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TM 10-205

WAR DEPARTMENT TECHNICAL MANUAL

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MESS MANAGEMENT AND TRAINING

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TECHNICAL MANUAL

MESS MANAGEMENT AND TRAINING

CHANGES No. 1

WAR DEPARTMENT,
WASHINGTON 25, D. C., 3 December 1944.

TM 10–205, 3 October 1944, is changed as follows:

102. Garrison Ration Accounts and Records

* * * * *

a. BY COMPANY MESS. The Monthly Mess Account, W. D., Q. M. C. Form No. 469. (See fig. 12.) **(When present supply is exhausted this form will be renumbered W. D., A. G. O. No. 10–134.)** Additional improvised accounts * * * its own convenience.

* * * * *

103. Monthly Mess Account

The Monthly Mess Account, W. D., Q. M. C. Form No. 469 **(until such time as W. D., A. G. O. Form No. 10–134 is available),** is the basic account kept by the mess. The primary purpose * * * of the month.

104. Preparation of Monthly Mess Account

a. GARRISON RATION. Mess accounts for an organization operating on the garrison ration are recorded daily on W. D., Q. M. C. Form No. 469 (Monthly Mess Account), **until such time as W. D., A. G. O. Form No. 10–134 is available.** The heading of * * * are as follows:

* * * * *

(18) *Column 19.* The entry in * * * entry (column 18). On days of inventory, this entry will be the actual value of the physical inventory as taken by the mess officer and entered on the back of Form 469, **until such time as W. D., A. G. O. Form No. 10–134 is available.**

* * * * *

(20) *Column 21.* This entry will * * * times as directed. This inventory value will be entered in column 19 on the date taken and adjustments noted at the foot of Form No. 469, **until such time as W. D., A. G. O. Form No. 10–134 is available,** as illustrated on the sample form.

b. As vouchers to * * * should be kept.

* * * * *

(2) Orderly files of * * * be readily determined. At the end of the month, the sales slips and invoices are filed with the completed Form No. 469, **until such time as W. D., A. G. O. Form No. 10–134 is available.**

* * * * *

WAR DEPARTMENT
Q. M. C. Form 469
Approved Dec. 7, 1925

MONTHLY MESS ACCOUNT OF Company C 501st Infantry MONTH March YEAR 19 44

Value of Ration, $ 0.4500 . Allowance from Company Fund for Month, $ None , for Day, $ None Value of Stock at End of Previous Month, $ 250.00

1	2		3	4	5	6	7	8				9				10				11		12		13		14		15		16		17		18		19		20		21	
Date	Number Men Rationed		Total Value of Ration for the Day		Daily Allowance from Company Fund		Day's Income from Boarders or Other Sources			Total Credit for Day (3+4+5)		Total Credit to Date		Purchases from Commissary				Purchases from Post Exchange				Purchases from Other Sources				Total Purchases for Day (8+9+10)		Total Purchases to Date		Savings from Q. M. for Day (3−8)		Deficit Due Q. M. for Day (8−3)		Standing with Q. M. (13 or 14 for day+15 for previous day)		Standing for Mess to Date (7−12)		Value of Stock in Supply Room		Cost of Meals for Each Day		Balance of Stock on Hand (17−18)		Gain or Loss with Reference to Inventory		Actual Standing of Mess (20−16)	
	Today	To date													Today		To date		Today		To date		Today		To date															
1	200	200	90	00			4	75	94	75	94	75	100	00	100	00				43	90	43	90	143	90	143	90			10	00	− 10	00	− 49	15	393	90	90	00	303	90	+ 53	90	+ 4	75
2	195	395	87	75			4	50	92	25	187	00			100	00				35	00	78	90	35	00	178	90	87	75			+ 77	75	+ 8	10	338	90	93	50	245	40	− 4	60	+ 3	50
3	197	592	88	65			4	50	93	15	280	15			100	00				30	50	109	40	30	50	209	40	88	65			+166	40	+ 70	75	275	90	97	00	178	90	− 71	10	−	35
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* The entry made in column No. 19, on the 10th, 20th and last day of the month is the actual physical inventory value. Adjustments are made in the space below.

Value of stock on hand at end of present month, . . $_____

Value of stock on hand at end of previous month, . $_____

Increase—Decrease—in value of stock, ... $_____

Standing of mess on last day of month, ... $_____

Gain—Loss—in mess for month, ... $_____

INVENTORY ADJUSTMENTS

	10th	20th	Last Day
1. Physical inventory value			
2. Column 17 minus 18			
3. Difference GAIN: LOSS			
4. Standing of Mess per column 21-			
5. Corrected standing			

Audited:

March 31, 19 44

I certify that the above is correct.

John Doe,
Mess Sergeant.

April 1, 19 44

A. M. Jones, 1st Lt., 501st Inf.
Officer in charge of Mess.

3—8018

Figure 12.—W. D. Q. M. C. Form No. 469—Monthly Mess Account

[AG 300.7 (17 Nov. 44).]

BY ORDER OF THE SECRETARY OF WAR:

OFFICIAL:
J. A. ULIO
Major General
The Adjutant General

G. C. MARSHALL
Chief of Staff

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For explanation of symbols, see FM 21–6.

U. S. GOVERNMENT PRINTING OFFICE: 1944

WAR DEPARTMENT TECHNICAL MANUAL

TM 10-205

This manual supersedes TM 10-205, 6 July 1942.

MESS MANAGEMENT AND TRAINING

WAR DEPARTMENT 3 OCTOBER 1944

127951

United States Government Printing Office

Washington: 1944

WAR DEPARTMENT,

WASHINGTON 25, D.C., 3 OCTOBER, 1944.

TM 10–205, Mess Management and Training, is published for the information and guidance of all concerned.

[A. G. 300.7 (10 May 44).]

BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:

J. A. ULIO,
Major General,
The Adjutant General.

DISTRIBUTION:

As prescribed in paragraph 9a, FM 21-6; C and H (3).

For explanation of symbols, see FM 21-6.

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This manual supersedes TM 10-205, 6 July 1942.

SECTION I

GENERAL

1. Purpose

The purpose of this manual is to provide a clear, practicable, and concise source of information for responsible troop mess officers, to familiarize them thoroughly with War Department mess management policies, and to develop a constructive attitude in all mess personnel toward established principles of mess management.

2. The Mess

a. The term "mess" is applied to installations in which Army groups eat together for convenience, practicability, and economy. The term is applied to units of various sizes and composition: to companies, batteries, troops, squadrons, etc. Separate messes for commissioned personnel and enlisted personnel may be provided.

b. GENERAL OR CONSOLIDATED MESS. A general or consolidated mess is a combination of two or more units in one general mess. Such a combination is made when the number of men in the individual organization is low, or when economy and efficiency of management and operation can best be effected by the combination. When companies are joined in a general mess, the company mess officer confines his supervision of the mess to observation.

c. COMPANY MESS. A company mess is the mess of a single company, troop, battery, squadron, or similar unit.

d. DETACHMENT MESS. A detachment mess is the mess of a unit smaller than a company.

3. Mess Management

The supervision and control exercised over every part of an Army mess is mess management. This supervision and control is a function and responsibility of command. All commanders are expected to give close and constant supervision to the messes of their commands in order that all food may be properly prepared and unnecessary waste avoided. They are required to see that kitchen equipment is given the proper care and repaired when needed, and that high standards of sanitation are maintained in the mess at all times. Although a commanding officer may delegate direct supervision of a mess or messes to junior officers, the responsibility for proper mess management remains his.

4. Mess Management Objective

The objective of mess management is the proper preparation of nutritious food served in sufficient quantity to assure ample portions for every man. Feeding the Army is a complex and costly task which begins with the purchase of subsistence supplies at their source and ends with the unit mess. Foodstuffs purchased by the Army are of the highest quality obtainable; they are stored, distributed, and handled with great care and under strict regulation. All this may be rendered useless if the unit mess is carelessly managed.

5. Importance of Mess Management

Good food, well prepared and carefully served in clean and orderly surroundings—the right food in the right quantities to sustain active and vigorous men—does much to keep the men healthy, give them pride in their organization and build up their morale. The foods served and the menus supplied are designed to satisfy the body's needs, and to satisfy them fully. Painstaking attention to mess management will help to produce a vigorous and proud outfit, and contribute much to its intelligent, effective, and continuous operation. Constant supervision by the unit mess officer and mess sergeant, and the use of skilled personnel will produce a good mess. Even under combat conditions when mess operations may become difficult, the mess officer, mess sergeant, or cook who uses this as an excuse for neglecting to supervise and attend to details of food preparation contributes much toward the reduction of his

outfit's combat value.

6. Mess Management Functions

The functions of mess management are:

a. The economical and efficient use of rations. (See sec. III.)

b. The planning and preparation of menus to secure a balanced and sustaining diet, when menus are not supplied. (See sec. IV.)

c. The procurement and storage of foods. (See sec. V.)

d. The preparation, cooking, and serving of food, to assure clean, attractive, and nutritious meals. (See sec. VI.)

e. The conservation of foodstuffs and elimination of food waste. (See sec. VII.)

f. The elimination of insanitary conditions that breed disease and infection. (See sec. VIII.)

g. The proper use of mess equipment. (See sec. IX.)

h. The maintenance of proper records to cover the receipt and use of rations. (See sec. XI.)

SECTION II

MESS PERSONNEL

7. Classification of Mess Personnel

a. Mess personnel are classified as permanent and temporary food handlers. Permanent food handlers are persons assigned to messing units for permanent duty requiring them to serve food and drink or to handle the dishes, tableware, or kitchen utensils in which food is prepared or served. Included in the classifications are:

(1) Mess sergeants.

(2) Cooks, assistant cooks, and cooks' helpers.

(3) Waiters (permanently assigned to officers' messes).

(4) Permanent dining room and kitchen helpers.

b. Kitchen police, detailed by daily roster or rotated schedules, are classified as temporary food handlers.

8. Qualification

a. In mess management, the importance of ideal messing conditions cannot be overemphasized. One of the primary requisites to a good mess is the selection of well-qualified mess personnel.

b. Mess officer. (1) The mess officer who is charged with the immediate supervision of the mess must be fully aware of his responsibility for maintaining a high standard of physical fitness and morale among the troops in his mess. He must be familiar with the phases of mess operation including:

(*a*) Duties of his subordinates. (See sec. II.)

(*b*) Supervision of personnel. (See sec. II.)

(*c*) Nutritional requirements. (See sec. IV.)

(*d*) Inspection of subsistence. (See sec. V.)

(*e*) Storage of foods. (See sec. V.)

(*f*) Food preparation designed to produce attractive, palatable, and nutritious meals. (See sec. VI.)

(*g*) Methods of cookery. (See sec. VI.)

(*h*) Mess sanitation. (See sec. VIII.)

(*i*) Mess accounting. (See sec. XI.)

(2) He must be interested in his duties and take pride in his mess organization. The mess officer who, under the pressure of other assignments, degrades the mess to the position of a minor duty, is guilty of an error which may create serious decline in the morale and general well-being of the organization.

c. Mess sergeant. The selection of a well-qualified mess sergeant should receive careful attention. He is a keyman in any organization and is particularly so for the mess personnel. When an experienced mess sergeant is not available and an individual must be selected for the position, an experienced cook with leadership ability (preferably a graduate of a school for bakers and cooks) should be selected. This method will afford cooks an opportunity for advancement which contributes to the morale of the permanent mess personnel. The selection at random of any noncommissioned officer as a mess sergeant will only detract from the general efficiency of mess operations. The mess sergeant should have the following qualifications:

(1) He should be a leader.

(2) He must be familiar with all phases of cookery.

(3) He must be thoroughly versed in the vital subjects of—

(*a*) Inspection and storage of foods.

(*b*) Nutrition.

(*c*) Menu preparation.

(*d*) Mess sanitation.

(*e*) Care and use of equipment and utensils.

(4) He must possess a working knowledge of mess accounts and records.

d. Cook. In the mess organization the cook holds a responsible position. Good cooking contributes to economical mess operation and is vital to the welfare and morale of the troops, because their general health and contentment depend largely on the quality of the cooking in the mess.

A good Army cook must:

(1) Possess initiative.

(2) Be conscientious and reliable in the performance of his duties.

(3) Have a thorough working knowledge of the functions of foods.

(4) Have a thorough understanding of the methods of food preparation and cookery.

(5) Be able to carry out instruction.

(6) Be capable of directing the work of his assistant cooks and the kitchen police. The first cook must be able to prepare all dishes on the menu and direct general kitchen operations. The second cook must be capable of preparing all dishes under the supervision of his superiors.

e. KITCHEN POLICE. Commanders, by creating a feeling of pride in their mess among the troops, will do much toward making the kitchen police detail less a drudgery and more a prideful obligation of the soldier to his mess. The duty of kitchen police should never be regarded by commanders as a punishment detail. The soldier who is inept at drill or other company duties is not the man to be placed in the kitchen, entrusted with the health of the troops. Men detailed to kitchen police must be able to carry out instructions and understand the necessity of maintaining sanitary conditions in the preparation and handling of foodstuffs.

9. Duties

a. MESS OFFICER. The mess officer is directly responsible to his immediate commanding officer for the operation of the mess. The commanding officer of a company, battery, troop, or similar unit is not relieved of responsibility for the operation of the mess by appointing a subordinate as mess officer. The mess officer will—

(1) Obtain required subsistence, equipment, and supplies necessary for the operation of the mess and the feeding of the troops.

(2) Inspect all subsistence received for quality and quantity. Only in emergencies will he delegate this responsibility to the mess sergeant.

(3) Make frequent daily inspections of the mess. During these inspections he will see that—

(*a*) All subsistence is properly stored, according to its perishable nature.

(*b*) The menu is being followed, and that only authorized substitutions are made.

(*c*) Correct methods of preparation, cookery, and serving are employed to avoid waste and to preserve the nutritive value of foods; and that timely preparation of all foods becomes a daily habit in his mess.

(*d*) Left-overs are kept to the minimum and utilized to the fullest extent. He should check daily to see that left-over food items are used during the following 24-hour period.

(*e*) Accounts and records pertaining to the ration in effect are posted and accurately maintained at all times.

(*f*) Inventories pertaining to the mess are properly recorded.

(*g*) All mess equipment is properly maintained and kept in a good state of repair.

(*h*) All phases of mess sanitation are enforced at all times.

(4) It is the duty of the mess officer to encourage all mess personnel to further their training and improve themselves in the performance of their duties.

(5) Assisted by the mess sergeant, the mess officer prepares the menu when the garrison ration is in effect.

(6) The mess officer should assure himself of an adequate supply of mess personnel at all times for needed replacements.

(7) He will frequently sample dishes to determine their palatability and attractiveness.

(8) He supervises the following:

(*a*) The use of mess equipment, to prevent breakage and excessive deterioration.

(*b*) The handling of food, to prevent contamination and the spread of disease and infection.

(*c*) The food handlers; making certain that they observe proper sanitary habits. He will be responsible for seeing that permanent food handlers have been examined by the medical officer and that certificates of such examinations are posted in the kitchen. He should replace any food handler who appears to be suffering from communicable disease and when in doubt he should request a special physical examination for the individual concerned.

(9) Assisted by the mess sergeant the mess officer will decide the style of food service best suited to the mess, that is, family style or cafeteria style, first considering the following:

(*a*) Design of mess hall.

(*b*) Adaptability of equipment and utensils.

(*c*) Number of men to be fed and the hours meals are scheduled to be served.

(10) Consider the service of "early chow" and keep the practice of early feeding at a minimum.

(11) Assist and advise mess sergeant as to arranging lay-out of kitchen and dining room service equipment. He will be especially careful to place service equipment in its most convenient location.

b. Mess sergeant. The mess sergeant is in direct charge of the detailed operation of the mess. He is responsible to the mess officer for its proper operation.

(1) He supervises the actual preparation, cooking, and serving of the food.

(2) He is responsible for keeping the mess building, equipment, and area in an excellent sanitary condition at all times.

(3) He organizes the work in the mess, assigning such detailed duties to individuals working under his supervision as are necessary for the successful operation of the mess.

(4) He maintains order in the mess at all times.

(5) He assists the mess officer in planning the menus and keeping the necessary records and accounts.

(6) He frequently checks appliances and equipment, reporting shortages and recommending necessary repairs. Assisted by his mess officer, he provides storage for equipment when it is not in use. (See fig. 1.)

(7) He reports all breakages promptly to the mess officer to enable him to establish responsibility therefor and to prepare the required statement of charge.

(8) He takes all necessary steps to insure the proper utilization of food and the elimination of food waste.

(9) Under the field ration system, the mess sergeant does not prepare the menus but studies menus prepared by higher authority and confers with the cooks to insure correct preparation of food. He prepares, for the guidance of the cooks, a quantity break-down of the items of food required for each meal on the approved menu. Under the garrison ration system, he requisitions or purchases such supplies as are needed; he is especially careful to buy only small quantities of perishable goods for current use to prevent loss by spoilage.

(10) Under the field ration system, he prepares, with the assistance of the first sergeant, estimates for the approval of the unit commander showing the number of rations required.

(11) When the unit is on garrison ration, he prepares and submits to the unit commander a daily statement of the exact financial status of the mess (W.D., Q.M.C., Form No. 469).

(12) Whether on the garrison or field ration he checks the left-over food and advises the cooks on its preparation for the fullest utilization. He must realize that full utilization of left-over food should be a daily practice rather than an exception and should include the use of fat trimmings and bones from carcass meats. He should always plan to use his left-over food item within 24 hours. He should always advise that the left-over be prepared so that it appears to be a new dish and not a left-over item.

(13) He is always on the alert for new recipes and improved cookery methods which will add variety and new food appeal to his mess.

(14) He holds frequent meetings (daily if possible) with personnel assigned to his mess when he discusses problems concerning his mess and ways and means to improve over-all operation, the cooking and serving of food in particular.

c. Cook. The cook, with the aid of his assistants, will personally prepare all dishes on the menu. He must take an interest in his duties and constantly endeavor to produce the best possible meals in order to promote the health, contentment, and pride of the organization.

(1) He observes the rules of personal hygiene at all times, keeping his kitchen and equipment clean. He must be especially careful to eliminate all methods of work causing food waste.

(2) He keeps a check on kitchen utensils in order to be certain that they are clean and sanitary and he sees that they are returned to their proper place when not in use.

(3) He follows the prescribed recipes and cooking practices in order to make use of the maximum nutrients and to minimize cooking losses.

(4) He serves the food as neatly as possible and is painstaking about the attractive appearance and taste of the food.

(5) He schedules the work of his assistants and the kitchen police and trains them in the performance of their duties.

(6) He personally fires the ranges and is responsible for seeing that an ample supply of fuel is available at all times.

(7) During any authorized absence of the mess sergeant, he assumes the duties and responsibilities of that office.

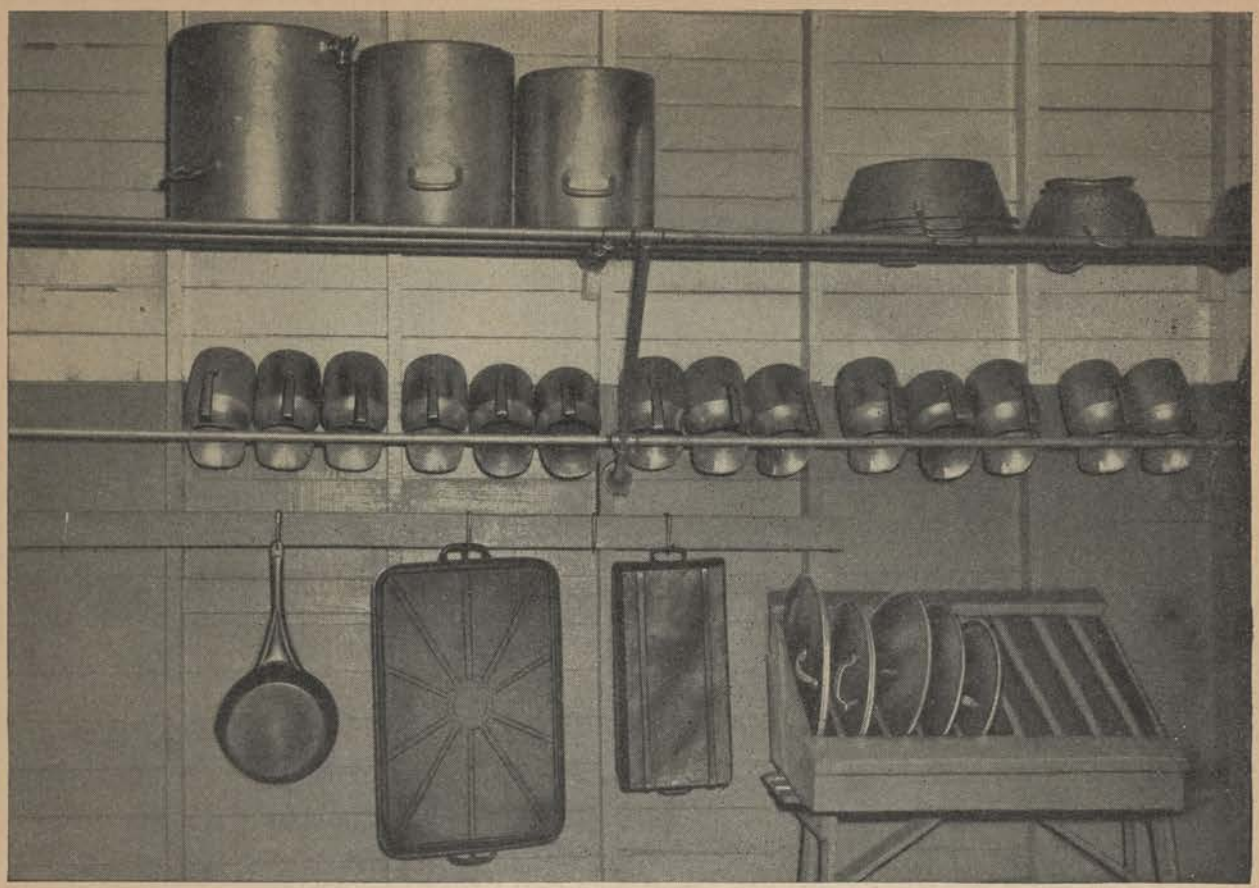


Figure 1. Kitchen utensils in racks.

(8) He studies the menu, plans his procedure, and before starting each task, assembles the necessary equipment and ingredients to prevent waste motion and loss of time in the preparation of meals.

(9) Before closing the mess hall at night, he is responsible for putting it in order, and for seeing that all windows and doors are secured, lights extinguished, and foods properly stored; that sufficient fuel is on hand, and that advance preparations have been made for the breakfast meal.

(10) When student cooks are assigned to his kitchen for practical instructions he supervises and instructs them in all cooking procedures and gives them complete instructions in Army mess operations.

(11) He will use extreme caution in preparing correct quantities of food each meal for the men he is to feed, being ever mindful of the necessity to avoid food waste. All left-over food items will be saved and reused at a subsequent meal within 24 hours. Left-over food items are to be prepared by him for reserving in an attractive and appetizing manner—the dishes to appear as new items if possible. He will exert every effort to divert edible food from the garbage cans.

(12) He will always be on the alert to bring in new recipes for the mess sergeant's approval in order that new dishes and variety in preparation may be offered the men.

d. KITCHEN POLICE. Under the direct supervision of the mess sergeant and cooks the kitchen police will perform the following duties:

(1) Assist in all tasks necessary to keep the mess hall and all utensils and equipment, both fixed and movable, scrupulously clean and sterilized at all times.

(2) Assist the cooks in the preparation of foods prior to cooking, washing, peeling, and slicing vegetables, and fruits. Foods to be consumed raw should be handled by permanent food handlers who have recently passed a medical examination.

(3) Assist in serving the food to the troops

under the direct supervision of the mess sergeant.

(4) Assist in the receiving and storage of subsistence and perform such other duties in connection with the mess as may be directed.

e. Dining room orderly. The dining room orderly is responsible to the mess sergeant for cleanliness and arrangement of the dining room. Assisted by the kitchen police, he sets the tables with necessary china, glassware, silver, and condiments. Under the supervision of the mess sergeant, he assists in serving the food, when the meals are served "family style."

SECTION III

RATIONS

10. Definition

A ration is the allowance of food for the subsistence of one man for 1 day.

11. Ration Cycle

a. The ration cycle is the sequence of meals for which rations are drawn. Under the field ration system in the continental United States, the cycle is the normal breakfast—dinner—supper; in the theater of operation, the cycle may be whatever the situation demands. For units on garrison ration, however, certain stock records are maintained on a supper—breakfast—dinner cycle, and the money-credit accounts on a day-to-day basis.

b. Rations are issued to—

(1) All enlisted personnel on active duty.

(2) Applicants for enlistment while held under observation.

(3) General prisoners of war.

(4) General prisoners at posts.

(5) Hospital matrons.

(6) Female telephone operators with expeditionary forces.

(7) Civilian employees of wagon companies and pack trains.

(8) Civilian employees whose rate of pay does not exceed $95.00 per month and whose location or nature of employment makes assignment to an organization mess desirable.

12. Kinds of Rations

The Army uses the following kinds of rations each intended for and adapted to special conditions of the service:

a. GARRISON RATION. This ration is prescribed in time of peace for all persons entitled to a ration, except, when under specific conditions, other rations may be prescribed. It is a money value allowance based on the current prices of the ration components, and is furnished the messing unit as a credit at the commissary. By means of this credit, the messing unit purchases from the sales commissary such food as it requires to prepare menus of its own making. Currently, the use of the garrison ration system is limited to—

(1) The United States Military Academy.

(2) General and station hospitals.

(3) Organizations traveling by train.

(4) Enlisted men authorized to mess separately.

(5) Survey parties in the field.

(6) Units, organizations, or installations where the use of the field ration is considered impracticable; when approved by the Commanding General, Army Service Forces, upon recommendation of the commanding general of the service command, or when approved by the Command General, Army Air Forces. (Consolidated messes of 1,000 or over will operate under the field ration system.)

b. FIELD RATION. This ration is used in time of war or national emergency when the garrison ration is not used. It is issued in kind, and no ration savings are allowed. There are several types of field rations, and various possible combinations. The actual foodstuffs authorized for issue and the permitted substitutes are prescribed by the War Department or by the commander of the field forces. The individual messing unit has no choice in the foods it receives, except to use them to the best advantage.

c. FILIPINO RATION. This ration is for use by the Philippine Scouts in time of peace. It is issued in the form of a money credit in the same manner as the garrison ration.

13. Garrison Ration

a. The garrison ration is credited to each messing unit by the sales officer at the end of each month when he makes up the ration and savings account. The money value of the garrison ration, however, is computed by the sales officer on the first day of each month, or whenever a new

station is established, and communicated to all organization commanders at his station. At the same time he publishes the price list of all articles authorized for sale by the sales commissary.

b. Under the garrison ration system, menus are prepared under the supervision of the unit mess officer, and may include any desired food. The only restriction is that the total cost of the subsistence supplies purchased during the month should not normally exceed the ration credits for the month. The unit commander, knowing the money value of the garrison ration and the ration strength of his unit, can readily discover the ration credits due his organization, and, knowing the price of the subsistence supplies to be bought, he can control his purchases accordingly.

c. Purchases of foodstuffs by units messing on the garrison ration are made from the sales commissary. Certain exceptions to this general practice are allowed.

(1) If the sales commissary is unable to supply a desired article on the authorized sales list, the quartermaster or the sales officer furnishes a certificate of nonavailability to the unit commander. The unit commander keeps the certificate as his authority for the purchase of the desired items in the local market. The purchase is made and paid for from the unit's ration and savings funds.

(2) When a station or general hospital mess requires special grades of subsistence of articles for the proper diet of the sick, or of Army nurses and other women employees subsisted on the status of Army nurse, the purchase of such special articles from local dealers may be authorized by the commanding officer of the station or general hospital. No certificate of nonavailability is required for such purchases.

(3) When troops are so located as to make the purchase of supplies from a sales commissary impracticable, the mess officer may purchase supplies in the open market.

(4) When troops are traveling on troop trains with kitchen facilities provided, and the garrison ration is authorized, purchases may be made of additional items needed en route.

(5) Exceptional articles (articles of subsistence and other articles not on the authorized sales list) may be purchased through the commissary or from local dealers, upon instructions issued by the local post, camp, or station commander.

d. Charge accounts are maintained by the sales officer for each unit mess, and all purchases made from the commissary are entered on a Statement of Account (W.D., Q.M.C., Form No. 398). At the end of the month, or when an organization is transferred, the account is closed, and the total amount shown on the statement is deducted from the organization's ration credits.

14. Ration Components

a. The value of the garrison ration is based upon the current sales price of the component articles of the ration, listed in paragraph 4a, AR 30–2210. The articles listed are representative foods of various types: meats, eggs, dry vegetables, and cereals, fresh vegetables, fruits, beverages, milk and milk products, wheat flour, shortening, seasoning and flavoring articles, and condiments. Taken together, these components represent neither a typical ration, nor a balanced diet. The quantities of each of the foods listed do not represent the quantity each man is entitled to each day, nor the quantity issued for each man whenever these articles are used. Experience and experiment have shown that the articles and quantities listed provide a sensitive index to the change, up or down, in the cost of eating. By adding the current cost price of the amounts of the components listed, an accurate estimate of the cost of feeding one man for 1 day can be found. This estimate in cost is then established as the money value of the ration, or, in other words, the amount of money credit which may be used to feed one man for 1 day.

b. Normally, the value of the garrison ration is computed on the basis of the articles listed and the quantity of each article provided. Under certain circumstances, these amounts are changed and the articles are increased in number.

(1) In computing the garrison ration value for troops in Alaska the beef component is increased by 10 percent, the bacon component by 33⅓ percent, and the vegetable component by 20 percent. This increase in the garrison ration value in Alaska is provided to absorb the increased cost of feeding troops in that area.

(2) On Thanksgiving and Christmas the meat components of the ration are replaced by 25 ounces of drawn turkey or 28 ounces of undrawn turkey, and the ration value for these days increased proportionately.

(3) In stations where it is impracticable to procure fresh milk, the milk components are replaced by 6 ounces of evaporated milk.

(4) At stations where it is impracticable to bake soft bread, or where it is more economical to purchase commercial soft bread than to bake it, 8 ounces of soft bread and 4 ounces of wheat flour are substituted for the present 12 ounces of flour.

