



Step 5—Draw off ice cream into chilled containers as rapidly as possible after desired volume has been reached.



Step 6—Place filled ice cream containers in storage cabinet at -10° F.

Illustration 1
Steps in Making Ice Cream Using Mixes

Care and maintenance of ice cream freezers are discussed in Section G, "Galley and Bakery Equipment: Operation and Maintenance."¹

Pour the chilled reconstituted mix into the freezer. Start the dasher motor and turn on refrigeration. If the dasher motor is not turned on first, the dasher may freeze to the walls of the machine and possibly damage the freezer.

Determining Proper Consistency. Watch through the mix inlet to observe the freezing process. When the mix has frozen to a creamy appearing consistency, draw off a sample. If it has a good consistency, it will pile up high in a cup. The ice cream should have a temperature of 24° - 25° F at this stage. Shut off the refrigeration. Return the sample to the freezer through the mix inlet slowly so as not to block off observation of the ice cream expansion.

Determining Proper Volume. Allow the freezer to run without refrigeration until ice cream has doubled in volume. This volume can be determined by one of several ways:

1. By observing the fullness of freezer. Generally, if the ice cream has expanded so that it can be seen rising up to the mix inlet, the desired volume has been obtained.
2. By accurately measuring overrun. Draw off partially frozen ice cream into a pint cup at regular intervals and weigh it. To determine overrun, 1 pint cupful of ice cream (not including weight of cup) should weigh exactly 9 oz for 100 percent overrun.

Overrun should be controlled so that the ice cream does not more than double its volume; that is, does not exceed 100 percent at the time it is drawn out of the freezer. The rate of freezing affects ice cream volume and therefore its texture. Controlling the rate of freezing and length of time the mix is in the freezer is the best way to obtain the right overrun. If the rate

¹ To be published at a later date.

of freezing cannot be increased by providing more refrigeration, excessive overruns can be prevented. There are two ways to do this:

1. Add extra mix to the freezer. A quantity of mix can be made up in addition to that needed for the freezer and added in quart or pint quantities to the original batch. This will retard the rate of overrun because it eliminates free space in the freezing chamber and eliminates the possibility of whipping more air into the mixture being frozen.
2. Draw off only 2½ gal of frozen ice cream (if this is the capacity of the freezer) from the first batch and from each successive batch. The first freezer full will have an excessive overrun and a small quantity of this mix can be left in the freezer. This can serve as a temperature control. In successive batches, the rate of freezing will be speeded up because of the ice crystals left behind in the freezer from a previous batch.

1805-b(3)—Flavoring—Add fruit to ice cream just before it is drawn off, including fresh, canned, or frozen fruits, well drained, before combining with the frozen mix.

Canned or Frozen Fruit, crushed

Pineapple
Peaches
Strawberries

Fresh Fruit, cut

Strawberries (plus sugar mixed at least 2 hours prior to use)
Bananas

Other flavor additions can be added in a "stream" not stirred into the frozen ice cream as it comes from the freezer, to produce a ribbon effect with vanilla ice cream. These flavorings include:

Chocolate syrup or chocolate ice cream sauce
Jelly or jam (any appropriate flavor)

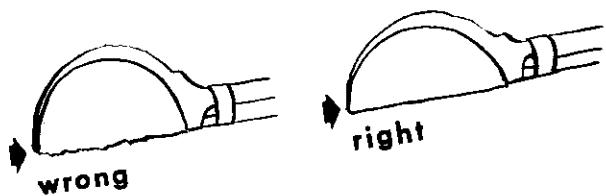
Solid flavors, such as chocolate or coffee, are added to the basic vanilla ice cream by first incorporating these flavors with the water so that the proportion of liquid to basic mix remains unchanged. In all cases where flavoring materials are to be used, add liquids in lieu of, or as a substitute for, water required in the formula. **DO NOT INCREASE THE TOTAL AMOUNT OF MIX.**

1805-b(4)—Drawing—After the ice cream leaves the freezer, the product is in a semisolid state which must be subjected to freezing again until it becomes solid. The smooth texture obtained in the freezing operation should be maintained. Draw off the ice cream from the freezer as rapidly as possible into containers which have been chilling in the hardening cabinet. Put the filled containers into hardening cabinets or rooms at once.

