for insulation. A reasonably heavy door should be built and attached by hinges. This door should be large enough to cover the tops of both boxes. The door can be further covered with a wet blanket or with dry leaves or branches if camouflage is needed. It may be advisable, depending on the terrain and the type of soil, to dig a drainage ditch around the box to prevent seepage during heavy rains. This box may be used for fruits, vegetables, milk, butter and other perishables without the aid of frozen meats for refrigeration. Lower temperatures may be obtained by keeping the insulation material damp by pouring water around the sides from time to time. This box may be constructed of different sizes and for different uses. Similar boxes can be used for highly perishable storage if cooled with ice or by the use of frozen meats. If ice is used, a separate compartment should be made for the food.

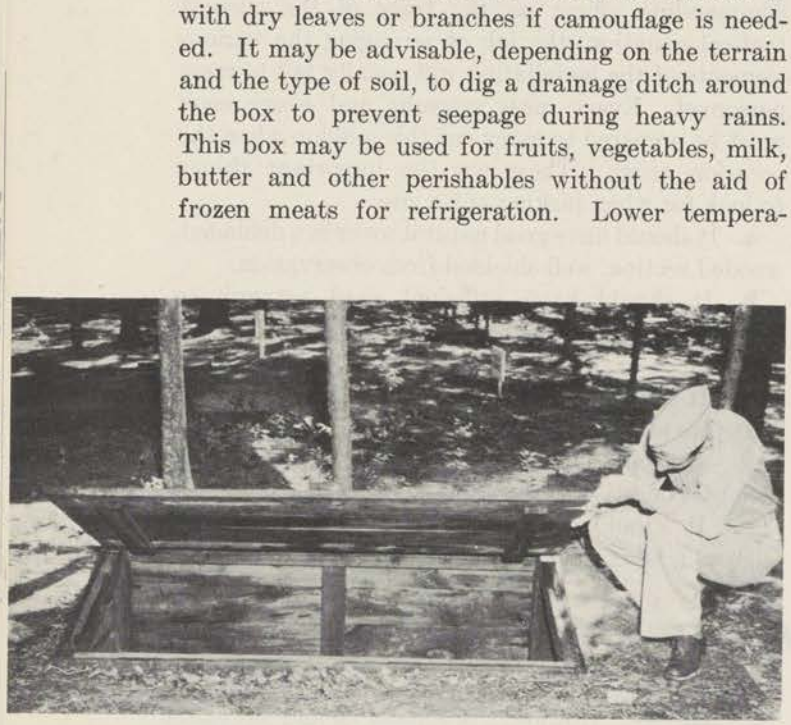


Figure 95. Underground food box.

(3) In hot, humid climates, underground storage is usually impossible because of the extremely low elevation; seepage becomes too great a problem to make such storage efficient. In some localities, the difficulties involved in excavating prohibit the use of underground storage. In such cases, use must be made of other expedients.

b. Root Cellar. For the storage of most fruits and vegetables, the root cellar is recommended. (See figure 96.) This cellar should be dug into the side of a hill on a slope because of the convenience of approach and because drainage will be better. After the required space has been excavated, the sides are lined, preferably with waterproof material and reinforced to prevent caving in. The top should be covered with heavy boards or logs and canvas in a way that will give complete protection from the elements. Top ventilation must be provided, drainage must be assured, and plenty of dunnage should be used. Finally, a door may be added. Be sure that the door is large enough to admit containers without too much crowding. When the door is not in use, it should be kept securely closed and covered with canvas. Care must be taken to check temperatures in extremely hot or cold weather to prevent spoilage and freezing.



Figure 96. Root cellar.

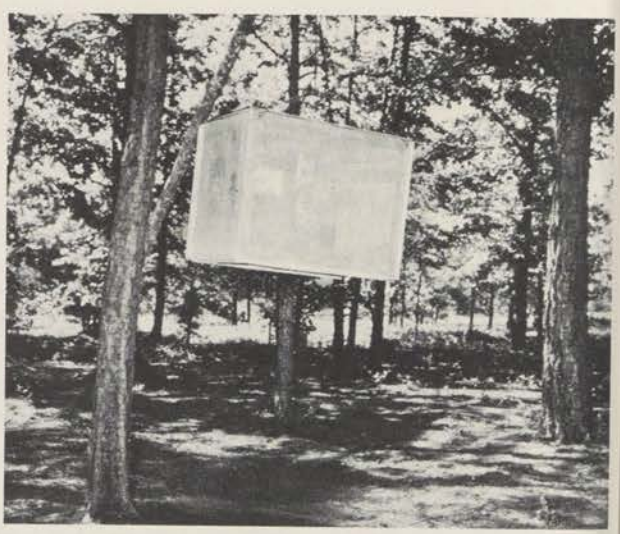


Figure 97. Suspended food container.

c. Other Storage Expedients. There are many other ways food may be stored in the field. In temporary camps, food can be stored in watertight containers and placed in springs or streams. For a short time, supplies may be simply buried in the ground, by digging a hole, lining it with burlap sacks and boards and covering it over with soil, straw or leaves. A food box (figure 97), screened with wire or cloth netting, can be suspended from the branch of a shade tree. This provides plenty of ventilation and will also act as a protection against insects and rodents. The cooling effect can be increased by wrapping the box in cloth material which can be kept damp by sprinkling frequently with cold water. Meats, dairy products, fruits and vegetables can be stored temporarily in such a container. This type is used in areas where underground storage is impracticable. Another improvised means of keeping food cool in the desert, known as the desert cooler, is constructed with a square or rectangular frame of any desired size with a pyramidal-shaped top sloping from the center. This frame is covered with wire mesh and then covered with burlap or other similar available material. A door covered with burlap overlapping the burlap covering of the frame is constructed to open on one side. A can containing water is suspended above the box to provide a constant dripping of water over the cooler. The flow of water keeps the burlap damp and by evaporation keeps the contents cooler. (See fig. 98.)

d. Storing Nonperishables. When canned, packaged or bagged goods are stored in the field, especial attention must be given to the conditions of the particular climate. In cold climates, care must be exercised to prevent freezing. In tropical areas, constant attention is required to prevent spoilage. In hot, humid climates, goods must always be stored with plentiful dunnage. High shelves made of an open framework are particularly valuable. In storing goods, allow sufficient room between containers for full circulation of air.

e. Inspecting Edibles. In tropical climates, canned goods must be inspected *every day*. Spoilage can occur very quickly. All other food products should be inspected constantly and contaminated goods disposed of promptly.

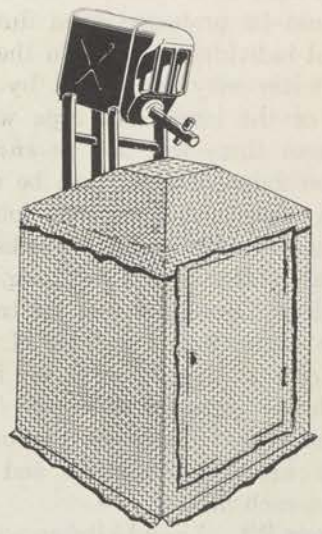


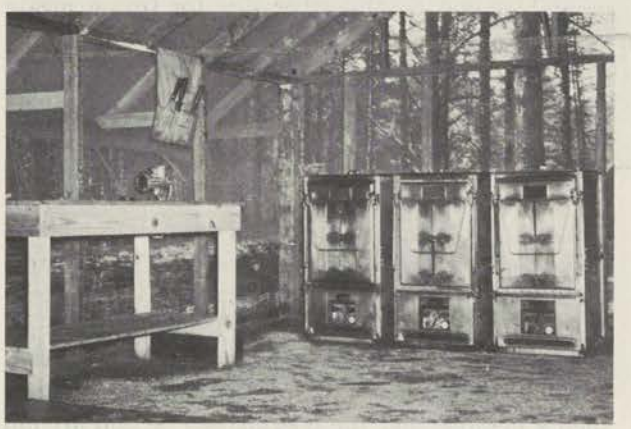
Figure 98. Desert cooler.

233. COMPLETE FIELD KITCHEN. Illustrated in figure 99 is an example of a field kitchen which is a model of efficiency. If time and materials are available, this type of kitchen is the best to build in semipermanent areas.

a. First, a large storage pit is dug to serve as a combination cellar and refrigerator. (See fig. 100.) Space is provided on one side for fresh fruits and



Figure 99. Kitchen shack. ① Exterior.



② *Interior.*

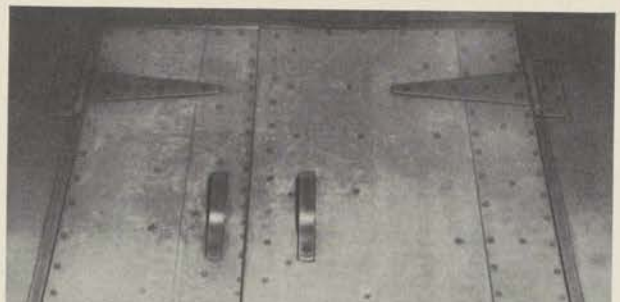
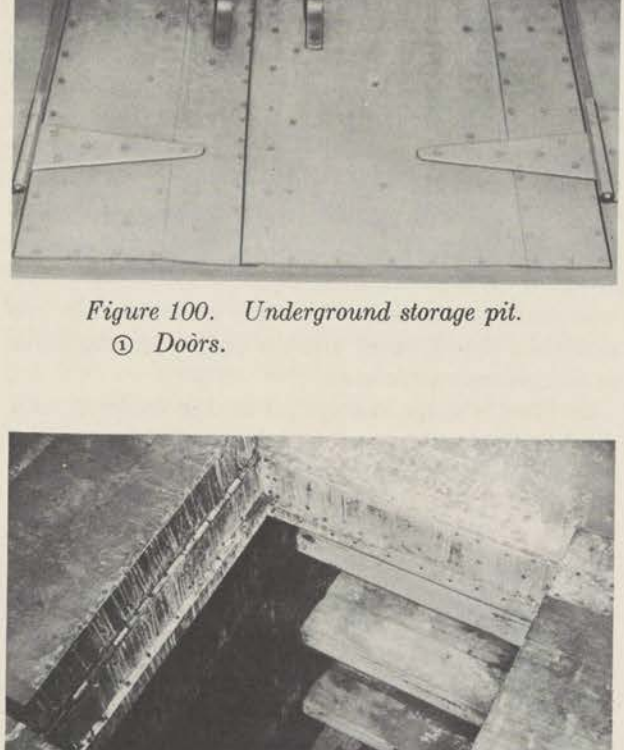


Figure 100. Underground storage pit.
① *Doors.*



② *Interior.*

vegetables and on the other side for frozen meats and dairy products. The result is an adaptation of the root cellar and the underground ice box. The principles of construction explained above can be applied here. Steps can be built leading down into the pit. The greatest problem is drainage. The cellar must be located on high ground, and a foundation of rock and gravel should be laid at the bottom to absorb seepage. This storage area is covered over by heavily insulated trap doors.

b. The next step is constructing the kitchen shack. A frame work of two-by-fours is erected in such a manner that the flooring can be laid around the trap door, leaving the storage pit in the middle of the floor. There should be plenty of space under the flooring for ventilation and surface drainage. After the framework is completed and the flooring laid, the sides are boarded up about 2½ feet and the openings at the sides and both ends are covered with wire screening. A tent fly or other canvas is then stretched across the top for a roof and the kitchen is ready for use. Ranges, tables and racks are arranged in the most convenient manner. A gasoline lantern provides light for the entire kitchen. Best of all, food supplies can be taken from the cellar through the trap door, without having to go outside the kitchen. The materials shown in this model field kitchen may or may not be available for use under actual field conditions. However, substitute materials can be used, and the general plan of the kitchen can be followed and adapted to the particular situation. In hot, wet climates, ordinary wire screening is not practicable because it is destroyed quickly by rust. Proper screening is available, however, which because of its rust resisting qualities is long lasting.

234. SANITATION. One of the most vital considerations in the organization and maintenance of equipment in the field is that of securing proper sanitary conditions. A sanitary mess can be a strong factor in the prevention of disease. Sanitation is especially important in the field.

a. Cleanliness of Cooking Equipment. All eating and cooking equipment should be cleaned and sterilized immediately after use by washing in hot soapy water, followed by rinsing in boiling, clear water. This is necessary to destroy any disease germs which might be present. The equipment should then be air dried. When not in use, utensils should be protected from dust and from flies. To aid individual soldiers in the cleaning of mess kits, water may be heated by the M1937 field range or the immersion type water heater. In many cases there will not be enough fuel to operate these units. It will then be necessary to improvise a means of doing the job. The fire trench is the best and easiest expedient (See fig. 101.) Dig a trench about 8 feet long, 1 foot wide and 1 foot deep. Build a fire in the trench. Place four or five angle irons or pieces of 1 inch pipe across the top and then set over the fire three GI cans filled three-fourths full of water. The water in all three cans can be kept at the boiling point. These cans must be emptied and thoroughly cleaned after each meal.

b. Soakage Pit. Liquid kitchen wastes are best disposed of by the use of a soakage pit (See fig.