15. Substitutive Articles

A table of food equivalents for components of the garrison ration is provided for establishing the field ration and for determining the rates of authorized articles when forced issues are required. (See par. 10, AR 30–2210.)

a. Forced issues. When a loss due to deterioration of subsistence supplies is likely, and the supplies cannot be disposed of by reclamation or by shipment elsewhere, the sales officer reports the fact to the commanding officer of his station; the commanding officer may authorize the issue of the stores in question to troops. Before such forced issues are made, three matters must be determined: the quantity that may be issued, the frequency of issue, and the correction of the ration credits to prevent undue loss or gain to the unit mess. The quantity of an article of forced issue is limited to the quantity per ration listed in the table of food equivalents. If the article of forced issue is not a component of the garrison ration, it can be issued only 2 days in 10; if a component of the garrison ration, it can be issued as often as is practicable. When a forced issue is made, credit or debit on the ration and savings accounts of each organization involved will be given for the cost of the article issued as compared with the cost of the component of the garrison ration for which it was substituted. Forced issues are rarely necessary and occur infrequently.

b. Substitutive articles in the field ration. The list of food equivalents is used for two purposes. In the issue of the field ration in continental United States, the list is used when necessary to determine what foods may be substituted for those on the menu. When field ration B is issued, the list may be used by issuing officers to determine both the value and the nature of the ration to be issued.

16. Field Rations

The following are types of field rations:

a. Field ration A. This ration corresponds as nearly as possible to the components, or their substitutes, of the garrison ration. This type of field ration is issued as often as circumstances permit. As specified in paragraph 4*d*(1), AR 30–2210, field ration A is issued to all troops other than those specified in paragraph 12a.

b. Field ration B. This ration corresponds as nearly as possible to the field ration A with the exception that nonperishable, processed, or canned products replace elements of a perishable nature.

c. Field ration C. This ration consists of three cans of meat components and three cans of B unit issued to the individual soldier for a 1 day's supply. B unit cans contain biscuits, confection, and a beverage. The meat components, although more palatable when heated, may be eaten cold. Beverages may be prepared without difficulty in either hot or cold water.

d. Field ration D. This ration consists of three 4-ounce chocolate bars wrapped in cellophane and over-wrapped in wax-dipped cartons.

e. Field ration K. This ration consists of three packages labeled "Breakfast Unit," "Dinner Unit," and "Supper Unit"; it is issued to the individual soldier. Ration K is lightweight and compact, and the component will withstand long periods of storing without appreciable change in flavor, texture, consistency or appearance.

f. The "10-in-1" ration. This ration consists of canned, evaporated, and dehydrated foods in quantities sufficient to supply 10 men for 1 day. Five different combinations of foods are packaged and are designated as Menu No. 1 through Menu No. 5. In addition to foodstuffs, each of the five menus includes cigarettes, halazone tablets, matches, can openers, toilet paper, toilet soap, and paper towels.

SECTION IV

NUTRITION AND MENU PLANNING

17. General

All officers responsible for the operation of Army messes should be familiar with the fundamentals of nutrition. This is obvious when the organization operates on garrison rations and the mess officer must prepare the menus. It is also helpful for the mess officer of a unit on field rations to be aware of the nutritive values of the foods used, especially when emergency substitutions are required.

18. Function of Food

a. The function of food is to provide the body with the material necessary for the maintenance, growth, and renewal of body tissues. The process of digestion is the conversion of food from its usual familiar forms to substances which can be utilized by the body for the purpose of—

(1) Building and repairing tissue.

(2) Furnishing energy for muscular movement and body warmth.

(3) Regulating body processes.

b. The human body should function smoothly if six essential requirements of the diet are satisfied. They are:

(1) Proteins, for repair and maintenance.

(2) Carbohydrates } for energy.
(3) Fats }

(4) Minerals, to regulate body functions and to aid in tissue growth and repair.

(5) Vitamins, to aid in the metabolism of food and maintain the normal functions of the body.

(6) Water to regulate body temperature, transport food, eliminate waste, promote secretions, and aid generally in body function.

19. Protein

a. There is a protein maintenance requirement for every individual in proportion to his weight, independent of his muscular activity. Protein is the building material of the body, its nitrogen content being essential to the repair and maintenance of every living cell. The chief food sources of proteins are flesh food, cheese, milk and eggs —in general, animals and animal products.

b. Proteins are broken down by digestive processes into simpler substances called amino acids. There are over 20 amino acids, about 10 of which must be present in the food eaten. Protein cannot be stored in the body in quantity; it must be supplied daily. An insufficient supply causes the body to consume its small reserve and, eventually, its own tissues.

20. Carbohydrates

a. Carbohydrates are the main source of body energy. They are found chiefly in sugars, syrups, starches (grains, flour, lima beans, navy beans), and cellulose (leafy vegetables and cereals, useful in supplying bulk to assist the process of digestion and evacuation).

b. Energy foods are burned not on the basis of the amount eaten but on the demands of the muscles. If energy foods are eaten in excess, the surplus is stored in the body as fat. Too great storage is undesirable since it handicaps activity. An individual becomes easily fatigued if he does not eat energy foods in sufficient quantities.

21. Fats

a. Fats are the second source of energy, in concentrated form. Also, fats supply certain fatty acids required in the chemical reactions of the body.

b. The sources are animal foods such as meat, milk, butter, and lard, and vegetable oils such as cottonseed, corn, and olive.

c. Fats digest slowly and hence delay the sense of hunger. For this reason some fat should be eaten daily. Excess fat is stored as such, and the same cautions that apply to the excessive consumption of carbohydrates apply to the eating of fat. Since fats digest slowly, the excessive use

of fat in cooking and frying may have a bad effect on digestion. Cooks should be instructed not to serve too many fried foods.

22. Minerals

a. Minerals assist proteins in maintaining and repairing the body. The chief function of minerals in the adult body is to serve as regulating substances with vitamins, but they build and repair as well. Iron and phosphorus are vital parts of every living cell, and calcium and phosphorus make up a large part of the bony structure.

b. Minerals, with vitamins, are regulatory substances. They coordinate the functions of the nerves, glands, and muscles, enabling the body to use its available fuel and building material to the best advantage. The most important minerals are sodium, potassium, calcium, phosphorus, sulphur, iron, and iodine.

c. There are many food sources of minerals, although pure carbohydrates and fats furnish none. Since minerals are lost daily, they must be replaced daily. The usual American diet is deficient in minerals, chiefly because of the too small quantities of milk, fruit, and leafy vegetables and the frequent failure to use the liquids from cooked and canned fruits and vegetables. If the body's needs in calcium, phosphorus, sodium, iron, and iodine are met, the other minerals, since they are found in the same sources, will be supplied.

d. Sodium and potassium, found in many foods, keep the water content of the body correct (80–90 percent of body weight) so that it functions normally. In normal activity, the small needs of the body are met by the foods eaten, but when perspiration is excessive the salt loss affects the whole body operation, and can result in the shock condition ordinarily associated with heat prostration. An increased intake of salt is a good precautionary measure.

e. Calcium, found in leafy vegetables and milk, is used by the body in relatively large quantities to maintain the bones and teeth, to produce clotting of the blood in wounds, and, with potassium and sodium, to control the functioning of the heart. Unless foods are chosen carefully, a serious shortage may result. Some reserve supply is contained in the bone structure of the adult, but this reserve cannot be drawn on safely for a long period of time.

f. Phosphorus. Phosphorus, found in whole grain cereals and in milk, is necessary for the bone structure and, with iron, is an aid to cell life.

g. Iron. Iron, found chiefly in eggs, green vegetables, cereals, whole grain and restored legumes, red meats, and liver, is an important part of the pigment which gives the blood its red color. Red blood cells transport oxygen through the body. Iron is not used in large quantities by the body; but since there is practically no stored reserve, the daily needs must be met by a careful selection of food. Many minor infections of the body cause a relatively large loss of iron. The lack of iron can eventually result in anemia.

h. Iodine. Iodine, found in small quantities in many foods, and in larger concentrations in sea foods and iodized salt, is ordinarily supplied in sufficient quantities by a balanced diet, except in certain geographic areas. It controls the basal metabolism of the body. A prolonged lack of iodine results in goiter, nervousness, and short breath.

23. Vitamins

a. The function of vitamins is likened to the function of spark plugs in the automobile: they, with the minerals, assist the body to utilize its food. Though present in many foods, chiefly in vegetables and fruits and in the products of plant-eating animals, they cannot be detected by the senses; so taste and smell are useless in discovering them. All but one must be provided by food, since only vitamin D can be manufactured by the body. The Army ration provides sufficient quantities if properly used, but bad handling or careless cooking can destroy the vitamin content of the ration. The failure of many military campaigns because of lack of stamina in troops has been the result of vitamin deficiencies in their food.

b. Vitamin A. Vitamin A is found in whole milk, butter, egg yolks, fish liver, leafy vegetables (cabbage, lettuce), green vegetables (string beans, asparagus, peas), yellow vegetables (carrots, sweet potatoes), tomatoes, and fruits (apricots, yellow peaches, cantaloups); an excess intake can be stored in the body for future use. The chief function of this vitamin is to build up resistance to local infections of the skin cells and the mucous membranes of the respiratory tract, and of the digestive and genito-urinary systems. A lack of vitamin A produces night blindness, susceptibility to colds and lung infections, diarrhea, and other digestive disturbances, dry and scaly skin, dry hair,

and infected eyes and ears. The proper intake of vitamin A, to prevent night blindness, is of peculiar importance to aviators and to soldiers on outpost duty, where defects in vision can have immediate and disastrous consequences. Similarly, combat conditions are such that a high resistance to colds and lung infections is essential to the efficient operation of troops. A fair daily allowance of vitamin A is provided by a pint of milk, an ounce of butter, and one egg. Foods stored for a long time in heat or air or cooked in intense heat, and dried fruits and vegetables lose a large part of their vitamin A content. Since vitamin A is soluble in fat, foods containing it should not be cooked with grease; butter, in particular, should not be used for frying because heating butter to average frying temperature destroys the vitamin A.

c. VITAMIN B_1 THIAMIN. Vitamin B_1, a part of the so-called "B complex," is sometimes called the "morale" vitamin. The ordinary American diet is most frequently deficient in this vitamin. Although it is found in many foods (whole grain or restored cereals, leafy vegetables, fresh peas, lima beans, carrots, nuts), it is not found in such energy foods as milled white flour, rice, macaroni, starches, sugar, fats. Meats, especially lean pork, heart muscle, and glandular organs are sources of B_1, but the richest natural source is brewer's yeast. Since vitamin B_1 cannot be stored in the body it must be supplied daily. Vitamin B_1 prevents disturbances of the nervous system, maintains appetite, digestion, particularly of the carbohydrates, and checks infections of the intestinal tract. Lack of sufficient vitamin B_1 results in loss of appetite, fatigue, disturbance of digestive function, and lowered morale. A severe lack of vitamin B_1 will result in beriberi and polyneuritis. The daily requirement of vitamin B_1 is not stationary but varies with the energy requirement; hence, physically active men need much larger amounts than are required by men in sedentary work. Daily needs of B_1 are supplied by a pint of whole milk, five slices of whole grain or enriched bread or the equivalent in cereals, one medium potato, one egg, and a cup of tomato juice, or half a cup of orange juice. Since vitamin B_1 is soluble in water, it is made useless if containing foods stand in water or on steam tables for a long time. Long cooking, particularly in large quantities of water, reduces the vitamin B_1 content of foods. The vitamin is not affected by air.

d. VITAMIN B_2 (RIBOFLAVIN). This element of the B complex, often called the "growth" vitamin, is found associated with B_1 in practically the same foods (milk, cheese, egg yolk, turnip greens, beet tops). The only food in which it exists separately is the white of egg. The richest natural source is brewer's yeast, though liver and kidney are almost as rich. Vitamin B_2 is essential to growth and to normal nutrition. A lack of vitamin B_2 is shown in faulty teeth and bones, loss of weight, digestive disturbances, nervous depression, and a general lowering of body tone and morale. Liberal amounts are required daily, since it cannot be stored in appreciable quantities. Such requirements are supplied by a pint of milk, generous helpings of fruits and vegetables, one egg, and some meat, eaten daily. Since it is soluble in water, foods containing it must be handled carefully. Vitamin B_2 is affected by light; hence, foods containing it should not be exposed to light over long periods of time.

e. NIACIN NICOTINIC ACID. This is another element in the B complex, found chiefly in meat (it is not nicotine found in tobacco). Its absence induces pellagra, a peculiar seasonal disease found among the underfed. Its symptoms vary, but a typical case begins with a skin disease resembling sunburn, and develops into an ulcerous and scaly skin, particularly on the hands, face, neck, elbows and knees; a red tongue, sore mouth, indigestion, and diarrhea may be early symptoms. The ultimate effect of the disease is a break-down of the nervous system and eventual insanity. The disease, however, is rare among individuals whose diet is varied and well balanced.

f. VITAMIN C. Vitamin C, the vitamin that prevents scurvy (the degeneration of muscle fibers and bone structure indicated by loosening of the teeth, and easy fracture of the bones), is found in fresh or canned citrus fruits (lemons, oranges, grapefruits), bananas, tomatoes and tomato juice, and in many vegetables (potatoes, cabbage, Brussels sprouts, green peppers, watercress). Scurvy proved fatal to the personnel of many military and semimilitary expeditions in the past. (In 1795, the British Navy required the daily issue of lemon juice, then known as lime juice, to its personnel. It is from this practice that the name "Limey" for a British seaman developed.) Since vitamin C is not stored in the body, it must be provided in the daily intake of food. As it is used by the body to maintain the structure of the body

cells, its lack will show quickly in cell weakness, which opens the way for infection. A tendency toward easy bleeding, weakness, loss of weight, pallor, swollen gums, tender joints, or tooth decay can be symptoms of vitamin C deficiency. The day's requirement can be met by a glass of grapefruit, orange, or tomato juice. This vitamin is easily destroyed by heat and air, by baking soda used in cooking, by cooking in copper utensils, or by letting the particular food containing it stand. The loss in canning or cooking can amount to as much as half of the original vitamin content. Fruit juices, especially, should be used as quickly as possible if the original vitamin content is to be retained.

g. VITAMIN D. Vitamin D, called the sunshine vitamin, is the only vitamin manufactured by the body itself, through the direct influence of sunlight on the skin. It is found in egg yolk, salmon, and butter, but the richest food source is fish liver oils. The best source is sunlight, and for active men engaged in outdoor activity, there is little need for supplementary sources. A shortage of vitamin D produces faulty bone formations, particularly the bone disease called rickets, since it enables the body to assimilate the calcium and phosphorus intake. The daily requirement varies with the season and mode of life. In the winter season, where outdoor activity in sunlight is infrequent, there may be need of fortifying the daily diet with some vitamin D concentrate.

h. GUIDES FOR THE USE AND STORAGE OF VITAMIN CONTENT FOODS. (1) Vegetables should be used as fresh as possible as the vitamins are partially destroyed in vegetables that are limp and wilted from long standing. They should be prepared just before cooking and should not be left standing in water, since water dissolves the B_1, B_2, and C vitamins, and minerals. They should be cooked in as little water as possible and for as short a time as is sufficient. The water from cooked vegetables should be used in sauces, soups, and gravies. Canned vegetables should be heated quickly just before serving. Baking soda should not be used in cooking vegetables, since its use destroys vitamin C.

(2) Fresh fruits should be stored in a cool place (bananas in a dry and not too cool place). If they are to be cooked, they should be prepared immediately before cooking.

(3) Raw fruits and vegetables should be served frequently in salads. These should be prepared just before serving.

(4) Butter should be stored in a refrigerator in air-tight containers, if possible. It should not be used for frying.

24. Water

Water is absolutely essential to life. It is the vehicle for transporting food materials to the body cells; it is the medium in which chemical changes take place; it helps to regulate the body temperature; it carries off the waste products; and it lubricates the body's moving parts. The body gets its water from the beverages and liquids we drink, from the solid foods we eat, many of which are largely water, and from the water formed in the tissues by the combustion of fuel foods. A good supply of liquids should be taken with and between meals. The body loses its water through the skin (perspiration) through the respiratory passages (breathing), and through the alimentary tract and kidneys (evacuation). A lack of water can be responsible for such disorders as general nervousness, inability to concentrate, headaches, loss of appetite, and constipation.

25. Balanced Diet

a. The body functions best when supplied with food that meets its needs. Heavy physical work demands energy foods; but the nutritive process is so involved that the mere increase in energy foods will not be sufficient for proper nutrition. Other food factors must be increased also to maintain nutritional balance; otherwise, malnutrition or digestive troubles will appear. When foods are provided in proper proportion, the diet is said to be balanced. The Army field ration provides a balanced diet when properly issued, handled, and used.

b. A balanced diet includes sufficient fuel food to supply energy (cereals, breads, starchy vegetables, fats and sweets), sufficient protein to build and repair body tissue (milk, meat, eggs, fish, cheese, legumes), sufficient minerals (calcium, phosphorus, iron, iodine) to build bones and teeth, to maintain neutrality of the blood, and to keep heart, nerves, and muscles ready to respond to every impulse. A balanced diet also includes sufficient vitamins to control growth, body operation, and health, and sufficient water to cool, and service the body.

c. Three basic rules for maintaining a balanced diet are—

(1) Include food from each class of foods and for each purpose. (See Food Chart, par. 27.)

(2) Have variety, different meats, different vegetables, salads, desserts.

(3) See that the vitamin and bulk foods, especially vegetables, fruits, and milk, are served daily.

26. Nutritional Qualities of Basic Foods

a. Cereal grains. Cereal grains, as a class, are primarily sources of energy, are easily digested and generally relished. Their value as a source of energy varies with the amount of water used in cooking them. Three tablespoons of wheat flour is the equal of 1¼ cups of puffed or shredded wheat products in energy value, and three tablespoons of uncooked whole grain cereal is the equal of a cup of cooked oatmeal mush. The whole grains of wheat, oats, rye, and barley are good for promoting and supporting growth, but are not equal to equivalent weight of milk, eggs, or meat, and cannot be depended upon by themselves for the entire protein requirement. Combined with milk, they are a suitable source of protein. Bread made with milk and breakfast food served with milk are excellent combinations of foods. Cereal grains are not an adequate source of minerals. They are deficient in calcium as a class, although they contain some phosphorus in the whole grain, and certain ones (oatmeal and whole wheat) have a high yield of iron. They are a poor source of vitamin A (unless fortified), and are lacking in C and D. Their chief contribution is as a source of the B complex group, whole or enriched grains being particularly rich sources.

b. Milk. Milk has the greatest assortment of nutritive substances found in any single food, and is the foundation of a proper diet. At least a pint a day or the equivalent in milk products is essential for adults. It is a good source of protein, it contains essential minerals (calcium and phosphorus) in quantity, and it supplies vitamin A, B_1 and B_2 in good amounts. Evaporated and powdered milk are nearly as good in all nutritive values as fresh, whole milk.

c. Vegetables and fruits. Vegetables and fruits vary greatly in energy value; leafy vegetables have little fuel value, and only such vegetables as dried peas or beans and sweet dried fruits are comparable to cereals as a source of energy. The protein value of vegetables and fruits is of little significance. The chief value is as a source of minerals and vitamins. Leafy green vegetables are good sources of vitamins A, B_1, B_2 and C; citrus fruits (oranges, lemons, grapefruit) and tomatoes are good sources of vitamin C. The vitamin B complex, although found in many vegetables and fruits, is usually supplied in the diet by milk, eggs, liver, and grain products primarily.

d. Fats and sugars. Fats and sugars are the most concentrated sources of energy. They give the dish the "satisfying" quality. Although the most common food fats are easily and completely digested, they produce digestive upsets when used in too great proportions. Butter used for frying becomes less digestible. Sugars and syrups are more readily digested when taken with food than when eaten separately. Sugar taken on an empty stomach is directly irritating to the mucous lining of the digestive tract. Too much sugar tends to replace other foods and produces an unbalanced diet. Sweets should be used with moderation.

e. Eggs, cheese, meat, fish, fowl, etc. These items of food are the chief sources of protein. Eggs have the additional value of supplying vitamins A, B_1, and B_2, and the minerals, iron and phosphorus. For easy digestion they should be cooked at a low temperature. Yellow and cream cheese contain most of the protein, fat, calcium, phosphorus, iron, and a large part of the vitamin A content of raw milk. Meats, chiefly the muscles tissue are high in protein, phosphorus and iron, and are an additional source of vitamin B_1 and B_2. Liver and kidney are excellent sources of vitamins A and B_2.

27. Food Chart

The following food chart is useful in obtaining a quick view of the functions of foods, their classification, and the products in which their particular contribution to good diet can be found.

FOOD CHART

Function	*Classification*		*Foods*
Furnish energy	Carbohydrates	Sugars	Sugars
			Syrups
			Molasses
			Fruits
		Starches	Flour and flour products
			Breads
			Crackers
			Cereals
	Fats		Butter
			Lard and lard substitutes
			Meat fats
			Oil (vegetable)
			Cream
			Nuts
			Cheese
Build and repair the body	Proteins for muscles		Meats
			Glandular meats
			Fowl
			Fish
			Cheese
			Beans and peas
			Eggs
			Nuts
	Minerals	Calcium for bones and teeth	Milk
			Cheese
			Vegetables (green)
	Phosphorus for bones and teeth		Glandular meats
			Meats
			Fowl
			Fish
			Milk
			Cheese
			Beans and peas
			Eggs
			Whole grain cereals and breads
	Iron for blood		Glandular meats
			Meat
			Fowl
			Oysters
			Eggs
			Vegetables (green)
			Dried fruits
			Whole grain cereals
			Whole wheat or enriched bread

FOOD CHART—*Continued*

Function	*Classification*		*Foods*
Regulate body processes Vitamins	A		Fish liver oil Liver Kidney Green and yellow vegetables Butter Cream Eggs Milk Yellow corn meal
	Thiamine (B_1)	Pork Glandular meats Meats Potatoes Vegetables (green) Fruits Whole wheat or enriched bread	
	B_1 Riboflavin (B_2)		Glandular meats Meats Milk Legumes Vegetables (green) Eggs
	Nicotinic acid	Glandular meats Meat Eggs Legumes Whole grains enriched flours and breads	
	C		Potatoes Fruits Vegetables (raw) Citrus fruits Melons Berries Pineapple
	D	Fish liver oil Liver Butter Eggs Milk (fortified)	

28. Menu Planning

a. A menu or bill of fare is a list of the actual dishes to be served at a particular meal.

b. Where a large number of individuals are fed, menus must be prepared long in advance for each of the meals served. Such long-range planning is necessary to permit the economical procurement and use of foodstuffs, to produce a varied diet, and to meet all nutritional requirements. The most frequent cause of bad mess management is the last-minute planning of menus, meal by meal. Under the field ration system, such long-range planning is done by practical experienced personnel, as well as nutritional experts in the Menu Planning Section, Office of the Quartermaster General. The resulting menus are distributed as a guide to all services commands each month. The menu, prior to printing, is correlated through the various subsistence sections of the Office of the Quartermaster General as well as Field Headquarters, Chicago, Illinois, on the future availability of canned and perishable items. The survey of these menus is made 110 days prior to the month in which they will be used. Food combinations on each menu are planned for attractiveness and appeal to the eye, as well as for nutritional requirements. When the menus are received at posts, camps, and stations, they are reviewed by a Menu Board composed of the Sales Officer, the Nutrition Officer, Post Food Service Supervisor and other officers who are familiar with foods and mess management. This Board considers the food habits of the particular groups at a post, camp, or station, and the availability of local products to be used in lieu of food items which appear on the Master Menu, thus saving the cost of shipping long distances and the deterioration of perishable items. The Master Menu lists critical items which should not be exceeded as called for on the menu. Under the garrison ration system, the responsibility for such planning rests with the unit mess officer. Regulations require that a bill of fare providing for meals of adequate quantity and variety be prepared in advance and adhered to as far as practicable.

c. Well-planned menus have interest and variety that encourage eating, are satisfactory to the appetites of active men, and provide a balanced diet. For the preparation of menus under the garrison ration system, the mess officer and mess sergeant must know the basic principles of food preparation and nutrition, since they are responsible for the proper feeding of the men. Menus should be planned for as long a period as is permitted by the conditions of operations, such as the location of the mess and the frequency of issue of subsistence supplies. The process is simple. First, menus are drawn up on the basis of a balanced diet and variety. The cost of such a menu is then computed for the day on the basis of sales list prices. If the cost greatly exceeds the ration money allowance for the day, some substitution of cheaper foods, of the same or nearly the same nutritive values, must be made. The resulting menu is then established and followed for the period planned. It is useless to plan menus if needless variations are subsequently permitted.

d. Menu planning is an important function of the mess officer whose unit is operating on the garrison ration. The mess officer of a unit on the field ration also should know something of the balanced menu and of the basis for the components of the various types of menus, especially if substitutions must be made.

e. The first requisite of menu planning is the providing of a balanced diet. The quantity of the food consumed by the troops will depend largely upon the nature of the duty being performed and upon their geographical location. Troops in combat, at drill, or at other hard physical labor will require different kinds and quantities of food from those engaged in less arduous work.

f. There is no danger that insufficient food values will be included in the menu of the Army under normal conditions and planning. However, under combat conditions, there may be danger of insufficient health-protection foods. This same danger may exist on the garrison or field ration when food is improperly handled and cooked. Careless handling and cooking may cause partial or complete loss of vitamins or minerals naturally present and essential to good health.

g. Eating and food selection habits are formed early in the life of the individual and are all a matter of training, custom, and environment. Individuals responsible for menu planning must consider the nutritional requirements of the troops, the subsistence available, and the fact that the Army is a cosmopolitan group. Individuals responsible for the menu planning must not permit their personal eating habits to affect the planning of the menu. The principles of menu

planning are the same, regardless of the ration used. All menus will be made in advance to permit intelligent purchase of future supplies and the utilization of those on hand.

29. Food Requirements and Menus

Food requirements vary with the individual, the work he is doing, and the climate in which he lives. A desk worker requires about one-third less calories than a man active in the field; men stationed in frigid climates require more calories than those stationed in the Tropics. To provide for this variation in needs, various menus have been developed for use in particular areas. The menu in use in the Tropics cuts down on the volume of energy foods (carbohydrates and fats), contains large quantities of vitamins and minerals, utilizes canned vegetables, etc., and provides for use of such drinks as coffee, cocoa, and fruit drinks. The difference between the menu in use in the Arctic and in the Tropics is not so much in the foods themselves as in the proportions in which they are used, and the form in which they are issued. Dehydrated foods may be convenient in the jungle, but they only complicate the supply problem in the desert where water is scarce.

30. How to Make a Menu

a. In planning normal menus, the following information serves as a guide, especially when the garrison ration is in effect:

(1) Know the foods essential for good nutrition.

(2) Plan menus to include all classes of food. (See Food Chart, par. 27.)

(3) Know the availability of fresh fruits and vegetables during each month. This permits menu plans to be made far in advance so that procurement is possible. There may have to be substitutions of one food for another, but these are not difficult, and the balance of the meal need not be upset if substitution tables are followed.

b. First, consider foods which are perishable—meat, fish, fresh milk, fresh fruits and vegetables, butter, and eggs.

c. If there is an insufficient quantity of one food for a meal, it may be combined with another. For example, beef and pork may be mixed for meat loaf; carrots and peas may be served together; carrots and cabbage may be used in salad.

d. If the same kind of meat or vegetable must be served on the same day or on consecutive days, vary the method of cooking or serving.

e. Canned tomatoes are an excellent protective food. Use them often and be sure to include them when fresh vegetables are scarce. One raw vegetable daily is desirable.

f. Serve foods with contrasting qualities: crisp and soft, cold and hot, white and colored. This rule has much to do with making an appetizing menu.

g. Be sure that hot foods are not lukewarm. Nothing is more discouraging to the appetite than lukewarm soup and coffee. Likewise serve cold foods cold. Food intended to be cold can be very unpalatable when served warm.

h. Season foods well. Monotony can be avoided by careful seasoning.

31. Sample Menu

a. BREAKFAST.

Fruit
Cereal
Milk
Main dish
Bread
Butter
Coffee
Sugar

(1) Fruit—fresh, evaporated, or canned—is appetizing as well as nutritional. It is a welcome starter for the day, but should not be reserved for breakfast if it would be more useful in improving other meals.

(2) Cereal is a fuel food and has the advantage of being a milk carrier. Serve hot or cold, depending on the supply, the climate, the food habits of men, or the need for variety.

(3) The main dish may be ham, bacon, eggs, sausage, creamed dried beef, fried mush, French toast, hot cakes, or other satisfying breakfast dish. Do not have the same thing on the same day each week. If fried mush or French toast is on the menu, syrup or jelly should be served.

(4) Vary breads as much as possible. Toast, rolls, corn bread, hot cakes, biscuits, coffee cake, doughnuts, and pan bread are some suggestions.

b. DINNER.

Soup

(1) Soup may be served at the

Relish or salad

Meat

Potatoes

Vegetable (canned or fresh)

Dessert

Bread

Butter

Jam

Coffee

noon or the evening meal depending upon when the extra nourishment is needed. When a vegetable soup is on the dinner menu, the salad may be omitted if desired. Soup is one means of getting men to eat vegetables.

(2) A relish may also take the place of salad occasionally—raw carrot strips, young onions, radishes, peppers, sliced cucumbers and onions, and pickled beets are suggestions.

(3) A leafy green or yellow vegetable is valuable because of the flavor, appearance, and vitamin content. Do not overcook. Season well.

(4) Meat is always popular. The grade of meat purchased for the Army is excellent. Many good cuts are spoiled by poor cooking. Do not prepare too long in advance. Serve hot.

(5) Gravy or sauce is usually served with meat. Good gravy is smooth and not greasy. Serve hot.

(6) Salads may be made from meat, vegetables, or fruits. Serve as cold and crisp as possible.

(7) Dessert has a definite place in a menu because it gives a feeling of physical satisfaction. Many people crave sweets and are accustomed to having them at the end of the meal. Dessert adds calories and will round out a light meal. Serve lighter dessert with a heavy meal.

c. SUPPER.