1805-b(5)—Hardening—Hardening rooms or cabinets are maintained at temperatures below 0° F. The lower the temperature, the faster the ice cream will harden and the smoother the texture will be. Check refrigeration regularly in these spaces.

Ice cream containers should be placed so that air can circulate around them. Guard against overloading cabinets because this slows down the rate of hardening. Slow hardening produces ice cream with large ice crystals and grainy texture. Ice cream should be held in the hardening cabinet until it is thoroughly hard.

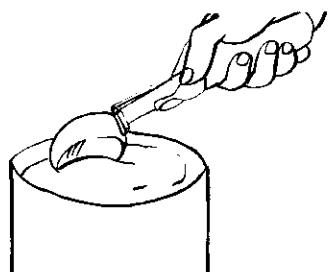
1805-b(6)—Storage—The length of storage period after hardening is not important, as long as temperatures are sufficiently low to maintain ice cream in a hardened state. To accomplish this, temperatures of -10° F (not 0° F) are necessary. Normal cabinet temperature fluctuations at levels above zero will cause the ice cream to lose its smooth, velvety texture. If frozen ice cream warms up and becomes soft, it should be refrozen in the freezer; if it is allowed to become refrozen in the cabinet, it will be very rough and icy.



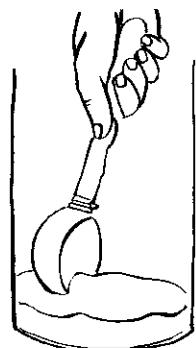
Step 1—Use sharpened dipper.



Step 2—Keep dipper clean.



Step 3—Move dipper in circles across surface of ice cream.



Step 4—Keep ice cream surface level even as dipping proceeds.

Illustration 2
How To Dip Ice Cream

1805-b(7)—Dispensing—Ice cream is dipped and served most satisfactorily at about 8° F. The ice cream should be transferred to the dispensing cabinet far enough in advance to permit proper tempering, or softening, before serving.

If a dispensing cabinet is not available, the temperature of the hardening cabinet should be set at 0° F to permit reasonably good hardening and serving conditions. Ice cream should not be stored long at this temperature if a smooth texture is to be retained.

1805-c—HOW TO DIP ICE CREAM—The desirable characteristics of good ice cream can easily be lost between the can and the consumer. "Gouging" or "hacking" ice cream breaks down its uniform air cell structure, shrinks its volume, and causes its texture to become rough and icy.

The server may dip ice cream with a minimum of effort while preserving the original fine qualities of the ice cream for the crews' enjoyment. Observe the four steps shown in illustration 2, and the following directions:

1. Keep dipper sharp and true-edged.
2. Keep dipper clean. Between scoops of different flavors, dip dipper in hot water and rinse. Air dry. A wet dipper causes iciness in ice cream servings.
3. When starting on a full can, move dipper in circles across surface of ice cream cutting ribbons of ice cream off surface and rolling it into a smooth round ball.
4. As ice cream level drops, follow the same method, keeping ice cream surface level. Maintaining level surface of ice cream to bottom of can not only preserves desirable qualities of product but also eliminates risk of contaminating the ice cream. Improper dipping methods cause pile up on sides of can.