102.) These pits may be dug as deep and as large as the occasion demands. For an ordinary company mess, the following pit is usually sufficient. Dig a hole 4 feet deep and 4 feet square, and fill it with broken rock, bricks or very coarse gravel. A grease and garbage trap must be used with this pit to collect grease and avoid stoppage. This trap can be made from an ordinary salvage pail by punching holes in the bottom. The pail is then filled with layers of straw and ashes or gravel. A suitable grease trap can be made also from a half-barrel or a wooden box. (See fig. 103.) A rocket ammunition box is suitable. The barrel (or box) is divided into unequal chambers by placing a wooden baffle or board extending to within one inch of the bottom. The large chamber is the place where liquids are poured in, and the smaller chamber is the side that grease-free water flows out. The trap has a hinged removable lid. A metal strainer, 8 inches square and 6 inches deep, is put into the larger chamber. The bottom of the strainer is filled with holes and is removable, so that it can be easily cleaned and kept in working order. A 1-inch pipe is placed in the upper third of the small chamber. This pipe carries the greaseless water to the soakage pit. The trap should be drained and cleaned daily to prevent sour odors.

c. Garbage Disposal. In bivouacs, overnight camps and areas near combat, garbage or solid waste is generally disposed of by burial in shallow trenches. These trenches should be dug about 1 foot wide and 2 or 3 feet deep. The garbage should be covered immediately after being deposited. In some sections, coral or rock formations prevent digging. In such cases, pits can be formed by blasting or garbage can be disposed of by having a chute that will carry it into the sea, if it will not be unsanitary, or it may be dumped into the sea from barges. If garbage is disposed of in the sea, perforate all cans that may be included to make certain that they sink. If seepage is prevalent, do not attempt to bury garbage. Either send it out to sea or burn it. If pits are formed use two; one for dry garbage and one for wet. Cover each pit with a mesh that will hold sod or other suitable covering, leaving an opening through which the garbage can be poured. Cover the opening with a box or boards. Burning is a very satisfactory means of destroying garbage. The cross trench incinerator provides one of the best methods of burning. (See fig. 104.) It is constructed by digging two trenches, each 8 feet long, 1 foot wide and 1 foot deep, crossing at their centers. A grate, made of pieces of scrap iron or pipe about 24 inches

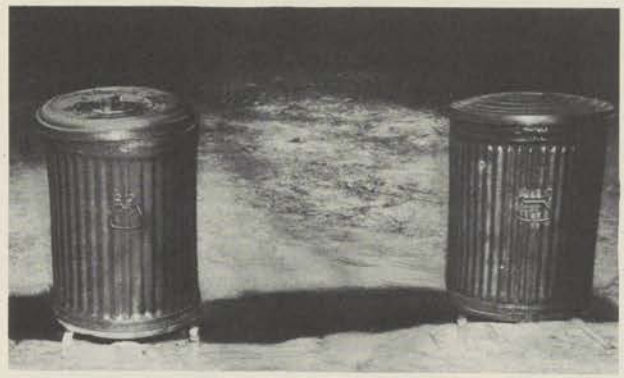


Figure 101. Fire trench with can for washing mess kits.

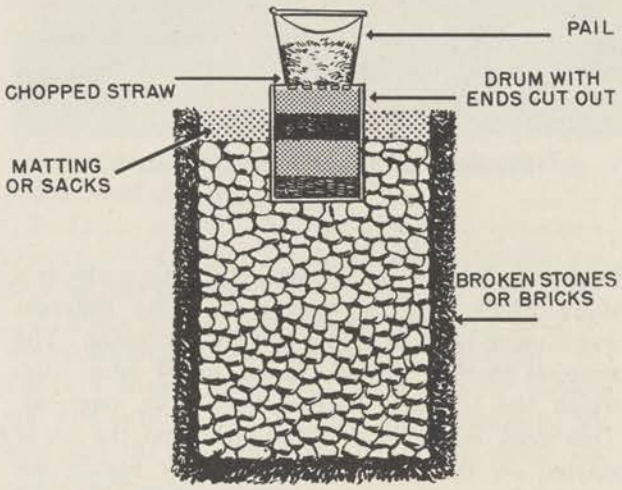


Figure 102. Kitchen soakage pit.

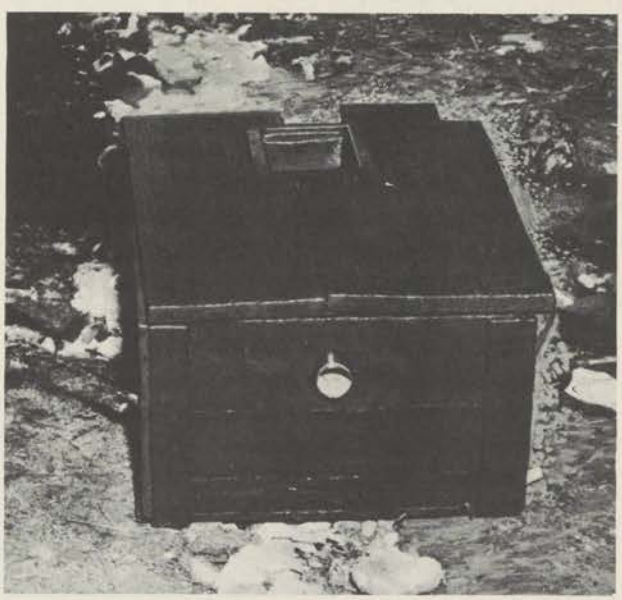


Figure 103. Baffle grease trap, half-barrel type, made from wooden box.

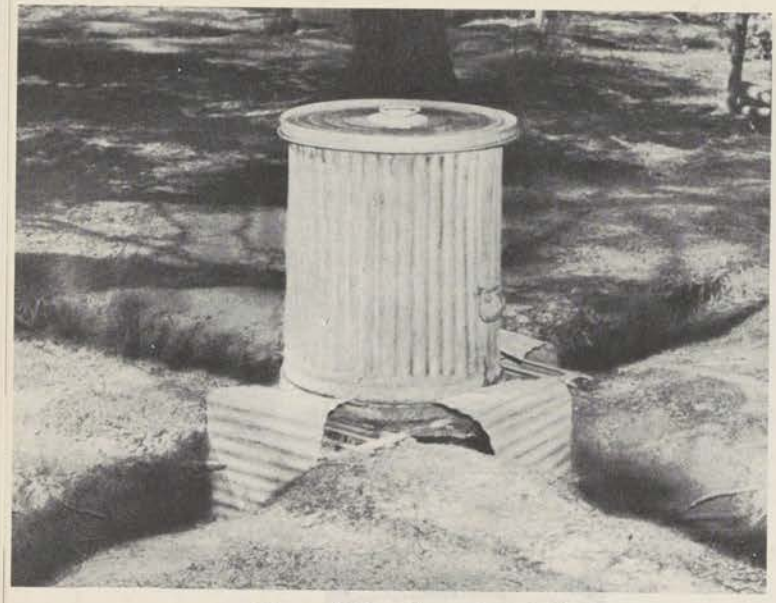


Figure 104. Cross trench incinerator.

long, is built over the center. Over the grate, is a stack which may be erected in many different ways, using brick or stones and clay or metal. The simplest stack is an old GI can or oil drum from which the top and bottom have been removed. This stack is placed over the grate and the fire is started on the grate. Do not allow fire in the trenches. Rubbish and drained garbage are used as fuel after the fire has become hot enough. It is necessary to keep the burning mass loosened so that all parts may continue to receive oxygen and keep burning. This incinerator will function best if three of the four sides of the trenches are blocked off, leaving the one open toward the direction from which the wind is blowing.

d. Lister Bags. In semipermanent areas, lister bags should be installed with special attention to drainage and to overhead protection. (See fig. 105.) A small sump pit will prevent the accumulation of water in small puddles. If a suitable branch of a tree is not available, two trees or uprights to provide a support for the bag and the unit can be covered with a strip of canvas or camouflage.

e. Police of Mess Area. A kitchen area may be set up with care and skill but unless constant attention is paid to policing of the grounds, the mess operations cannot be satisfactory. Bits of food and garbage, paper and grease must be cleaned up continually in order to keep the area in a sanitary condition. The mess personnel should see to it that the field area assigned to them is thoroughly clean. Special attention should be paid to the



Figure 105. Lister bag with sump pit.

areas near the kitchen, serving tables, soakage pit, incinerators and water cans for cleaning equipment. In these places, food waste which is not thoroughly cleaned up will create unpleasant odors and will offer a breeding place for insects and germs.

235. DANGER OF FOOD CONTAMINATION. **a.** It should be remembered that the principal reason for the safe storage of food, the thorough cleaning of equipment, the careful disposal of waste is to avoid any chance of food contamination. In the busy performance of daily duties, it is easy for personnel to become careless in matters of sanitation, but every man concerned should be constantly aware of his own responsibility in the preservation of health and the prevention of disease among the members of his unit.

b. The most persistent enemy of pure food is the fly. These insects breed on warm, moist places polluted by animal and vegetable waste, and may travel long distances in search of food. Therefore, even if the immediate area is kept thoroughly clean,

flies from nearby sections favorable to breeding may find their way to the kitchen and to the food. Because the fly can contaminate food and spread typhoid, dysentery, diarrhea, and many other diseases, it is necessary to keep him away from the cooking and serving. Fly control can be aided by observing the following rules:

(1) Keep all food covered as much as possible.
(2) Keep garbage cans tight.
(3) Dispose promptly of all stale food and waste.
(4) Use fly paper, fly tape and fly traps.
(5) Use sprays.
(6) Keep swatting.
(7) Discourage the fly by making it impossible for him to find particles of food anywhere in the mess area.

c. Other common pests can be disposed of more easily if proper methods are used. Roaches can be controlled by the use of issue liquid insecticide, but care should be taken to avoid spoiling food with the spray. Ants can be destroyed by locating their nests and saturating them with kerosene or boiling water. Rodents may be controlled best by the use of traps. The best preventives and the best cures for any pest trouble, however, are constant cleanliness and persistant care.

d. The only way to be sure that all these conditions of proper storage and sanitation are being maintained is to conduct frequent inspections. The mess officer will make his own inspections, but inspections must be continually made by the mess personnel if everything is to be kept in order. Checkups on the cleanliness of equipment and of the general area should be made after every meal. Be sure that all waste is disposed of and that all supplies are safely put away. Frequent inspections should be made of all food in storage, and any spoilage or contamination of any kind should receive prompt attention.

236. SANITATION IN THE TROPICS. In tropical climates, sanitation is an especially serious problem. Mess personnel must fight an unending battle against flies and various kinds of insects and rodents. These pests are so numerous and so persistent that no time can be wasted in disposing of garbage and spoiled foods. There are several expedients which have been used successfully in these areas. All foods must be kept in closed cans for protection against insects and rodents. As soon as sacked or loosely packaged food is received, it must be transferred to cans, because it may be destroyed in a few hours if left exposed. Because of the great prevalence of flies in the tropics, traps must be used at all times, and the bait (canned salmon or jelly) must be changed daily, because of its rapid spoilage. Boards should be used around the traps to protect against wind and to make the interior of the trap warmer and more attractive to the flies. This is illustrated in figure 106. Since the fly trap has such importance in the control of sanitation, the following is presented as a means of constructing a trap very quickly from salvaged scrap.

a. Take a piece of 12 by 12 by 2-inch wood. Place the lid of a mayonnaise jar in the center of this board and draw a line around it. Using an auger with an expansion bit (this is the best tool to use if you can get one) cut a hole the size of the lid three-quarters of the way into the board, or about an inch and a half deep. In the center of this "well," drill another hole which is 1½ inches less in diameter and all the way through the wood. Fit four pegs for legs into the corners, making a stand 2 inches high.

b. In the center of the lid of the jar, cut a hole exactly the size of the hole that goes all the way through the board.

c. Make a cone out of screen wire by cutting the wire according to the pattern shown. (See fig. 106.) Leave a three-quarter inch allowance for tacking the wire onto the stand. The base of the cone, not counting the allowance, should be the same size as the hole in the jar lid.

d. Form the cone from the wire and then fasten it. Spread the three-quarter inch allowance at the base of the cone flat for tacking. Next, fit the cone into the hole in the inverted jar lid. Tack the trap (in lid) into the "well" in the wooden base. The tacks go through the lid and the wire and into the wood base.

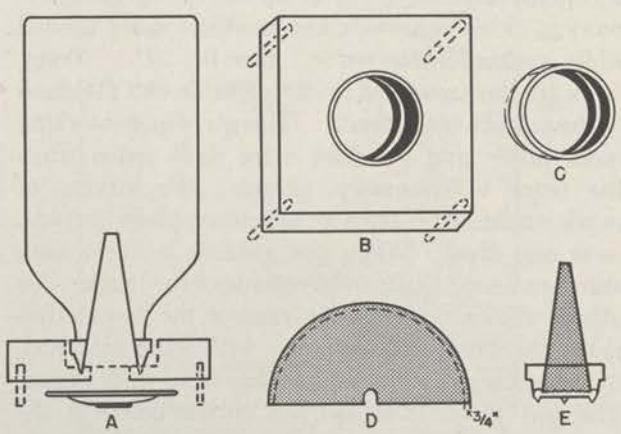


Figure 106. Fly trap.

e. Screw the inverted gallon jar into the lid on the stand, place some bait underneath the opening.

237. CHOW LINE. In the field, certain precautions must be taken and certain principles must be observed in the organization and control of the chow line. Camouflage discipline must be enforced. Mess kits are excellent reflectors of light, and should be kept covered until troops actually reach the serving tables. Space should be provided under cover of trees for the men to eat their meals and they should be restricted to that area. Sufficient space must be used to allow the necessary dispersion of men while they are eating. Dispersion should also be required in the chow line for security. Serving pots should be far enough apart to prevent crowding of troops. Serving the men is an important function which tired and hurried mess personnel can easily overlook. Care should be taken to make servings as attractive as possible. Food should be placed in the mess kits in a uniform and reasonable fashion. For each meal, a routine should be established for the placing of each portion. All portions should be of the same quantity.

SECTION III. FIELD EQUIPMENT AND FIELD EXPEDIENTS

238. GENERAL. Special equipment is issued to company messes in the field to meet the special problems of cooking and serving under combat conditions. Mess personnel must be skilled in the use and care of this equipment and in the art of improvising the tools for cooking they must have as the needs arise. Below are noted various items that will be helpful to the cook.

239. KITCHEN TRUCK. The kitchen truck is a 2½-ton, 6 x 6 cargo truck, appropriately converted for this special purpose. Although not always available, nevertheless the cook should know how to arrange and use a truck for kitchen purposes. In order to convert the truck, first remove the tarpaulin and raise the bows fourteen inches above their normal height. Drill a hole in each end of the bow at a point where it emerges from its stake-and-plate assembly on the truck. Insert a nail or bolt in each hole so that it rests securely upon the stake-and-plate assembly. It is necessary to raise the bows in order to provide the overhead space needed while working in the truck. (See fig. 107.) Troop seats are then removed from the inside and attached to the outside of the truck. This gives more working room inside and provides more shelf space when the truck is stationary. During the serving of meals, these seats afford a convenient place for pots, pans and food. When the vehicle is in motion, seats are folded against the outside of the truck. To attach seats to the outside, remove the bows. Remove the side rack assembly, with seats attached, by extracting the side rack stakes from their plates. The seat which is on the left on the inside of the truck goes on the right on the outside of the truck. Therefore, move the right assembly to the left side of the truck and insert stakes into the plates, allowing the seats to face outside of the truck. Similarly, move the left side rack assembly to the right side. Replace bows. (See fig. 107①.)

a. Truck Equipment. Three M1937 ranges are placed in a row and chained at the front of the truck. The ice box is placed at the side. A utility shelf is attached to the side opposite the ice box. A collapsible serving table is kept next to the utility shelf near the tail gate. The utensil cabinet goes in the side space between the ice box and the range. Room remains for several 5-gallon water cans. This arrangement gives plenty of room for cooking on the move or in bivouac. A plan of the most efficient arrangement of kitchen-truck equipment is shown in figure 107⑤.