Main dish

Relish or salad

Vegetable

Bread

Butter or jam

Dessert

Tea or coffee

(1) Meat may or may not be used, according to supplies on hand. This is a good time to combine meat and rice, macaroni and cheese, or to serve chili con carne, chop suey, creamed meat, thick chowder, baked beans, etc. This meal must be heavy enough so that the men will not be hungry when they go to bed.

(2) Utilize dinner left-overs when possible in addition to the regular supper menu. Some foods can be served without change, while others may be combined with something else. *Example:* rice and stewed tomatoes; string beans and other vegetables in salad, etc.

32. Substitution Lists

a. GENERAL. When making menus, study lists of available foods. Select foods that will give variety. Any food may be substituted for another in the following lists. Avoid serving two vegetables of similar flavor at the same meal.

b. KEY TO SAMPLE MENU MAKING (par. 31).

Breakfast—Select from (1), (2), (3), (4), (5), (8), and (9) below.

Dinner—Select from (1), (3), (4), (5), (6), (7), (8), (9), (10), (11), and (12) below.

Supper—Select from (1), (3), (4), (5), (6), (7), (8), (9), (10), (11), and (12) below.

(1) *Fruits.*

Fresh	*Dried*	*Canned*
Apples Apricots Avocado Bananas Berries Cantaloups Cherries Cranberries Grapefruit Grapes Limes Oranges Peaches Pears Pineapple Plums Prunes Rhubarb Tangerines Tomatoes Watermelon	Soak overnight well covered with water. Bring fruit, and water in which it was soaked, slowly to the boiling point. Cook about 30 minutes. Add sugar if necessary. Apples — May be used for pie or for sauce; stew with sliced lemon; flavor with cinnamon. Apricots, Prunes, Figs, Peaches — May be stewed with sliced lemon or oranges, or stewed with whole cloves or cinnamon. Raisins — Use in puddings, sauces, cakes, salads, or pies.	Fruit juices Berries Figs Peaches Tomatoes The less sweet juices are good for breakfast; canned fruits are better for dinner or supper.

(2) *Cereals.* Serve with fresh milk or with canned milk when fresh is not available. A small amount of salt and vanilla may be added to canned milk if desired.

(a) Dry cereal. Assorted ready-to-eat cereals are convenient and offer variety.

(b) Cooked cereal.

Corn meal mush, Farina, Hominy grits, Rice, Rolled oats, Whole wheat — Cook thoroughly in boiling salt water. Serve hot.

(3) *Eggs and other breakfast dishes. (a) Eggs.*

1. Boiled—soft, medium, or hard—with or without bacon.
2. Scrambled, plain, with minced bacon or ham, or with fried bacon.
3. Fried with bacon, ham and/or potatoes (fried, hashed brown) or hot hominy grits (creamed) or fried rice cakes, potato cakes.
4. Omelet. Spanish, ham, jelly, bacon, cheese.

(b) Chipped beef.

1. Creamed on toast.
2. Creamed, with poached egg on toast.

(c) Fried bacon, Ham, Sausage — With or without potatoes (fried, hashed brown, potato cakes).

(d) Hot cakes. With syrup and with or without — pork (fried), bacon, fried ham

(e) Ham. With cream gravy.

(f) French toast. With syrup and — frankfurters, pork sausage

(4) *Breads.*

White, Whole wheat, Graham, Rye, Brown, Corn bread, Biscuits, Muffins, Toast — Serve with butter, jam, jelly or marmalade. May be toasted.

French toast. Serve with syrup

(5) *Doughnuts.*

Cake dough — Sweet rolls
Bread dough — Other sweet rolls

(6) *Beverages. (a) Coffee.* With canned milk (which is much like cream in coffee) and sugar. It should be strong and not merely coffee-colored water. Put sugar and canned milk on table.

(b) Cocoa. Usually partially sweetened in cooking.

(c) Chocolate. Better if made with milk; canned milk will do. Serve once or twice a week.

(d) Tea. Serve cold with lemon in hot weather.

(7) *(a) Relishes*

Beets (pickled)	Celery
Carrots (raw)	Olives

(b) Pickles.

Dill	Sour
Mustard	Sweet

(c) Onions.

Sliced	Young green

(8) *Soups. (a) General.* During cold weather it is well to serve soup once a day. Soups may occasionally be served even during hot weather. Soups should always be served hot and free from grease.

(b) Varieties.

Barley	Oyster stew
Chicken	Pepperpot
Clam chowder	Puree of peas
Kidney bean	Puree of tomato
Lima bean	Split pea
Mushroom	Tomato and rice
Navy bean	Vegetable
Onion	Vegetable chowder

(9) *Meats or alternates. (a) Beef.*

A la mode	Hash
Braised (pot roast)	Liver
Braised with vegetables	Loaf
Chili con carne	Oven roast
Chop suey	Patties
Corned (baked, boiled hash)	Pot pie
Creamed	Pot roast
Croquettes	Rolls
Dried, chipped, creamed	Short ribs
Fricassee	Steak
Goulash	Stew
Hamburg	Turkish

(b) Beef heart.

Baked	Stuffed
Boiled	

(c) Chicken.

A la king	Fried
Broiled	Hash
Casserole	Pot pie
Chop suey	Roast
Creamed	Stew
Fricassee	

(d) Pork, fresh.

Breaded	Pigs' hocks
Tenderloin	Roast
Chops	Spare ribs
Chop suey	Stuffed shoulder

(e) Ham.

Baked	Croquettes
Baked slices in milk	Fried
Boiled	Loaf
Broiled	Roast
Cold slices	Scalloped with potatoes
Creamed	

(f) Veal.

Braised	Steak
Cutlets	Stew
Paprika	Stuffed shoulder
Roast	Birds

(g) Lamb.

Braised	Roast
Chops	Stew
Curry	Stuffed shoulder

(h) Miscellaneous dishes.

Beans baked with bacon or pork (potatoes or other beans are not desirable in meal with baked beans)
Croquettes
Frankfurters
Macaroni with cheese
Fish—baked, salad, scalloped, fried
Stuffed peppers

(10) *Irish potatoes, method of preparation.*

Baked (in jackets or French baked)
Boiled (with or without jackets)
Creamed
Fried:
- French
- Hashed brown
- Lyonnaise
- Plain

Mashed
Parsleyed
Roast browned
Scalloped

(11) *Alternates for potatoes.*

Black-eyed peas	Rice
Dried lima beans	Spaghetti
Dried navy beans	Sweet potatoes:
Kidney beans	Baked
Macaroni	Boiled
Noodles	Candied

(12) *Vegetables.*

Asparagus—buttered, creamed, salad
Beans—buttered, creamed, salad (green string, lima, wax)

Beets—buttered, Harvard, pickled, salad
Broccoli—buttered, creamed, au gratin
Brussels sprouts—buttered, creamed
Cabbage—boiled, buttered, fried, slaw
Carrots—buttered, creamed, fried, glazed
Cauliflower—buttered, creamed, raw in salad
Corn—creamed, with green peppers or tomatoes, corn pudding
Cucumbers—sliced, raw, salad
Eggplant—baked, fried
Greens (kale, spinach, turnips)—buttered, creamed, raw in salad
Lettuce—salad and garnish
Okra—fried, with tomatoes, in soup
Onions—boiled, creamed, fried, raw
Parsnips—baked, buttered, fried
Peas—buttered, creamed, with carrots in salad
Peppers—in salads, with tomatoes or corn
Potatoes—(see potato list)
Pumpkin—mashed
Radishes—raw, as relish, or in salad
Rutabaga—buttered, creamed, mashed, raw in salad
Salsify—buttered, creamed
Sauerkraut—baked, boiled
Spinach—buttered, creamed, raw in salad
Squash—baked, mashed
Tomatoes—canned, buttered, scalloped, stewed with fresh green peppers and onions, fried, salad, sliced
Turnips—buttered, creamed, mashed, mashed with potatoes

(13) *Salads.* At least one a day at dinner or supper is desirable. Salads are usually made from raw vegetables or fruit; although they may contain both cooked and raw vegetables and fruit. It is better to serve dressing (cheese, French, mayonnaise, Thousand Island, or cooked dressing) separately and let each man take as much as he wants. Nearly all salads are better with lettuce. If no lettuce is available, sliced cabbage is a good substitute.

33. Monthly Menus (Field Ration)

A master menu is prepared originally in the Subsistence Branch, Office of The Quartermaster General, Washington, D.C., 3 months prior to the time in which the menu will be served. This menu is sent to the service commands for use as a guide in preparing the monthly menus for the posts, camps, and stations within the service command area where local conditions are taken into consideration. The cost will not exceed the cost of the garrison ration for the same month at the same station. Menus are finally prepared at such places as the commanding general of the service command or oversea department may direct. The menus are arranged to indicate the components for each of the three daily meals and to give a daily recapitulation of the total quantity by unit of each item required to feed the menu to 100 men.

SECTION V

PROCUREMENT, INSPECTION, AND STORAGE OF FOODS

34. Procurement

a. There are two methods of subsistence procurement in effect.

(1) Purchase by the mess operating on the garrison ration system. In this type of procurement, the initiative rests with the mess officer to select and procure the foodstuffs he desires.

(2) Issue to troops on the field ration. This method is automatic and as direct as possible, the mess officer's chief responsibility being to see that his organization is issued the supplies due it.

b. In either case, foodstuffs must be handled and stored to prevent their deterioration or contamination. They must be protected from excessive temperatures, dirt, insects, rats, and rot. Army sanitary regulations are particular and precise on these points. (See AR 40–205.)

35. Inspection

Most subsistence supplies for Army use are purchased on specifications stating grade and quality, and inspection is usually made at the supplier's plant or warehouse by trained Government inspectors. Final acceptance, however, depends upon their condition upon arrival at point of acceptance by the Government. Although trained inspectors frequently are available at installations where large quantities of supplies are stored and the quartermaster or his representative inspect all subsistence received, the mess officer or mess sergeant is responsible for the further inspection of the supplies received at the unit mess. Therefore, the unit mess personnel must have at least an elementary knowledge of what to look for and what to guard against in foodstuffs. The mess officer or mess sergeant need not be an expert in food inspection, but he should be able to detect discolorations, strange odors and misshapen food cans. It is especially important that canned goods and all highly perishable foods such as meat, fish, poultry, fresh milk, fresh fruits and vegetables, butter and eggs be carefully inspected. Discrepancies in weight, measure, or count should be noted on the delivery order, shipping ticket, or invoice before the food is accepted.

36. Canned Foods

a. The following procedure should be followed when inspecting canned foods:

(1) Read the label for information about the contents. Preserve the labels on cans, and if they fall off, replace them with some means of identification.

(2) Examine outside of the can for holes, rust, general appearance, and evidence of swelling.

(a) Rust on the outside of the can does not injure the contents, unless the rust has penetrated the can and caused a leak. When products contain little or no liquid, leaks may not be easily noticeable. Bad rust spots, particularly at the seams, should be closely examined for holes. The contents of leaky cans are almost certain to be spoiled.

(b) A dented can does not always indicate spoilage. Unless the dent has caused a leak or hole in the container, the contents will be sound. Severe dents often spring the seam sufficiently to cause small leaks or to permit air to reach the contents. The contents of dented cans should be examined when the can is opened.

(c) Evidence of fermentation and decomposition of the contents is usually shown by some alteration in the shape of the can. If the decomposition has been going on for some time, the can presents a swelled appearance, with both ends bulged out and unyielding to pressure. Such a can is known as a "swells," and the contents must not be used. If the process is not so far advanced, the ends will be less bulged and will yield to pressure. When one end is pushed in the other springs out. This can is known as a "springer," and the contents should not be used. When the air in the can has not been properly exhausted

in packing, the result is a can with loose ends which may be pushed in, or forced outward by striking one end sharply against a flat surface. Such a can is known as a "flipper." The contents may or may not be spoiled.

(d) The contents of a can may spoil without much outside evidence. Sometimes with acid foods, a weak spot on the can lining is attacked and eaten through by the acid, producing what is called "pin holing." Evidence of pin holing will eventually show as leaks, but may be found only by close examination in the early stages.

(3) Food may ferment in cans with no external evidence. Such cans are known as "flat sours." When the can is opened, spoilage is detected by taste. Flat sours are generally confined to starch foods, such as canned corn, which have been insufficiently or improperly processed.

(4) Open the can and smell and taste the contents. When the food is spoiled, off-odors and bad taste are evident.

(5) Remove the contents and examine for discoloration, contamination by filthy or foreign matter, and quantity (compare with quantity stated on label).

(6) Examine the inside of the can for evidence of pollution or spoilage. (For additional details, consult paragraphs 3 through 7, TM 10–210.)

b. Considerable loss of canned goods may be prevented by observing the following suggestions:

(1) Avoid storing in a damp place, and provide proper ventilation.

(2) Avoid high temperatures. The ideal is about 50° F.

(3) Avoid freezing temperatures. In defrosting, do not warm cans suddenly.

(4) Store cases on their sides on dunnage.

(5) Use oldest lot first. However, use newer lot if it begins to show signs of deterioration.

(6) Keep clean and sanitary the places where spoiled canned food is held awaiting action of the contractor or the survey officer for reclamation.

37. Fresh Fruits and Vegetables

a. General. The following points should be kept in mind when examining fresh fruits and vegetables:

(1) Standard grades for fresh fruits and vegetables, known as United States grades, have been developed by the United States Department of Agriculture. Minimum quality requirements are defined in the various grades. However, fruits and vegetables graded at the point of origin may not grade the same when received at their destination because of deterioration or injury in transit.

(2) Large-sized fruits and vegetables are not always of the best quality. As vegetables mature, they become woody or coarse.

(3) Avoid commodities showing decay because they deteriorate rapidly.

(4) Distinguish between blemishes that affect appearance and those that affect eating quality. The amount of blemish that must be removed in preparation for table use is a determining factor in acceptance or rejection.

(5) Fine appearance does not necessarily indicate fine quality, although the two are closely associated. A better test of fresh fruits is taste.

(6) Be sure that containers hold their full measure, and that the quality of the fruits or vegetables is uniform throughout.

b. Qualities of fresh fruits. (1) *Apples.* Good apples are firm and of good color and flavor. Slightly tart apples are best for all purposes. Avoid soft, mealy, overripe, tough-skinned apples, or those with bruised or brown surfaces.

(2) *Bananas.* Good bananas should be plump, well-filled, and firm. For eating, yellow fruit with brown flecks is best. For cooking, solid yellow or yellow with green tips is satisfactory. Slightly green bananas ripen in a few days at room temperatures. Avoid bruised, soft, mushy, or moldy bananas.

(3) *Berries.* Good berries have a bright, clean, fresh appearance, full solid color, and plumpness. They should be free of dirt, trash, moisture, and mold. Overripe berries are dull, soft, and leaky. Badly stained containers usually indicate leaky fruit.

(4) *Cherries.* Good cherries are bright, fresh, plump, firm, and juicy. Stale cherries are dull, shriveled, sticky, and leaky. Decay is indicated by small, brown, circular spots, and by damp, stained, leaky boxes. Worminess can be detected by close inspection. It is best to open a few cherries, since worminess tends to run in lots.

(5) *Grapes.* Good grapes have a fresh appearance, good color, and plumpness. Decay is indicated by mold, wet grapes, or stains on the boxes. Frozen grapes have a flat flavor, may be shriveled, and may show a milky pulp.

(6) *Peaches.* Good peaches are free from blemishes, and have a fresh appearance and firm flesh. Color is not a sure sign of maturity. Imma-

ture peaches are flavorless. Overripe peaches are soft and easily broken. Bruised fruit rots quickly. Punctures through which a gummy substance oozes may indicate worm injury, or the presence of worms.

(7) *Plums and prunes.* Good plums and prunes are plump, clean, and fresh looking. They should be full-colored for the variety, and soft enough to yield to slight pressure. Immature fruit is hard, generally shriveled, and poor in color and flavor. Overmature plums and prunes are soft and often leaky. The presence of moisture indicates injury, overripeness, or decay.

(8) *Citrus fruits—grapefruits, oranges, and lemons.* Good citrus fruits are firm and springy, have fine textured skins, and are heavy for their size. Surface blemishes on the skin do not affect quality. Soft or spongy sections indicate decay. Shriveled, dry, or hard skin indicates poor fruit. Since most packers color their fruit artificially, color means little. Lemons, however, are not colored artificially, and are a deep yellow. Decayed citrus fruits, however slight the decay, must not be used.

c. Qualities of fresh vegetables. (1) *Asparagus.* Good asparagus is fresh looking, tender, and firm, with close compact tips. A tender stalk is brittle and breaks with a snap. If the bottoms of the stalks are dry or holes run the length of the stalk, the asparagus is not fresh. Bad asparagus is wilted and has spreading tips.

(2) *Beans, lima.* Good lima beans are plump, have tender skins (test with thumbnail), are green or greenish white. If slime or mold is present, the beans have spoiled; hard tough skins indicate overmature and flavorless beans.

(3) *Beans, string.* Good string beans have silky, flat pods through which the beans scarcely show. They break with a crisp, sharp snap—the best test of good beans. Ridged, swollen, shriveled, or wilted pods, with large seeds, are undesirable.

(4) *Beets.* Good beets are smooth, free from blemishes, and red throughout. The tops should be fresh and green. Rough or ridged beets are tough or woody; soft, flabby, or shriveled beets are poor in flavor. Soft spots indicate decay.

(5) *Cabbage.* A good head is reasonably solid, firm, heavy or fairly heavy for its size. Veins on the leaves should be solid and white. Yellowing leaves, soft, puffy, or wormy heads indicate a bad product. Decay shows readily in the odor and the slimy condition of the cabbage.

(6) *Carrots.* Good carrots are firm, fresh, and smooth, and have a uniform golden orange color. Large carrots are apt to be tough. Tops should be fresh and green. Wilted, flabby, soft, shriveled, or excessively scarred, forked, or "whiskered" carrots should be rejected.

(7) *Cauliflower.* A good product is compact, firm, heavy, white or creamy white in color, and is surrounded by fresh green leaves. A spreading flower cluster indicates overmaturity and poor quality. Spotted, speckled, or bruised cauliflower should be rejected.

(8) *Celery.* White or blanched celery is generally preferred, but the green has a higher vitamin content. Good celery is of medium length and thickness and is solid and brittle in the stalk. The parallel grooves along the stalk should not be too far apart. The heart should be large, free of bleach rot (a brown, moist condition). Wilted, pithy, or stringy celery should be rejected.

(9) *Corn.* Good corn should have fresh, green husks, and silk that ranges from golden to dark brown. Field corn of inferior flavor can be recognized by the fact that there is little if any silk visible. The cob in good corn is filled with bright, plump, milky kernels just firm enough to offer slight resistance to pressure. Worm injury is found, when present, along the sides of the ear. Bad corn has a shriveled, dried, or yellowed husk, and tough, shriveled kernels.

(10) *Greens.* Beet tops, broccoli, chard, chicory, collards, cress, endive, escarole, kale, mustard, sorrel, spinach, and turnip tops are the chief greens used. Good greens are fresh, young, tender, and green. Bad greens have poorly developed leaves, are dry or yellow, dirty or insect injured, or coarse-stemmed. Headed greens like broccoli should be compact, and should not show an excessive amount of coarse leaves or stems.

(11) *Lettuce.* Good lettuce is crisp, fresh looking, tender, and firm headed. Decay is indicated by discolored areas on the leaves, and may be trimmed off if not too extensive. Soft rot may penetrate to the center of the head; heads showing extensive soft rot should not be accepted.

(12) *Onions.* Dry onions should be bright, clean, hard, well-shaped, mature, and dry-skinned. Decay usually appears at the neck or base, and may extend well into the center. Moisture at the neck indicates decay. There should be no evidence of sprouting. Green onions are fresh in

appearance, have fresh tops, medium-sized necks, and are well bleached for at least 2 or 3 inches from the root. They should be young, crisp, and tender. Wilted, yellow, or flabby tops indicate age.

(13) *Peas.* Good fresh peas are dry, sweet, and tender; pods are bright green, velvety, full, and brittle. The peas are well-shaped, firm, and unsprouted. Swollen pods of poor color, flat pods of dark green, and moldy or water-soaked appearance indicate bad peas.

(14) *Potatoes.* Potatoes should be sound, smooth, and firm; not knobby, scabby, misshapen, or with too many eyes. The color of the cut surface should be creamy yellow. A deep yellow potato is not likely to cook well. Wilted, shriveled, leathery, sprouting, discolored, hollow-centered, black hearted, wet or leaky, and wet or dry rotted potatoes should be discarded. Sweet potatoes should be smooth, plump, and chunky, tapering at both ends. Avoid excessively large ones or those to which rootlets are attached. Damp sweet potatoes should be examined carefully.

(15) *Spinach.* Good spinach has well developed, stocky plants, with fresh crisp leaves of good green color. It is reasonably free from sand. Small, straggly, or stalky plants with yellow, coarse leaves should be rejected. Decay is indicated by soft, slimy rot.

(16) *Tomatoes.* Good tomatoes are firm, fairly well formed, plump, smooth, of good color, and free of blemish. Shriveled ones are angular in form and tomatoes of poor color are immature. The flesh and seeds, when a good tomato is cut, hold together in a firm mass. Watery tomatoes are poor in flavor. Decay shows in wet breakdown of the flesh, or in soft, discolored spots.

(17) *Turnips.* Good turnips should be smooth, firm, have few leaf scars around the top, and very few fibrous roots at the base. Tops should be green and fresh. Yellow wilted tops indicate too long in storage. Large coarse, overgreen, or lightweight turnips are apt to be pithy, tough, hollow, or strong flavored.

38. Dried Fruits and Vegetables

a. The following drying terms are in general use:

(1) *Dehydrated.* Fruits and vegetables dried in artificially heated air under forced draft and controlled conditions of humidity and temperature; the resultant product has a moisture content of less than 8 percent by weight.

(2) *Evaporated.* Fruits and vegetables dried in artificially heated air without forced draft and under controlled conditions of temperature and humidity; the resultant product has a moisture content between 17 and 24 percent by weight.

(3) *Sun-dried.* Foods dried entirely by exposure to rays of the sun.

(4) *Dried.* All dried foods regardless of means used for extracting moisture.

b. Dried fruits should be free of dirt, mold, insects, and other foreign matter. If hard and crystalline, that is the effect of natural sugars; the taste is not affected. If mold, which is soft and fuzzy, or mildew is present, the product must not be used. The presence of insects is revealed by larvae, cocoons, or a brownish substance resembling sawdust.

39. Dry Beans

Good dry beans are dry, plump, uniform in color, and have a strong, glossy skin. Good beans are hard enough to resist denting when pressed with the thumbnail. Beans that are too hard are undesirable, and those that are soft or "wet" will not store well. A good test is to lay beans on a table and try to cut them crosswise with a knife. If the knife goes through in an easy manner without cracking the bean open immediately, the bean is too "wet." Weevils present in the bean deposit small white scales on the outside. These may be seen with some difficulty. A good test is to soak the beans in water for about 2 hours. Insects present will float to the top. Weevil-infested beans should be rejected.

40. Fresh Fish

Only strictly fresh fish should be accepted. The following rules are helpful in judging freshness:

a. The eyes should be bright, clean, and firm, not clouded or sunken.

b. The gills should be bright and of a fresh color, rather than grey.

c. The scales should not be loose, they should cling firmly to the skin, and have a characteristic sheen.

d. The odor should be fresh; never tainted or stale. If the slightest suspicion of taint is present, the fish are not acceptable.

e. The flesh should be firm and elastic. If laid across the hand, a fresh fish will bend but little.

f. Shells of live oysters and clams should be tightly closed all around.

41. Fresh Meat

a. Meats should be inspected by trained personnel of authorized agencies. Good meats are free from bruises, slime, sourness, and taint. Surface spoilage can be trimmed off, and the meat used. Deep seated spoilage, discovered by inserting the trier (a long, thin-bladed knife) along the bone, withdrawing it and smelling it at once for off-odors, warrants rejection of the meat.

b. The exposed surface of good beef is a cherry red color, and firm and fine textured, with little visible connective tissue. The bones are pinkish white and porous. If the flesh is soft, dark, and coarse grained, the animal was old or the meat is poor. Fat should be brittle, creamy white, and flaky.

c. Good veal has flesh that is light pink, firm, moist, and fine grained. The fat is white, smooth, and not brittle. The bones are red and soft enough to be sawed or cut easily without splintering.

d. The flesh of lamb is pink, but becomes dull red as it reaches the mutton stage. The fat of the young lamb is pink, but becomes white as the animal grows older. Bones are soft and red in young animals, hard and white in older ones.

e. Good pork has a firm flesh, marbled (a fine network of fat running through the meat), and is grayish-pink.

42. Smoked Meats

Good smoking is indicated by dry surfaces, shrunken skin, and a bright, light, cherry-red color. Pale color, soft, moist meat, and flaccid skin indicate insufficient smoking. Sourness occurs most frequently in thick pieces and those that contain bones. Smoked meat will mold if not kept dry and uncovered; such mold is not harmful but may impart a moldy taste.

43. Sausage, Bologna, Frankfurters

These should be free of mold and slime, have a fresh appearance, and show no discoloration, faded areas, discolored spots, rings, centers, or internal greening.

44. Poultry

Breasts should be plump and broad; the thigh, back, and bones should be covered with a thick layer of flesh, and there should be streaks of fat along the back, breast, and thighs. Old birds may be detected by brittle, rough breast bones, coarse skins, and long hair on the skin. Properly dressed birds have clean skins and feet, practically no pin feathers, and show no bruises, broken skins, or discolorations of the wings and tail. Poultry generally deteriorates under the wings first. If the odor of the flesh under the wings is sour, rancid, or sticky, the fowl should be rejected.

45. Dry Stores

Inspection of dry stores such as sugar, flour, coffee, rice, and cereal products, will cover net weights, count, and condition of package. Prior storage under damp conditions will be indicated by lumps, mustiness, and mildew. Flour and cereal products are subject to insect infestation. This condition is cause for rejection. Coffee should be left in a closed, clean, dry container.

46. Milk

Fresh milk for Army use is delivered in glass bottles or fiber containers. Glass bottles are easily inspected for dirt and color of the milk. Bottles should be scrupulously clean and should have no broken or chipped edges. The color of milk varies with the breed of cattle and the nature of the feed. Quartermaster of post should make frequent checks on the quality of the fresh milk delivered by having random samples tested for bacteria count and butter fat content.

47. Eggs

Inspection of eggs includes determination of net weight and quality or grade. Cases need not be new, but they should be sound, clean, and free from stains and bad odors. Fillers and slats should be sound, clean, sweet, and free from soilage. Specifications should prescribe net weight per case required during various months for various grades.

48. Scales

Accurate scales should be available in every mess. The Army generally contracts for net weights—that is, the weight of the food with weight of the container deducted. The weight of wrapping paper, burlap bags, cardboard containers, etc., should be deducted when checking weights.

49. Storage

a. The mess officer must conduct frequent inspections of storage facilities, and of the stored foods themselves. Adequate storage facilities are usually provided in garrison kitchens, and the following information applies chiefly to them. Storage problems for messes operating in the field vary, but rarely would any quantity of supplies requiring storage be in the unit kitchen for longer than 24 hours.

b. Heat and humidity are the two chief causes of food spoilage. This applies especially to highly perishable foods, such as meats, fish, butter, eggs, and milk. Foods keep best when dry and cold.

c. During the summer season, all food stores are prone to rapid deterioration; during this time the following supplies should be checked carefully at frequent intervals since they are most susceptible to spoilage:

(1) Alimentary paste products, including noodles.
(2) Beans and peas, dried.
(3) Cereals of all kinds (mainly uncooked types).
(4) Dried fruits.
(5) Flour (all kinds).
(6) Juice, tomato.
(7) Milk, evaporated, canned.
(8) Peanut butter.
(9) Raisins.
(10) Rice.
(11) Tomatoes, canned.

d. If stocks on hand and due in are in excess of normal requirements during the summer months, report should be made to the commissary officer of the installation concerned, who will take action under provisions of paragraph 20, AR 30–2210, prescribing forced issues of subsistence supplies. If excess stocks cannot be disposed of in this manner, action will be taken under provisions of paragraph 4, AR 30–2210.

e. Heavy demands on the food resources of the country emphasize the importance of measures to prevent loss of food stores through deterioration and spoilage. All reports of survey of subsistence supplies lost through spoilage will be scrutinized closely to determine whether failure to comply with War Department instructions resulted in such spoilage. (Cir. No. 113, W.D., 1943.)

50. Storage of Nonperishables

a. The requirements for the storage of nonperishables are simple. A cool, dry, clean, well-ventilated room equipped with shelves, racks, or dunnage, which is reasonably verminproof and insectproof, and one which can be locked, is required. The nonperishable subsistence items are arranged in an orderly and convenient fashion on the shelves, racks, or dunnage. The stores are arranged so that the oldest can be used first. Flour, dry beans, sugar, etc., are stored best in cans. Bread is stored best in boxes, screened from flies, and protected from dust. Dry cereals should be stored in their original cartons, and these opened only when necessary. Open packages of foods should not be kept on the floor in dark corners, as it is in such places that insect infestation takes place easily, and mold and rot attack quickly.

b. No spoiled food should be kept in the storeroom or the kitchen; it should be set apart from other food, preferably in boxes or closed containers, so it will not contaminate other foods.

c. Roasted and ground coffee should always be kept in tightly closed containers.

d. Keep food such as onions, which give off strong odors, segregated. (Onions should be kept in slatted bins.) Do not keep articles such as varnish, kerosene, and oily rags in the storeroom.

51. Storage of Perishables

a. Proper storage of perishable subsistence requires more equipment than nonperishable subsistence. More than one-half of the weight of the ration issued is composed of perishable items. Nearly three-quarters of these items, by weight, require refrigeration. If improperly refrigerated, the foods will wilt, soften, lose weight and vitamin content, become discolored, rotten, sour, and develop mold. In most garrison kitchens, adequate refrigeration equipment is provided through the provision of a cold storage room in the consolidated mess buildings, as well as refrigerators or ice boxes which are provided in company mess.

b. Cold storage in the consolidated mess. Usually, three cold storage rooms, each with a definite purpose, are provided in the consolidated messes: a chill room for the storage of frozen or fresh meat and meat products, a "cooler" room for the storage of dairy and egg products and for

fresh fruits and vegetables, and a ventilated storage room for fresh fruits and vegetables which are not highly perishable. The chill room is normally kept at a temperature slightly under freezing; the cooler room at temperatures around 40° F., and the ventilated storage room at temperatures of 55° to 60° F.