(1) *The multipurpose ice box.* This improvised ice box provides storage space and refrigeration. Make it a convenient height so that the top can be used for a cutting table. The top must be leakproof to prevent seepage into the box, and if it has an overlapping top, a meat grinder or a can opener can be attached. (See fig. 108①.) An improvement can be made by constructing a tight-fitting door in the upper part of the front of the box. This makes it easier to remove or replace food without moving the work being done on top of the box.

(2) *Improvised serving table.* This table offers a firm base on which to place serving vessels. When meals are ready to be served, open the table and place it on the ground close to the truck. It makes a firm stand for stock pots. When the truck is stationary, the table can be used as an auxiliary cutting table. It is collapsible and can be quickly



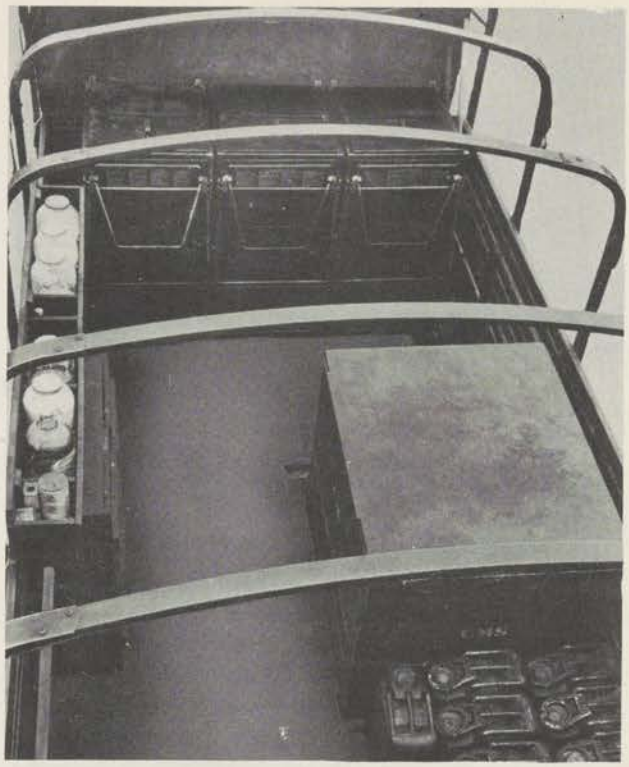
Figure 107. Converting the 2½ ton, 6 x 6 cargo truck for use as a kitchen truck.
① Bows raised for kitchen use.



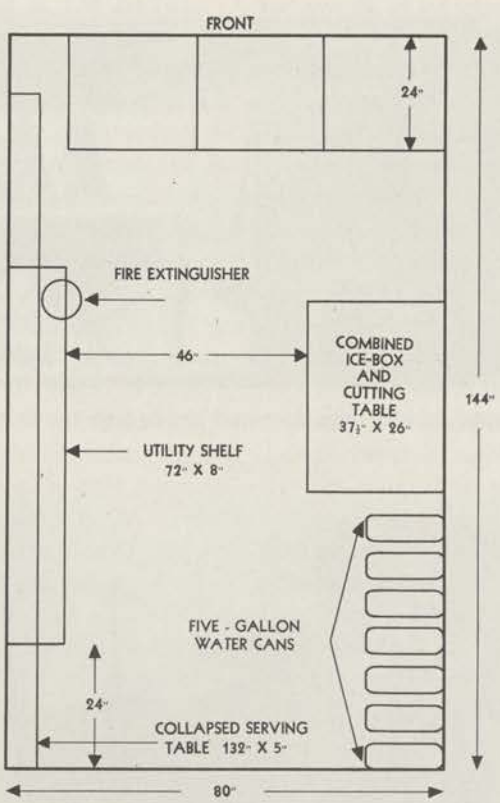
② Troop seats on outside of truck, opened for use.



③ Same seats folded while truck is in motion.



④ Equipment in the truck.



⑤ Ground plan of truck.



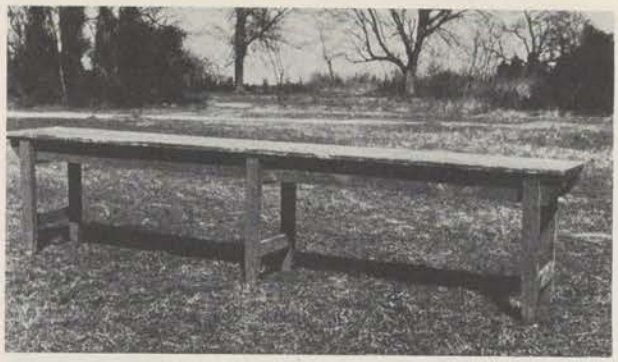
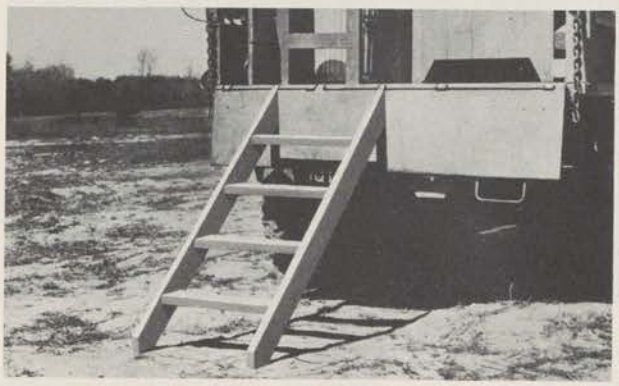
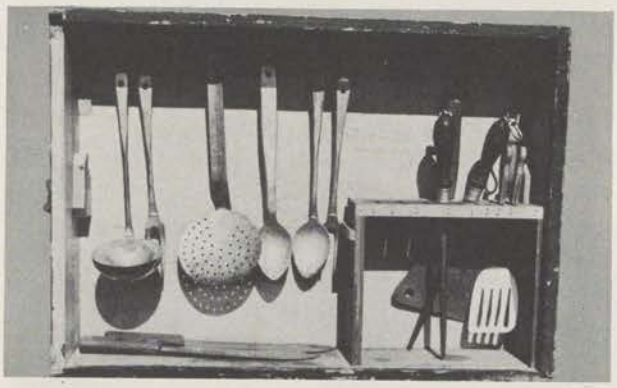


Figure 108. Field expedients of kitchen truck.

① *Multipurpose ice box.*

② *Serving table.*

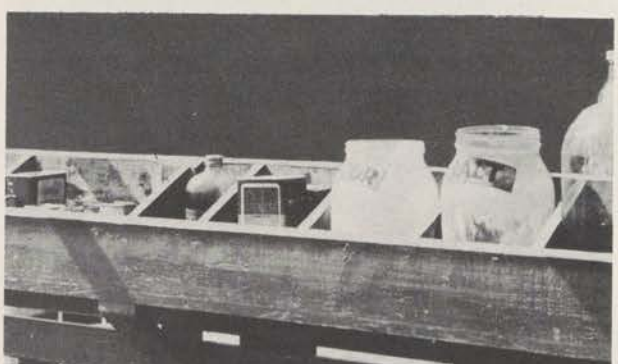




③ *Step ladder.*

④ *Placement of utensils in utensil cabinet.*





⑤ *Utensil cabinet with door and rod to hold utensils in place.*

⑥ *Utility shelf.*

⑦ *Safety bars.*

⑧ *Fly tent.*

and easily folded. When carried on the truck, it occupies very little space. (See fig. 108②.)

(3) *Improvised step ladder.* A step ladder is a convenience that can make field operations run more smoothly. Placed against the tailboard, as in figure 108③, it facilitates the movement of heavy pots and hot food to the ground and permits cooks to enter and leave the truck without soiling their hands in climbing. It is carried in the trailer when the truck is moving.

(4) *Utensil cabinet.* The utensil cabinet is improvised from available lumber. It is hung by metal hooks on the side of the truck and is removable. (See fig. 108④.) A sliding door keeps out dust and dirt and prevents utensils from falling to the floor. Inside the cabinet, racks should be constructed in a manner that will provide a space for each individual utensil so that it will stay in place while the truck is moving. The cabinet should be removed and cleaned frequently. (See fig. 108⑤.)

(5) *The utility shelf* is built of wood, and is divided into bins. The dimensions are 72″ x 8″. (See fig. 108⑥.) This is a handy place for condiments, sugar, flour and cooking oils as well as for those cleaning supplies and miscellaneous items which are in constant use. The bins should be built with a specific use in mind and items should be restricted to their assigned place.

(6) *Safety bars,* for the protection of mess personnel, are made of scrap metal and bolted into place between the bows of the truck. (See fig. 108⑦.) When the truck swerves or stops suddenly, men can grab these safety bars to keep from being thrown against the hot ranges.

b. Equipping the truck with a fly tent. A fly can be used in inclement weather to provide working and serving space outside of the truck. Every truck should be equipped with materials for this emergency. To set up the fly, remove the tarpaulin and sew an additional eight feet of canvas on the *under* part of each side. Adding the canvas to the under part prevents seepage of rain. Flatten each end of two twelve-foot reinforcement rods and drill a hole through the flattened part. Sew a seam in the extended canvas approximately nine inches from each end and insert reinforcement rods, sewing them in securely. Insert seven grommets, 2 feet apart, in the edge of the canvas. The fly is pitched by using four 6-foot tent poles, fourteen tent pegs and the necessary ropes. Use two poles and seven pegs to each side (See fig. 108⑧.)

c. Installing Lighting Equipment. A single interior light is sufficient for all operations. To install attach interior lamp to the top of the front bow, using a piece of angle iron as a bracket. Put in a switch on the right, inside the vehicle near the rear, so it can be operated from the ground. Install a conduit from under the front, right corner of the truck floors to a point just above the height of the ranges. A thin-walled, steel tube, ½ inch conduit is satisfactory. Connect the wire to the truck battery and run it through the conduit. Split the wire above the conduit and run the negative side directly up the front bow to the lamp. Run the positive side along the right side of the truck to the switch. Connect the wire and run it back a long the right side of the truck and then up the front bow to the lamp. Attach both sides of wire to the lamp. If the headlight socket is grounded through the lamp frame, attach negative wire to any metal piece in contact with the lamp frame.

d. *The trailer* holds equipment and supplies not needed while the truck is in motion. Water heaters, water containers (not in use), lister bags, cleaning equipment, rations (to be distributed for the dinner meal), tent poles and pins are items which are usually stored in the trailer. (See fig. 109.)

e. *Range, Field, M1937* is now the most widely used range in the field. This range, with its fire units, is the most complete and efficient equipment yet devised for cooking in the field. This cooking and heating equipment is described in complete detail in TM 10–701. A knowledge of its care and operation is essential to field cooking. In emergencies, the Army field range M1937 may be adapted, with improvised materials, for baking on an extensive scale. In areas where other bakery facilities are not provided, the range will be found to be very satisfactory as a bake oven substitute.

(1) *Method No. 1 (Bread and Pastry).* The most satisfactory method of adapting the range for baking bread and pastry is to construct three solid shelves and fit them to the rails in the range. (See fig. 110.) This method triples the ordinary baking capacity of the range. Construct the bottom shelf in the form of a "sandwich," consisting of a piece of ¼ inch black iron plate, a ¼ inch layer of asbestos (or sand), and a top sheet of 22-gauge iron plate. The shelf is 19 by 23⅛ inches, with two oblong circulation slots, 9¼ by 2 inches, cut on each side, ¾ inch from the side and 1¼ inches from the ends. Cut the front corners 1½ inches from front and side, as illustrated in figure 191. Construct the center shelf also in the form of a "sandwich," with 2 pieces of 22-gauge black iron, 19 x 23⅛ inches, separated by a 3/16 inch layer of asbestos or sand. Cut the shelf with the same slots as the bottom shelf and cut the front corners similarly. Construct the top

shelf of one piece of 16-gauge black iron, 17⅛ x 23⅛ inches, with 2 oblong slots at each side, 9½ inches x 1 inch. In order for the oven to reach the proper baking temperature of 425° to 450° F. without excess flash heat, light the firing unit 30 minutes before baking is started. Temperature can be determined by the hand count method. Be sure that the burner maintains a green flame throughout the baking process. The oven will bake 24 pounds of regular field bread or 30 pounds of field sheet bread at one time. During baking, shift the pans from bottom shelf to top, from top to middle, and from middle to bottom at least four times. Approximately 60 minutes are required to bake the sheet bread and from 100 to 110 minutes to bake the field bread. Besides bread, such products as biscuits, rolls, cobblers, and pies can be baked successfully with the range when it is adapted in this manner.

(2) *Method No. 2 (Pastry).* (See fig. 111.) A simpler method of increasing the baking capacity of the range is to construct only pan rests instead of solid shelves. When adapted in this manner the range will bake pastry very well but will not bake bread satisfactorily. For the bottom shelf, cut two angle irons, 19 inches long (④, fig. 112). Place these on the middle burner rails in the cabinet and lay on them any large flattened can (①, fig. 112). This can serves to distribute the heat evenly and will be found more satisfactory than a single piece of metal. For the center shelf, construct an angle iron pan rest in the shape of an H (②, fig. 112). Make the rest 19 inches wide and not more than 23 inches deep. In order to fit the rest to the top burner rails, cut a notch from each end of the front iron, ¾ inch from each end, as illustrated. For the top shelf, construct an H rest similar to that described above. (See ③, fig. 112.) Make the rest 17½ inches wide and cut a notch ¾ inch from each end of the front iron. Fit the rest onto the rails in the cabinet which are normally used for the roasting pan.

f. Gasoline Pressure Lantern. The Army cook in the field will find the gasoline lantern very useful because much of the work will be done at night. It produces a brilliant light and is the most practical type of lantern for use in the field. A complete knowledge of the lantern is necessary to operate it most efficiently. Consult War Department publications for detailed instructions. To keep the lantern in operating condition it will be necessary to keep the fount clean, the valve packing nut tight, the leather well-oiled and the generator clean.

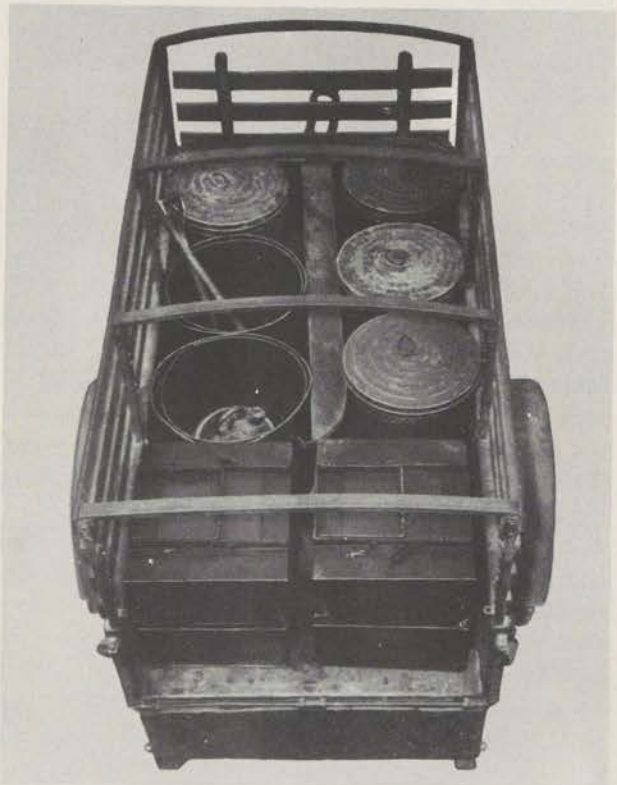
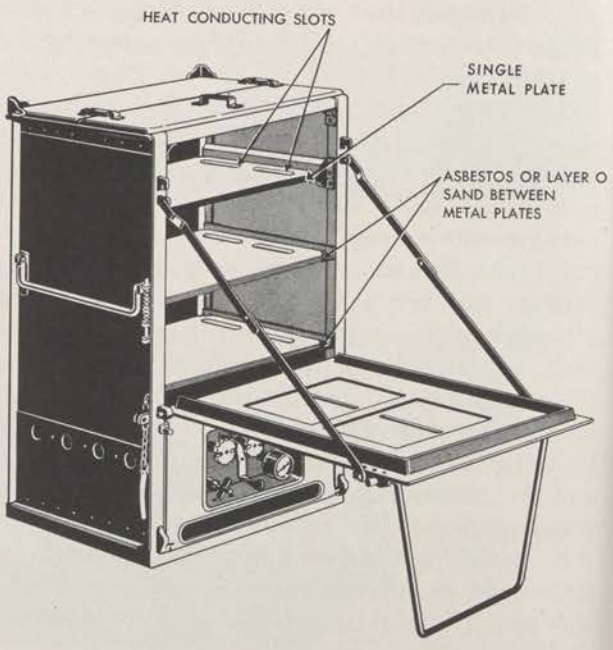


Figure 109. Trailer with equipment in place.



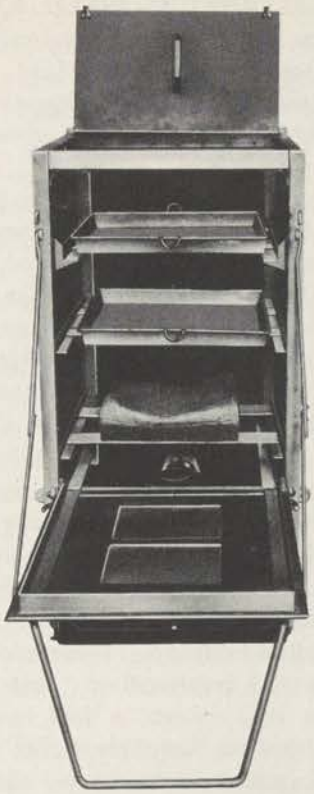


Figure 111. Range, field, M1937, adapted for baking pastry.

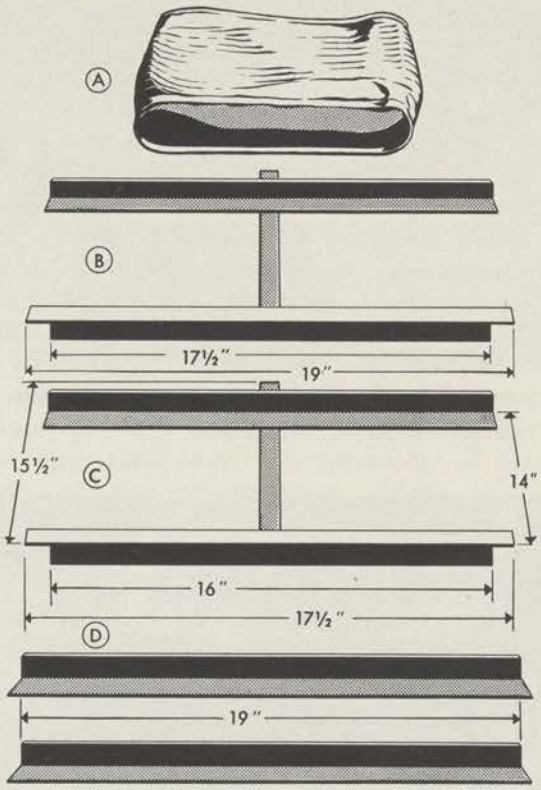


Figure 112. Parts necessary for adapting Range, Field M1937 for pastry baking.

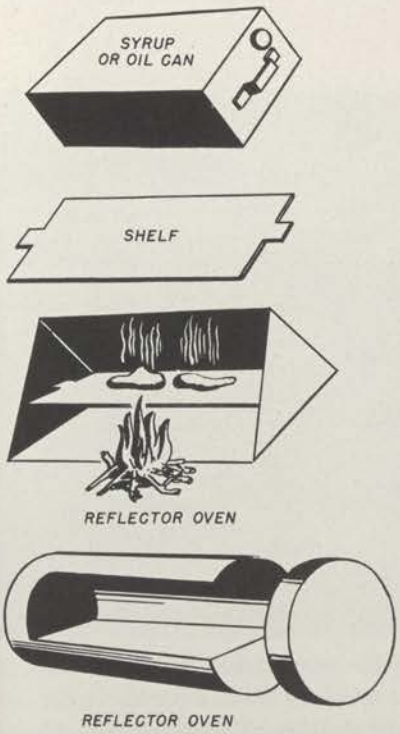


Figure 113. Reflector oven.

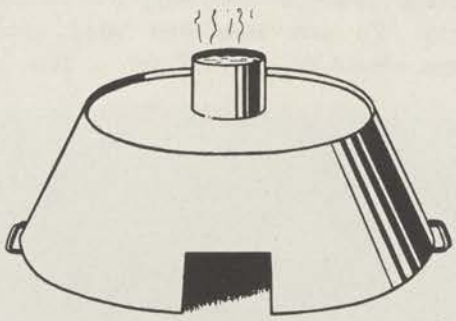


Figure 114. Washtub stove.

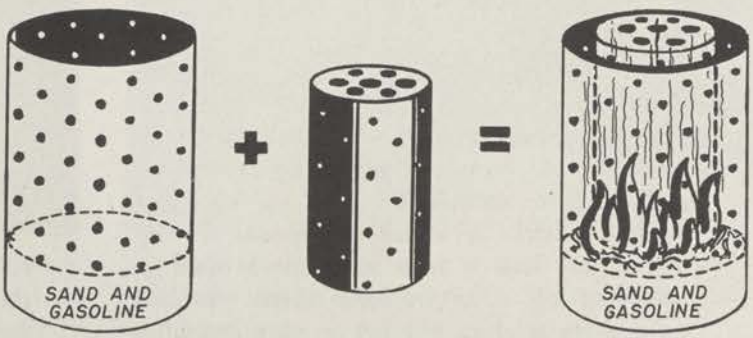


Figure 115. Gasoline stove.

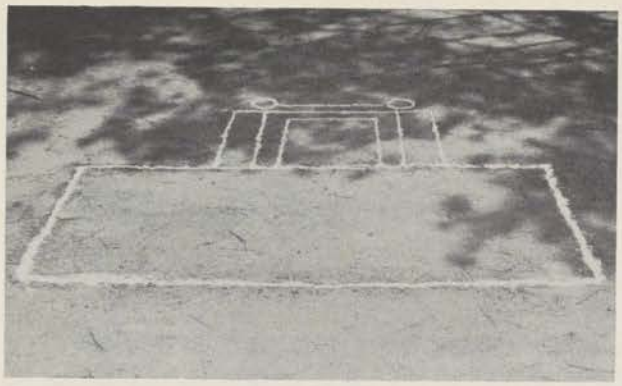
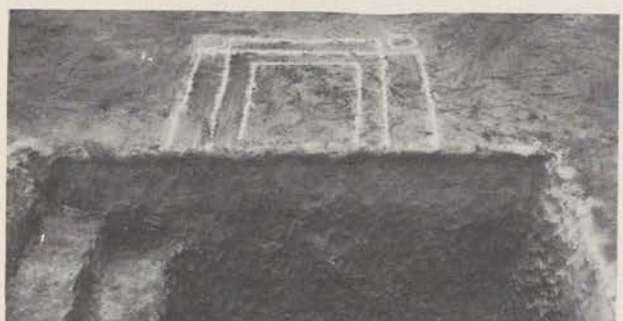


Figure 116. The underground oven. ① The first step is to mark off the ground plan as a guide.



② The initial excavation is then made to provide enough space for easy approach to the oven itself. To save time and effort, descending steps should be provided for at this point.



③ With the original ground plan as a guide, the space for the oven and fire boxes is dug out and the three sections are built up and supported by bricks or stones and cement or clay. Tin or any kind of sheet metal can be used for sides and top. The fire boxes should run back for a depth of about 2½ feet or more depending upon the size of oven desired.

240. MISCELLANEOUS FIELD EXPEDIENTS. Following are a few of the many improvised items which have been employed in the field. A knowledge of these expedients should suggest many other variations which the cook can develop for his own use.

a. Tinware. In the field, many foods are received in metal containers that may be put to use for cooking and serving. Often, when a particular piece of equipment is needed such as a measuring cup, a candle-holder or a dipper, a tin can may be made to do the job. The standard tin can is made of sheet metal bearing a coating of tin so thin that it amounts to less than 1.5 percent of the finished can. Never heat the can without liquid or food in it as this will crack the film and cause it to burn away. This is a protective coating and should remain on the can. Some cans are enameled and have a gold-colored interior. If used for cooking, this enamel lining should first be burned off and the metal cleaned thoroughly. There are no essential tools for tin can improvising. Just use what is available. A can opener, a nail, a jackknife, a screwdriver, and tin "snip" or shears will all serve the purpose in working with tin. A skillet or dipper may be made by cutting off a section of a can and leaving as a handle the seam section where the sheet of metal was joined and soldered to form the cylindrical body of the can. Wooden handles can be improvised by nailing or wiring the seam section to



④ The bottom of the oven should then be lined with the same type of material used for the sides and top. Note how the oven is raised and supported by bricks.

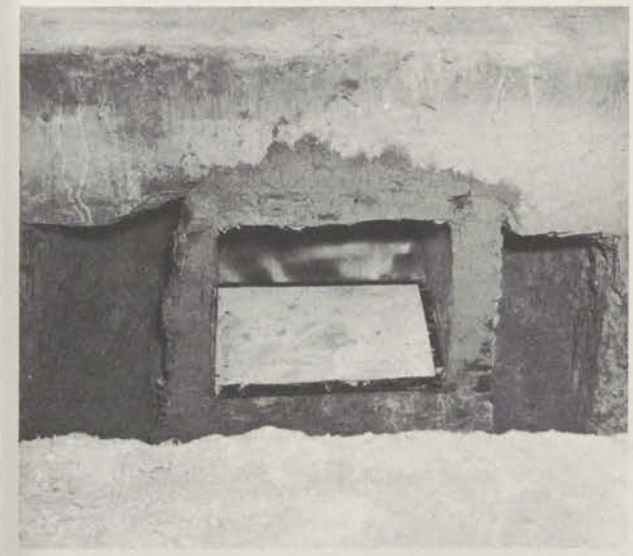
a piece of wood. A reflector oven can be made from large cans either round or rectangular. (See fig. 113.) A shelf is provided upon which baking can be done by reflected heat. The fire should be placed so that the food is cooked indirectly. A number of other easy-to-make items may be constructed.

b. Improvised Stoves. Any large metal container such as a washtub can easily be made into a stove. (See fig. 114.) It is only necessary to provide an opening for tending the fire and for bottom draft and to make a chimney at the top. A tin can, with both ends removed, makes a good chimney. A surprisingly efficient gasoline stove can be made from two cans. (See fig. 115.) The outer can, a No. 10 can, is pierced with nail holes from the top to within about 1½ inches from the bottom. Clean sand is put into the can, filling it up to the level of the holes. The sand is then saturated with gasoline. The inner can, which may be any type can of smaller size, is punctured with holes in the body and top, and placed in the center of the larger can, top up. The nail holes furnish a draft and upward direction of heat.

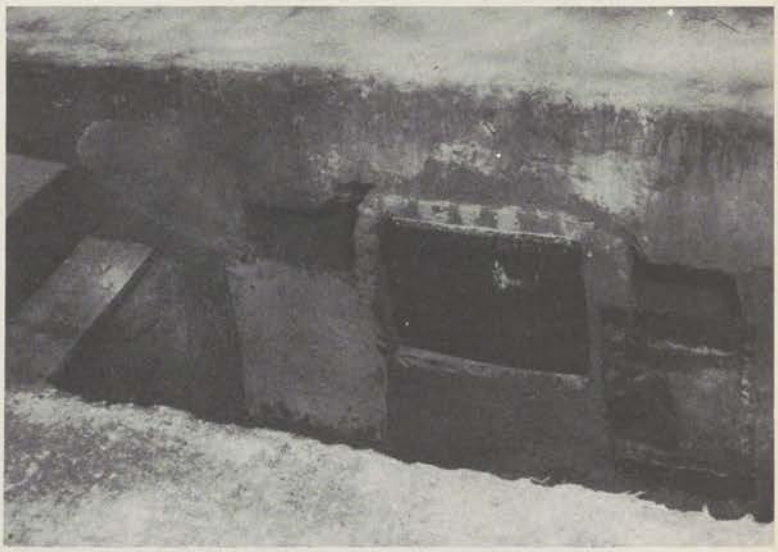
c. Ovens. The principles of oven-building are simple and there are many ways by which expedients may be constructed. Ovens may be of widely differing styles, and of materials ranging all the way from common clay to gas mask cans. Remembering the few elementary principles of oven construction which are described here, the ingenious baker may use whatever materials he finds available and construct an emergency oven.