(1) All fresh frozen items are stored in the chill room. Solidly frozen products are arranged in compact stacks. Fresh meats are hung from hooks, or laid on racks, and spaced so as to permit circulation of air. Air movement should be sufficient to maintain a uniform temperature throughout the room; too much air movement will dry out the meats. The temperature is not allowed to drop below 30° F., since slow freezing of fresh meats causes discoloration. Since fresh pork and pork products require a slightly lower temperature, they should be stored for limited periods only. If frozen fish is stored in this room, the fish should be carefully wrapped in clean, odorless packages, since material escaping from improperly packaged fish may contaminate the room and give rise to offensive odors.

(2) The cooler room is equipped with racks upon which the foodstuffs may be stored but spaced to permit easy circulation of air. The velocity of the refrigerated air should be just sufficient to maintain a uniform temperature in the room, since higher velocities may cause undue dehydration and injury to the products. The room is used for the storage of eggs, dairy products, most fresh vegetables, berries, grapes, and fruits like apricots, cherries, peaches, plums and pears.

(3) The ventilated storage room is readily maintained at 60° F., when artificial refrigeration is available. When it is not, it should be well-ventilated during the cool hours of night and closed as much as possible in the day. In winter, the room may have to be heated to prevent freezing. It is equipped, like the other rooms, with racks for storing the foods. The room is used to store apples, bananas, all varieties of citrus fruits, dried fruits, onions, root vegetables (beets, potatoes, turnips), tomatoes, pumpkins, Hubbard squash, syrup, nuts, cooking oils, molasses, pickles, etc. Apples may be stored in this room for several weeks if they have not previously been refrigerated. If they have been previously refrigerated it is best to store them in the cooler room. The same thing is true of citrus fruits, though these should never be stored at temperatures under 40° F. Cucumbers, eggplant, and tomatoes may also be injured by storage at temperatures under 40° F. Lard and its substitutes may be stored in the ventilated storage room for a short time without damage if the temperature is below 65° F. They may be refrigerated either in the chill room or the cooler room, but should not be placed in a confined space with fruits and vegetables.

(4) In storing perishable supplies the following should be observed:

(*a*) Fresh fruits that are to be stored for a day or two require ventilation in order that they may be cooled satisfactorily and the volatile products given off may be carried away.

(*b*) If cases of eggs are to be stored for more than 2 weeks, provision for ventilation around and between them must be made.

(*c*) Boxes or cartons of meat or meat products should be well separated to provide suitable circulation of cool air around them.

(*d*) Frozen meats and meat products may be stacked solidly.

(*e*) Under no circumstances should any package of food or the food itself be permitted to come into contact with concrete walls, floors, or pillars.

(5) Wherever temperatures in cold storage rooms are below freezing, safety precautions must be taken. Alarm signals, which can be operated from within the room, should be installed, and a long-handled ax should be hung in a suitable place near the exit door for the use of anyone accidentally locked inside the room. When not in use, meat hooks should be turned with their points inward and away from the working space.

(6) Careful attention to sanitation is essential. The rooms should be kept clean, orderly, neat, and as dry as possible. No smoking should be allowed in the storage spaces.

c. Storage in the unit kitchen refrigerator. (1) Products placed in either mechanical or ice-cooled refrigerators may cause overcrowding and result in poor operation and insanitary condition. Spoiled foods should never be placed in the refrigerator. Excessive dampness caused by poor air circulation or spilled liquid is as undesirable in the refrigerator as anywhere else.

(2) The mess refrigerator should produce a storage temperature of 50° F., or lower, whether cooled by ice or by mechanical means. A lower temperature is more desirable, and 40° F., may

be obtained in refrigerators properly designed for that purpose.

(3) Avoid interference with the air circulation in the refrigerator. Since cold air is heavier than warmer air, the air is circulated downward from the cooling coils or melting ice, and upward through the storage space, continuing to the top where it moves across to the cooling section, is cooled, and moves downward on another cycle.

(4) Wash the refrigerator frequently.

(5) Keep the doors closed as much as possible.

(6) Do not place food in the ice compartment of an ice-cooled refrigerator.

(7) Hang fresh meat on hooks. Avoid piling. Where blood may drop from meat, place dishes underneath.

d. Mechanical refrigerators. Mechanical refrigerators may be of two different types:

(1) *Dry-coil type.* This has a cooling unit temperature which is below 32° F., the freezing point of water. Moisture deposits appear on the surface in the form of frost. Frosted coils should be defrosted frequently by shutting down the unit, never by the use of hot water or by scraping or chipping. Accumulations of frost reduce the cooling efficiency of the unit.

(2) *Extended surface wet-coil type.* This operates with a cooling unit temperature above 32° F. Moisture deposits appear on the surface in the form of drops of water. An electric fan circulates the air of the refrigerator through this cold, wet surface where the air is cooled. The excess water is taken off through a drain. The functioning of this type of refrigerator is comparable to a well designed ice-cooled refrigerator.

e. Arrangement of food in refrigerator. (1) Two refrigerators are generally provided in each unit mess hall. Where only one is available, it should be divided and operated as two separate refrigerators.

(2) One refrigerator should be used for eggs, dairy products, fresh meat, and prepared or cooked foods of high moisture content which are not highly odorous.

(3) The other refrigerator should be used for fresh fruits and vegetables and other products prepared or cooked, which are relatively low in moisture content and distinctively flavored.

(4) Products in sealed containers may be placed in either refrigerator without becoming damaged or causing damage to other products. It is not advisable to use covered containers for other than cooked or prepared foods.

(5) Some perishable products need not be placed in the mess hall refrigerator. It is seldom that products are carried beyond 2 or 3 days, and the general supply room is suitable for these.

(6) The following is a list of products which should always be placed in one of the two refrigerators:

(*a*) *First refrigerator.* Odorless foods:

Butter.
Cream.
Fresh eggs.
Peanut butter.
Fresh meat and meat products.
Milk and buttermilk.
Fresh poultry.
Jams, jellies.

Cooked or prepared foods high in liquid content and not highly odorous such as cole slaw, salads, custards, pudding, liquid gelatin, gravies, sauces, cooked vegetables, cooked fruit, and cooked meat. (All cooked food should be cooled before being placed in the refrigerator.)

(*b*) *Second refrigerator.* Odor foods:

Cheese.
Fresh fruits.
Green vegetables.
Cold cuts.
Cured meats.

The first refrigerator is preferable for uncut smoked meats, such as whole ham, bacon, and bologna, when sliced or with exposed cut surface.

(*c*) Where the refrigerators are mechanically cooled, and ice is to be carried in one, it is more desirable to place the ice in the second refrigerator. The resulting increased humidity not only helps keep the products fresh and crisp, but the melting ice absorbs and carries away to the drains organic gases developed by the products in the confined space.

(*d*) In the coil-type mechanical refrigerators no open containers of food should be placed under the coil where drippings from the condensation on the coils could drop into the food.

52. Field Storage

As mentioned previously, the problems of storage in the field are different from those in garrison, but rarely do foods have to be stored in the field for any length of time. Improvised expedients, such as iceboxes, must be made to meet particular conditions. (See par. 88.)

53. Protection Against Gas

a. General. Food having a peculiar odor or taste and suspected or known to have been exposed to chemical agents, should, as a rule, be discarded or subjected to examination by a medical officer. Water suspected of poisoning by chemical agents should not be used unless it is subjected to purification processes and rendered fit for consumption.

b. Gas contamination of food. Food may be contaminated by gas either by direct contact with chemical agents in liquid or solid form or by exposure to vapor. Some foodstuffs absorb vapor more quickly than others. Fatty and oily substances, such as meats and butter, and also meals and flour are quickly contaminated by such means. Green vegetables are less readily affected by vapors.

c. Decontamination. Some thought has been given to the question of purifying contaminated food, but little, if any, practical study has been made of it. The obvious facts that no one method will apply to all chemical agents and that use of chemical reagents will probably destroy the taste or otherwise impair the value of the food have apparently discouraged efforts in this respect.

(1) Highly volatile agents which form nontoxic compounds upon hydrolysis are the least dangerous with respect to food contamination. Such agents (phosgene, diphosgene and chlorine) might to some extent be removed from food by ventilation. Removal would be accelerated by heating. At any rate, these agents would eventually be completely destroyed by hydrolysis. The acidity of such food would probably not render it appreciably injurious, though the taste, especially in chlorine contamination, might be very disagreeable.

(2) Food contaminated by chlorpicrin cannot be purified even by cooking since this agent is not hydrolyzed.

(3) Screening smokes will not seriously affect food unless the latter is in contact with the liquid smoke agent before it has hydrolyzed, where the effect would be similar to that of a strong acid. If white phosphorus particles are lodged in food, the food will be rendered highly poisonous.

(4) Contamination by agents of the mustard gas type is not removed by ordinary methods of cooking as usually the heat developed is insufficient even to drive off all the water content of the food. Bread made of mustard-contaminated flour is highly poisonous.

(5) Lewisite and other arsenic agents such as diphenylchlorarsine and solamsite will cause arsenical poisoning of food which cooking will not remove.

d. Food protection at the front. Rations issued to troops at the front should, if practicable, be kept in airtight containers until required for use. When circumstances permit, gasproof shelters should be used for storage of food supplies in the field. Cooked rations sent up to troops should be kept in closely covered containers until issued. Rations and ration vehicles should be covered with paulins for protection against chemical spray. Tent flies or some such overhead cover should invariably be provided for field kitchens. If canned goods are sprayed with chemicals, the cans should be decontaminated by boiling before they are opened. In dire emergency, the outer portion of food exposed to chemical agents might be removed, using the inner portion which might not be affected.

e. Protection of food in rear areas. The problem of gas protection of food supplies prior to its issue to troops in the field is a considerable one. The possibility of gas attacks from the air far to the rear necessitates elaborate protective measures. Food depots, slaughter houses, bakeries, and cold storage plants should be made as gastight as possible. Ration articles, so far as practicable, should be packed originally in airtight containers.

f. Purification of water. The self-purification power of water as regards chemical agents is appreciable. A very considerable quantity of chemical agent would be required to contaminate the water of large streams, lakes, or reservoirs to such a degree that it would not readily yield to simple field methods of purification. Small bodies of suspected water, particularly water in shell holes, should never be used. Water poisoned by arsenical agents cannot be purified by boiling.

SECTION VI

PREPARATION AND SERVING OF FOOD

54. Preparation of Foods

a. Cooking as an Art. Cooking is the art of preparing food to retain the maximum nutritive value, while improving digestibility and palatability. Effective cooking takes into account—

(1) Characteristics of cereals, vegetables, fruits, spices, and meats.

(2) Nutritive value of food and how to retain it.

(3) Changes in texture and flavor.

(4) The functions of foods.

(5) The possibilities of combining foods to obtain variety and increased palatability. Serving the food attractively is part of the process; for thought and care spent in seasoning, in attractive serving, and in inventing new combinations and mixtures of foods add to the interest of the soldier in the food served, and have a beneficial effect upon morale.

b. Responsibility. Although the responsibility for cooking and preparing food rests with the cook, under the direction of the mess sergeant, the mess officer should supervise the entire operation to see that the expected results are obtained. Too often the good quality of the food purchased by the Army is spoiled by inferior cooking with the result that such food is wasted. Hence, the careful and scrupulous preparation of food is essential to the elimination of waste.

c. Supervision. It is the mess sergeant's duty and responsibility to see that the cook selects the proper materials in correct quantities, and that he follows the prescribed and approved menu. The mess sergeant directs the cook in the selection of recipes that are to be used and insists that they be followed. TM 10–405 (The Army Cook) provides detailed information for the mess sergeant and cook. This training manual should be in the library of every Army mess. The mess officer supervises and advises the mess sergeant and the cook. He is directly responsible to the commanding officer for the operation of the mess and should actively supervise the over-all mess operation. It would be well for the mess officer to familiarize himself with TM 10–405 and use it as a constant reference.

d. In garrison and in field. More time and energy can be spent in the preparation of food when a unit is in garrison. Although the essentials of satisfactory preparation must be followed at all times, adaptation to temporary conditions may present difficulties.

55. Serving Food in Garrison

a. General. In the garrison mess hall, food is served either "cafeteria" or "family" style, under the direction of the mess sergeant. The senior cook is responsible for the actual service of meals: he must see that foods are ready at the proper time and set out in an attractive manner. Proper serving of even the plainest of foods is an essential.

b. "Cafeteria" style. The "cafeteria" style of serving is similar to the method used in a commercial cafeteria. The men form in a line or lines, receive trays or plates, and pass a point where the food is served to them, generally by the assistant cooks who may be helped by the K.P.'s. The mess tables should be set up with tableware, condiments, individual beverage containers, and, on occasion, with the salad and dessert before the men enter for the meal. If salad, dessert, and beverage are placed on the table, they should be placed there immediately before the men enter. If soup is served it should be the last item on the "chow line" to reduce the distance it must be carried to a table. At times it is advisable, as a conservation measure, to place meat as the last hot item on the "chow line." After receiving the food on their trays or plates, the men proceed to the tables. Some orderly fashion for seating the men should be instituted. This is sometimes supervised by the D.R.O. After eating, the men return the soiled trays and dishes to a selected

point for washing. Additional chinaware, vegetable dishes, platters, an added expense for initial procurement, are not necessary for the "cafeteria" method of serving.

c. "FAMILY" STYLE. In the "family" style of eating, the men sit down at tables which have been previously arranged with dishes by the dining room orderlies. The food is placed on the table in service platters, and the men help themselves. Salads, desserts, and soups may be handed out in individual portions. It is desirable, after they have eaten, to have the men bring their dishes to a central point for washing. This system permits the entire body of men to enter the dining room at one time, and avoids the discomfort of waiting outside the mess hall during inclement weather.

d. PLACING FOOD ON DISHES. (1) Roast beef, veal, pork, and lamb, should be cut in slices of uniform thickness and the slices laid evenly and neatly on the platter or individual trays. Spilled gravy should be wiped away.

(2) Soft foods, such as mashed potatoes or turnips, should be neatly rounded off, and not thrown into the dish.

(3) Foods intended to be served hot, such as soups, meats, and beverages, should be served hot, and not lukewarm or cool. Foods intended to be served cold should be chilled sufficiently in advance to make them cold at the required time. Hot or cold foods, when served "family" style, should not be placed on the tables until just before the men are seated.

(4) Care should be exercised in slicing bread and in the amount sliced in advance of the meal. Each slice should be cut in half in the interest of bread conservation.

(5) Butter should be cut in small individual patties and either placed on tables, one patty for each place at table, or in "cafeteria" style messes, placed on the "chow line" to be handed out with the other food items.

(6) Salads are usually of a cold nature and to be most palatable should be served cold. If salad is placed on tables, use chilled dishes when possible; if on chow line, keep in the ice box as long as possible and place individual portions neatly on trays or plates.

(7) Pies and cakes should be neatly and carefully cut without excess loose crumbs. Other desserts, according to their nature, should be served with care and made as attractive as possible. Individual services are ideal when possible; it should be remembered that dessert to some men is more appealing than the main dish of the meal, and for that reason an attractive dessert service should always be attempted.

(8) Beverages should be very hot or very cold at meal time, according to their nature. This is the prime consideration whether the service is at the tables or on the "chow line."

e. GARNISHING. One of the best ways to make food attractive is by garnishing. Paragraph 75, section VI, TM 10–405, furnishes some valuable suggestions in this line.

f. WASTE. It is essential that the men be instructed not to take more food than they can eat. The cook and the mess sergeant can fulfill their obligations thoroughly by preparing and serving meals well and thoughtfully, but the men themselves can cause much food to be wasted if they do not adhere to the practice of taking only as much food as they need. Instruction in food conservation, in the form of talks and posters in the mess hall, must be given constantly.

g. MESS HALL ORDERLINESS. The mess hall must be a clean and orderly place while meals are in progress; whenever possible, a noncommissioned officer should be assigned to each table to insure the maintenance of decorum. Quiet conversation and a friendly atmosphere go a long way to help a meal along, but the men must not be permitted to become boisterous or to forget good table manners. Little niceties, such as curtains on windows, help to brighten the atmosphere of a mess hall.

56. Serving Food in Field

a. MENU. When operating in the field, the messing unit is faced with a different situation from that of the unit mess in the garrison. When the supplies arrive, the mess sergeant can inventory them to see what is on hand, and break them up into as practical a menu as circumstances permit. This menu must be designed to suit the mess kit and the conditions under which the troops will be fed. Since the commissioned officer personnel will be occupied with many other problems, the mess sergeant must bear the chief responsibility in almost all matters concerning the feeding of the troops of a unit.

b. PLAN FOR FEEDING. (1) The regimental supply officer determines the best plan for feeding his regiment. He must consider the method of

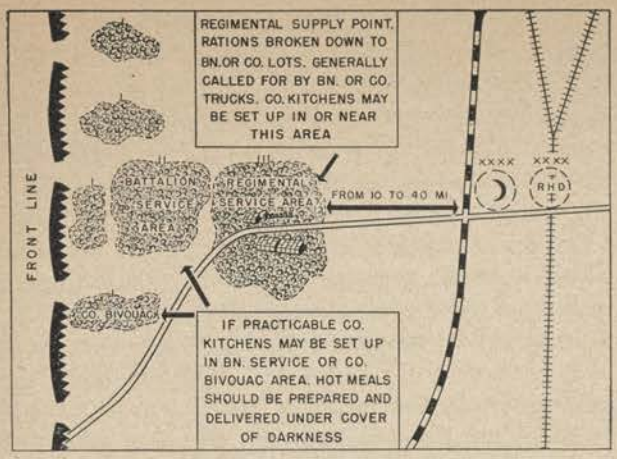


Figure 2. Ration distribution.

distribution prescribed by the division or higher authority, the ration cycle, the tactical situation, the terrain, the weather, the availability of trucks and routes, and the traffic conditions in general. When his plan has been approved by the regimental commander, it is made known to the battalion supply officers and the commanders of companies and other attachments not parts of battalions. The details of the plan are sent to the company commanders as early as practicable so that they can give the necessary instructions to the mess personnel of the different companies in time. In the absence of other instructions each company will be responsible for drawing its rations at the regimental supply point and for solving its own problems as to where the meal will be prepared and how the company troops will be fed.

(2) The plan of feeding includes any of the following instructions that might be appropriate:

(*a*) The location of kitchen bivouac(s) (usually in the regimental-train bivouac).

(*b*) The place where each meal will be prepared (in the regimental-train bivouac, in the advanced regimental or battalion kitchen areas, or in company mess location).

(*c*) The number of kitchen and baggage vehicles per battalion to be used to deliver food to troops (usually one truck per company—two per battalion when necessary to conserve transportation or keep down traffic).

(*d*) Any additional items of supply to be sent forward to troops.

(*e*) The time kitchen trucks will leave the bivouac to deliver meals to troops.

(*f*) Any restrictions upon movement.

c. Preparation. (1) Mess sergeants should be notified when the supplies are ready for distribution. Company supplies are turned over at the regimental distribution point to details from company mess groups, who then carry them to their kitchens. If the kitchen locations are beyond hand-carrying distance from the distributing point, one or more kitchen trucks of a battalion are used for delivery.

(2) When the rations are received at the company kitchens, they are divided into three meals, and the menu and recipes to be used are worked out. Each company's mess detail prepares the meals on its field ranges at the kitchen locations in the regimental-train bivouac, at battalion kitchen bivouacs located nearer the troops than the regimental-train bivouac, at some forward location near the company, or in the kitchen truck either while in movement or at a halt.

(3) It will seldom be feasible to advance the kitchens to the locations of units which are dispersed for combat. During combat, meals are usually prepared at a rear kitchen location. This is usually in the regimental-train bivouac, but sometimes in the battalion kitchen bivouac.

(4) Whenever possible, cooked food should be sent forward under the cover of darkness. Plans should provide for timing the preparations of supper so that trucks carrying it to the troops leave the field-train bivouac just after dark, and for timing breakfast so that trucks can return before daylight.

(5) The fundamentals of cooking are the same in field as in garrison. The chief difference is in the equipment used. Since Field Range M–1937, a gasoline burning range, can be operated with wood if necessary, the cook should be trained in the handling of both types of fuel. The menu must be adjusted to the type of range in use. Part of the meal should be prepared on the top of the range and part in the oven. This is especially true when either Field Range No. 1 or No. 2 is used. Dishes that require long preparation should be avoided when cooking time is limited.

(6) Necessary camouflage measures must be taken to protect kitchen installations from observation both from the air and the ground. Since most cooking must be done at night, care must be taken to limit the glare from stoves. Refuse, such as tin cans and litter from field rations,

should be buried. Utensils that might reflect light must not be allowed to lie exposed.

57. Distribution of Meals to Troops

a. After the meals are prepared, kitchen trucks carry them forward in food containers to a point close to the location of the troops. A single truck (with trailer, if needed) can be used to deliver food to more than one company if a shortage of vehicles or some tactical circumstance requires it. Otherwise, a truck is used for each company. The movement of kitchen trucks into forward company areas by day would usually give important information to the enemy and bring prompt action from him. Accordingly, a hot supper is prepared and loaded on the kitchen trucks by dusk; by dark, the loaded trucks are normally grouped and conducted under the control of the regimental supply officer to the regimental point of release, which should be a location on the route forward convenient to all battalions. There, they are released to subordinate control. The trucks are then conducted under battalion control to the battalion release points, where they are turned over to company representatives who guide them to the company mess locations. Men who can come to the company mess locations are fed there; others are served by carrying parties who take the food to them in containers.

b. A company mess location should be concealed from hostile observation both from air and ground and defiladed from hostile fire; but it should be as near the troops to be fed as the tactical situation permits. The company commander selects the company mess location, sends a guide to meet the kitchen truck at the battalion point of release, and upon its arrival sees that his own troops and all other nearby troops separated from their kitchen are fed. He has food containers carried forward by carrying parties to troops who cannot come to the mess location. The company commander arranges to have carrying parties at the mess location when the truck arrives. They are told the latest hour at which the company commander must have the emptied containers returned to the mess location for use in delivering the next hot meal.

c. Breakfast is usually a hot meal and lunch a cold one. These meals are prepared at rear kitchen locations or company mess locations when the situation permits. The standard gasoline field range has a concealed, smokeless flame; it can be used in company mess locations without danger of disclosure, provided the location is properly concealed or camouflaged and camouflage discipline is observed. Kitchen details prepare breakfast and lunch during the night, and these meals are issued at the latest hour of darkness which not only satisfies tactical requirements, but also allows enough time for containers to be returned and trucks withdrawn before daylight comes.

d. When a complete ration is on hand at dark, the kitchen trucks may go forward from the bivouac and issue all three meals before returning. When this can be done, supper is prepared at the bivouac, and breakfast and lunch at the company mess locations or at some other convenient forward location. This procedure requires only one round trip between the regimental-train bivouac and the company mess locations during the night, and may often be best when traffic conditions are bad. But this procedure may also be too difficult to carry out when units are in contact with the enemy.

e. When it is impossible to prepare meals in the forward area, the following procedure may be used: At dark, the kitchen trucks carry supper up to the company mess locations, and as soon as the emptied food containers are reloaded in the trucks, they return to the bivouac. While this is being done, the company mess details at the bivouac begin to prepare the hot breakfast and cold lunch. The kitchen trucks then carry these two meals forward. This procedure involves two trips forward during the night; it is therefore sometimes impracticable.

58. Serving Meals in Field

Food which is to be served to men in their mess kits, from the gasoline range or other field kitchen, should be systematically arranged. This expedites service while the food is hot, and avoids spilling and wasting. In general, foods should be served in the following order: meat, vegetables, salads, dessert, bread, butter or jam, and beverage. Men who are inexperienced or inexpert in handling the mess kit are likely to spill or waste food. Therefore, it is best to fill the mess kit in the following order: meat can (bottom), cover, and cup. The meat can is deeper and holds food more securely than the cover. The beverage should be served last to reduce the distance it is to be carried and thus to minimize the chance of spilling it. Where

large commands are to be served, it is well to arrange the containers of cooked food in a broken line in the open so that two lines of men may pass by the serving line, one line of men on each side of the food. If the containers are set on boxes, crates, or similar bases, there is less distance to reach for the food, and less likelihood of spilling it. The soldier who is to serve each food or group of foods stands in a space between the containers in the serving line, and faces the approaching men. He can serve his particular food or foods to the two lines as fast as they can conveniently pass him. In order not to waste food, portions issued for the first helping should be of moderate size. No man should be given a second helping until all have had a first serving. Food servers must be trained to estimate accurately the number of portions of a given size which may be served from the different sized kitchen containers. Servers should also be instructed to avoid spilling food, overfilling mess kits, overturning mess kits, and unnecessarily mixing foods in the mess kits. It is possible to serve food from the back or sides of the kitchen trucks, but such a method is less convenient than that described above. The serving line should be located so that the men will naturally head away from the kitchen area after being served, and preferably in the direction of the Lister bag or fresh-water supply. It is best to assign a definite area in which food served in mess kits will be eaten in order to keep men from taking it into tents or scattering debris throughout the area. Adequate and definite means for ready disposal of scraps of food left over must be provided. One or more garbage cans in which to dump uneaten food and peelings, or an open garbage pit can be used for this purpose. Provisions for washing mess kits must also be made.

59. Desert Operations

a. General. The conduct of unit messes is impossible in the desert when troops are within operating range of hostile fighter and dive-bombardment aircraft. Each vehicle must carry rations and water for the occupants of the vehicle, and meals must be prepared by individuals or the group assigned to the vehicle. Every vehicle should carry as a reserve only, and never for daily consumption, 3 days' supply of water and three rations for emergency use. Unit combat trains should carry one ration and 1⅕ gallons of water per man per day.

b. Food. (1) No dependence can be placed on local sources for the supply of food for troops engaged in desert operations. Even small long-distance patrols should be supplied with sufficient food to cover the period of their operations, as there is no assurance that any food can be obtained at oases.

(2) Normal field and emergency rations are suitable for the nourishment of troops in the desert. Rations should be so packed that they can readily be broken down for issue to individuals and small groups. They should be of a type which makes possible individual preparations with a minimum amount of water. This indicates the necessity for a high proportion of canned goods.

c. Cooking. (1) Unit messing will be possible in rear areas only when the threat of low-flying or dive-bombing air attacks is negligible. Under normal conditions, every vehicle should be equipped with a small stove (using gasoline or canned heat as fuel) adequate for preparing the food for the personnel transported in the vehicle.

(2) When food is prepared in a unit mess, care should be taken to avoid the use of condiments which induce thirst. Food prepared by small units should be limited to articles which can be heated in cans, for the water used in cooking must come from the individual water rations.

d. Water. (1) The importance of water cannot be overemphasized in desert operations. In training troops, it must be made clear to each individual that the water supply will play a vital part in the success of the operations. Restricted water consumption must become a habit. Training must condition troops to live on a limited water ration, and must develop such self-discipline in the use of water as will assure the maintenance of combat efficiency on the limited water supply available. Rapid drinking during the day must be avoided, as nearly all the water thus consumed is quickly thrown off in excessive perspiration and is thus wasted. The first cravings for water are lessened by moistening the mouth and throat. Small sips from the canteen will accomplish this. All issues of water to individuals should be made by noncommissioned officers only upon the order of an officer, and no water should be taken from water-supply cans except under supervision at regular issue periods.

(2) Prior to desert service, troops must become

accustomed to drinking water in which salt has been dissolved, because many of the sources of water supply in the desert furnish water with a relatively high degree of salinity. Hot sugared tea has been found beneficial; it reduces the thirst of troops in the desert. Smoking, particularly during the day, increases the desire for water.

(3) In the Western Desert in Africa a ration of 1⅕ U. S. gallons of water per man per day is found to be sufficient for extended operations by trained troops. This ration is for all purposes: drinking, cooking, washing, shaving, and brushing teeth. Troops on this ration cannot bathe but are limited to an occasional damp rubdown. The minimum ration for all of the above purposes is ¾ U. S. gallon per man per day; however, individual efficiency will start to decrease after about 3 days on this minimum ration. In an emergency, men conditioned to desert life can operate for as long as 5 days on a quart of water per man per day, if traveling is done at night and they can find shade during daylight hours. But on such a ration, combat efficiency will be seriously lowered.

e. Receptacles for water and food. (1) The water and food rations for all of the occupants of a vehicle should be carried on the vehicle. Water is best carried in tins of from 2- to 4-gallon capacity. Larger capacity tins involve the risk of a loss of all water in the event of a leak. The water container should be provided with a screw top, fastened to the can by a chain. A rubber washer should be used with this top, as leather washers will foul the water. To prevent rusting, water cans should be galvanized or have an interior coating of paraffin wax with a high melting point. Every vehicle should be provided with at least one funnel to prevent wastage in issuing water rations.

(2) If possible, vehicular racks should be provided for water and ration containers. These should be readily accessible to permit rapid unloading if the vehicle must be abandoned. When such racks are not built on the vehicle, wooden cases must be provided to protect water cans and rations. No case should contain more than 2 water cans, or 1 day's rations for the occupants of the vehicle. Water containers should be so loaded that they are easily inspected for leakage. A large fixed tank is unsuitable for carrying water rations. To the danger of loss of all water if the container should be injured is added the difficulty of locating and repairing leaks and of removing the collection of sludge and other deposits that accumulate in the bottom. In addition, the tank cannot be emptied quickly as often is necessary in emergencies.

60. Jungle Warfare

a. Food. Proper food is necessary, but the quantity required is not so great as is commonly believed. For jungle service most food should be ready to eat without cooking, and all food carried should give the maximum food value for the minimum weight. Ordinarily, undried foods contain more water than solids. Foods such as dried cooked meats, dried breads, powdered milk, quick cooking oatmeal, rice, coffee essence, cocoa malt, sugar, salt, and dried fruits and vegetables are light, easily carried and preserved, yet give ample nutrition, vitamins, roughage, and volume. Two pounds per day of such dry foods are enough for prolonged hard marching. Precooked soy bean flour is almost a balanced ration in itself.

b. Cooking utensils. Cooking utensils need include only a light aluminum vessel for boiling and a spoon. The 1-quart canteen cup is useful both as a cooking and eating utensil. Most foods obtained in the jungle can be cooked over an open fire.

c. Rations. Rations will necessarily consist mainly of nonperishable items: canned meats, vegetables, and fruit, dried vegetables and fruits, and candy. Rice and hominy may be substituted for potatoes. Fragile containers (paper and cloth) should be reduced to a minimum to avoid loss and destruction due to insects, dampness, and breakage. To supply small reconnaissance or security detachments, small tin containers are desirable. For units which are to march in single file along narrow trails, it may often be advisable prior to the march to distribute components of the ration so that meals can be prepared by squads or individuals. Field bread, with hard crust, should be baked in individual loaves to facilitate handling and to prevent damage when transported by packs. The supply of food in small (preferably individual) containers is of particular importance where scarcity of water precludes sterilization of mess equipment. Field ration C fully meets this requirement.