(1) *General.* There are two general types of improvised ovens, those constructed in the manner of the M1942 oven, with both a firing chamber and a baking chamber and those consisting of a single baking chamber only (dutch oven). In the latter type the fire is removed after the baking chamber is sufficiently heated to carry through the baking period. Walls of an earth oven must be about 8 inches thick in order for the oven to retain enough heat for baking. The tops of earth oven should not ordinarily be much thicker than 8 inches or they may cave in. A slow fire is needed for heating an improvised oven. An intense fire of short duration will heat only the lining. If the soil surrounding the baking chamber is damp, dry it out thoroughly before attempting any baking. Keep up the fire for several hours before the first charge and preheat the oven from 45 minutes to 1 hour for each successive charge. If necessary, construct a hearth of stone or brick to control excessive ground moisture

(2) *Underground oven.* The first step is to mark off the ground plan as a guide: The initial excavation is then made to provide enough space for easy approach to the oven itself. To save time and effort, descending steps should be provided for at this point. With the original ground plan as a guide, the space for the oven and fire boxes is dug out and the three sections are built up and



⑤ *The oven shelf is completed and holes are made for the smoke stacks. These holes are cut at an angle so that the stacks will slant away from the ovens.*



⑥ *Stacks sealed in, wooden steps in place, and metal covers provided for the oven and the fire boxes.*

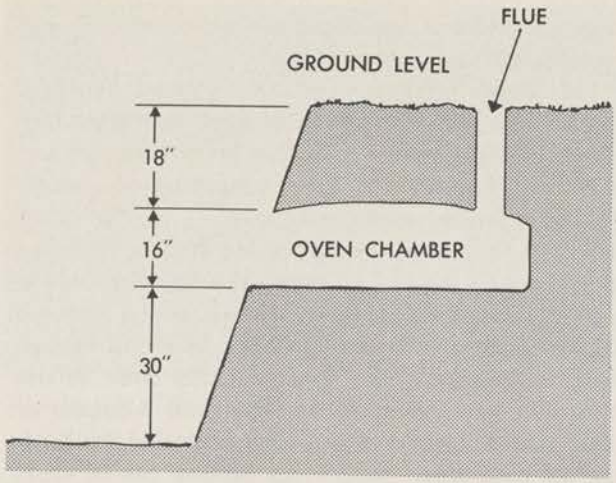


Figure 117. Earth oven.

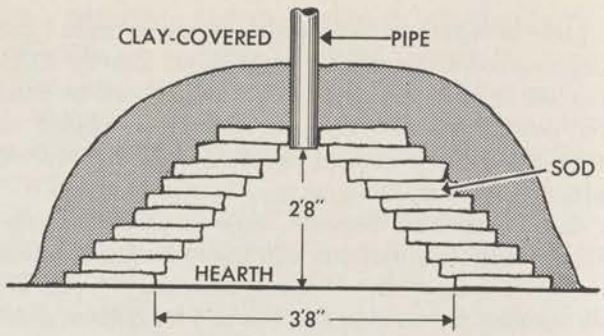


Figure 118. Sod oven.

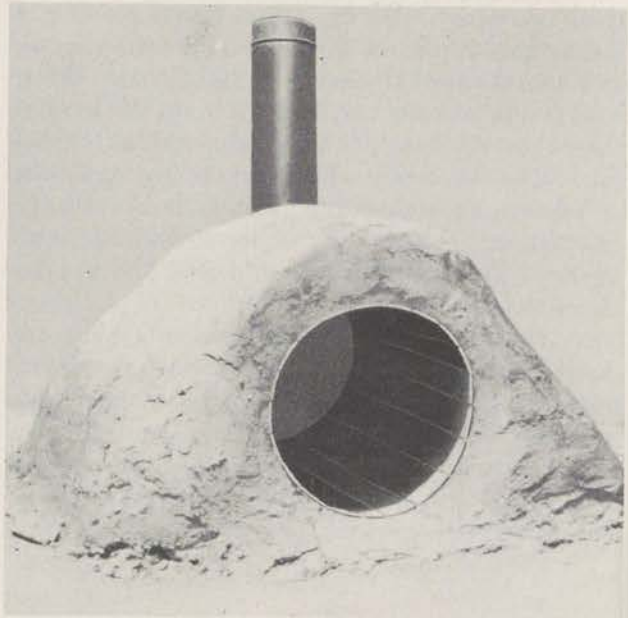


Figure 119. Single barrel oven.

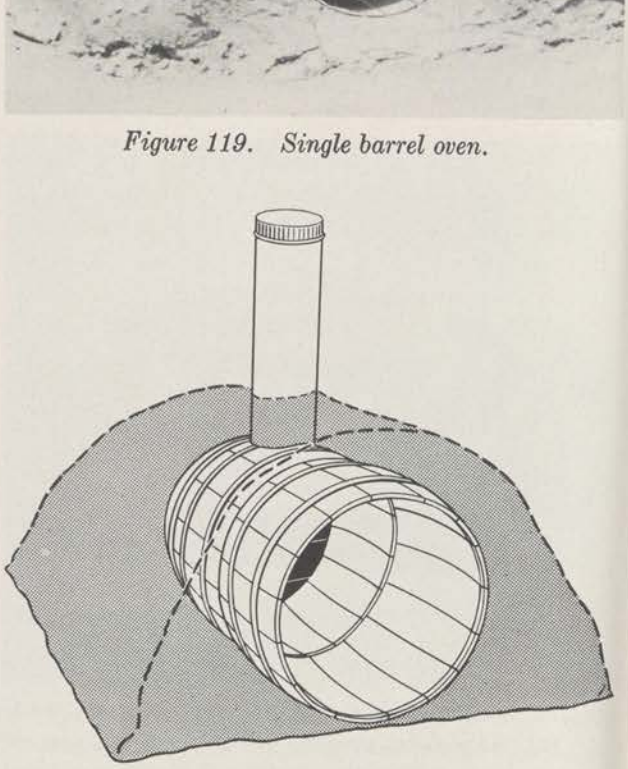


Figure 120. Two barrel oven.

supported by bricks or stones and cement or clay. Tin or any kind of sheet metal can be used for sides and top. The fire boxes should be run back for a depth of about 2½ feet or more depending upon the size of oven desired. The bottom of the oven should then be lined with the same type of material used for the sides and top. Note how the oven is raised and supported by bricks. The oven shelf is completed and holes are made for the smoke stacks. These holes are cut at an angle so that the stacks will slant away from the ovens. The next illustration shows the complete oven, with stacks sealed in, wooden steps in place, and metal covers provided for the oven and the fire boxes.

(3) *Earth oven.* A simple type of oven may be improvised by digging horizontally into a steep bank of earth 4 to 6 feet high. (See fig. 117.) The best tools for the purpose are a spade and a long-handled shovel. Make the face of the bank as nearly vertical as possible. Excavate an area in the bank 4 or 5 feet wide, 2½ feet deep, with an arched roof about 16 inches high at the center. The top covering of the oven should be about 1½ feet thick. Keep the opening as small as possible. Dig a hole for a draft at the rear of the oven and if possible attach a piece of stovepipe. If for any reason, however, material suitable for a stack cannot be obtained, the oven will function almost as well without it. To keep heat in the oven, salvage scrap metal suitable for a door. Regulate the temperature in the oven by using the door and by adjusting the length of the flue. Oven temperature may be determined by the hand count method, as follows: Hold your hand in the oven 1 inch from the bottom and count slowly; if you can hold your



Figure 121. Excavation for oil drum oven.

hand in this position for seven counts, the temperature is right for baking. If the count is less than seven, the oven is too hot; if it is more than nine, the oven is too cold.

(4) *Sod oven.* Prepare a hearth of brick, stone, or hard clay, 3 feet 8 inches by 6 feet or more. Cut pieces of sod about 12 inches by 10 inches and build the oven by overlapping the layers of sod to a height of 2 feet 8 inches. Insert a piece of stovepipe and then cover the sod framework with a heavy layer of clay or firm soil. Leave an opening at the front for the door. Fit a suitable metal door.

(5) *Barrel oven.* A very satisfactory oven may be constructed by using wooden barrels as a framework. Knock the top or bottom from a barrel and place the barrel on level ground, with the closed end at the rear. If bricks or flat stones are available, lay a floor and place the barrel on this. If sand is available, cover the barrel with a layer sloping from a thickness of 2 inches at the top to 4 inches at the sides. Cover the layer of sand or the barrel with a heavy mixture of clay and grass or hay. Work from the sides upward and make the layer of clay about 12 inches thick at the sides and 6 or 8 inches thick at the top. If the barrel is not covered by sand, make this layer of clay somewhat heavier. If a brick floor has been laid, extend the clay walls beyond the floor. Allow the form to stand for 48 hours; then start a small fire in the barrel and burn it out. When the barrel is completely burned, scrape out the sand and loose material. For convenience in handling the bread, dig a 2-foot trench in front of the oven. Use a suitable piece of metal for the door, fitting it as tightly as possible. Keep up a moderate fire in the oven for about 2 hours.



Figure 122. ① Oil drum oven, front view.



② Oil drum oven, side view.

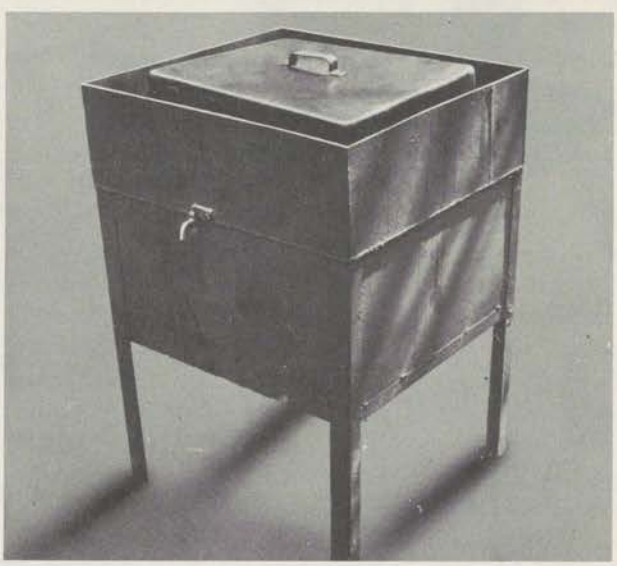


Figure 123. Metal steam table, front.

While the dough is being punched down, spread the coals evenly over the floor of the oven and close the door as tightly as possible. When the dough is ready for the pans, draw all the coals from the oven. Seal it up again for half an hour and then test the temperature by the hand count method. If the temperature is correct, put in the bread. Before baking a second run, fire the oven for 45 minutes and then draw the coals. Close the oven for 15 minutes. To construct a two-barrel oven, knock the top and bottom from one barrel and the top from another. Place the two barrels end to end on level ground, with the closed end at the rear. If bricks or flat stones are available, lay a floor and place the barrels on this. For a still larger oven, two additional barrels may be placed beside the first two.

(6) *Oil drum oven.* To construct an oil drum oven, dig a trench as illustrated. (See fig. 121.) The narrow part of the trench, near the smokestack, is designed for a hot plate, or improvised stove, and may be eliminated if this is not desired. Place a 55-gallon drum crosswise over the trench, making sure that it is secure at both ends. Install a sheet of metal (stove lid or any improvised material) over the narrow part of the trench, to serve as a hot plate. Cover the drum with a layer of mud or clay and fill in the spaces around the hot plate and the smokestacks. Improvise a metal door for the oven and see that it fits tightly. Using the firing pit as a convenient place to work, build a slow, steady fire in the fire trench, to dry out the hearth and the covering of the oven.

d. Steam tables. (1) An improvised steam table can be made of sheet metal if welding materials are available. (See fig. 123.) The table consists of two essential parts, a water container and a compartment for the M1937 fire unit. A roasting pan is placed in the top section and hot water is poured in around it. The frame should be raised to a height convenient for serving.