61. Operations in Snow and Extreme Cold

During operations in snow and extreme cold, the

production and conservation of heat are of primary importance, and require among other things, proper food.

a. Some foods produce more heat than others. Sugar and fats are high in heat-producing qualities, and corn bread furnishes more heat than wheat bread. Consequently, the ration should include a greater percentage of these than is normally issued. The amount of food should also be increased. In the absence of drinking water, small quantities of snow may be eaten while troops are warm or on the move, but eating snow in large quantities chills the stomach and materially reduces the body temperature. Alcoholic drinks cause the body heat to come to the surface, resulting in radiation and subsequent chilling. They are therefore dangerous during exposure to cold.

b. Whenever possible, food, tea, coffee, and soup should be served hot. Cold mess equipment soon chills food. At the kitchen, it is desirable to provide means for heating cups and mess pans. This can be accomplished by dipping them into cans of hot water just before food is placed in them. It is better to serve each soldier with two small helpings of hot food than to give him all of his food at once and allow it to chill before he can eat it. Whenever possible, meals should be served in heated tents or shelters, and arrangements should be made so that the men will not have to sit on the snow. At installations where fires are not permissible, thermos containers are advantageous.

c. When the meal is finished, mess gear must be thoroughly cleaned in boiling water in order to remove all grease and other material which tends to cling to the mess kit. Mess gear which is not thoroughly clean may be the cause of diarrhea.

d. For patrols and other small units engaged in operations which separate them from the company kitchens for several meals, special provision for food and drinks must be made. Since each soldier will carry his own food, it should consist of components which are not subject to freezing and which are highly concentrated. The ration should contain a high percentage of sweets and fats. Dehydrated, precooked soups, fruits, vegetables, and meats are highly satisfactory. Oatmeal, cornmeal, and bacon are recommended. Thermos containers should be provided for liquids. In very cold weather liquid placed in the issue canteen will freeze.

e. In the absence of a normal diet, scurvy sometimes occurs. However, men can live indefinitely without ill effects upon a diet composed entirely of fresh meat, provided the whole animal, including viscera organs is eaten. About 1⅓ pounds of lean meat and ½ pound of fat per man per day will suffice. It is well to boil the meat for a short time; to drink the water in which it is boiled; and to serve the meat rare since the necessary vitamins are destroyed by excessive cooking.

SECTION VII

CONSERVATION OF FOOD

62. Supervision of Messes

a. Commanding officers of all echelons are charged with the duty and responsibility of requiring that the maximum care and attention be given to the proper messing of troops, the issue of rations, the prevention of an accumulation of supplies in organization storerooms, and the salvage of waste materials, to the end that the food supplies of the nation may be conserved to the fullest extent. The food facilities of the nation are overtaxed, and critical shortages exist in many foodstuffs. Food wastage must be reduced to an absolute minimum. The fact that the civilian population foregoes certain foods in order that the Army's requirements may be met is no justification for the extravagant and wasteful use of foodstuffs.

b. The objective of mess supervision is twofold:

(1) To improve the standards of messing throughout the Army by improving the handling, preparation, and serving of rations to troops.

(2) To conserve foods and eliminate waste in mess operations.

c. The commanding officer of an organization or unit often works under the stress of administrative activities and other duties; as a result, mess operation within his command may not receive the full attention necessary for the maintenance of high standards. Designation of a mess supervisor to assist with the detailed supervision of mess operations will aid in providing the necessary direct supervision. Appointment of a mess supervisor does not, however, relieve the commanding officer of the direct responsibility for maintaining the necessary standards of his organization or unit. The mess supervisor becomes a member of the commanding officer's staff, and, as such, is available for consultation and aid in the satisfactory solution of problems of mess management.

d. For the intelligent supervision of mess operation, the mess supervisor should possess a keen insight into the factors and problems of messing. Practical experience in mess operations or large group feeding in either civil life or in the service is essential. In order to offer assistance and consultation for mess personnel, he must frequently visit the messes. However, such visits should in no manner bear semblance to the usual periodic mess inspections. The prime purpose of the visits should be to detect defects and search out their causes, and to recommend the necessary steps to remove the cause in order to prevent recurrence. He should serve as advisor and instructor rather than inspector.

e. In order to form the mess organization into a closely knit unit, the mess supervisor should hold frequent meetings with the mess officer, mess sergeant, and cooks of the command. At these meetings, conducted as a forum, new ideas can be expressed, new methods discussed, and a general exchange of ideas can result. These meetings afford an opportunity for group discussions of new policies placed in effect, general mess improvements, and methods of waste elimination. Many cooks have excellent ideas that are well worth consideration and adoption. Such meetings afford the opportunity to consider and weigh ideas for the welfare of all concerned.

f. In connection with the conservation of food and the elimination of food waste, the mess supervisor must be prepared to perform the following duties:

(1) To instruct mess personnel in the causes of food waste, in the reasons for its elimination, in the effects of continued waste on the natural resources and national morale.

(2) To show mess personnel how food waste can be eliminated by an orderly system of messing and mess management, an efficient mess sergeant, the exercise of economy in the kitchen, the time of cooking, the proper serving of tasty, hot, balanced, and especially, food which is not

overcooked, and the inspection of the contents of garbage cans to determine which foods are wasted and to prevent the recurrence by determining the reason for the waste and guarding against it in the future.

(3) To become familiar with and determine by observation and inspection that the best use is being made of the ability of the mess personnel.

(4) To check each of the following possible sources of mess deficiencies and recommend changes as required:

(*a*) *Menu.* Food waste may result from substitutions in the menu due to marketing conditions and food conservation measures which are made without regard to or understanding of the classification or function of the food in the diet. Insufficient intervals between the serving of dishes without due consideration of the troops' choice may also result in food waste. Often the omission of a dish appearing on the menu will result in food waste, since excess supplies will accumulate.

(*b*) *Preparation and cooking of food.* Overcooking of foods increases "cooking loss" or shrinkage. In meats, shrinkage can be as great as 35 percent. This is a direct waste. Foods are often wasted if they are unpalatable because of improper serving, poor combining, drying out, tastelessness, lack of condiments, and unattractiveness in appearance. The ultimate aim is to insure that the food is so well prepared that the men will desire to eat everything on their plates without being told to do so.

(*c*) *Serving of meal.* A simple rule which will assist in the conservation of foods is: "Serve all hot foods hot, and cold foods cold." In the "cafeteria" type of mess serving, consideration should be given to the portions of food placed on the trays and plates. Excess amounts served will result in plate scraps. Poor messing atmosphere due to unattractiveness of surroundings and inadequately trained serving personnel may also result in food waste.

(*d*) *Deficiencies in training.* Inadequately trained personnel may, through their inexpert handling of mess equipment and appliances, cause considerable food waste. Excessive amount of left-overs, or inadequate utilization of left-overs result in food waste.

(*e*) *Efficiency of personnel.* The success of a food conservation program depends largely upon the efficiency of the mess personnel. The mess supervisor should look for ability that is not being utilized or lack of ability which is directly causing food waste or hindering efficient general mess operations.

(*f*) The conservation of all food items must be stressed at all times. All personnel connected with procurement, storage, issue, operation, and serving of foods must be indoctrinated with the vital importance of correct conservation of foodstuffs.

63. Food Conservation Suggestions

a. Various means of conserving foodstuffs include—

(1) Use of citrus fruit peeling for marmalade, and the use of apple peeling for apple butter and jellies when possible or practicable.

(2) Rendering all fats, beef, and pork used in cooking as a substitute for lard and shortening; grinding fat through coarse plate before rendering will yield an additional 10 percent. Using this rendered fat in cooking as a substitute for issue lard or shortening.

(3) Use of bones for soup and in stock pot. All large bones (such as shank or shin bones) should be sawed in pieces to expose the marrow before using for soup or stock.

(4) Use fillers such as left-over bread, rice, and oatmeal in meat loaf, hamburger, and patties.

(5) Use left-over bread for croutons, dressing, and bread pudding.

(6) Cutting of bread only as needed, and the halving of each slice to avoid left-over pieces.

(7) Use of gravies with meat dishes such as roast, steaks, and chops.

(8) Serving of dressing with all roast meats and poultry to help stretch meat.

(9) Serving soup twice a day if possible.

(10) Use of ham hocks as a seasoning in beans.

(11) Use of left-over bacon as a seasoning in greens.

(12) Saving and drying of all celery tops. They can be used as a seasoning.

(13) Cut butter in small patties and place on table in platter containing one pat per man. If cafeteria service is used, place both bread and butter on line.

(14) By assigning a noncommissioned officer to each table when "family style" service is used. He can prevent plate waste by "chow hounds."

(15) Mess sergeant and cooks supervise service and distribution of foods in "mess line."

(16) Keep close check on ice box to see that left-overs do not accumulate.

(17) The timely preparation of all food items should be watched closely.

(18) Proper temperatures should be used in roasting meats to prevent shrinkage.

(19) Systematic daily garbage check to prevent waste by instituting effective methods of control.

(20) Simple syrup should be made to sweeten all cold drinks. This will eliminate loss of sugar that may be left in bottom of container.

(21) The use of the cafeteria style of feeding will eliminate waste. Each man should be held responsible for consuming all he accepts.

(22) Close supervision by the mess sergeant to determine the likes and dislikes of his men.

(23) Bone all meat. Meat that has been boned can be sliced better.

(24) Trim off all excess fat from meats. The men will not eat it and it will become waste.

(25) Canned goods should be opened when needed.

(26) Loose labels on cans should be either reglued or fastened on with rubber bands. This will eliminate possibilities of a wrong can being opened.

(27) A small amount of water used to rinse out all opened cans of vegetables.

(28) All stock rotated to make sure old stock is used first.

(29) Immediate use of perishables to eliminate spoilage and reduce consumption of canned goods.

(30) Exchange between messes to avoid accumulation.

(31) Making new recipes to improve palatability of foods that are not popular to increase their consumption.

(32) Mess sergeant checks each shift to see that the cooks understand proper preparation of all dishes.

(33) Company officers should give short talks to men to make them waste-conscious.

(34) All foods served should have "eye appeal."

(35) Hot foods should be served hot and not lukewarm.

(36) Salads should be kept in the ice box until just before mealtime.

(37) Grapefruit should be cored and sections separated, and served cold.

(38) Hot cakes and French toast must be hot to be tasty. Only enough for the first serving should be cooked ahead, then cook as they are needed.

(39) Coffee should be made just before time of serving and on the basis of 7 gallons per 100 men.

b. The mess officer and mess sergeant must exercise constant supervision to guard against undue waste. They, as well as any special mess supervisor designated by the commanding general of the service command, will be responsible for the following in the supervision and inspection of messes:

(1) Elimination of food wastage in the distribution, preparation, and consumption of food.

(2) Systematic check of garbage to prevent recurring waste.

(3) The preparation and serving of proper menus.

(4) Improvement in the preparation of food.

(5) Making sure that canned foods are used only when fresh or frozen foods are not available.

(6) Rendition of reports of any wastage to the responsible commanders, and following up these reports to insure compliance with recommendations.

c. The responsible officers must drop in and eat at the mess at unexpected times, and praise, criticize, or give suggestions. They must watch particularly for left-overs and note how they are used.

64. Avoid Hoarding of Supplies

Mess officers must guard against overdrawing supplies, and stocks must not be permitted to pile up. Except for certain staples, seasonings, and condiments, no accumulation of reserve stocks in the storeroom of a unit on the field ration system is necessary. All excesses of supplies on hand will be returned to supply channels for use where they are immediately needed.

65. Instructions to Troops

a. The men must be instructed to avoid undue waste. They must learn not to place more food on their plates than they expect to eat. They must not ask for second helpings unless they expect to eat the food they take. Units should be informed through lectures by the commanding officer, through the medium of posters and illustrative material, and through any other effective means, of the necessity for food conservation, to make sure that there is a constant supply for our own armed forces, for the people at home, and

for shipment to our allies.

b. Besides the instructions furnished at regular school for bakers and cooks, discussed in section XII, fresh and pertinent instructions must be given constantly to the mess personnel on new and improved ways of preparing and serving food and eliminating waste. New current recipes, which recognize the present food problems, must be utilized.

66. Conservation of Coffee, Tea, Cocoa, Sugar

a. GENERAL. Mess personnel should be well versed in methods of conserving imported products, such as coffee, tea, cocoa, and sugar, which during times of national emergency may not be easily obtainable because of shortage of shipping facilities or other reasons.

b. COFFEE. (1) Do not waste, spill, or spoil dry coffee.

(2) Use less frequently; substitute lemonade and fruit juices when practicable.

(3) The preparation of more than 7 gallons of coffee for 100 men per meal usually results in waste.

c. TEA. (1) Do not waste, spill, or spoil dry tea.

(2) Make only the quantity needed.

(3) One ounce of tea per gallon of water has proved satisfactory for hot tea. This quantity will not be exceeded.

(4) One and one-half ounces of tea per gallon of water has proved adequate for iced tea. This includes the water from the melting ice. This quantity will not be exceeded. (Iced tea should be served in preference to hot tea in warm weather.)

d. COCOA. (1) Do not waste, spill, or spoil the powder.

(2) Keep the can closed tight.

(3) Protect from light, moisture, insects, and heat. (Avoid temperature above 70° F.)

(4) Use only the required quantity. One pound of cocoa should make about 60 cups.

e. SUGAR. (1) Do not waste in handling.

(2) Use less in kitchen recipes. Two-thirds of the sugar ration is consumed in the preparation of food. The preparation of food requiring excessive use of sugar should be reduced to a minimum.

(3) Instruct men to use less sugar on cereals, etc.

67. Gardens

a. The War Department recognized the need and value of gardens at posts, camps, and stations to help meet the demand for fresh foodstuffs. Such an activity, in addition to procuring foods, has morale-building features, since a soldier so engaged feels he is contributing to the food supply. The planting of gardens, conducted only with the approval of the commanding officer of the post, camp, or station and as a voluntary off-time recreational activity, is permissible only—

(1) When the equipment and tools are on hand or readily available and no additional farm implements are necessary.

(2) Where the soil is suitable and plots are reasonably close to quarters.

(3) When the gardens are of such size and planted with such vegetables that military personnel, in the time available to them, can care properly for the garden.

b. Food so produced will be for the consumption of military personnel only and not for sale to civilians. Units contemplating the planting of gardens should consult the local county agricultural agent for information relative to the types of crops and time of planting, and for other information to aid in the cultivation of crops.

68. Salvage of Food Containers

At such times as a critical shortage may exist in food containers as well as foodstuffs, such containers as crates, cartons, boxes, textile bags, glass jugs, jars, and bottles should be saved intact for salvage. Such containers are collected and shipped to food processors for reuse. Tin cans should be handled as directed by local post regulations.

69. Waste Products

a. Meat drippings and fats will be utilized in kitchens. All excess animal fats can be rendered, and some can be used in supplementing commercial lard. The rest of it, as well as grease from grease traps under kitchen sinks, can be reclaimed and sold.

b. Every particle of food value from the marrow of bones, meat from around the joints, and even a good deal of calcium from the bone itself can be used to enrich soups and sauces, before the bones themselves are turned over to salvage.

c. Instructions on the classification and utilization of kitchen waste can be found in section VIII.

SECTION VIII

SANITATION AND WASTE DISPOSAL

70. Responsibility

Insanitary surroundings and contaminated foods are a constant menace to health. Food poisoning can strike suddenly. Commanders of all grades are responsible for the enforcement of sanitary regulations and the exercise of sanitary measures. The Medical Department is charged with the initiation, inspection, investigation, and supervision in sanitary matters. All commanders must see to it that measures for the control of disease are put into effect. Complete sanitation is obtainable only by scrupulous attention to the sources of contamination in the foodstuffs themselves, in the handling, cooking, and serving foods, in the mess personnel, in the mess site, in the building and equipment, and in the waste matter.

71. Mess Inspection

Messes must be inspected regularly to see that proper care is being taken. However, they should be inspected not only on a fixed schedule, but also informally at unscheduled times, preferably just before or after meals. The following outline for sanitary inspection of the mess is suggested as a guide:

a. ATTENDANTS. (1) The mess sergeant should be qualified for his position with regard to—

(*a*) Knowledge of food requirements and preparation of foods.

(*b*) Ability to maintain discipline.

(*c*) Business ability.

(2) Cooks should be adequately trained.

(3) All food handlers should have "food handler's examination" and be certified as to health condition by the surgeon. A washroom should be convenient for their use. Food handlers should have clean clothing, hair, hands, fingernails, and personal habits.

b. MENUS. (1) The food served should correspond with the menu posted.

(2) The menus should be well balanced, and the amount of food should be adequate.

(3) The file of menus and mess account balance sheet should be checked. (Daily food supplied each man should yield at least 3,000 calories, provide at least 100 grams of protein, and contain adequate vitamins.) (See sec. IV.)

c. FOOD SUPPLIES. (1) *Meat and fish.* (*a*) Source.

(*b*) Quality.

(*c*) Freshness.

(*d*) Handling.

(*e*) Storage.

(*f*) Preparation.

(2) *Milk and dairy products.* Same consideration as meat.

(3) *Fruit and vegetables.* (*a*) Is supply adequate and satisfactory?

(*b*) Are men educated to their use?

(4) *Canned foods.* Is supply satisfactory?

(5) *Bread and bakery products.* (*a*) Source.

(*b*) Quality.

(*c*) Delivery method.

(*d*) Storage.

d. FOOD STORAGE. (1) *Refrigerator.* (*a*) Is space adequate?

(*b*) Condition and sufficiency.

(*c*) Cleanliness.

(*d*) Disposal of drip water.

(2) *Pantries.* (*a*) General neatness, cleanliness, and adequacy of storage facilities.

(*b*) *Vegetable storage.* 1. Have vegetable bins been provided?

2. Condition of vegetables in storage?

3. Do conditions for storage guard against undue waste by rotting?

(3) *Bread boxes.* Sufficiency, cleanliness, and neatness.

e. FOOD PREPARATION AND SERVING. (1) Refer to cooks' training.

(2) Is food served in a reasonably attractive manner?

(3) Could you eat and enjoy the meals served

and as served to the men in your organization? If not, what corrections are advisable?

f. KITCHEN POLICE. (1) *Dishwashing.* (*a*) Does the method meet the requirements of Army Regulations?

(*b*) Are trays and dishes clean?

(2) *Kitchen utensils.* (*a*) Are pots and pans kept grease-free?

(*b*) Are they properly stored when not in use?

(*c*) Are knives and forks clean? Look between fork tines and around handles of hilts.

(*d*) Is there a knife rack and knife sharpener?

(3) *Kitchen police.* (*a*) Cleanliness of floors, walls, and ceilings.

(*b*) Are dirty rags allowed to accumulate on ledges, top of bread box, top of refrigerator, etc.?

(*c*) Are personal belongings of mess attendants allowed to accumulate in kitchen?

g. WASTE DISPOSAL. (1) Is waste handled in a satisfactory manner inside the kitchens and storerooms?

(2) Is vegetable preparation and peeling carried out satisfactorily?

(3) Is waste properly sorted and kept in proper receptacles?

(4) Is edible and nonedible garbage properly arranged?

(5) Are empty cans flattened before going to the trash can?

(6) Has a trash and garbage stand been provided? Is it kept clean?

(7) Is the surrounding area kept dry and free from soil pollution?

(8) Is waste removed at reasonable intervals?

(9) Are clean containers provided at reasonable intervals?

(10) How and by whom are containers washed?

(11) How are wastes disposed of?

h. Ashes are combustible trash and tin cans kept in separate containers?

i. INSECTS AND RODENTS. (1) Is mess screened adequately?

(2) Is there a supply of fly swatters or other fly destroyers? Are they used?

(3) If roaches, other insects, and rodents are present, what methods are being used to control them?

72. Foods

Although foods issued to messes have been inspected for quality and condition, they should be re-examined at the mess by a responsible officer. If deterioration, spoilage, or contamination is found, the articles should not be used. Fresh meats should be examined for slimy deposits on the surface or indications of decomposition in or near joints and bones. The affected portion should be cut away and discarded. Slight surface contamination can be trimmed off or thoroughly washed and scrubbed in clean water. If the contamination is widespread, the entire piece should be laid aside for examination by the proper medical officer. Fresh vegetables suspected of contamination should be carefully trimmed and washed, and thoroughly cooked. (For further details on food inspection, see section V).

73. Water

Drinking water is a problem in the field. Wherever possible, the water supply in the field is provided by water purification units, a responsibility of the Corps of Engineers. The Lister bag (water-sterilizing bag) capacity of 36 gallons, issued to all organizations at the rate of one for each 100 men, or fraction thereof, is used primarily for the distribution of water previously disinfected by water-purification unit or otherwise. Water can be purified in a water-sterilizing bag only by chlorination, and the process should be used in emergencies only. However, the duty usually falls on the personnel of the unit kitchen. The technique for sterilizing the water in a Lister bag is as follows:

a. Fill the bag to the 36-gallon mark, or if this mark is not present, to within 4 inches of the top, with as clear water as can be found.

b. Draw a small quantity of water through one of the faucets into a canteen cup.

c. Break an ampule of the calcium hypochlorite into the water in the cup and rub it into a thin paste containing no visible lumps. Add sufficient water to fill the cup two-thirds full, and stir.

d. Empty the solution of calcium hypochlorite in the cup into the bag and stir thoroughly with a clean stick long enough to reach the bottom. Flush out each of the faucets.

e. After the calcium hypochlorite has been in the bag for at least 10 minutes, wash out one of the faucets by allowing a small amount of water to run through it into the ground. From the same faucet, fill a canteen cup to a depth of ½ inch.

f. Add one cc (approximately 15 drops) of the orthotolidine solution to the water in the cup, and allow to stand for about 5 minutes so that the color will develop. A well-marked yellow color indicates that the water contains about the proper amount of residual chlorine. An orange color is evidence of over chlorination.

g. If no residual chlorine is present at the end of 10 minutes, as shown by the color test, repeat the chlorination procedure as outlined above.

h. The water should be allowed to stand for at least 30 minutes before being used for drinking purposes.

i. If water-sterilization bags are not available, water may be sterilized in water cans, or even in canteens by using appropriate amounts of calcium hypochlorite. Water may be purified in the issue canteen by the use of individual water-purification tablets. Directions must be followed as given on the container for these tablets.

j. A rough test for the safety of water which has previously been treated for 30 minutes by one of the acceptable chlorination methods is the presence of an odor or taste of chlorine in the water. The water is safe if chlorine can be tasted or smelled. This indicates the presence of at least 0.4 parts per million of available chlorine. In performing this test, precaution must be taken to determine that the odor or taste comes from the treated water and not from a contaminated container or the hands.

k. If neither powdered calcium hypochlorite nor individual water purification tablets are available, water may be purified by boiling for 1 minute. This method should not be used, if avoidable, by the individual soldier, but the water should be boiled in comparatively large quantities and then distributed to the troops. Aeration of the water by pouring it through the air from one receptacle into another will eliminate the flat taste due to boiling.

74. Handling, Cooking and Serving Foods

a. Foods and drinks must be stored, issued, handled, prepared, and served in a sanitary manner. (See par. 12*a*, AR 40–205). The food must be protected from sun, heat, dust, insects, rodents, and other damaging and contaminating agencies.

b. Bread and meat and other exposed foods must be transported in vehicles that are scrupulously clean. (See par. 12*b*, AR 40–205). Paulins should be provided for such transportation. Bread should be transported in covered bread boxes or clean bags, and should be kept in screened bread boxes at the mess. Whenever practicable in the field, a suspended bread container should be made.

c. Meat should be transported in bags of stout canvas, or comparable containers. These should be closed at the point of issue and kept closed until the kitchen is reached. The meat is then cleaned and cut up, and immediately stored in the refrigerator or icebox.

d. Cleanliness of clothing and equipment is essential in transporting frozen subsistence supplies from cold storage rooms. Rapid handling to prevent loss of refrigeration and exposure of frozen products to high temperatures is necessary. Loss of refrigeration can be reduced by covering trucks carrying such supplies with paulins and occasionally sprinkling the paulins with water. Frozen meats are defrosted only immediately before use. Meats must never be left exposed to heat, flies, or dust.

e. Meals should be prepared in such quantities that little left-over food remains, and the use of left-overs should be reduced to a minimum. A handy guide to the use of left-overs is: cooked foods other than bread, cake, and dry pastry, when kept in an efficient refrigerator, should be used within 24 hours; when kept in field ice boxes, they should be used within 12 hours; when not kept in refrigerators of any kind, they should be used in the next meal. In any case, cooked left-over foods will be thoroughly recooked before serving. Hash, except corned beef hash, should be prepared only from fresh foods. (See par. 12*c*(3), AR 40–205.) Protein foods and salads (potato and egg) should not be prepared more than 4 hours before serving and, unless hot, should be kept in a refrigerator until served. Sliced cooked meats, ground meats, ground cheese, ground boiled eggs, and peeled boiled eggs should be prepared immediately before use. The use of ground meats and eggs or cheese spreads as sandwich fillers is dangerous unless the foodstuffs are prepared immediately before use. Sandwiches prepared for troops for future consumption should be made of jelly, jam, butter, sliced cheese, and sliced meat, and no mayonnaise or other cooked dressing should be used with them. Meat and cheese filler, when thus used, should be covered on both sides with a ground pickle mixture containing vinegar.

f. Certain containers and utensils in the mess must be used with care. Contrary to popular notions, foods may be allowed to remain for limited periods in the tin cans in which they are packed by commercial packers. The galvanized containers in the mess kitchen may be safely used for the temporary transportation and storage of water and dry foods, and for washing and temporary storage of roots and tubers (carrots, potatoes, turnips) after they are peeled. Galvanized containers, however, should never be used for the preparation or storage of fruit or vegetable salads, or acid drinks (lemonade, tea, coffee, fruit juices). The use of food containers and cooking utensils which are plated with cadmium on surfaces in contact with food is absolutely forbidden.

75. Mess Personnel, Medical Inspections, and Cleanliness

a. Strict sanitary precautions must be observed by all mess personnel. Any personnel showing signs of infectious disease should be immediately relieved of their duties and ordered to report to the medical officer for examination. All permanent food handlers and prospective permanent food handlers are required to be examined by a medical officer and certified to be free of venereal, respiratory, intestinal, or other communicable diseases in the transmissible stage. Unit commanders report in writing to the station or organization medical officer the names of prospective permanent food handlers in their organizations. The station or organization medical officer will take steps to have these men examined and will report the results to the unit commander, recommending that those found unsuitable be relieved from their duties in the mess.

b. Although temporary food handlers are not required to be examined, they should be observed closely for evidence of communicable disease. If any evidence of illness, particularly colds or other respiratory diseases, or diarrhea or other intestinal diseases is found, the individual should be relieved from duty at once.

c. All men on duty in kitchens and mess halls, whether permanent or temporary, must be clean. They must bathe frequently, wear clean clothing, keep their hands and nails clean, and their nails trimmed short. All food handlers should be encouraged to wash their hands frequently, and required to do so immediately after visiting the latrine. Convenient facilities for washing should be provided when practicable. Personnel should be required to shave daily and to keep their hair trimmed short. In warm weather, they should be required to bathe daily, and to change underwear daily or oftener. Cooks should wear caps, whenever practicable, to prevent hair or dandruff from falling into the food. Under extreme field conditions, some of these sanitary precautions become impossible; however, they should be observed to the fullest degree possible.

76. Mess Area

a. The primary purpose of policing the mess area is to eliminate possibilities of contamination by pests of all kinds through the removal of all materials favorable to their breeding and continued existence. The area should be selected with attention to proper drainage, to prevent the accumulation of stagnant water or the presence of moist soil in which pests may breed. Such other possible breeding places as garbage pits, latrines, soakage pits, etc., should be kept at a distance.

b. Flies. (1) The most common and most persistent pest is the fly. These insects feed upon filth and waste materials, and breed in warm, moist places, polluted by animal manure, human excreta, and fermenting vegetable waste. Flies can transmit to man, by contaminating his food, the organisms causing typhoid and paratyphoid fevers, dysentery, epidemic diarrhea, and many other diseases. Under ordinary conditions the fly remains within several hundred yards of his breeding place, but under favorable conditions may range several miles in search of food. A fly is attracted to well-lighted places, avoids dark areas, and tends to rest on vertical surfaces and hanging objects. Successful control measures are based upon these habits. By the careful removal of possible breeding places, the careful construction of latrines, garbage, and soakage pits, manure heaps, etc., and by the treatment of soiled areas with larvicides, crude oil, or soap suds, the multiplication of flies can be largely prevented. Energetic measures taken to destroy adult flies by means of traps, fly paper, fly poisons, fly sprays, and fly swatters, and to keep them from the food and food utensils by proper screening will reduce the fly as a menace to health. Fly control can be furthered in the Army mess by closely observing the following general rules:

(*a*) Keep doors closed, never propped open.

(*b*) Keep window screens tightly fastened.

(*c*) Keep fly traps freshly baited and cleaned.
(*d*) Use fly paper and fly tape.
(*e*) Use sprays.
(*f*) Keep swatting.
(*g*) Garbage belongs in tightly covered cans, *not* on the ground or on the rack.
(*h*) Repair all screens and screen doors promptly when needed. See that they fit snugly, allowing no unprotected space for flies to enter.
(*i*) Keep all food covered.
(*j*) Dispose of all stale food promptly.

(2) The bait chamber of the fly trap is the lower and darker part into which flies are attracted by the odor of the bait. The trap chamber is the upper part and is separated from the bait chamber by a screen cone, ending in a small opening through which the flies crawl upwards toward the light after having fed on the bait. The trap may be of various shapes and materials, but the principle of its construction is the same for all types. The following fly bait, recommended for general use, has been tested and found satisfactory. The necessary ingredients are found in nearly any Army mess.

Cereal (cornmeal, oatmeal, wheat cereal)	1 pound
Molasses or syrup	½ pint
Water	1 quart
Yeast	½ ounce

Mix water and molasses or syrup, bring to boil, stir in cereal. Allow to cool. Add yeast and let stand in a warm place for a few hours before using. A few drops of vanilla extract added to the bait helps increase its efficiency.

c. Roaches and ants. Although roaches and ants are not known to be agents for the transmission of insect-borne diseases, they are a serious nuisance and may transmit intestinal diseases by contaminating food. Cleanliness in the mess and protection of food supplies in proper containers will do much to eradicate them. Spraying cracks and corners of cabinets and walls, particularly around water pipes, with issue liquid insecticide will destroy roaches. It is best to spray at night; but care must be taken to prevent spoiling the food with the spray. Ants can be eradicated only by locating and destroying their nests and by pouring kerosene or boiling water into them.

d. Rats and mice. Rodents can be controlled either by destroying them through the use of traps or poison, or by ratproofing the building or storing food in containers that are ratproof. Poison is an effective measure against rats, but since most rat poisons are injurious to human beings, extreme care must be taken in using such preparations. Trapping is an effective measure, but one which requires some skill and a good deal of labor. The most effective measure, whether in field or garrison, is to store foodstuffs, in rodentproof containers, or rooms. (For further particulars, see paragraph 179–196, FM 8–40).

e. The selection of the kitchen bivouac and mess sites in the field is determined by many factors. As many sanitary precautions against the contamination of food as are practicable should be considered when selecting kitchen bivouacs and mess sites in the field. Certainly, refuse, scraps, soiled containers, empty milk cans, etc., should not be left exposed to attract flies; they should be buried in approved type garbage pits. In the garrison, the mess area should be well drained by proper grading and trenching, and standing water should be eliminated as rapidly as possible. Particular attention should be paid to areas at the entrances and exits, under buildings, and around garbage stands.

77. Buildings and Equipment

a. Kitchens, mess halls, and mess equipment must be kept thoroughly clean if proper sanitation is to be maintained. Buildings used for mess purposes are required to be securely screened, with screen doors and window screens tightly in place, and with doors fitted to close automatically. Under no circumstances should screen doors be allowed to stand open or partly open. All food receptacles, dishes, and tableware are required to be protected against insects when not in use. (See AR 40–205.) Kitchen and mess hall wall sheathing, floors, and doors should be kept constantly clean. Rafters, windows, and screens should be cleaned weekly. Floors of mess halls may be treated with floor oil, wax, or the like, when desirable, but are also scrubbed with soap and water at suitable intervals.

b. Buildings and furniture. (1) The required sanitation of the mess kitchen can be maintained only by painstaking attention to many details. Floors, pipes, metal wall guards, serving counters, tables, sinks, and racks should be washed, scrubbed, or otherwise cleaned after each meal. The sink grease trap should be cleaned daily.

The meat block should be scraped, brushed, and cared for daily. Food preparation tables should be cleaned after each use. The bread box should be washed, scrubbed, and thoroughly dried daily and, whenever possible, it should be sunned.

(2) In the stock room, the shelves, bins, and floors, should be kept free of dirt, dust, and spilled food and should be washed and thoroughly dried at least once a week.

(3) Refrigeration chambers provided for consolidated messes are normally moist, but under no circumstances should water be allowed to stand on the floors. The racks in such chambers should be washed daily, and the chambers themselves should be periodically cleaned.

(4) In the mess hall, the overhead lights and shades and the walls and doors should be kept scrupulously free of dust and grime. The tables and floors should be scrubbed after each meal. If the tables are varnished, they should be washed with soap and water, but not scrubbed. The composition board tops of tables, if treated with varnish or liquid cellophane, can easily be kept free of food stains. Windows and screens should be washed weekly.

c. EQUIPMENT, UTENSILS, AND TABLEWARE. (1) Mechanical equipment, such as meat and vegetable slicers and grinders, dough mixers, bread slicers, steam kettles, pressure cookers, and baking machines should be cleaned and cared for as directed in the booklets of instructions that accompany the machine. In general, such mechanical kitchen apparatus can be cleaned with hot soapy water if care is exercised to protect the electrical parts of the machines. Heavy abrasives should not be used on highly polished, enameled, or aluminum surfaces. For a more detailed discussion of this, see paragraph 74, TM 10–405.

(2) Utensils such as boilers, dippers, meat forks, ladles, skimmers, and basting spoons should be washed, scoured with mild abrasives if necessary, scalded, and air-dried (sunned, if possible) after each use. Small utensils should be similarly cleaned. Abrasives should be rarely used on Monel metal or aluminumware, and when used, must be used with care; heavy abrasives or metal wools should *never* be used. Baking pans should never be scoured, but should be washed in hot water and air-dried. Particular attention should be paid to spaces where food might collect, such as those between the prongs of forks, at the junction of handle and blade of knives, etc. Black iron pans must be thoroughly cleaned so that no food particles baked on them can later contaminate or discolor foods. Kitchen ranges should be polished and cared for daily.

d. DISHWASHING METHODS. All utensils, dishes, tableware, mess trays will be thoroughly washed and disinfected immediately after each meal by one of the following methods (dish towels should not be used for drying):

(1) By dishwashing machines in which the washing period is not less than 40 seconds, with the temperature of the water held at 140° F. or higher. This must be followed by a 20 second rinsing in water at a temperature not less than 180° F. Use commercial dishwashing machine compounds. Soap will gum the inside of the machine and is unsatisfactory for machine use.

(2) Where dishwashing machines are not available, the dishes will be thoroughly washed and then carefully rinsed in hot water at 120° to 140° F. Following this, they will be rinsed or immersed in hot water for 30 seconds at 180° F. if the heat is controlled by an adequate thermostat or thermometer. If not, they will be immersed in boiling water for at least 1 minute and then removed and allowed to air-dry.

(3) When proper facilities are lacking to provide adequate amounts of water at 180° F. for cleaning and disinfecting mess equipment and mess kits, the use of Compound, Germicidal Rinse (Stock number 51–C–1616) is recommended. Regardless of weight, the contents of one unit in 25 gallons of rinse water is sufficient to disinfect mess equipment and kits of 200 men in a continuous rinse period.

(4) When the cleaning of mess kits by the individual soldier is necessary, three suitable containers provided with the M1937 field range of such galvanized iron cans or tin boilers will be provided. The first receptacle will contain hot soapy water, and the others will contain clear rinse water to be kept boiling during the entire period it is being used. Each soldier will clean his mess kit by scraping the residual food with his spoon into a suitable receptacle. Then he washes the equipment carefully, using the long-handled brushes provided, in the first can of soapy water, then rinsing it in the second and third cans. After the final rinsing, the equipment will

be well-shaken and air-dried. Dish towels will not be used. Where facilities for heating the water adequately cannot be provided, the rinse water will contain a wetting agent and at least 50 parts per million of available chlorine.

78. Waste

a. General. Kitchen waste consists of the food remnants accumulated after meals and in their preparation (solid wastes), the water in which kitchen utensils and mess gear have been washed (liquid waste), and the tin cans, paper cartons, ashes, and sweepings which accumulate in the process of preparing food (rubbish).

b. Waste disposal. Kitchen wastes are disposed of by garbage collection service, by incineration (burning), or by burial. Usually in posts, camps, and stations of a permanent character, waste is collected from the individual kitchens in suitable vehicles and disposed of by the collecting agency. If garbage carts of approved design are available, the kitchen waste cans are emptied at the kitchen; otherwise, they are taken off and returned when emptied. Where suitable means of collection are not available, incinerators are used by each kitchen. In bivouac of short duration, waste may be buried in trenches.

c. Classification of waste. (1) Food waste is separately classified as follows:

(*a*) Bread, including all unfit for human consumption.

(*b*) Cooked meat, including all scraps collected from plates after meals.

(*c*) Raw fats and meats, including—

1. Trimmings and raw scraps rejected for use as food.
2. Meat condemned by health authorities as unfit for human consumption.

(*d*) Cooked grease, including that discarded as having no future value.

(*e*) Bones, including those discarded as well as those used in the preparation of food.

(*f*) Other miscellaneous food waste fit for animal food.

(*g*) Miscellaneous waste food injurious to animals such as coffee grounds, tea leaves, citron rinds, banana peels and stalks, and fish heads and scales. Other items include ashes, tin cans, empty glass bottles, other glass containers, and broken glass, and waste paper including that from barracks.

(2) This elaborate classification is made necessary by salvage operations. Glycerine for war uses is derived from bones and grease. Meat trimmings, ground bones, and cracklings are used for manufacture of poultry food and fertilizer. Edible waste is used for hog feeding. Tin cans supply scrap metal and tin. Glass containers, boxes, cartons, egg crates, etc., are sold for reuse.

d. Garbage cans. When the garbage cans are emptied into approved collection trucks, the cans must be cleaned by the unit kitchen personnel. Garbage cans at the unit mess must be tightly covered and set upon stands of approved design. Cans must not be whitewashed. The best garbage stands are built in the form of a solid concrete block with a center wall of stone and earth, and with an apron of 12 to 18 inches of concrete at the base. The stand may be from 1 foot to 44 inches in height. The highest stands must be supplied with steps, but they are at the level of truck floors to facilitate the transfer of cans. When concrete is not available, wood stands of substantial construction should be built with the flooring strips at least 1 inch apart. Cans should be marked to indicate contents. The immediate area surrounding the cans must be well drained.

e. Liquid waste accumulated in kitchens of post, camp, or station is poured into the sewer system. Otherwise, soakage pits of approved design must be constructed and used. (See pars. 78, 79, 80, and 81, FM 8–40.) When soakage pits are necessary in camps of long duration, two should be constructed for each kitchen for use on alternate days. Once a month each pit should be given a rest period of 1 week. Soakage pits should be located at a convenient distance from the kitchen if soil conditions are favorable; otherwise they must be placed where good drainage can be secured. Porous, sandy, or loamy soil is suitable; clay is not. Soakage pits should not be placed where they can contaminate the sources of drinking water.

79. Field Incinerators

Field incinerators are of various types, the inclined plane, and the barrel and trench types being most frequently used. The principle of operation is the same for all types. The incinerator provides a means by which the garbage is dried out before it reaches the fire so that it

will be combustible when it does. The incinerators provide a fire chamber with an easily accessible firing place and a chamber in which garbage is dried and ultimately burned. The best type for company use is the barrel and cross-trench type, consisting of a barrel like stack placed over the intersection of cross trenches. The trenches, about 1 foot wide and 10 feet long, cross at their centers. Each trench slopes from the surface of the ground to a depth of about 10 inches at the center. The barrel stack, supported by scrap iron bars or sheets and made of stone, clay, or bricks, is about 4½ feet in diameter at the bottom and 3 feet at the top. Either at the bottom of the barrel or about 6 inches above, grate iron, made of iron pipe or rods, are inserted to hold the unburned garbage of the fire. Galvanized iron garbage cans or oil drums with the ends knocked out may be used for the barrel stack of the incinerator.

80. Soakage Pits and Grease Traps

The soakage pit is a device to permit rapid disposal of water through the soil. It is about 4 feet square and 8 feet deep, and is filled with rubble, bricks, or empty flattened tin cans covered with about 4 inches of fine soil. It is equipped with a grease trap to prevent clogging the pit. A vent pipe provided in one corner and extending about 6 inches above ground will minimize odors. The grease trap is merely a device to separate grease and food particles from the water. It may be a pail or oil drum, with holes punched in the bottom and filled with a filtering material such as grass, hay, or straw. Or it may be a baffle trap, which works on the principle that grease floats on water. Two chambers are provided, separated by a partition that extends from several inches above the outlet level in the second chamber to about an inch above the bottom of the first chamber. The liquid waste is poured into the first chamber through a strainer which removes the coarse debris from the liquid. The grease floats to the top and solidifies; the clear water flows under the baffle and out the outlet pipe. The solidified grease, prevented by the baffle from reaching the outlet, is removed and disposed of. (For further particulars, see pars. 78, 79, 80, and 81, FM 8–40.)

SECTION IX

MESS EQUIPMENT IN GARRISON AND FIELD

81. General

The chief difference between messing garrison and in the field is in the equipment used. The fundamentals of cooking are the same. The equipment, wherever used, must be cared for and utilized properly.

82. Basis of Issue

Mess equipment is issued as provided in the Tables of Equipment and Tables of Basic Allowances for the particular unit. At post, camp, and station, additional equipment is provided by tables of allowances. Certain fixed kitchen equipment such as mechanical dishwashers and mechanical mixers, used in consolidated messes, may be purchased from company funds or issued under Table of Allowances.

83. Purchase of Equipment

When certain mess equipment and labor-saving devices are not obtainable from the quartermaster, they may be purchased from the company fund. (See AR 210–50.) When Tables of Allowance equipment is needed immediately and is not available at the post quartermaster, it may be similarly purchased, providing vouchers for such purposes are supported by a certificate from the quartermaster or other supply officer stating that the equipment was not available. (See AR 210–50.) Price lists of kitchen and mess utensils are published in table II, AR 30–3010.

84. Requisitions

a. Initial issue of equipment is based upon the T/E and T/A. Usually, requisitions for new equipment are made quarterly within the breakage allowances provided in the tables mentioned above. Requisitions for kitchen utensils must contain the following information:

(1) The estimated cost.

(2) The strength of the command.

(3) The organization for which they are required.

(4) A statement whether supplies are required for initial use or replacement.

(5) Other pertinent information. Requisitions for chinaware, glassware, and tableware will indicate, in addition to organization strength, the actual number of men served.

b. The procedure to follow in requisitioning of supplies, other than subsistence, and equipment is outlined in TM 38–403, 1 August 1944.

85. Limitations on Requisition and Purchase

Observation has shown that the "cafeteria" method of serving is more satisfactory than the old "family style," for saving time and necessary equipment. As an instance, where 1,000 men are served in one cafeteria line, only 500 pieces of tableware are required. Men can be served at the rate of 12 per minute. Since each man spends, on the average, 15 minutes at the table, there is a 25-minute interval after the first men finish their meal before the original supply of equipment is exhausted. During this time the articles used by the men who are first to finish are returned to the dishwashing room, sterilized, rinsed, dried, and put back into service. From this point on the turn over is fast enough to take care of continuous serving, regardless of the number of men served or the length of time they spend in eating.

86. Care of Ranges and Cooking Utensils

a. Responsibility. While it is essentially the responsibility of the cook to keep the kitchen equipment in good condition, the mess officer and sergeant must be aware of the necessary factors involved. To get the best results from cooking, the equipment must be kept in the best condition possible.

b. Ranges. (1) *Army Range No. 5.* (*a*) The Army Range No. 5, a common variety of coal

stove, is the type most frequently installed in garrison kitchens. Frequent firing is necessary to provide an even heat with a small consumption of coal.

(*b*) Ashes under the firebox should be cleaned out frequently, several times a day if necessary.

(*c*) The oven should be swept out and the top and outer surface of the range and stovepipe rubbed with a greasy cloth daily. This daily rubbing keeps the range in better condition than stove polish applied at weekly intervals.



Figure 3. Loaded kitchen truck.

(*d*) The range should be thoroughly cleaned out once a week. Remove the top and sweep the top of the oven, protecting the casing plates. Remove the soot with a scraper through the flue doors. The mantel should be wiped often with a damp cloth and, when necessary, washed with soap and water. This prevents dishes from picking up dirt and grease, thus soiling the tables.

(*e*) Never maintain an intensely hot fire, for hot water piping and the top sections of the range may be damaged, and foods may become scorched or overcooked.

(2) *Army field ranges.* (*a*) There are three types of field ranges in use: Army Field Range No. 1, Army Field Range No. 2, and Army Gasoline Field Range M–1937. Since M–1937 can be operated with wood, if necessary the cooks, as well as the mess officer and mess sergeant, must be trained in the handling of wood fires and the gasoline burner. Usually too much heat is used with the gasoline burner, and difficulty is experienced with the wood fire when one is not accustomed to it.

(*b*) *Army Field Range No. 1.* A detailed description can be found in paragraph 77, TM 10–405.

(*c*) *Army Field Range No. 2.* A detailed description can be found in paragraph 77, TM 10–405.

(*d*) *Army Field Range M–1937.* Army Gasoline Field Range M–1937 is a compact burner type range designed to perform a variety of cooking operations. It provides cooking capacity for approximately 75 men to the unit, and is normally issued 3 units to the company. It contains the cooking pots and pans as integral parts of the unit. The range is composed of a cabinet, a separate fire unit, various size cooking pots, and a roasting pan, the cover of which when inverted becomes a griddle. The roast pan is also used for deep-fat frying and baking. The fire unit may be used separately or in any one of three positions in the cabinet. Thus the whole equipment is not only compact, but readily adaptable to various cooking uses. A separate fire unit is provided for heating water. The fuel used is preferably unleaded gasoline, but leaded gas can be used if the burners are kept clean and the filters changed daily. The allowance of fuel per fire unit per day is 3 gallons. In field use, the range has held up well when properly cared for.

(*e*) *Rebluing.* Daily use in the mess causes the

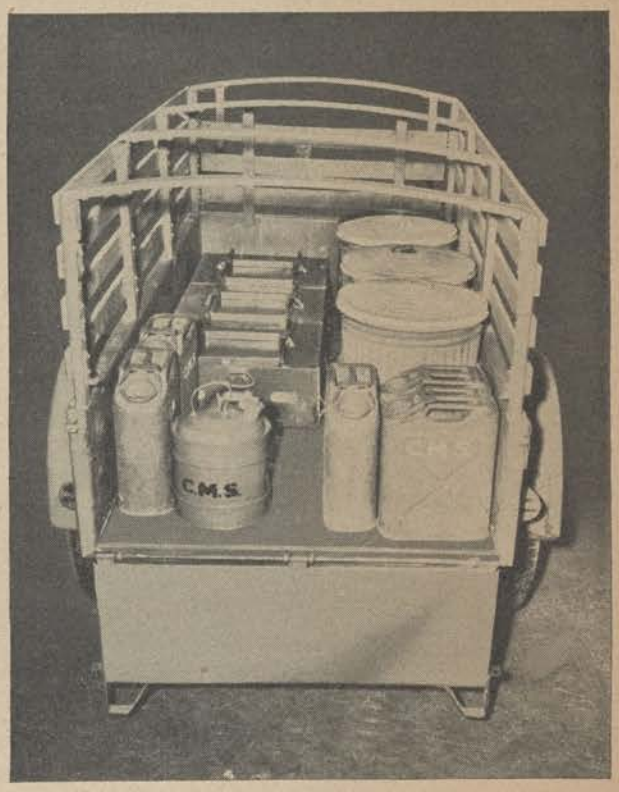


Figure 4. Loaded kitchen trailer.

burned-in coating on black iron roasting and baking pans to wear off, this is indicated by shiny, light-colored areas. When this occurs the pans should be washed, dried, and reblued to prevent rusting. The pans should be thinly coated with lard or lard substitute when dry, then placed in a medium oven (325° to 400° F.) for about 1 hour. They should be inspected frequently while in the oven. When they acquire a dark, blue, gunmetal color, they should be removed. Too much heat will cause the tin to melt. Pan burning will be greatly accelerated if a reasonable amount of steam is used. After the pans are removed from the oven, while still warm, they should be greased with melted grease. Pans should never be used before burning. The coating of lard burns-in and gives a smooth, glazed surface, closing up the tiny pores in the metal and preventing rust. The process is called "bluing" or "rebluing."

87. Kitchen Truck

a. To provide kitchen facilities for a unit on the march, a "kitchen truck" is used. One of the 2½-ton cargo trucks provided for the unit is used as a kitchen truck. It provides space for the transportation of kitchen and mess equipment and some supplies, and makes cooking possible while the unit is on the march. A trailer may be attached to the kitchen truck to provide additional space for the transportation of equipment and supplies. The supply truck may also be used to carry additional items, such as G.I. cans, kitchen equipment, or subsistence supplies still in their original cases.



Figure 5. Inside of kitchen truck.

b. Some adjustments must be made to place kitchen equipment in the trucks. The two long seats in the body of the truck can be placed outside in the same relative position to serve as strong shelves for use in storing, preparing, or serving foods. The bows carrying the canvas top must be lengthened to provide overhead clearance for the personnel at work in the truck. Provision must be made for drainage from the ice box if it is carried in the truck. A box for storage of cooking tools is needed, and a food preparation shelf or table must be provided. A set of steps made of wood or of metal and wood provides easy access to the truck body. A bread box and one improvised ice box should also be provided.

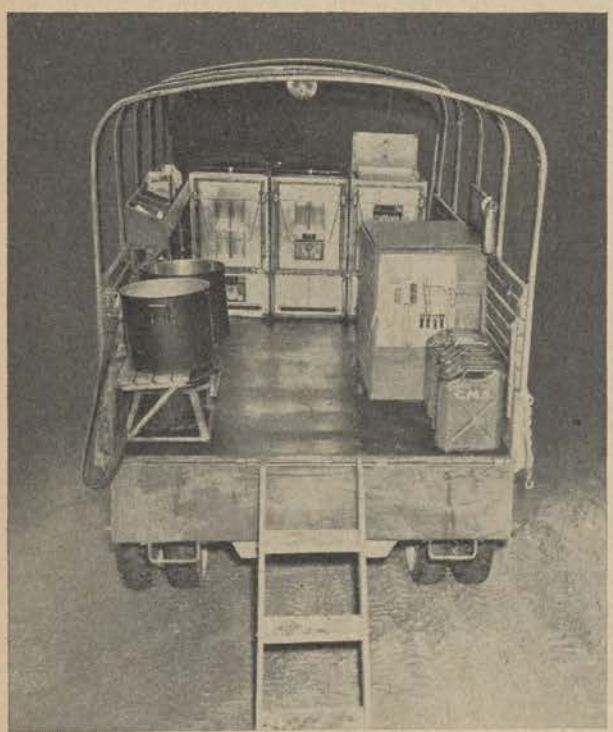


Figure 6. Inside of kitchen truck.

c. The arrangement of the kitchen equipment on the truck varies and depends on the working habits of the mess personnel. It is set up in a fashion determined by the convenience and efficiency of operation. Ordinarily, two or three gasoline ranges are carried: If two, they are placed along the left side of the truck just back of the cab; if three, across the truck just behind the cab. These are chained and blocked into place to prevent shifting. A box for kitchen spoons and cutlery, the bread box, and a box for nonperishable supplies are usually combined in one cabinet running along the side of the truck, so built to provide a flat top for food preparations. Bin dimensions should not exceed 2½ x 21½ x 6 feet, and should be provided with supports to raise it above the floor. The improvised ice box is usually located in the trailer, if a trailer is provided. The ice box itself, either single or double wall, is limited in size to 3 x 3 x 5 feet because of the dimensions of the trailer. If the box is carried on the truck, it is placed along the side wall opposite the cabinet provided for storage of nonperishable supplies, bread, and kitchen tools. The tool kit for the range units and the fuel containers for range units and for the truck are usually bolted to the outside of the truck. Additional equipment is stored in the trailer or in the truck wherever it is convenient.

88. Field Ice Box

a. In the garrison kitchen, the ice box or refrigerator provided is usually one of a familiar type. In the field, however, an underground ice box or cooling box is the usual article employed for refrigeration purposes. This underground ice box is simply a buried double-walled box. It is made by placing a smaller packing box within a larger one, packing the space between the two boxes with sawdust, grass, hay, or straw, and providing lids to both boxes and a drain pipe through the bottom of both. A hole is dug in the ground, deep enough to hold the ice box and to provide a small soakage pit below it. The box is put in place and a drainage ditch dug around it to keep surface water out. If ice is used, the box may be divided into two compartments, one for ice and one for food; or shelves may be fixed in such a fashion as to keep the foodstuffs from direct contact with the ice. Similar ice boxes are used on troop trains and kitchen trucks.

b. A second type of field ice box consists of three plywood panels, 4 x 8 feet, and two panels, 4 x 4 feet. These panels may be readily assembled to make an open box, 4 x 4 x 8 feet. This box is sunk in the ground (as described under *a* above), and covered with a wet blanket. The refrigeration is supplied by the frozen meats provided in the ration, for when these meats leave the railhead cars they are 20° colder than ice. They take 24 hours to thaw and in the thawing process provide sufficient refrigeration to cool the box to temperatures considerably below air temperatures.

SECTION X

MESSING EN ROUTE

89. Messing on Troop Trains

a. In continental United States troop movements are made chiefly by rail. When the number of troops and the distances to be traveled warrant it, the troops are fed from accompanying kitchens operated in kitchen cars and staffed by the regular mess personnel. By arrangement with the railroads, baggage cars or other suitable cars are provided in which the kitchens and kitchen equipment may be installed and the rations carried.

b. Cars are provided for trips of not less than 24 hours' duration. Different provisions are made for troops and for cadres (small groups of troops traveling to a specified place to accompany or convoy a larger number of troops, or returning from such duty).

(1) For troops traveling within continental United States, one kitchen car is provided for each 250 troops or fraction thereof, provided that the group is not less than 100. For groups between 100 and 250 which originate at different points to be consolidated at some intermediate point on the journey, a kitchen car is provided at each original point of departure and is carried through to the destination.

(2) For cadres, 1 car is provided when the cadre number 27 or more persons, traveling on tickets or fares good for sleeping car service (not coach fares). If the cadre number less than 27 persons, a car will be provided upon payment of 27 fares. (See AR 55–135.)

c. Travel orders state whether troops are to be subsisted from kitchen cars, or otherwise. When the commanding officer of troops ordered to travel requests transportation from the transportation officer, he accompanies his written request with a copy of the travel orders, and usually asks that the cars to be used for kitchen purposes be provided 2 days in advance. It requires nearly that much time to install the kitchen equipment.

90. Kitchen Car (figs. 2 through 8).

Regulations refer only to a baggage car, but box or freight cars are sometimes used when baggage cars are not available. The baggage car is to be preferred, since it is larger, is more nearly fireproof, has end doors to permit easy traffic to other cars, has openings in the roof to allow venting the smoke pipe without cutting holes, and has electric lights. The car is best placed in the train between the coaches containing the men to be served.

91. Mess Equipment for Kitchen Cars

a. Usually, for movements of troops from induction and reception centers to other posts, camps, and stations within continental United States, the necessary kitchen equipment is secured from the post quartermaster property officer on memorandum receipt. For movements of established units, the kitchen car is normally equipped with the unit's own T/BA equipment.

b. The following is a check list of the equipment needed:

(1) Army field ranges, with their parts and equipment.

(2) Sand or dirt and boxes for base of Army Field Range No. 1 or No. 2.

(3) One 5-gallon gasoline can with each M–1937 range set. Three such cans of gasoline may be furnished for each gasoline range in the kitchen car, with a maximum number of nine cans in any one car. A reserve supply of gasoline may be carried in a boxcar adjacent to the kitchen car, or other boxcar, in a mixed troop train. This reserve supply is limited to eight 5-gallon cans.

(4) Carbon tetrachloride fire extinguishers and buckets of sand (one 1-quart extinguisher and

one bucket of sand for each set of three cabinets of the M–1937 range).

(5) Cleaning and preserving equipment and materials (soap, brushes, brooms, mops, and rags).

(6) Ice box (to be built).

(7) Work bench (to be built).

(8) Container for gasoline safety can (a wooden container, fixed to the floor as far removed from the range as practicable, and fitted neatly to the 5-gallon gasoline can to keep it in place—one such box for each can).

(9) Splash floats for G.I. water cans (made of wood).

(10) G.I. cans, in addition to those furnished with range sets.

(11) Water buckets.

(12) Water pitchers, or other container for water.

(13) Stovepipe elbow, additional, as an extra or spare, and collar, if stovepipe runs through the side of a wooden car.

(14) Wire, 100 feet, for securing stovepipe.

(15) Lanterns and kerosene, if car has no light.

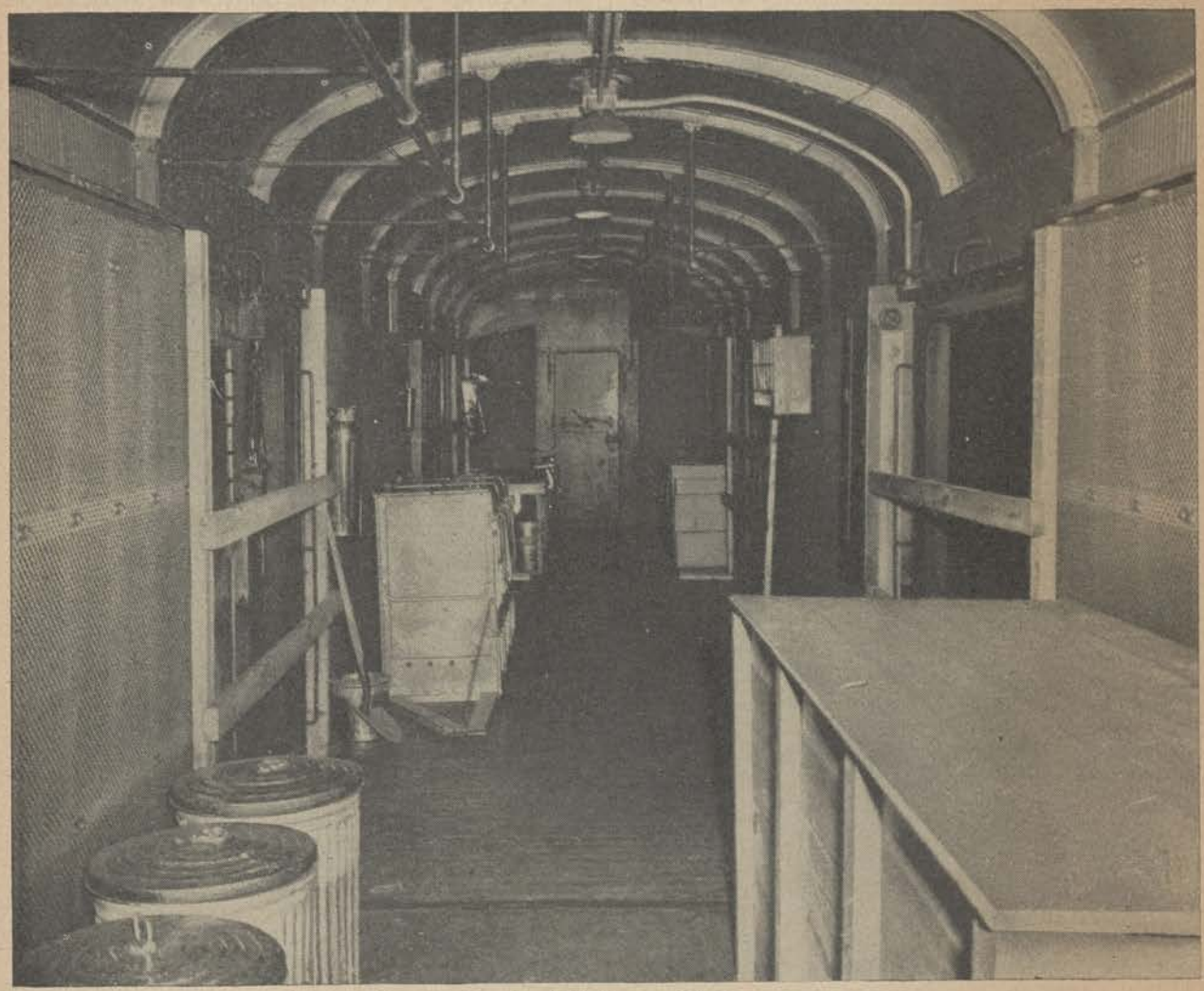


Figure 7. Interior of kitchen car with M–1937 range.