(2) A wooden steam table can be made to accommodate the M1937 range pots in the field. (See fig. 124.) A waterproof box is constructed with the aid of tar or roofing cement. The cover is then made with round openings to hold the pots and the immersion type heater which is used to heat the water. Hinges are attached to each side for the purpose of holding the pots in place.

e. Hot Water for Emergency Rations. A long hot-water trough can be improvised for the purpose of heating the meat component emergency ration cans. (See fig. 125.) The construction of the metal trough is similar to that of the metal steam table. A compartment for the fire unit should be built in, and the height should be made convenient for serving. If metal materials are not available, a similar trough can be made of wood and the water can be heated with the immersion type heater, or boiling water can be poured in from other cans. This type of trough makes it possible to heat cans for an entire company.

f. Ammunition Box Grill. Using an empty 50-caliber machine gun ammunition box as a framework, an efficient grill can be constructed using

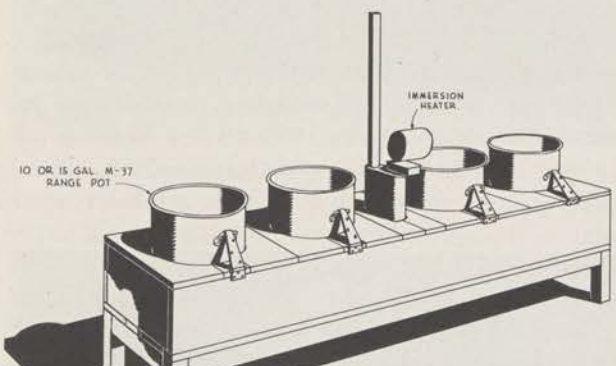
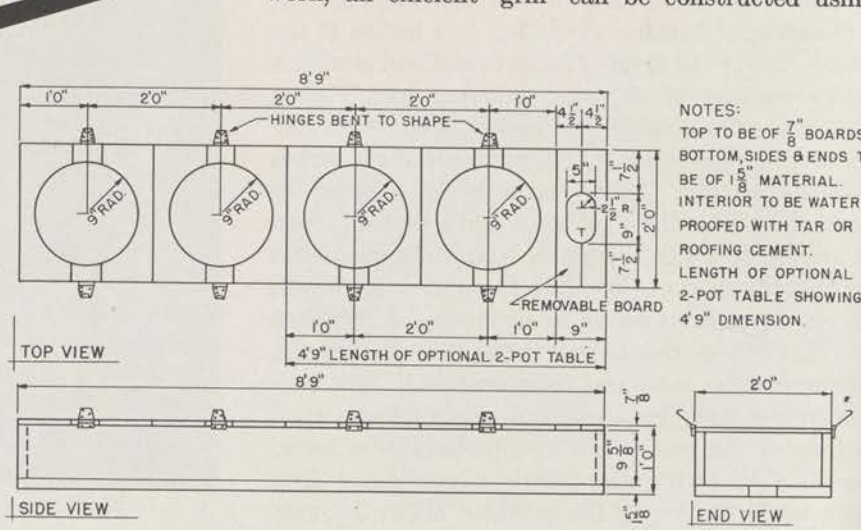


Figure 124.
① *Wooden steam table.*



② *Detail.*

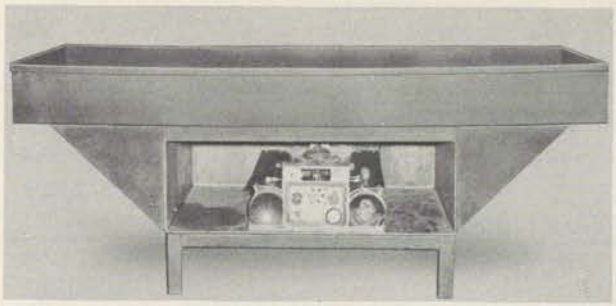


Figure 125. Trough for heating emergency rations.

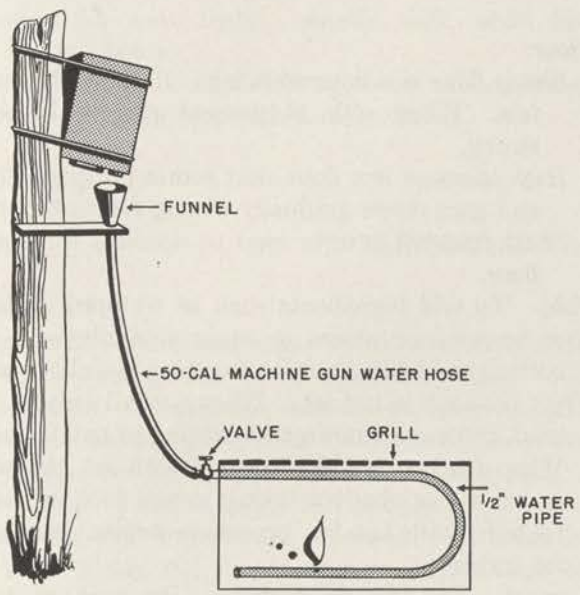


Figure 126. Ammunition box grill.

materials usually available in combat areas. (See fig. 126.) The cover of the box is removed. A short length of ½ inch water pipe, which is easily obtainable from abandoned buildings, is bent to form a "U" shape. Plug one end of the pipe and drill a 1/32-inch hole in the pipe a few inches from the plugged end, on the inside of the "U." Place the bent pipe into the ammunition box with the plugged end in the bottom of the box so that both ends of the pipe run parallel to each other and in a horizontal position. Attach one end of a section of 50-caliber machine gun water hose to the upper portion and open end of the "U" pipe. At this junction, place a valve. Raise the other end of the water hose and attach it to any convenient support. Attach a can or funnel to the upper end of the base. With the valve closed, pour 80-octane gas into the can or funnel, filling the water hose. Open the valve slightly to allow gasoline to run down into the pipe. The gasoline can be ignited at the small hole on the bottom side of the pipe, producing a thin flame that heats the upper end of the pipe. Place a grill over the top of the ammunition box, and over the upper end of the pipe. This expedient has been tried in the field and has been found to be very successful. It produces a great amount of heat, and because the parts are easily obtainable, it can be left behind without much sacrifice.



Figure 127. Table for cleaning pots.

g. Pot-Cleaning Table. A table for cleaning pots, pans and cooking utensils can be easily constructed in the field. (See fig. 127.) The sides are inclined toward the center so that water will run into the trough. The trough slants toward one end, which is provided with a drain pipe. The opposite end is closed off. The drain pipe can be run directly into a sump pit to save time and extra work. Care should be taken to see that bits of food do not accumulate in the pipe. It should be constructed to that it can be removed for thorough cleaning at least once a day.

241. CAMOUFLAGE. Mess personnel must be prepared at all times to take the security measures required by the particular tactical situation of their unit. Camouflage will be a constant problem. All installations and equipment must be hidden from air observation, and camouflage discipline must be strictly enforced in the mess area. These precautions are of first importance when feeding troops in forward areas close to the front. Most of this feeding will take place under cover of darkness, and practice in working under blackout conditions is essential. For full information on camouflage, see FM 5–20 and TM 5–267.

APPENDIX I

COOKERY TERMS

1. TERMS USED IN COOKERY PROCESS

Bake. To cook in an oven. Applies to all oven-cooked foods except meats, which, when baked, are usually known as roasts.

Baste. To pour liquids over food while cooking especially over roasting meat.

Beat. To whip by lifting mixture rapidly up and over with fork, spoon, wire whip, rotary or electric beater.

Blanch. To dip in boiling water, generally in order to loosen skin.

Boil. To cook in a liquid which should bubble actively during the time indicated. Just enough heat should be applied to keep the liquid in this state, unless rapid boiling is designated in the recipe.

Bouillon. Soup stock clarified by straining.

Braise. To brown meat or vegetables in a small amount of shortening and then to cook covered in the oven or on top of the stove, sometimes adding a small amount of liquid.

Broil. To cook under or over direct heat.

Broth. Liquid in which meat has been simmered.

Chop. To cut in small pieces with a sharp knife or chopper.

Cream. To soften shortening and to blend with sugar by rubbing and beating with a spoon or electric beater.

Cube. To cut in small square pieces.

Cut in shortening. To blend cold shortening with flour by means of pastry blender or two knives.

Dice. See *Cube.*

Dot. To scatter bits, such as butter, over surface of dish to be cooked.

Drawn butter. Butter melted. Flour and water may be added to form a sauce, with seasoning as desired.

Dredge. To cover with a thin coating of a dry ingredient such as sugar or flour.

Drip. Way of making coffee in a utensil designed for such method.

Flour:

Strong flour is a flour with high, 13 percent, protein. Flour with 11 percent protein is not strong.

High tolerance is a flour that comes up gradually and goes down gradually during fermentation.

Short patent is a term used to describe the best flour.

Fold. To add ingredients such as whipped cream or beaten egg whites or sugar carefully with a cutting and folding motion to preserve air bubbles.

Fry. To cook in hot fat. When a small amount is used, process is known as sauteeing or pan frying. When food is partially covered with fat, process is known as shallow frying; when food is surrounded with hot fat, process is known as deep-fat frying.

Garnish. To add an accessory for sake of appearance or flavor.

Grate. To rub on a grater, a utensil with a rough surface.

Grill. To broil on a rack.

Knead. To fold and press dough firmly with palms of hands, turning between foldings.

Lard. To cover meat with strips of fat, or to insert strips of fat with skewer or larding needle.

Lardoon. Long strip of salt pork, bacon, or suet used for larding.

Leavening. Ingredient needed to make mixture rise such as baking powder, soda, yeast.

Marinate. To suspend in oils, cream, milk, vinegar, or lemon juice for a period of time.

Mince. To cut or chop fine.

Pan Broil. To cook in dry, hot frying pan, pouring off fat as it cooks out of meat.

Pan-Fry. To fry in small amount of fat.

Parboil. To boil in water until food is partially cooked.

Pare. To remove skin or rind by cutting off with a knife.

Peel. To remove skin by pulling, scraping, paring, or brushing.

Percolate. Way of making coffee in utensil designed for this method.

Poach. To cook egg in hot liquid below boiling point.

Pot Roast. Method of cooking less tender meats. Meat cooked in water with or without previous browning.

Puree. To press food through a coarse sieve.

Roast. To cook by dry heat in an oven.

Saute. To cook in small amount of fat on top of stove.

Scald. To heat liquid, usually milk, until hot but not boiling.

Score. To make shallow lengthwise and crosswise slits across surface with a sharp knife.

Shred. To cut or tear in thin strips or pieces.

Sift. To put dry ingredients through a sieve.

Simmer. To cook in liquid just at or below the boiling point.

Skewer. To fasten meat with a thin wooden or metal pin. Sometimes small bits of meat, fish, or vegetables are boiled on a metal skewer.

Steam. To cook over or surrounded by steam.

Steep. To let stand in hot liquid below the boiling point.

Stir. To blend ingredients, using a circular motion with spoon or other utensil.

Stock. Liquid in which meat and/or vegetables have been cooked. Used as a base for soups and gravies.

Toast. To brown by direct heat or in a hot oven.

Whip. To beat rapidly in order to incorporate air.

2. TERMS USED FOR RECIPE INGREDIENTS

Caramel. Granulated sugar stirred over heat until melted and golden brown in color.

Condiment. A seasoning such as salt, spice, or herb.

Cream. Fat content of milk. Usually thin or coffee cream, and heavy cream suitable for whipping.

Croutons. Toast or fried cubes of bread.

Crumbs. Soft crumbs are prepared from bread at least 1 day old, but not dry. Bread may be crumbled with fingers or rubbed on a grater. Dry corn flakes, or other ready-to-eat cereal. Dry crumbs are usually sifted through a coarse sieve.

Croustade. A toasted bread shell to be filled with some type of food.

Drippings. Fat which cooks out of meat or poultry.

Eggs, slightly beaten. Whole eggs beaten until well blended and slightly thickened.

Egg white, slightly beaten. White beaten until foamy.

Egg white, stiffly beaten. Whites beaten until they will stand in peaks, but still moist and shiny.

Egg yolks, well beaten. Yolks beaten until thick.

Fat. Fats used on table and in cooking, including butter, margarine, lard, bacon fat, drippings, salad oils, and hardened vegetable oils.

Fillet. Boneless strips of meat or fish.

Flavoring. An extract such as vanilla, almond, lemon, a fruit juice, chocolate and coffee, generally used in sweet dishes.

Herbs. Savory leaves used in fresh or dried form, such as parsley, mint, tarragon, bay leaf, and others.

Seasoned Flour. Flour seasoned with salt and pepper.

Seasoning. See Condiment. Also liquid seasoning such as Worcestershire or Tabasco Sauce, and others.

Shortening. Any cooking fat.

Stock. The liquid in which meat, fish, or vegetables have been cooked.

APPENDIX II.

AVERAGE AMOUNTS ISSUED

(Calculated per 100 men per meal)

Note. In the columns under Fresh, Frozen, Canned, Dry or Evaporated and Dehydrated are shown the average amounts normally consumed by 100 soldiers in the mess. This does not mean 100 portions of the Prepared Individual Serving. Allowance is made in each case for men who never eat the item, occasionally take a portion, usually take only one-half portion, are trying it for the first time, seconds to the men who normally take them, and many other factors that affect the consumption of any item at each meal.

AVERAGE AMOUNTS ISSUED per 100 MEN per MEAL

Item	Remarks	Prepared Individual serving	Fresh	Frozen	Canned					Dry or Evaporated	Dehydrated overseas
					Domestic		Overseas		Weight of contents		
					Amount	Size	Amount	Size			
APPLES	Eating or baked	1 ea	100								
Pie	6 cuts	1 cut	30 lb	20 lb	3	No. 10	3	No. 10	6 lb	7 lb	4 lb
Sauce	With pork	3 oz	30 lb	20 lb	20	No. 2	16	No. 2	1 lb 4 oz	7 lb	3½ lb
	Reduce issue ⅓ or ½				4	No. 10	3	No. 10	6 lb 11 oz		
APPLE BUTTER		2 oz			7	28-oz jar.	2	No. 10	7 lb 8 oz		
APRICOTS		1 ea	100		16	No. 2½	12	No. 2½	1 lb 14 oz	7 lb	
		3 pieces			4	No. 10	3	No. 10	6 lb 12 oz		
Pie	6 cuts	1 cut	30 lb	20 lb	12	No. 2½	12	No. 2½	1 lb 14 oz	7 lb	
ASPARAGUS	4 pieces	3 oz	30 lb	15 lb	3	No. 10	3	No. 10	6 lb 12 oz		
					16	No. 2	16	No. 2	1 lb 3 oz		
BACON	Breakfast	2 strips	15 lb				1½	12 lb	6 lb 7 oz		
BEANS:											
Lima	Side dish	3 oz	35 lb	15 lb	16	No. 2	16	No. 2	1 lb 4 oz	8 lb	
					3	No. 10	3	No. 10			
Navy	Main dish	7–8 oz								18 lb	
	Side dish	3 oz								8 lb	
Red kidney	Main dish	7–8 oz								18 lb	
	Side dish	3 oz					3	No. 10	6 lb 12 oz	8 lb	
	With chili	6–8 oz					3	No. 10	6 lb 12 oz	8 lb	
String-wax		3 oz	25 lb	15 lb	16	No. 2	16	No. 2	1 lb 3 oz		
					12	No. 2½	12	No. 2½	1 lb 12 oz		
					3	No. 10	3	No. 10	6 lb 5 oz		

BEEF:

String-wax		3 oz	25 lb		3	No. 10	3	No. 10	6 lb 5 oz			
BEEF:												
Boneless	Stew	3 oz	20 lb	20 lb								
	Ground	3–4 oz	30 lb	30 lb			6	6 lb	6 lb			
	Roast-steaks	4–16 oz	40 lb	40 lb								
Carcass	Stew	3 oz	35 lb	35 lb								
	Ground	3–4 oz	45 lb	45 lb								
	Roast-steaks	4–16 oz	55 lb	55 lb								
Corned	For hash	3 oz	20 lb				3	6 lb	6 lb			
	Boiled sliced	5–7 oz	50 lb				6	6 lb	6 lb			
Dried-chipped	Creamed								6 lb	7 lb		
BEETS	Vegetable	2–3 oz	20 lb		8	No. 2½	12	No. 2½	1 lb 12 oz		3½ lb	
					2	No. 10	3	No. 10	6 lb 8 oz			
BERRIES	Pie, 6 cuts	1 cut	24 qt		3	No. 10	3	No. 10	6 lb 10 oz			
	Fruit	3 oz	24 qt		3	No. 10	4	No. 10	6 lb 10 oz			
BOUILLON CUBES	Gravy	Ingredients							100 cubes	30		
	Soup								Container	70		
BREAD	2 slices	2½ oz	15 lb									
BROCCOLI	Vegetable	2 oz	25 lb	15 lb								
BRUSSELS SPROUTS	Vegetable	2½ oz	20 lb	15 lb								
BUTTER	Domestic	⅓ oz	2⅓ lb									
	Overseas	½ oz					3 lb	5 lb	5 lb			
CABBAGE	Vegetable	2½ oz	25 lb								3½ lb	
	Cole slaw	1½ oz	15 lb								2½ lb	
CANDIES:												
Hard	Holiday	3 oz	20 lb									
Mints	Holiday	1½ oz	10 lb									
CARROTS	Vegetable	2½ oz	20 lb				16	No. 2	1 lb 4 oz		4 lb	
							3	No. 10	6 lb 8 oz			
CAULIFLOWER	Vegetable	2½ oz	20 lb	15 lb								
CATSUP	Condiment	1 oz			7	14-oz bottle.	1	No. 10	6 lb 15 oz			
CELERY	Salad	1–2 oz	15 lb									
CEREAL:												
Assorted dry	Individual package	1 oz							1 oz	75		
Cornmeal	Hot bread	Ingredient							28-oz pkg	4		
	Cereal	4 oz							28-oz pkg	3		
	Fried	6 oz							28-oz pkg	4		
Hominy grits	Cereal	6 oz							24-oz pkg	3		
Oats, rolled	Cereal	6 oz							48-oz pkg	2		
Wheat	Cereal	6 oz								6 lb		
Whole wheat	Cereal	6 oz								6 lb		
CHEESE:												
American cheddar	Sliced	1½ oz	10 lb					10 lb	6–7 lb			
	Cooking	Ingredient	5 lb					5 lb	6–7 lb			
Cottage	Salads	Ingredient	5 lb									
CHERRIES, SWEET	Fruit	11 ea	30 lb	20 lb	12	No. 2½	16	No. 2½	1 lb 14 oz			
					3	No. 10	4	No. 10	6 lb 12 oz			

APPENDIX II (Continued)

AVERAGE AMOUNTS ISSUED per 100 MEN per MEAL (Continued)

Item	Remarks	Prepared individual serving	Fresh	Frozen	Canned					Dry or Evaporated	Dehydrated overseas
					Domestic		Overseas		Weight of contents		
					Amount	Size	Amount	Size			
CHERRIES S. R. P.	Pie, 6 cuts	1 cut	30 lb	20 lb	16 3	No. 2 No. 10	16 3	No. 2 No. 10	1 lb 4 oz 6 lb 11 oz		
CHICKENS	Fresh	3–4 oz	65 lb	65 lb							
	Canned	3–4 oz					11	35 oz	35 oz		
CHILI CON CARNE	Without beans	3 oz					3	No. 10	6 lb 8 oz		
COCOA	Beverage, 1 cup	8 fluid oz			2½ lb	1 lb 5 lb	2½ lb	5 lb	1 lb 5 lb		
COFFEE R & G	Beverage	8 fluid oz, 1 cup									
COLLARDS	Vegetable	2 oz	25 lb		3 lb		4 lb	Bags			
CORN, on cob (canned)	Vegetable	1 ea.—3 oz	110	15 lb	16	No. 2	20	No. 2	1 lb 4 oz		
		3–4 oz	Ear		3	No. 10	4	No. 10	6 lb 10 oz		
CORNSTARCH	Sauce	Ingredient							1 lb pkg		
CRACKERS, OYSTER	For soups	½ oz			3 lb		3 lb				
CRACKERS, SODA	For soups	3 ea			3 lb		3 lb				
CRANBERRIES	With meat	1½ oz	5 lb								1 lb
CUCUMBERS	Salad	4 slices	20 lb or 25 ea								
EGGS	Fried-boiled	2 ea	200								
	Scrambled	2–3 oz	156				2	No. 10	Approximately 3 lb		5¾ lb
EGGPLANT	Vegetable	2 oz	25 lb								
ENDIVE	Salad	1 oz	20 lb								
FISH, dressed, Salt Mackerel	Main dish	4–5 oz	30 lb	30 lb	25	No. 1	25	No. 1	1 lb		
FLOUR:											
Buckwheat	Hot cakes	Ingredient							20 oz pkg.	7	
Wheat	Hot cakes Rolls	Ingredient							5–10–50 100 pound sacks.	15 lb	
Overseas issue	50 lb sacks										
FRANKFURTERS	Main dish	2–3 ea	30 lb								
FRUIT COCKTAIL	For gelatin use ⅔ or ½	3 oz			12 3	No. 2½ No. 10	16 4	No. 2½ No. 10	1 lb 14 oz 6 lb 12 oz		
GRAPES	Fruit	3 oz	20 lb								
GRAPEFRUIT	Breakfast	½–3 oz	50 lb		20	No. 2	20	No. 2	1 lb 4 oz		
GREENS, LEAFY	Vegetable	2½ oz	25 lb								
HAM, S. C.		4–5 oz	50 lb								
HASH, CORNED BEEF	Main dish	5–7 oz					25	24 oz	24 oz		
HOMINY, LYE	Vegetable										

HAM, S. C.		4–5 oz	50 lb									
HASH, CORNED BEEF	Main dish	5–7 oz					25	24 oz	24 oz			
							7	5½ lb	5 lb 8 oz			
HOMINY, LYE	Vegetable	2–3 oz					3	No. 10	6 lb 9 oz		4 lb	
HONEY		1½ oz			10	1 lb			1 lb jars			
ICE CREAM	Quart, 8 cuts	1 cut			3¼	gal			4 lb 8 oz			
		2½ oz							Gallon			
JAM—PRESERVES and JELLY.	Domestic	1 oz			4	3 lb			2 lb jar			
	Overseas	2 oz					2	No. 10	Jam 8 lb 8 oz			
									Jelly 8 lb 8 oz			
JUICES:												
Grapefruit	As juice	5–6 oz			4	No. 10	13	No. 3 cylinder	3 lb 14 oz			
							6	No. 10	6 lb			
Orange-grapefruit	As juice	5–6 oz			4	No. 10	13	No. 3 cylinder	2 lb 14 oz			
							6	No. 10	6 lb			
Orange	As juice	5–6 oz			4	No. 10	13	No. 3 cylinder	2 lb 14 oz			
							6	No. 10	6 lb			
Pineapple	As juice	5–6 oz			4	No. 10	13	No. 3 cylinder	2 lb 14 oz			
							6	No. 10	6 lb			
Tomato	As juice	5–6 oz			9	No. 3 cylinder	13	No. 3 cylinder	2 lb 14 oz			
					4	No. 10	6	No. 10	6 lb			
KALE	Vegetable	2 oz	25 lb									
LAMB, CARCASS	Stew	4–5 oz	35 lb	35 lb								
	Ground		45 lb	45 lb								
	Roast-chops		55 lb	55 lb								
LARD	Cooking	Ingredient	1 lb									
LEMONS	Beverage	10 fluid oz	96 ea									
LEMON JUICE POWDER, SYNTHETIC.	Beverage	8 fluid oz					1	12 oz	12 oz			
LETTUCE	Salad	2 oz	20 lb									
MACARONI	Side dish	4 oz							5 lb			
	Main dish	8 oz							10 lb			
MARMALADE	Domestic	1 oz			4	2 lb	No. 10		2 lb jars			
	Overseas						2	No. 10	8 lb 6 oz			
MAYONNAISE	Salad	Ingredient			2	qt jar			2 lb jar			

APPENDIX II (Continued)

AVERAGE AMOUNTS ISSUED per 100 MEN per MEAL (Continued)

Item	Remarks	Prepared individual serving	Fresh	Frozen	Canned					Dry or Evaporated	Dehydrated overseas
					Domestic		Overseas		Weight of contents		
					Amount	Size	Amount	Size			
MEAT SPECIALTIES:											
*Bologna	Assorted meats	1–2 oz	10 lb								
*Head cheese	Assorted meats	1–2 oz	10 lb								
Hearts	Main dish	3–5 oz	40 lb	40 lb							
Liver	Main dish	3–5 oz	30 lb	30 lb							
Luncheon meat	Main dish	4–5 oz					5	6 lb	6 lb		
Meat and Vegetable Hash	Main dish	6–8 oz					7	10 lb			
Meat and Vegetable Stew	Main dish	6–8 oz					25	30 oz	30 oz		
Tongue	Main dish	4–5 oz	45 lb	45 lb							
*Amounts shown only half of requirements. Two or three types of meat should be used. Total 30 lb including cheese.											
MILK	Breakfast	8 fluid oz	25 qt		28	14½ oz	28	14½ oz	14½ oz		
					3	gal	3	gal	8 lb		6 lb
MINCE MEAT	Pie, 6 cuts	1 cut			3	No. 10	3	No. 10	8 lb		
MOLASSES	Beans or cake	Ingredient			1	No. 2½	1	No. 2½	2 lb 6 oz		
NOODLES	Side dish	2–3 oz							10 lb box	10 lb	
NUTS—MIXED	In shells	3 oz								20 lb	
OKRA	Vegetable	2 oz	20 lb								
OLIVES—RIPE GREEN	200 in can	3 ea			1	No. 10	1	No. 10	4 lb 2 oz		
ONIONS	Salads	1–2 oz	15							20 lb	2½ lb
	Vegetable	2–3 oz	bunch								
ORANGES	Breakfast	1 ea	100								
OYSTERS	160 to gal	6–7 ea			4	gal	4	gal	9 lb		
OIL-VEG-SALAD	Salad dressing	Ingredient			¼	gal	1	qt	qt 2 lb		
PARSLEY	Soup	Ingredient	¼ lb						gal 8 lb		
	Salad										
PARSNIPS	Vegetable	2 oz	20 lb								
PEACHES	Fruit	1 ea	100		12	No. 2½	16	No. 2½			
					3	No. 10	4	No. 10	1 lb 14 oz	7 lb	7 lb
	Pie, 6 cuts	1 cut	30 lb		12	No. 2½	12	No. 2½	6 lb 12 oz	7 lb	7 lb
					3	No. 10	3	No. 10			
PEANUT BUTTER		1–2 oz			4	1 lb 9 oz	2	No. 10	6 lb 12 oz		
PEARS	Fruit	1 ea	100		12	No. 2½	16	No. 2½	1 lb 13 oz		
		1 slice			3	No. 10	4	No. 10	6 lb 10 oz		
PEAS	Vegetable	3 oz	40 lb	15 lb	16	No. 2	20	No. 2	1 lb 4 oz		
					3	No. 10	4	No. 10	6 lb 9 oz		
PEAS, dry split	Soup	Ingredient				(*)		(*)	10–50–100 lb	8 lb	

*Domestic issue	10 lb and 100 lb bags										
Overseas issue	50 lb bags										

PEAS, dry split	Soup	Ingredient				(*)		(*)	10–50–100 lb	8 lb	
*Domestic issue	10 lb and 100 lb bags										
Overseas issue	50 lb bags										
PEAS, blackeyed	Side dish	3 oz								8 lb	
PEPPERS, GREEN	Salad	Ingredient	5 lb								
	Stuffed	Ingredient	20 lb								
PEPPER	Condiment	Ingredient			1 oz			1 oz	4 oz 1 lb		
PICKLES	Relish	1½ oz			⅕	Keg	1	gal	gal–8 lb keg–40 lb		
PINEAPPLE	Sliced	3 oz			12	No. 2½	12	No. 2½	1 lb 14 oz		
PORK, fresh:					3	No. 10	3	No. 10	6 lb 12 oz		
Butts	Main dish	4–5 oz	55 lb	55 lb							
Ham	Main dish	4–5 oz	55 lb	55 lb							
Loin	Main dish	4–5 oz	55 lb	55 lb							
Spareribs	Main dish	4–5 oz	60 lb	60 lb							
POTATOES, Irish	Vegetable	6 oz	40 lb					Hash brown or fried Au gratin Potato salad Mashed Mashed precooked shreds			7 lb 7½ lb 5 lb 7 lb 4½ lb
POTATOES, sweet	Vegetable	6 oz	40 lb		20	No. 2½	20	No. 2½			7½ lb
					5	No. 10	5	No. 10			
POWDERED DESSERT:											
Butterscotch	Dessert				½ lb	10 lb	1	No. 5	5 and 10 lb		
Chocolate	Dessert				½ lb	10 lb	1	No. 5	5 and 10 lb		
Vanilla	Dessert				½ lb	10 lb	1	No. 5	5 and 10 lb		
Gelatin	Dessert				½ lb	10 lb	1	No. 5	5 and 10 lb		
POWDER, BAKING		Ingredient			½ lb	1 lb	½ lb	1 lb	1 and 5 lb		
						5 lb		5 lb			
PLUMS	Fruit	1 ea	100		12	No. 2½	16	No. 2½	1 lb 14 oz		
		3 oz 1 cut			3	10 lb	4	No. 10	6 lb 12 oz		
PRUNES	Fruit	3 oz				(*)		(*)	No. 10		
	Cobblers	1 cut							25 lb box	7 lb	7 lb
*Domestic issue	25 lb										
Overseas issue	25 lb box and No. 10 can										
PUMPKIN	Pie, 6 cut	1 cut			12	No. 2½	12	No. 2½	1 lb 13 oz		
PUREE, VEGETABLE	Hospital	Soup ingredient					10	No. 2	1 lb 4 oz		
RADISHES	Salad	2 ea	15 bunch								
RAISINS		Ingredient			4 lb	15 oz	4 lb	No. 10			
						25 lb		25 lb			
RHUBARB	Sauce	3 oz	20 lb								
RICE	Vegetable	4 oz				(*)		(*)		8 lb	
	Dessert	3 oz								6 lb	
*Domestic issue	1 lb pkg or 100 lb bag										
Overseas issue	50 lb bag										
RUTABAGAS	Vegetable	2 oz	25 lb								4 lb
SALT		Ingredient							1 lb, 3 lb, 10 lb.		