(16) Feeding baskets to carry sandwiches, etc., or any available container.

(17) Paper plates, bags, etc., to aid in serving food.

(18) Rations and subsistence supplies.

(19) Clean sugar, coffee, or flour sacks (cloth) for making coffee.

(20) Can opener, mechanical.

c. Three types of ranges are available for use in kitchen car, U. S. Army Field Ranges No. 1, No. 2, and M–1937. If ranges No. 1 or No. 2 are used, a dirt bed must be constructed on which they can be erected. The number of ranges provided is based upon the number of troops they are to serve. Usually one No. 1 range is provided for 100 troops, one No. 2 for 50 troops, and one battery of 3 cabinets of the M–1937 for 200 troops.

d. The ice box may be any easily built single- or double-walled box of sufficient capacity to store such perishable supplies as are needed. Its construction is similar to the construction of the field ice box.

92. Installation of Equipment

a. Floor plan. The arrangement of the equipment in the car depends upon the kind of range used and the type of car. When Field Ranges No. 1 and No. 2 are used, one-half of the car contains the range and the other half the remaining equipment. When the M–1937 range is used, one-half of the car contains the range and the cooking and serving equipment, and the other half the supplies, refrigeration, and food preparation bench. The equipment should be arranged with the convenience of cooking and serving in mind. When installed, all equipment is subject to the inspection and approval of a railroad representative. Reference for this installation is found in Circular No. 355, W. D., 26 October 1942.

b. Field Ranges. No. 1 and No. 2 (fig. 8). These ranges are installed in the center of one-half of the car and are set upon a dirt or sand



Figure 8. Interior of kitchen car with Field Range No. 1.

box. The box must be of such dimensions as to provide about 8 inches clearance around the back and sides of the range and about 2 feet at the front. It should be a foot deep, be elevated 4 inches from the floor, and be firmly secured to prevent movement. The box is filled with sand or dirt to provide a base for the range, each section of which is supported on bricks embedded in the dirt. The range is then tied down with metal straps and securely fastened to the box. A wooden railing is built around the box to prevent personnel from being thrown on the stove by the lurching car. If the car is wooden, a metal collar should be provided where the stovepipe penetrates the side wall or roof.

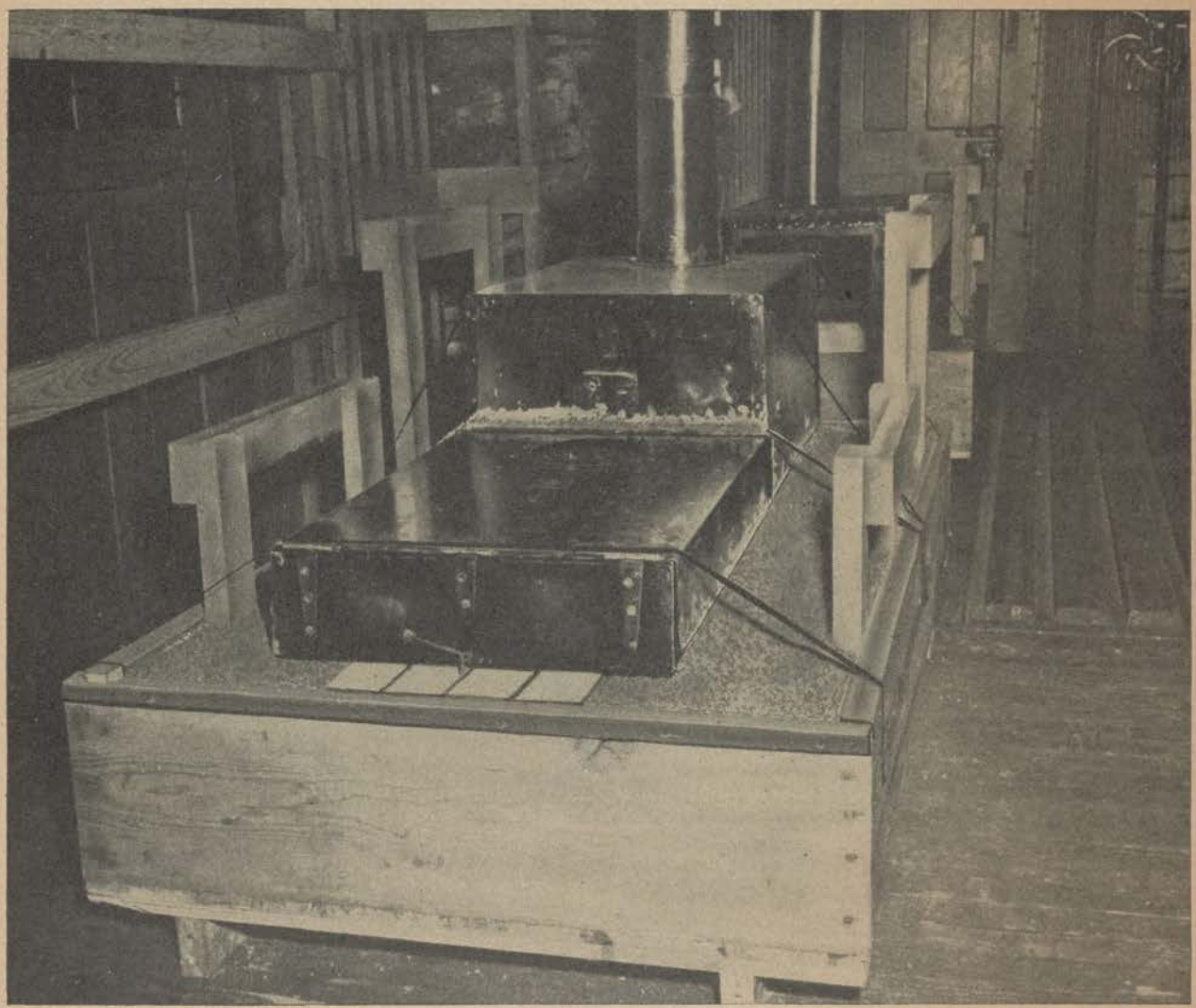


Figure 9. Field Range No. 1 in kitchen car.

c. Gasoline Field Range M–1937. The M–1937 range must be installed under the supervision of a commissioned officer. It is placed along the side wall of the car. In cars with wooden walls and floors the range is set up on a metal sheet, and placed 2 inches from the side wall. The metal sheet must be 20 gauge or heavier, and be large enough to cover the floor area under the ranges and extend 4 inches in the front. All cabinets of the range are securely lashed together in a battery and secured to the floor by strong chains and wooden blocks, which are fastened with 16-penny nails or lag screws, whichever will result in the least damage to the car floor. The wooden containers holding the 5-gallon gasoline cans used for the storage of reserve fuel are placed as far from the range as

possible. Installation of the auxiliary fire unit to heat water is prohibited. The unit may be carried as a spare part if securely fastened to the floor. The fire units of the range should be thoroughly inspected before they are installed to insure their operation. The boxcar containing the reserve supply of gasoline must be placarded "DANGEROUS." A label, 8 x 10 inches, reading "EXTRA GASOLINE FOR COOKING PURPOSES," beneath which appears the word "INFLAMMABLE" in red letters, will be placed below the placard marked "DANGEROUS." Care must be taken to prevent any other material in the car from sliding against the cans or falling on them.

d. UTENSILS, AND SUPPLIES. Racks or bracing should be supplied for all utensils and stored supplies to prevent their shifting during movement of the trains.

93. Rations

The ration issued for detachments or larger units of enlisted men directed to travel by train and to utilize the kitchen car facilities en route provided thereon will be a troop train ration. The train commander will submit to the sales officer at station of departure a copy of the order directing the movement on which order will be indicated the number of meals involved during the movement. On the basis of the movement order, the sales officer will issue the troop train ration as prescribed. In an emergency, when unforeseen delay en route exceeds 1 full day, additional subsistence items may be obtained from the emergency supply points by telegram as listed in Circular No. 219, War Department, 20 September 1943 as amended. The telegram dispatched by the train commander to the emergency supply points will state the time of arrival of train, train number, name of the railroad, and the number of breakfasts, dinners, or suppers of the troop train ration required. The components of the additional rations (meals) provided for subsistence for unforeseen delays en route will not be utilized



Figure 10. Serving food en route.

to supplement the normal meals. Officers and warrant officers in charge of or traveling with such troop movements may be subsisted en route at the cost of 25 cents per meal, collection therefor being made by the train commander. Rations for the feeding of the commissioned and warrant officer class of personnel en route will be drawn prior to departure on the basis of a copy of the orders directing the movement for the enlisted personnel. In an emergency the train commander may authorize the troop train railroad crew members to be subsisted en route. Collection for meals so furnished will be made at the same rate and in the same manner as for officers and warrant officers. To provide funds for the purchase of ice and, in an emergency, articles of subsistence, en route, the train commander will be furnished funds at the rate of 6 cents per ration (2 cents per meal) for the scheduled travel time, plus amounts at the same rates for all additional rations or meals provided for delays en route. Prior to departure, the train commander will submit two copies of the travel orders to the local disbursing officer who will make payment to the train commander in cash of the funds required on W.D., F.D., Form No. 12 or Standard Form No. 1034, furnishing two signed copies of the forms used to the train commander for use in preparation of his account.

94. Officers' Mess

The order directing the movement usually states whether a separate officers' mess will be operated en route. If one is not operated, officers are served from the troop mess. The sums collected from officer boarders will be at the rate of 25 cents per meal. These sums are collected by a commissioned officer and are covered by a voucher on which each officer boarded certifies that he has paid a certain sum for a stated number of meals. These vouchers are certified correct by the train commander.

95. Menus

The menu will be prescribed by The Quartermaster General, with the concurrence of the Commanding General, Army Service Forces. This menu will be based upon the sedentary employment of troops traveling by train.

96. Serving

If the kitchen is set up in a baggage car, meals can be served while the train is in motion; otherwise they can be served only at stops, which must be provided for in advance by arrangement with the railroad representative. At such stops, the kitchen waste may be disposed of. There are various ways of serving meals while the train is in motion. Sandwiches and coffee can be carried through the car in feeding containers, and served to the troops in their seats. Chow lines can be established, with the troops moving to the kitchen cars to be served in their mess kits and returning to their seats to eat. In this case, provision for cleaning and washing the mess kits must be supplied in the car vestibules. This method is awkward, and the least preferable. The best method is to serve the food to the men in their seats. (See fig. 10.) The troops of one car are fed a complete meal before serving begins in the rest. Those in the car furthest from the kitchen car are served first. The serving in each car is supervised by the car leader. If mess kits are used, they may be washed in buckets set up in the vestibule of the car; there are four buckets, usually 14-quart size, one for garbage, one for hot soapy water, and two filled with hot clear water for rinsing. If paper plates and cups are used, the problem of washing equipment is greatly simplified. Provision must be made, however, in the car for the disposal of garbage and paper plates separately. After each meal each car, including the vestibules, is carefully policed under the direction of the car leader. (See fig. 11.)

97. Mess Personnel

a. The preparation of all meals is under the supervision of a mess officer. He inspects the perishable foods twice daily and inventories the food stores daily to prevent shortage. The enlisted personnel of the mess are appointed, given a medical inspection, and informed of their particular duties before the trip begins. The personnel consist of the following:

(1) A mess sergeant for each kitchen car.
(2) One cook for each 30 men.
(3) One K.P. for each 50 men.
(4) One ration carrier for each 30 men.
(5) One car leader for each car.

As a rule, the mess sergeant, car leader, and cook are noncommissioned officers, the K.P.'s and ration carriers are privates.

b. The mess personnel are instructed that the fire unit of the M–1937 range is to be refilled only

when a commissioned officer is present, when the train has stopped, and when there is no fire in the car. Preferably, the unit should be taken outside the car when being filled. They should also be warned that the carbon tetrachloride fire extinguisher will give off deadly fumes when used. Personnel should get out of the car as soon as possible after extinguisher is used unless all possible ventilation is provided.



Figure 11. Policing car after meal.

98. Mess Accounts

The train commander will be required to account for subsistence and funds by means of a sales account as prescribed in AR 35–6660, except as modified by Circular No. 341, W.D., 29 December 1943. A separate sales account will be prepared for each journey and the account submitted promptly upon termination of the journey to the commanding general of the service command (Attention: Fiscal Director) in which the station of departure is located for audit. Prices to be used for accounting purposes will be those current at the station of origin, regardless of where supplies are procured or disposed of.

99. At Destination

Upon arrival at the destination, the train commander presents his accounts and supporting vouchers through the commanding officers of the point of destination to the finance officer who audits them. Kitchen and mess equipment, if not T/BA equipment, is turned into the local quartermaster after it has been properly cleaned. The quartermaster will issue a credit memo-

randum for this equipment. Any excess nonperishable subsistence stores in broken containers are turned in to the local sales officer, who will receipt for them on shipping tickets made out in triplicate; one copy is retained by the train commander, one copy accompanies papers for audit, and one copy is forwarded to home station service command finance officer.

100. Meal Tickets

Meal tickets are ordinarily issued in all movements when one or more enlisted men are moved under orders and rations in kind are not furnished.

SECTION XI

MESS ACCOUNTS AND RECORDS

101. General

a. The keeping of mess accounts is a function of command. They are usually kept by the mess sergeant under the supervision of the mess officer.

b. Mess accounts are kept by the unit mess for three purposes:

(1) To keep an accurate record of the physical subsistence supplies received and used.

(2) To keep an accurate record of the credit and financial standing of the mess.

(3) To maintain a check against wasteful and careless use of subsistence supplies.

c. The money and credit income of a mess is derived from ration credits established at the commissary on the basis of ration returns and collected from occasional boarders. Stock on hand is determined from either a daily record of supplies received and used, or the trimonthly inventories taken on the tenth, twentieth, and last day of the month. The stock used is determined by a careful breakdown of the dishes served at each meal to show the precise ingredients that go into their preparation.

102. Garrison Ration Accounts and Records

Under the garrison ration system the following accounts must be kept:

a. By company mess. The Monthly Mess Account, W.D., Q.M.C. Form No. 469. (See fig. 12.) Additional improvised accounts may be kept by the individual mess for its own convenience.

b. By consolidated or general mess. The Daily Stock Record, W.D., Q.M.C. Form No. 340. (See fig. 13.)

103. Monthly Mess Account

The Monthly Mess Account, W.D., Q.M.C. Form No. 469 is the basic account kept by the mess. The primary purpose of the account is to keep the mess within its income. The account itself is kept in money value, but the back of the form provides, in a stock record account, for the trimonthly inventory taken to check both the use of the mess stocks and the accuracy of the money value record in the monthly mess account on the face of the form. The entries on the face of the form are made daily, usually in the afternoon after supplies have been received and a new shift of cooks has come on duty. Although this form is not required to be kept by the consolidated or general mess, it might be convenient to keep as a means of checking the ration savings due at the end of the month.

104. Preparation of Monthly Mess Account

a. Garrison ration. Mess accounts for an organization operating on the garrison ration are recorded daily on W.D., Q.M.C. Form No. 469 (Monthly Mess Account). The heading of this form is self-explanatory. (See sample forms figs. 12 and 14.) The value of the ration will be obtained from the quartermaster (sales officer) each month as shown on the price list of subsistence stores. Value of stock at the end of the previous month will be the actual value of all subsistence on hand, as shown on the inventory taken by the mess officer on the last day of the previous month. Daily entries to be made in columns 2 to 21, inclusive, are as follows:

(1) *Column 2.* Under "Today," enter the number of men rationed with the unit as shown in the W.D., A.G.O. Form No. 1 (Morning Report). (See AR 345–400.) Under "To date," enter the total number of men rationed, in the current month including today.

(2) *Column 3.* The total value of the rations for the day of entry is obtained by multiplying the value of the rations by the number of men rationed on the day of entry.

(3) *Column 4.* Daily allowance from company fund, if any, will be entered daily.

(4) *Column 5.* Income from boarders, when

authorized, will be entered daily.

(5) *Column 6.* Total credit for the day will be the value of the rations, plus allowances from the company fund, plus income from boarders for the date of entry.

(6) *Column 7.* Total credit to date is the total credit for the current month, including today.

(7) *Column 8.* The entry under "Today" will be the purchases made from the commissary on the date of entry. The entry under "To date" will be the total commissary purchases for the current month, including today.

are obtained by adding the amounts under "To date" in columns 8, 9, and 10.

(12) *Column 13.* When the total value of the rations (column 3) exceeds the purchases made from the commissary (column 8 under "Today") on the date of entry, the difference is posted in column 13.

(13) *Column 14.* When the purchases made from the commissary (column 8 under "Today") exceed the value of the ration on the date of entry (column 3), the difference is posted in column 14.

(14) *Column 15.* The entry in this column is

WAR DEPARTMENT
Q. M. C. Form 469
Approved Dec. 7, 1918

MONTHLY MESS ACCOUNT OF _____ MONTH _____ YEAR 19__

Value of Ration, $_____ Allowance from Company Fund for Month, $_____, for Day, $_____ Value of Stock at End of Previous Month, $_____

1	2		3	4	5	6	7	8		9		10		11	12	13	14	15	16
Date	Number Men Rationed		Total Value of Ration for the Day	Daily Allowance from Company Fund	Day's Income from Boarders or Other Sources	Total Credit for Day (3+4+5)	Total Credit to Date	Purchases from Commissary		Purchases from Post Exchange		Purchases from Other Sources		Total Purchases for Day (8+9+10)	Total Purchases to Date	Saving from Q. M. for Day (3−8)	Deficit Due Q. M. for Day (8−3)	Standing with Q. M. (14 or 14 for day +13 for previous day)	Standing For Mess to Date (7−12)
	To-day	To date						To-day	To date	To-day	To date	To-day	To date						
1																			
2																			
3																			
4																			
5																			
6																			
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31																			

Value of stock on hand at end of present month, . $_____

Value of stock on hand at end of previous month, $_____

Increase—Decrease—in value of stock, ... $_____

Standing of mess on last day of month, ... $_____

Gain—Loss—in mess for month, ... $_____

_____, 19__

I certify that the above is correct.

_____

Mess Sergeant.

_____, 19__

Audited:

_____

Officer in charge of Mess.

Figure 12. W.D., Q.M.C. Form No. 469—Monthly Mess Account.

(8) *Column 9.* This column is used in the same way as column 5 in recording post exchange purchases.

(9) *Column 10.* The entry under "Today" will be the purchases made from all sources not entered elsewhere on the date of entry. The entry under "To date" will be the total purchases from all sources not entered elsewhere for the current month, including today.

(10) *Column 11.* This entry represents the total purchases entered in columns 8, 9, 10, under "Today."

(11) *Column 12.* "Total purchases to date"

the daily balancing of the entries posted in columns 13 and 14. It represents the difference between the totals of columns 13 and 14.

(15) *Column 16.* This entry is the financial standing of the mess. When the ration credits (column 7) exceed the purchases (column 12), the entry in this column is prefixed by a plus sign. When the purchases exceed the credits, the entry is prefixed by a minus sign.

(16) *Column 17.* This entry represents the value of stock on hand on the previous day plus all purchases made on the date of entry (column 11). On the first of the month, the value of

WAR DEPARTMENT
Q. M. C. Form 340 (Old No. 444)
Approved March 22, 1922

DAILY STOCK RECORD

RATION ARTICLES	Unit	Bal. Fwd.	Rec'd	Total Acct.	Used	Bal. on Hand
Apples, evap., boxes	Lbs					
Baking powder	Cans					
Bacon, issue, cr. or cns	Lbs					
Beans, issue	Lbs					
Beef, fresh	Lbs					
Beef, corned, 1, 2, and 6 lb.	Cans					
Bread, soft	Lbs					
Butter, issue, prints	Lbs					
Butter, issue, tubs	Lbs					
Cinnamon, ground, ¼ can	Cans					
Cloves, ground, ¼ can	Cans					
Coffee, roasted and green	Lbs					
Corn meal, white or yellow	Lbs					
Fish, salmon	Cans					
Flavoring extract, L., 2-oz.	Bots					
Flavoring extract, L., 8-oz.	Bots					
Flavoring extract, V., 2-oz.	Bots					
Flavoring extract, V., 8-oz.	Bots					
Flour, issue	Lbs					
Ginger, ground, ¼ can	Cans					
Jam, asst'd	Cans					
Lard, issue	Lbs					
Lard substitute	Lbs					
Milk, evaporated	Cans					
Meats, fresh	Lbs					
Nutmeg, whole	Lbs					
Oleomargarine	Lbs					
Onions, fresh	Lbs					
Peaches, evaporated	Lbs					
Pepper, black, ground, ¼ can	Cans					
Potatoes, fresh	Lbs					
Prunes, boxes	Lbs					
Pickles, cucumber	Galls					
Rice	Lbs					
Salt, issue	Lbs					
Sirup, issue	Cans					
Sugar, granulated	Lbs					
Tea, black or green	Lbs					
Tomatoes	Cans					
Vinegar	Galls					
Yeast, compressed	Lbs					
SALES ARTICLES						
Allspice, ¼ can	Cans					
Apple butter	Cans					
Apples, No. 3 or 10 can	Cans					
Apricots	Cans					
Asparagus	Cans					
Bacon, breakfast, boxes	Lbs					
Barley	Lbs					
Bay leaves	Pkgs					
Beans, stringless	Cans					
Beans, Lima, dry	Lbs					
Beans, Lima	Cans					
Beef, dried	Cans					
Butter, sales	Lbs					
Capers	Bots					
Cheese	Lbs					

SALES ARTICLES—Continued	Unit	Bal. Fwd.	Rec'd	Total Acct.	Used	Bal. on Hand
Cherries	Cans					
Chocolate, plain	Pkgs					
Cocoa, br	Cans					
Coconut, shredded	Pkgs					
Corn, sweet	Cans					
Corn flakes	Pkgs					
Crackers, asst'd	Crts					
Cream of Wheat	Pkgs					
Currants	Pkgs					
Curry powder	Bots					
Farina	Crts					
Fruit, pie, asst'd	Cans					
Gelatin	Pkgs					
Grape Nuts	Pkgs					
Ham, sugar-cured	Lbs					
Hominy, lye	Cans					
Honey, strained	Bots					
Horse radish	Bots					
Jelly, asst'd	Cans					
Macaroni, boxes	Lbs					
Molasses	Cans					
Mushrooms	Cans					
Mustard, ground	Cans					
Mustard, prepared	Bots					
Oats, rolled	Crts					
Oil, olive	Bots					
Olives	Bots					
Peaches	Cans					
Pears	Cans					
Peas	Cans					
Peas, split	Lbs					
Pepper, cayenne	Bots					
Pepper, chili col	Bots					
Pickles, asst'd	Bots					
Pineapple	Cans					
Preserves, asst'd	Cans					
Pumpkin	Cans					
Raisins	Pkgs					
Rice, Puffed	Pkgs					
Sauce, T. C	Bots					
Sauerkraut	Cans					
Sausage, pork or Vienna	Cans					
Shredded Wheat	Pkgs					
Spaghetti	Crts					
Spinach	Cans					
Starch, corn	Pkgs					
Sugar, powdered	Lbs					
Tapioca	Crts					
OTHER ARTICLES						
Eggs, fresh	Doz					
Milk, fresh	Gals					

DAILY MESS STATEMENT. RATION VALUE, $.....

Rations due to-day ..... Value, $..... To date ..... Value, $.....
Collections from boarders to-day, $..... To date, $.....
Total value of rations and collections to date, $.....
Cost to-day, $..... To date, $.....
Savings, shortage, to date, $.....

Stock on hand at beginning of month....., 19 , Value, $.....
Stores purchased to-day, $..... To date, $.....
Total stock remaining on hand ..... and purchased to date, $.....
Total cost of stores consumed to date, $.....
Value of stock remaining on hand to date, $.....

3—4340

Figure 13. W.D., Q.M.C. Form No. 340—Daily Stock Record.

STOCK RECORD

		10th Day						20th Day						Last Day					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
ARTICLES	UNIT	BAL. FOR'D	REC'D	TOTAL ACC'T (3+4)	USED	BAL. ON HAND (5−6)	VALUE OF 7	BAL. FOR'D	REC'D	TOTAL ACC'T (9+10)	USED	BAL. ON HAND (11−12)	VALUE OF 13	BAL. FOR'D	REC'D	TOTAL ACC'T (15−16)	USED	BAL. ON HAND (17−18)	VALUE OF 19
Apples, evaporated,	Lbs.																		
Baking powder,	Cans																		
Bacon, issue,	Lbs.																		
Beans, issue,	Lbs.																		
Beans, stringless,	Cans.																		
Beans, lima, dry,	Lbs.																		
Beans, lima,	Cans																		
Beef, fresh,	Lbs.																		
Beef, corned,	Cans																		
Bread, soft,	Lbs.																		
Butter,	Lbs.																		
Cabbage,	Lbs.																		
Chocolate, plain,	Pkgs.																		
Cinnamon, ground,	Cans.																		
Cloves, ground,	Cans.																		
Cocoa, br.,	Cans.																		
Coffee, roasted or green,	Lbs.																		
Corn,	Cans.																		
Corn Flakes,	Pkgs.																		
Corn meal,	Lbs.																		
Currants,	Pkgs.																		
Eggs,	Doz.																		
Flavoring extract, L.,	Bots.																		
Flavoring, extract, V.,	Bots.																		
Flour, issue,	Lbs.																		
Hominy, lye,	Cans.																		
Jam, assorted,	Cans.																		
Lard, issue,	Lbs.																		
Milk, evaporated,	Cans.																		
Molasses,	Cans.																		
Oats, Rolled,	Crts.																		
Oil, olive,	Bots.																		
Oil, cooking,	Bots.																		
Oleomargarine,	Lbs.																		
Onions, fresh,	Lbs.																		
Peaches, evaporated,	Lbs.																		
Peas,	Cans.																		
Peas, split,	Lbs.																		
Pepper, black,	Cans.																		
Pickles, cucumber,	Gals.																		
Pineapple,	Cans.																		
Potatoes, fresh,	Lbs.																		
Prunes,	Lbs.																		
Rice,	Lbs.																		
Rice, Puffed,	Pkgs.																		
Salt, issue,	Lbs.																		
Sauerkraut,	Cans.																		
Sirup,	Cans.																		
Sugar, granulated,	Lbs.																		
Sugar, powdered,	Lbs.																		
Tea, black or green,	Lbs.																		
Tomatoes,	Cans.																		
Vinegar,	Gals.																		
Yeast, compressed,	Lbs.																		

ADDITIONAL ARTICLES NOT LISTED ABOVE WILL BE ENTERED BELOW

NOTE.—The officer in charge of the mess will, at the end of each ten-day period, personally make a physical inventory and will verify all entries in each column for that period.

8—6018

Figure 14. Stock record (reverse of) W.D., Q.M.C. Form No. 469.

stock on hand the previous day is the "Value of stock on hand at end of previous month." In all later entries, the value of stock on hand on the previous day is taken from column 19.

(17) *Column 18.* This entry is the cost of food consumed on the date of entry.

(18) *Column 19.* The entry in this column is the value of stock in the supply room (column 17) minus the cost of the food consumed on the date of entry (column 18). On days of inventory, this entry will be the actual value of the physical inventory as taken by the mess officer and entered on the back of Form No. 469.

(19) *Column 20.* This entry above the daily increase or decrease between the balance of stock on hand (column 19) each day and the value of stock at end of previous month. A plus or minus sign is prefixed to the entry to indicate an increase or decrease.

(20) *Column 21.* This entry will show a daily combined gain or loss in the financial standing (column 16) plus the gain or loss in the stock on hand (column 20). Inventories will be taken on the tenth, twentieth, and last day of the month, and at such other times as directed. This inventory value will be entered in column 19 on the date taken and adjustments noted at the foot of Form No. 469, as illustrated on the sample form.

b. As vouchers to the monthly mess account, the following records should be kept:

(1) A memorandum of the money received from boarders, kept by individual boarder's name, the charges against him, and collections made from him. When collections are made, the boarder should be required to initial the entry. Such collections should be made by a commissioned officer. At the end of the month, the memorandum is certified to be correct by the commanding officer. This memorandum is properly a voucher to the ration and savings section of the company fund.

(2) Orderly files of sales slips and invoices from the commissary and open market vendors are maintained in such order that any one day's purchases may be readily determined. At the end of the month, the sales slips and invoices are filed with the completed Form No. 469.

(3) The statement of accounts, prepared by the commissary and showing either the amount due the commissary or the amount of ration credit due the unit, is used as a supporting document to the account. It is properly a voucher to the ration and savings section of the company fund.

105. Daily Stock Record

The Daily Stock Record (W.D., Q.M.C. Form No. 340) is used as a record of the physical stock on hand, as a means of determining the quantities of supplies used to prepare each meal, and as a device for computing the cost of each meal and the total cost of the day's meals. It is required to be kept by the consolidated or general mess only, but might advisedly be kept by any mess. When kept, it is filled out by the mess sergeant under the supervision of the mess officer, and is usually prepared in the afternoon. The entries made are chiefly in physical quantities, although some entries show the money value of the commodities.

106. Preparation of Daily Stock Record (fig. 13.)

a. The form is prepared rather easily. Under each meal are listed the dishes served at the meal. With the aid of the recipes and the assistance of the cook, the exact quantity of each ingredient used is determined, and the cost computed by multiplying the quantity by price and the total cost of each meal is thus found. The vertical columns provide for the listing of the raw ingredients and the amounts used. The horizontal lines provide for the entry of the dishes in which they were used and the cost of each dish. The last line shows the totals of each ingredient used for the three meals and the total cost for the day. Upon the completion of this, the daily stock record can be filled out. The form lists the ration articles, the sales articles, and other articles separately. After each article, space is provided for the following entries:

(1) The amount of stock on hand at the close of the previous day, called "Balance Forwarded" and taken from the last column of the previous day's form.

(2) The amount of stock received during the day, called "Received."

(3) The total of these two columns, called "Total Account."

(4) The amount of stock used since the previous day, here called "Used" and taken from the bill of fare.

(5) The balance on hand, found by subtracting the entry in the "Used" column from the entry

in the "Total Account" column.

b. At the bottom of the form a daily mess statement is shown. The entries made here are money value entries in the menu, and the statement is intended to show the credit standing of the mess. The "Ration value" is the value of the garrison ration for the month.

(1) The "Rations due today" entry is obtained from the morning report, their "Value" is the total value found by multiplying the number by the value of the garrison ration; the "To date" entries, here and elsewhere, are found by adding the "Today" entries to the comparable "To date" entries on the previous day's form.

(2) The entry in "Collections from boarders today" shows the total cash thus collected, and should be supported by the memorandum described in paragraph 104*b*(1).

(3) The entry made in "Cost today" is taken from the "Total cost for day" on the bill of fare account.

(4) The entry in "Savings, shortage, to date" represents the current standing of the mess. If the "Total value of rations and collections to date" is greater than the "Cost to date," the latter is subtracted from the former, and the result entered with a plus mark, indicating a saving. If the reverse is true, the "Total value of rations and collections to date" is subtracted from the "Cost to date" and the result is entered with a minus sign, to indicate a shortage.

(5) The entry in the "Stock on hand at the beginning of the month" (insert name of month and year date) is the value of the stock as determined by the inventory taken on the last day of the previous month.

(6) The entry in the "Stores purchased today" is found by totaling the cost shown on inventories and sales slips for the stores received for the day. A file of these invoices and sales slips should be maintained as decribed in paragraph 104*b*(2).

(7) In the "Total stock remaining on hand .....
and purchases to date," fill in the blank with the date and enter the total of the two entries above it.

(8) The entry in the "Total cost of stores consumed to date" is the same as the entry "Cost to date" on the opposite side of the form.

(9) The entry of the "Value of stock remaining on hand to date" is found by subtracting the entry in the "Total cost of stores consumed to date" from the "Total stock on hand..... and purchased to date." This figure represents the value of the stores that should be in the mess stockroom.

(10) Supporting documents to the daily mess statement are the same as described in paragraph 104*b*.

107. Improvised Forms

In general or consolidated messes operating on the garrison ration system where large quantities of supplies are handled, the following improvised forms may prove convenient for use in stockroom.

a. A stock record sheet, comparable to W.D., Q.M.C. Form No. 424, may be used as a means of keeping a ready check on each subsistence item, and is useful in preparing W.D., Q.M.C. Form No. 340.

b. A tally-in for subsistence may be of use in checking the receipt of supplies.

c. A tally-out sheet may be used as a means of recording the supplies withdrawn from the stockroom in the preparation of each meal, and can be used to post to the bill of fare on Form No. 240, and to the stock record account.

d. An inventory of subsistence supplies may be used to take the inventories required on the tenth, twentieth, and last day of the month.

108. Field Ration Mess Account and Records

a. Basis of issue. Field rations will be issued on the basis of an adjusted estimate of the number of individuals who are expected to be present for rations on a specified subsequent date. The percentage deduction and the adjustment for over and under issues will be made by the officer preparing the Consolidated Ration Request. In making the estimate, he should give consideration not only to the factors discussed therein, but also to the probable number of persons who will be absent from each of the three meals on the date of consumption.

b. To whom issued. Unless specifically excepted by the War Department, Field Ration "A" and/or "B" as prescribed in paragraph 4*d*(1), AR 30-2210, will be issued to all troops stationed within the continental limits of the United States (excluding Alaska), and to all troops stationed in the Hawaiian Department, the Panama Canal Department, and the Antilles Department except as listed below. In the following excepted cases,

the use of the garrison ration system is authorized:

(1) Messes, general and station hospitals, and in numbered medical units or organizations functioning as a named hospital except during maneuvers or extended field exercises.

(2) Cadet messes, United States Military Academy.

(3) Survey parties in the field (AR 30–2210).

(4) Isolated small detachments of 50 persons or less (when authorized by the commanding general of the air force, service command, or department concerned).

(5) United States Army transports.

(6) United States Army mine planters.

(7) Army Air Forces rescue boat crews.

c. Issues on a meal basis. In exceptional cases and only where the numbers present for each of the several meals are disproportionate, the commanding general of the air force, service command, or department concerned may authorize the issues to be made on a meal basis, provided the total value of all subsistence so issued during the calendar month does not exceed the figure obtained by multiplying ⅓ of the total number of meals authorized during the same month by the current value of the garrison ration at the same station. Whenever issues are authorized to be made on a meal basis, the percentage deductions required will be applied against the total number present for each meal instead of against the average daily attendance.

109. Increased Issues

a. General. Increased issues in certain components of the field ration may be authorized under the circumstances set forth in *b* and *c* below, and issued in accordance with the provisions thereof. The authorization will list the components to be increased, the percentage of increase of each, and the approximate number of individuals to whom the increased issues will be made. A copy of the authorization will be mailed direct to The Quartermaster General, Washington 25, D.C. Attention: Subsistence Division. The authority granting additional issues will require that responsible unit commanders maintain constant personal supervision over the messes affected for the purpose of conserving food and preventing waste. Such additional issues will be included in the Abstract of Issues.

b. Organizations. When the field ration is insufficient in certain components to provide adequate sustenance for certain organizations, station commanders may, on request of the commanders thereof and with the approval of local medical authorities, authorize the issue of additional quantities of grain products (including bread and flour), legumes, potatoes, and such additional fats, spreads, and seasoning as may be required to make the additional foods palatable and to insure their consumption, provided the cost of such increases will not cause the value of the field ration for the station to be greater than the value of the garrison ration for the same month.

c. Small units. When the field ration is insufficient to provide adequate sustenance for members of outlying or isolated detachments, the commanding general of the air force, service command, or department concerned may grant such increases in specific components as will provide an ample ration in all components. Such increases will be restricted to those components found to be actually deficient, and will not exceed 10 percent of the money value thereof. Under such circumstances, corresponding reductions in other components need not be made to keep the cost of the field ration from exceeding the cost of the garrison ration for the same period at the same station. When after a practical test it is determined that the increased issue of specific components authorized herein is not adequate, the detachment commander concerned may submit through channels a request for further increased allowances to the commanding general of the appropriate air force, service command, or department for approval. The request will show complete justification for the additional increase, including the strength of the detachment concerned, available motor transportation, distance from nearest commissary, refrigeration, and other pertinent information.

110. Field Ration Head Count and Estimate Procedure

To assist in the preparation of accurate estimates of the number of rations to be requested for consumption on a future date, mess officers will maintain a mess attendance record as shown in exhibit A, prepared on W.D., A.G.O. Form No. 420, or similar form reproduced locally. Unit commanders will furnish such information to consolidated mess officers as will be of value for inclusion in the mess attendance record. Monthly mess attendance records will be retained by mess officers

until such time as the annual inspection has been completed by the Inspector General, and then destroyed. It will be the responsibility of the headquarters which consolidates daily ration requests to effect an unannounced spot check at least twice each month of head counts in messes which have forwarded their ration requests to them. The actual count will be made by a commissioned officer or a noncommissioned officer of the first four grades who is not part of the mess personnel, and will be reported to the commanding officer in charge of the consolidated mess and entered on the mess attendance record shown in exhibit A. One of the three methods outlined below will be followed in making the count.

a. When serving "family" style. The person making the count will subtract the table settings unused from the total number of table settings prepared. Add the K.P.'s, cooks, and the men eating before or after the regular meal. The result is the number of men eating the meal.

b. When serving "cafeteria" style. The person making the count will subtract the number of trays or plates unused from the total number of trays or plates on hand for use. Add the K.P.'s, cooks, and the men eating before or after the regular meal. The result is the total number of men present for the meal. Additional trays cannot be used for "seconds." Trays used for the purposes other than serving must not be counted.

c. Direct counting. When the methods given in (1) and (2) above cannot be used, the men should be counted as they enter the mess hall. After the count is completed the mess officer will compute the average mess attendance at the end of the day, complete entries of rations drawn and rations estimated, and enter a note in the comment column to indicate the causes of variations in the number of men eating (pay day, holiday).

111. Collections for Meals Furnished Men Authorized to Mess Separately

a. Where it is considered impractical for enlisted men (who are authorized to mess separately) to return to their homes at noon, unit and other commanders may authorize such men to eat dinner with their units. Such enlisted men will be required to reimburse the Government at the rate of 25 cents per meal. In order that such collections may be readily traced, funds received for the sale of meals or meal coupons will be turned in to the station sales officer in the manner prescribed in (1) below.

(1) When reimbursement in cash is prescribed, payment will be made to the unit commander or to the mess officer furnishing the subsistence. On the last day of the month, or more frequently when directed by the station commander, cash so collected will be turned in to the officer who draws field rations in bulk for the unit or mess concerned. The officer receiving such funds will furnish a hand receipt therefor. He will consolidate such funds and will prepare a shipping ticket in quadruplicate listing thereon the number of meals for which reimbursement has been made and the total amount of funds received from the several unit and mess officers. He will transmit to the sales officer the total amount of such funds, together with the original and two copies of the shipping ticket. The sales officer will sign and return both the original and one copy as a receipt for the cash and retain the unsigned copy as a debit voucher to his sales account. The officer who turned in the funds will retain the signed copy of the shipping ticket as his receipt and will deliver the signed original and one unsigned copy to the post commander for audit and disposition in accordance with the provision of AR 35-6660. The auditing officer may verify the correctness of the funds turned in by the examination of amounts recorded daily on exhibits B and C.

(2) When reimbursement through the medium of meal coupons is prescribed, station commanders will issue the instructions under which meal coupons are to be sold and accounted for. Such meal coupons will be serially numbered and will be transferred to selling agencies by means of shipping tickets, one copy of which will be forwarded to the commanding general of the service command concerned for the use of the property auditor. Unless such coupons are sold by sales officers, the funds collected for their sale will be turned in to the sales officer in the manner prescribed in (1) above.

b. During maneuvers or extended field exercises, officers or warrant officers regularly assigned to organizations are authorized, upon approval of the commanding officer of the organization to which they are assigned, to reimburse the Government for subsistence furnished them at Government expense by having the following notation placed on their pay vouchers: Due United States ..... meals at 25 cents per meal furnished

during the month of ..... It will be the responsibility of the personnel adjutant of the organization to see that such entries are made on pay vouchers. Officers and warrant officers temporarily assigned or attached to organizations will reimburse the Government for meals furnished by the payment of cash or meal coupons.

c. Whenever civilian employees are regularly subsisted at Government messes for one or more meals per day, collection to cover the cost of such subsistence will not be made in cash but by deductions entered on the pay roll at the rate of $22.50 for 3 meals per day, $15.00 per month for 2 meals per day, or $7.50 per month for one meal per day. When occasional meals are furnished to civilians, reimbursement will be at the rate of 25 cents per meal in accordance with *a* above.

112. Issue of Field Rations for Military Personnel and Civilians

When it is considered essential in the performance of official duties, station or organization commanders may authorize officers, warrant officer, enlisted persons who have been authorized to mess separately, accredited news representatives, civilian fire fighters, and civilians on duty with tactical forces to be subsisted at unit or consolidated messes. Civilian food handlers, including such dietetic personnel as cooks, kitchen helpers, meat cutters, bakers, mess attendants, apprentice dietitians, and any other personnel engaged in the preparation or serving of meals, will be authorized to eat at military messes. Civilian employees whose employment agreements stipulate that they may be subsisted at military messes will continue to be subsisted. Civilian employees who are not permitted to be subsisted at military messes as stated above will be so authorized, only, after obtaining the approval of the commanding general of the appropriate service command or department concerned. Prior to submission of applications for subsistence privileges to the foregoing authorities, station commanders will consider each application on its merits, and will exercise care to limit the number of civilians subsisting at military messes to a minimum. Particular attention will be given to nature of civilians' duties and hours of duty, food and drink dispensing installations, other than military messes, at civilians' disposal, and distance from nearest commercial eating place. A copy of each approval granted by the commanders referred to will be mailed direct to The Quartermaster General, Washington 25, D.C. Attention: Subsistence Division.

113. Ration Record

a. A separate monthly Ration Record will be maintained for each messing unit by the headquarters or other agency charged with the responsibility of consolidating the information received in the Daily Ration Request. This will be an informal record for the purpose of determining the net number of rations to be drawn for consumption on a specified subsequent date. The record will provide a means for computing over- and under-issues, the necessary percentage deductions, and for recording the number of meals furnished for which cash reimbursement to the Government has been or will be made. Under-issues may be used to offset prior over-issues. Deductions for over-issues may be distributed over a period of several days, but cumulative over- and under-issues should be brought into agreement by the last of the month. If, because of unusual circumstances, this cannot be done, the cumulative over- or under-issue figures will be carried forward to the first day of the following month and an effort made to effect an early adjustment. Over-issues will not be allowed to accumulate so that an under-issue made for the purpose of reducing accumulated over-issues to zero will interfere with the efficient operation of the mess.

b. When the figure "Estimated number of rations required" entered in section I of the Daily Ration Request is materially revised as a result of prior over- and under-issues, the unit commander concerned will be notified immediately of the number of rations which will be requested for his unit.

c. Division commanders and commanders designated to appoint officers to draw field rations in bulk will cause inspections of records to be made for the purpose of determining their completeness and accuracy with particular attention to necessary remedial action to avoid accumulation of over-issues.

114. Net Number of Field Rations Authorized and Requested

a. The net number of field rations to which a unit is entitled on a specified subsequent date and which will be delivered to it for consumption on that date will be determined by the head-

quarters charged with the responsibility of maintaining the Ration Record for the unit concerned.

b. The corrections are computed from the figures entered in sections I and II of the Daily Ration Request.

c. The figure in the space "Average" (sec. II), reduced by the application of the percentage deduction scale set forth below, represents the number of rations to which the unit is entitled on the day prior to the Ration Request day, while the figure in the space "Rations" (sec. I), reduced by the application of the same percentage deduction scale and adjusted for prior over- and under-issues, represents the number of rations which will be included in the Consolidated Ration Request and drawn for the unit for consumption on a specified subsequent date. Percentage deduction scale:

Less than 300—No deduction is necessary.
300–1,000—Deduct 5 percent.
Over 1,000—Deduct 7 percent.

A fraction of less than one-half will be disregarded. A fraction of one-half or more will be counted as a whole number. No deductions need be made in connection with "unit items" (commonly referred to as "each item") of the menu. A further adjustment will be made because of prior over- and under-issues. The percentage deduction and the adjustment for prior over- or under-issues will be subtracted from the figure in the space "Rations." The figure as finally adjusted will be the number of rations which will be ordered for subsequent delivery to the unit concerned.

115. Consolidated Ration Requests

Each headquarters or other agency receiving Daily Ration Requests or Consolidated Ration Requests submitted by its subordinate units or organizations will prepare and distribute Consolidated Ration Requests in accordance with the instructions printed on exhibit C. Since the headquarters which receives unit Daily Ration Requests is charged with the responsibility of making necessary adjustments in the number of rations requested and in the preparation of a Consolidated Ration Request, the headquarters to which such Consolidated Ration Requests are forwarded for further consolidation will make no changes thereon except to correct manifest errors.

116. Distribution of Field Rations

The number of issues made by sales officers will be held to the absolute minimum. Field rations will be distributed in bulk as follows:

a. For divisions and attached units, to the division quartermaster.

b. For nondivisional units operating under a headquarters and headquarters detachment, special troops, the commanding officer of such headquarters will appoint an officer to draw field rations for all troops attached to his headquarters. For all other nondivisional units, the senior commander of such units will appoint an officer to draw rations in bulk for all such units. When such troops are equivalent to more than a group or regiment (three battalions) one officer may be appointed to draw rations for each regiment or group; however, the number of such officers will be held to a minimum.

c. For station complement troops, the station commander will appoint an officer of the station complement to draw field rations for the group.

d. For training centers or schools, the commanding officer of such installations will appoint an officer or officers of the training center or school to draw rations. The number of such officers will be held to a minimum, and in no event will more than one officer be appointed to draw rations for an organization smaller than the equivalent of a regiment (three battalions).

e. In addition to supervising the receipt and distribution of field rations, each officer appointed as indicated above will receipt, account for, and transmit through the proper channels, cash collected from individuals required to reimburse the Government for meals furnished, and will turn in excess subsistence items, prepare and distribute vouchers connected therewith as directed. Officers so appointed will be furnished an adequate number of assistants by the appointing authorities. Personnel required to break down rations for groups will be provided by respective commanders on a detail basis. The station commander will designate a point at which bulk issues will be broken down and distributed. If desirable, several such points may be established.

117. Officers Responsible for Field Ration Break-down

Such officers will make distribution of the various articles on the basis of the requirements of the

unit messes affected. When units have on hand a sufficient stock of the items listed on the day's menu or suitable substitutes, further quantities of such items will not be furnished. When it is known in advance of the issue that the quantities of certain items listed on the daily menu will not be required, the officer drawing field rations in bulk will so advise the sales officer. To effect the foregoing, all officers concerned with the breakdown or distribution of field rations will maintain close liaison with unit or other mess officers in order to be currently advised as to the subsistence items on hand in such messes and the daily requirements of each mess. Cancelation of the delivery of all or part of highly perishable items will be made only after arrangements have been made by the sales officer for their disposition or storage.

118. Excess Subsistence Items to be Turned In

a. Station commanders are authorized to prescribe the quantity of subsistence items which may be stocked by unit or consolidated messes in excess of current needs to meet unforeseen contingencies. To prevent the accumulation of any excess beyond this reserve, and for the purpose of collecting and turning in excess items of subsistence, organization commanders will cause inventories to be taken twice a month, preferably on the twelfth and twenty-seventh, but may be taken on such other days as the sales officer may designate. The excess items, if in original unit packages or cans and in condition for storage and reissue, will be collected by inventorying officers and turned in to the officer in the manner prescribed. Excess items discovered in consolidated messes will be turned in as directed by the station commander.

b. When a unit makes a permanent change of station all accumulated subsistence in original unit packages or cans and in condition for storage and reissue will be turned in by the supply officer concerned to the sales officer prior to the departure of the unit, in the manner prescribed. This provision does not apply to the troop train or other rations specifically issued to the train commander or supply officer for the movement.

119. Method of Turning in Excess Subsistence Items

Shipping tickets, tally-outs, or Property Turn-In Slips, listing the excess subsistence items received from inventorying officers will be prepared in triplicate by the officer appointed to distribute field rations in bulk and will be delivered by him, together with the excess items of subsistence, to the sales officer. The sales officer will sign and return two copies of the shipping ticket, Property Turn-In Slip, or substitute form to this officer who will retain one copy for his file and immediately forward the other signed copy to the fiscal director of the service command or department in which the station is located.

120. Vouchers for Issue of Field Rations

Issues of field rations will be made on shipping tickets, preprinted lists, warehouse tallies, or improvised forms. These forms will be prepared in triplicate for each officer to whom field rations are issued in bulk. They will show the designation of the receiving officer, date of issue, unit and quantity of each item issued, and the number of rations involved. Unit prices will not be shown. When rations are issued to a consolidated issue point, one issue slip may be prepared to cover the entire issue made to the consolidated issue point or, where physical facilities permit, one issue slip may be used to cover issues made to an organization or to an issue point from various warehouses. In no event will the sales officer prepare consolidated issue slips to cover separate points of issue after issues have been made. The signature of the officer, or his authorized representative, to whom issues are made will be obtained on the original. One copy will be given to the receiving officer, and one copy will be retained for use as indicated. The signed original will be forwarded by the sales officer to the fiscal director of the appropriate service command or department on the tenth, twentieth, and last day of the month.

SECTION XII

TRAINING FACILITIES FOR BAKERS AND COOKS

121. General

Schools for bakers and cooks are established in each service command and department, and in such other places as directed by the War Department. The service command school is composed of the parent school and such branches or subschools as may be required to meet the training requirements of the service command.

122. Mission

The mission of the schools for bakers and cooks is to train selected officers and enlisted men of the Army of the United States in one or more of the following subjects:

a. Theory and practice of cooking.

b. Theory and practice of baking.

c. Mess management, supervision, and inspection.

d. Theory and practice of pastry baking.

123. Objectives

The objectives of the schools for bakers and cooks are:

a. To secure the maximum benefit from the ration through its intelligent utilization by trained personnel.

b. To train officers in all subjects necessary for them to become—

(1) Proficient mess officers, menu planners, and mess supervisors.

(2) Proficient instructors in mess management in troop schools.

(3) Commandants and assistant commandants, schools for bakers and cooks.

(4) Commanding officers of bakery companies and post bakery officers.

c. To train enlisted men in—

(1) The elements of nutrition.

(2) Theory and practice of baking and cooking, garrison and field.

(3) Mess management and menu planning.

(4) Use and repair of equipment and expedients.

124. Special Duties

a. The school for bakers and cooks will assemble theoretical and practical instructional materials and facilities for the local troop school courses and for such other troop schools as may be directed by the service command commander. This instructional material will include recipes, helpful hints and methods, menus, training schedules, courses for troop schools, classroom suggestions, etc.

b. The parent school for bakers and cooks will provide traveling specialty teams to demonstrate their subject in the subschools and such troop schools as may be directed by the service command commander. These specialty teams are—

Mess supervisors and inspectors.
Field range instructors.
Meat-cutting specialists.
Pastry specialists.

These specialty teams will demonstrate the latest approved methods, offer instructional suggestions, and when called upon, will render reports of messing conditions to the service command commander.

125. Students

a. The commander who has trained reserve mess personnel will not find his mess organization disrupted by the illness, transfer, or discharge of any one or more individuals. These trained reserves will be available during expansions to form cadres and replace personnel in the mess.

b. In selecting students to attend a school for bakers and cooks, the most capable and best qualified men should be chosen. A chef cannot be made of an inept, unreliable, and uninterested individual.

126. Dehydrated Foods, Courses

Excellent results have been obtained from dehydrated foods when mess supervisors and cooks have received proper instructions. Accordingly, special courses have been established to train mess officers, mess sergeants, and qualified or rated cooks to reconstitute, prepare, cook, and serve all types of dehydrated foods, as well as combinations of dehydrated articles with regular ration components. These courses are particularly available for units going overseas, units of the Transportation Corps, and for transport cooks. The course is generally of 1 week, or of 10 days duration, if time permits. It is given at the New York and San Francisco Ports of Embarkation, under the direction of the bakers' and cooks' schools of the Second and Ninth Service Commands.

SECTION XIII

COMMANDING OFFICER'S GUIDE TO MESS SUPERVISION

127. The following 17 points may be used by the commanding officer as a quick check list to see that no functions of mess management and control are overlooked:

1. GARBAGE RACK. Waste segregation. Edible waste. Cleanliness of cans and rack. Fly control.
2. REAR ENTRANCE. Coal bin. Mop and broom rack. Clean steps and door. Fly control.
3. KITCHEN STORE ROOM. Appearance. Stock arrangement. Segregation and quantity of surplus stocks.
4. MEAT BLOCK AND WORK TABLE. Condition of top. Orderliness. Nearby racks for cutting tools.
5. POTS, PANS, UTENSILS. Arrangement. Cleanliness. Conditions.
6. MENU AND WORK SHEET. Food for the meal (menu). Record of preparation on work sheet. Waste record.
7. COOK. Experience or training. Personal appearance.
8. RANGE. Proper firing. General conditions. Cleanliness.
9. FOOD IN PREPARATION. Conforming to menu and work sheet. Instructions on timing. Appearance and taste of food. Methods of cooking.
10. KITCHEN SINK AND DISHWASHER. Water temperature (140° Wash—180° Rinse). Cleanliness. Orderliness.
11. REFRIGERATOR. Odor on opening. Arrangement of food. Improper use. Cleanliness. Left-overs. Excesses.
12. BREAD STORAGE. Cleanliness. Air circulation. Arrangement. Freshness of bread.
13. SERVING COUNTER. Arrangement. Appearance of food and servers. Method of service.
14. MESS HALL GENERAL APPEARANCE. Windows. Inviting appearance. Floors. Decorations.
15. MESS TABLES. Condition and arrangement. Condiments. China, silver, glass. Clean and orderly.
16. FOOD CONSERVATION MEASURES. Plate scraping—location, control, cleanliness. Waste segregation. Food posters.
17. MESS OFFICER AND MESS SERGEANT. Ration requirement forecast. Head count. Daily meeting. Weekly drives. Fat conservation. Food preparation waste. Boarders. Mess organization and job assignment. Early chow.

EXHIBIT A

MESS ATTENDANCE RECORD

Day and Meal	April 3-9			April 10-16			April 17-23			April 24-30		
	Count	Initials of Counter	Comment	Count	Initials of Counter	Comment	Count	Initials of Counter	Comment	Count	Initials of Counter	Comment
Monday:												
Breakfast												
Dinner												
Supper												
Average												
Rations drawn												
Rations estimated												
Tuesday:												
Breakfast												
Dinner												
Supper												
Average												
Rations drawn												
Rations estimated												
Wednesday:												
Breakfast												
Dinner												
Supper												
Average												
Rations drawn												
Rations estimated												
Thursday:												
Breakfast												
Dinner												
Supper												
Average												
Rations drawn												
Rations estimated												
Friday:												
Breakfast												
Dinner												
Supper												
Average												
Rations drawn												
Rations estimated												
Saturday:												
Breakfast												
Dinner												
Supper												
Average												
Rations drawn												
Rations estimated												
Sunday:												
Breakfast												
Dinner												
Supper												
Average												
Rations drawn												
Rations estimated												

1. The mess attendance count will be entered in the "Count" column opposite the appropriate meal each day by the person making the actual count, who will place his initials in the "Initials of Counter" column. Total the three meals and divide by 3. Enter results opposite "Average." Enter total number of rations drawn for each day opposite "Rations drawn," and estimated number of rations required for each day opposite "Rations estimated." Enter in "Comments" column special influences such as pay day, bad weather, sports events in a nearby city, camp shows, or any other special shows in town, extra duty, holidays, bivouacs, or other factors influencing attendance.

2. All entries except those made in columns "Count" and "Initials of Counter" will be made by mess personnel.

EXHIBIT B (front)

DAILY RATION REQUEST

SECTION I—BASIS FOR ISSUE

DATE: 7 January 1944

UNIT: Company A, 405th Infantry

STATION: Fort Benning, Georgia

Estimated number of rations required for—Date: 10 Jan

Rations: 255

Breakfast..... Dinner..... Supper..... Total Meals

..... ÷ 3

Section II—Persons Subsisted

Mess attendance record for yesterday.....

Date: 6 Jan

Breakfast	244
Dinner	258
Supper	254
Total	756 ÷ 3 = 252 average

Section III—Persons Authorized to Subsist (For comparison only)

Net number of persons authorized to subsist for date shown in section II	270
Total other individuals for whom rations were drawn	5
Total	275

Section IV—Meals for which Reimbursement Is Required

Number of meals furnished for which reimbursement is required:

By cash	13
By meal coupons	2
By appropriate entry on pay voucher or pay roll	0
Total	15

The figures listed under section II above represent an actual count as reported to me and of which a record has been made.

(Signed) John B. Smith

Captain Inf. Commanding

EXHIBIT B (back)

INSTRUCTIONS

Prepare in duplicate. Forward original to officer preparing Consolidated Ration Request and retain duplicate.

Section I. Estimated number of rations (or meals) required for specified future date determined by estimating the number of persons expected to be present to consume rations. Unless issues have been authorized on a meal basis, no entries will be made in section I opposite the words "breakfast," "dinner," and "supper" nor in the space "total meals."

Section II. Number of individuals present for each meal as determined by an actual count. Records of actual counts will be kept by each mess and may be destroyed after 6 months.

Section III. Net numbers of persons authorized to subsist as taken from the Morning Report of same date as shown in section II. Section III is for comparison purposes only; if the total shown is not substantially larger than the average shown in section II, immediate action will be taken to determine the accuracy of the average daily attendance figure. "Total other individuals for whom rations were drawn" is equal to the total number of meals for which reimbursement is required (as shown in section IV) divided by 3.

Section IV. List the number of meals furnished individuals who are required to reimburse the Government and manner in which reimbursement will be effected.

EXHIBIT C

CONSOLIDATED RATION REQUEST

RATION REQUEST DATE: 7 January 1944

ORGANIZATION: 405th Infantry

STATION: Fort Benning, Georgia

	RATIONS
Number of rations required for consumption 10 January 1944	2750

Number of meals furnished on the date of this report to individuals for which CASH reimbursement has been or will be made at the rate of 25 cents per meal.

MEALS	MONEY VALUE
100	$25.00

(Signed) E. B. Smith

Major, 405 Inf.

INSTRUCTIONS

The date entered on this form will correspond with that shown on section I of the Daily Ration Requests of subordinate units. This form will be prepared and distributed as indicated below:

Regiment or separate battalion:

2 copies: Original to the division quartermaster.

Duplicate retained.

Division quartermaster:

2 copies: Original to the station sales officer as a requisition for rations.

Duplicate retained with Consolidated Ration Requests submitted by subordinate organizations.

Station headquarters:

For separate tactical and station complement groups:

2 copies: Original to the station sales officer as a requisition for rations.

Duplicate to the officer designated to draw field rations in bulk for the group.

Retained copies of this record may be destroyed after 6 months.

The sales officer's copies may be destroyed upon receipt of a clear certificate of audit.

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