APPENDIX II (Continued)

AVERAGE AMOUNTS ISSUED per 100 MEN per MEAL (Continued)

Item	Remarks	Prepared individual serving	Fresh	Frozen	Canned					Dry or Evaporated	Dehydrated overseas
					Domestic		Overseas		Weight of contents		
					Amount	Size	Amount	Size			
SARDINES		3–4 oz					25	15 oz	15 oz		
SAUERKRAUT	Vegetable	2½–3 oz	20 lb		3	No. 10	3	No. 10	6 lb 3 oz		
SAUSAGE:											
Pork	Breakfast	2½–3 oz	30 lb								
Vienna	Main dish	2½–3 oz					15	24 oz	1 lb 8 oz		
SIRUP					1	gal	1	No. 10			
SOUP:											
Bean	Approximately	8 oz									4 lb
Pea	Approximately	8 oz									4 lb
SPAGHETTI	Side dish	4 oz				10 lb box		10 lb box		5 lb	
	Main dish	7–8 oz								10 lb	
SHRIMP	Salad	Ingredient			10	No. 1½	10	No. 1½			
SPINACH	Vegetable	2½ oz	25 lb	12½ lb	12	No. 2½	12	No. 2½	1 lb 11 oz		
				3	3	No. 10	3	No. 10	6 lb 2 oz		
SQUASH	Vegetable	2½ oz	25 lb								
SUGAR, granulated		1 oz								6 lb	
TEA	Beverage, 1 cup	8 fluid oz							5 lb container	8 oz	
TOMATOES	Salad	3 oz	25 lb								
	Vegetable				16	No. 2		No. 2	1 lb 3 oz		
					12	No. 2½		No. 2½	1 lb 12 oz		
					3	No. 10		No. 10	6 lb 6 oz		
TOMATO COCKTAIL		5 oz						4 lb			3 lb
TOMATO PUREE	Spaghetti	Ingredient			2	No. 10	2	No. 10	6 lb 9 oz		
	Sauces				1	No. 10	1	No. 10			
TURKEY	Main dish	5–6 oz	70 lb	70 lb							
TURNIPS	Vegetable	2 oz	25 lb								
VEAL	Stew	4–5 oz	35 lb	35 lb							
	Ground		45 lb	45 lb							
	Roast		55 lb	55 lb							
VINEGAR		Ingredient			1 qt	gal	1 qt	5 gal	Keg qt–2 lb Gal–8 lb Keg–40 lb		
WATERMELON	28–32 lb melons	1 slice	7 ea								
YEAST		Ingredient		1 lb comp						8 oz	

APPENDIX III

MEAT AND WHAT TO SERVE WITH IT

(1) Beef and what to serve with it

Beef cut	Soup or appetizer	Starchy food	Other vegetable	Bread, rolls, etc.	Accompaniment	Salad	Dessert
ROAST	Corn chowder	Browned potatoes	Fresh lima beans	Parkerhouse rolls	Yorkshire pudding	Lettuce	Lemon pie
	Split pea	Mashed potatoes	Fried eggplant	Bread	Sage dressing	Apple and celery	Ice cream and cake
	Vegetable	Boiled potatoes	Asparagus	Soft bun	Pickles	Sliced tomato	Peach shortcake
POT ROAST	Cream of celery	Boiled noodles	Stewed tomatoes	Bread	Horseradish	Cabbage and apple	Stewed apricots
	Tomato	Baked potatoes	Kidney beans	Cheese biscuits	Chili sauce	Cucumber and onion	Baked custard
	Potato	Fried hominy	Glazed parsnips	Hot rolls	Pickled onions	Banana	Butterscotch pudding
STEAK	Cream of asparagus	French fried	Fried onions	Pan rolls	Pickled beets	Combination	Cocoanut cream pie
	Bean	potatoes	Cauliflower	Sour milk biscuits	Carrot sticks	Sliced cucumber	Chocolate pudding
	Chicken	Escalloped potatoes	Baked corn	Bread	Celery	String bean	Baked apples
		Hashed brown potatoes					
STEW	Clam chowder	Rice	Onions	Corn bread	Piccalilli	Fruit	Layer cake
	Tomato consomme	Boiled potatoes	Carrots	Whole wheat bread	Radishes	Pimiento	Rice pudding
	Fruit juice	Macaroni	Rutabagas	White bread	Spiced crab apples	Raw vegetable	Fruit and cookies
CORNED BEEF	Rice and tomato	Boiled potatoes	Boiled cabbage	Rye bread	Mustard sauce	Celery	Fruit jello
	Barley	Parslied potatoes	Buttered carrots	White bread	Dill pickles	Pineapple	Banana pudding
	Cream of spinach	Buttered noodles	Turnips	Hard rolls	Marmalade	Carrot and raisin	Gingerbread
HAMBURGER	Lima bean	Creamed potatoes	Buttered beets	Hot biscuits	Catsup	Cole slaw	Bread custard
STEAK	Potato and carrot	Fried potatoes	String beans	Raisin bread	Green onions	Lettuce and egg	Chocolate pie
	Cream of corn	Au gratin potatoes	Summer squash	Graham bread	Jam	Beet	Doughnuts

(2) Veal and what to serve with it

Veal cut	Soup or appetizer	Starchy food	Other vegetable	Bread, rolls, etc.	Accompaniment	Salad	Dessert
ROAST	Puree of bean	French baked	Mashed squash	Bread	Sweet pickles	Tomato and	Cherry pie
	Green pea	potatoes	Succotash	Hot rolls	Raspberry jam	cucumber	Brown betty
	Consomme	Baked sweet	Steamed spinach	Baking powder	Olives–celery	Cabbage and	Chocolate ice cream
		potatoes		biscuits		pineapple	
		Mashed potatoes				Celery and nut	
CUTLETS OR	Noodle	Escalloped potatoes	Harvard beets	Bread	Cranberry sauce	Peach and cottage	Butterscotch pie
CHOPS	Barley and tomato	Candied sweet	Carrots and peas	Parkerhouse rolls	Tomato sauce	cheese	Cottage pudding
	Vegetable	potatoes	Wax beans	Finger rolls	Mushroom sauce	Lettuce	Orange ice
		Potato cakes				Asparagus	
	Lentil	Curried rice	Carrots and onions	Bread	Currant jelly	Pickled beet	Apple cobbler
	Chicken and rice	Dumplings	Peas	Crusty rolls	Mustard pickles	Green vegetable	White layer cake
	Cream of tomato	Boiled potatoes	Braised celery	Graham bread	Sliced tomatoes	Fruit	Tapioca pudding

APPENDIX III (Continued)

MEAT AND WHAT TO SERVE WITH IT (Continued)

(3) Lamb and what to serve with it

Lamb cut	Soup or appetizer	Starchy food	Other vegetable	Bread, rolls, etc.	Accompaniment	Salad	Dessert
ROAST OR LOAF	Tomato juice Julienne Puree of carrot	Mashed sweet potatoes Parslied potatoes Browned potatoes	Baked onions Mashed turnips Fritter-fried eggplant	Parkerhouse rolls Bread Soft bun	Mint sauce Mint jelly Assorted pickles	Macedoine of vegetables Carrot and pineapple Lettuce and radish	Ice cream and cake Peach pie Cornstarch pudding
CHOPS OR PATTIES	Rice Beef bouillon Onion	Lyonnaise potatoes French fried potatoes Spanish rice	New peas Butter beans Glazed carrots	Sandwich buns Raisin bread Hot rolls	Tart jelly Celery–onions Mint ice	Bacon-combination Waldorf Sliced tomato	Berry shortcake Custard pie Cantaloupe
STEW	Puree of green pea Potato chowder Fruit cocktail	Steamed rice Baked noodles Boiled potatoes	Boiled kidney beans Swiss chard Buttered cabbage	Hot biscuits Corn bread French bread	Spiced beets Radishes Sour pickles	Prune and carrot Vegetable Pear and grated cheese	Bread pudding with chocolate sauce Berry pie Apricot tapioca

(4) Pork and what to serve with it

Pork cut	Soup or appetizer	Starchy food	Other vegetable	Bread, rolls, etc.	Accompaniment	Salad	Dessert
ROAST	Beef broth Cream of cabbage French onion	Whipped potatoes Buttered diced potatoes Sweet potatoes	Escalloped tomatoes Steamed spinach Broccoli	Bread Hot rolls Raisin bread	Apple sauce Brown gravy Tart jelly	Head lettuce Cole slaw Banana and nut	Lemon ice Custard pie Baked pears
CHOPS	Macaroni Clam juice Chicken and rice	French baked potatoes Cottage fried potatoes Baked potatoes	Cabbage au gratin Glazed carrots Green peas	French bread Parkerhouse rolls Graham bread	Fried apple rings Marmalade Celery	Pineapple and celery Sliced tomato Combination	Cherry dumplings Orange jello Spice cake
SPARERIBS	Cream of celery Tomato Puree of split pea	Boiled potatoes French fried sweet potatoes Mashed potatoes	Sauerkraut Swiss chard Creamed celery	Corn bread Hot biscuits Rye bread	Apple stuffing Barbecue sauce Sliced onions	Fresh fruit Cabbage and green pepper Beet and cucumber	Lemon cream pie Fresh fruit and cookies Caramel custard
BAKED HAM	Corn chowder Bean Sauerkraut juice	Candied yams Spanish rice Buttered hominy	Steamed cabbage Green beans Asparagus	Vienna bread Muffins Bread	Raisin sauce Jelly or jam Radishes–green onions	Raw vegetable Pineapple and cottage cheese Lima bean	Chocolate ice cream Apricot pie Fresh fruit and cookies
BOILED HAM	Lentil Tomato and rice Julienne	Mashed sweet potatoes Parslied potatoes Escalloped potatoes	Corn pudding Black-eyed peas Spinach	Soft bun bread Pan rolls Rye bread	Mustard pickles Spiced crab apples Horseradish sauce	Apple and date Onion and cucumber Cabbage and peanut	Banana cream pie Pineapple ice Fruit jello

HAM SLICE	Pineapple juice Vegetable Cream of asparagus	Fried corn meal mush Baked potato	Baked corn and tomatoes	Sour milk biscuits Bread	Sweet pickles	Apple, celery and	

HAM SLICE	Pineapple juice Vegetable Cream of asparagus	Fried corn meal mush Baked potatoes Curried rice	Baked corn and tomatoes Fresh lima beans Creamed carrots	Sour milk biscuits Bread Sandwich buns	Sweet pickles Cottage cheese Onion gravy	Apple, celery and nut Hearts of lettuce Tomato	Rhubarb pie Cocoanut custard Lemon loaf cake
SAUSAGE	Puree of potato Noodle Macaroni and tomato	Creamed potatoes Baked sweet potatoes Fried potatoes	Hot spiced beets Squash Escalloped onions	Corn bread Bread Hard rolls	Browned pineapple Milk gravy Watermelon pickles	Green bean Carrot and raisin Spinach and hard-cooked egg	Apple pie Chocolate cake Chilled melon

(5) *Miscellaneous meat dishes and what to serve with them*

Meat dish	Soup or appetizer	Starchy food	Other vegetable	Bread, rolls, etc.	Accompaniment	Salad	Dessert
CHILI	Tomato Cream of potato Beef broth	Buttered diced potatoes Steamed rice Baked potatoes	Kidney beans Broccoli Acorn squash	French bread Hard rolls White bread	Pickled beets Dill pickles Carrot sticks	Green pepper Lettuce and tomato Celery and raisin	Jello and oatmeal cookies Cocoanut layer cake Berry pie
FRANK-FURTERS	Oyster stew Split pea Cream of corn	Hot potato salad Spanish rice Baked macaroni	Steamed sauerkraut Asparagus Red cabbage	Rye bread Sandwich buns Bread	Barbecue sauce Mustard Catsup	Cabbage and pineapple Beet and onion Sliced tomato	Apricot brown betty Pineapple tapioca Strawberry shortcake
MEAT LOAF	Consomme Puree of white bean Tomato juice	Lyonnaise potatoes Hashed in cream potatoes Curried rice	Black-eyed peas Fried eggplant Creamed onions	Finger rolls Graham bread Corn bread	Spanish sauce Chilli sauce Mustard pickles	Fruit Combination Carrot, prune and celery	Jelly roll Coffee ice cream Peach cobbler
HEART	Navy bean Vegetable chowder Onion	Buttered noodles Candied yams Fried potatoes	Boiled onions Fried corn Escalloped tomatoes	Parkerhouse rolls Baking powder biscuits Bread	Sage stuffing Spiced gooseberries Currant jelly	Cole slaw Asparagus Combination fruit	Apricots and brownies Prune whip Raisin pie
LIVER	Tomato juice Spring vegetable Celery	French fried potatoes Potatoes in jackets Steamed brown rice	Hot slaw Lima beans French fried onions	White bread Raisin bread Hot rolls	Bacon Pickled onions Assorted pickles	Pineapple and cheese Endive Banana	Pumpkin pie Peaches and cream Cup cakes
TONGUE	Noodle Sauerkraut juice Beef broth with rice	Boiled potatoes Mashed potatoes Escalloped potatoes	Steamed spinach Wax beans Braised celery	Rye bread Hard rolls Bread	Raisin sauce Spanish sauce Horseradish	Spiced beet Pineapple Lettuce	Chocolate pudding Mince pie Ice cream with fruit sauce
ASSORTED COLD MEATS	Clam chowder Bean puree Onion soup au gratin	Potato salad Macaroni Creamed whole potatoes	Okra and tomatoes Beet greens Succotash	Cheese biscuits Bread Parkerhouse rolls	Sweet pickles Sliced cheese Mustard pickles	Shredded lettuce Fruit String bean and celery	Apple turnovers Rhubarb sauce and cookies Cottage pudding

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