PART XIX: SPECIAL MEALS: FLIGHT AND BOAT MEALS

	Page
1901—INTRODUCTION.....	D19-1
1902—INFLIGHT FEEDING.....	D19-1
1903—ORGANIZING AND MANAGING THE FLIGHT GALLEY.....	D19-1
1903-a Flight Galley Personnel.....	D19-1
1903-b Flight Galley Operating Procedures.....	D19-2
1903-c Flight Galley Equipment and Layout.....	D19-6
1903-d Flight Galley Management.....	D19-7
1903-d(1) Handling Orders.....	D19-8
1903-d(2) Estimating and Breaking Out Supplies.....	D19-8
1903-d(3) Controlling Costs.....	D19-9
1904—PLANNING FOR FLIGHT MEALS.....	D19-10
1904-a How to Plan for Special Food Needs.....	D19-11
1904-a(1) Foods to Include.....	D19-11
1904-a(2) Foods to Exclude.....	D19-11
1904-a(3) Fluids Required Aloft.....	D19-13
1904-a(4) Other Factors to Consider.....	D19-13
1904-b Meeting the Food Needs of Aircrews.....	D19-13
1904-c About Feeding in Jet Aircraft.....	D19-14
1905—THE SANDWICH MEAL.....	D19-14
1905-a Meal Patterns and Menus.....	D19-14
1905-b How to Produce the Sandwich Meal.....	D19-18
1905-b(1) Sandwich Production.....	D19-18
1905-b(2) Preparing Sandwich Ingredients.....	D19-19
1905-c Producing Other Components.....	D19-19
1905-c(1) Fried Chicken.....	D19-19
1905-c(2) Desserts.....	D19-20
1905-c(3) Beverages.....	D19-20
1905-c(4) Relishes and Fruit.....	D19-20
1905-c(5) Eggs.....	D19-20
1905-d How to Package the Sandwich Meal.....	D19-20
1906—THE BULK ISSUE MEAL.....	D19-22
1906-a Special Equipment and Supplies Required.....	D19-23
1906-b Sanitation.....	D19-23
1906-c Meal Patterns and Menus.....	D19-23
1906-d How to Produce the Bulk Issue Meal.....	D19-28
1906-e How to Package the Bulk Issue Meal.....	D19-28
1907—THE FOIL PACK MEAL.....	D19-30
1907-a Special Equipment and Supplies Required.....	D19-31
1907-b Meal Patterns and Menus.....	D19-32
1907-c How to Produce the Foil Pack Meal.....	D19-36
1907-c(1) Production Steps in the Ground Galley.....	D19-36
1907-c(2) Production Steps in the Aircraft Galley.....	D19-38
1908—PRECOOKED FROZEN MEALS.....	D19-38

PART XIX: SPECIAL MEALS: FLIGHT AND BOAT MEALS

1901—INTRODUCTION

The Navy's special meal feeding operation is an important part of our subsistence program. To slight any step in the production of good wholesome rations is to reduce the effectiveness and readiness of our fleets.

Good special meals for aircrews are the result of well-knit supply management, food production, and food service of all messes at each Navy activity. As distinct and separate units, or as a unit of general mess operations, flight galleys ashore or afloat are manned by commissarymen who must be aware of the requirements for special meals.

Conditions and facilities for eating and preparing food away from galleys limit possibilities for the menus. Other limitations, too, will be found in packaging meals. Special meals are often held for several hours before serving, thus requiring both special foods and extra care in handling.

At the present time, feeding systems authorized for special meals are—

1. sandwich meals or box lunches,
2. foil-pack meals (for aircraft only),
3. bulk-issue meals,
4. precooked frozen meals.

Menu planning guides, mess-management techniques, and instructions for special meal production are discussed for these systems.

1902—INFLIGHT FEEDING

Packing a good flight meal is an important job. Any doubting commissaryman need only ask one of his customers, or better yet, take a flight with him. To fly right you have to eat right.

The first step toward making your aviation customer happy is to know what basic food he needs. This know-how, translated into good menus and tasty food, is essential to the physical and emotional well-being of personnel in the Navy who fly and man our aircraft.

1903—ORGANIZING AND MANAGING THE FLIGHT GALLEY

Proper planning for producing inflight meals is equally as important as proper diet for aircrews. Planning right, like eating right, is not accidental. A well-planned and equipped galley plus effectively supervised personnel add up to a smooth operation; this is good management.

1903-a—FLIGHT GALLEY PERSONNEL

Good management begins with the men—commissarymen and subsistence personnel responsible for flight rations. Careful supervision of the mess at all stages of production is essential, and all flight-galley personnel do a better job if they develop a lively interest in the operation. The flight meal can be only as good as this interest is high.

Well-trained commissarymen should be permanently assigned to the flight galley. Other personnel with flight galley experience are needed for rotation and temporary assignment when workloads get unusually heavy. If necessary, establish round-the-clock watches to keep up with production requirements and to maintain high standards of work.

Require that the men observe habits of personal cleanliness. Observe regulations given in "Manual of Naval Preventive Medicine" (NavMed P-5010). A scrubbed, immaculate galley with clean, shining equipment goes hand in hand with efficient management. Take every possible precaution to avoid poor sanitation practices in the flight galley. Assurance of maximum effort in sanitary food handling is doubly important in flight rations because of long food-holding periods and the risk of the crew's becoming ill without benefit of medical assistance. Acquiring good work habits will reduce the danger of foodborne illness aloft.

1903-b—FLIGHT GALLEY OPERATING PROCEDURES—Ship and shore stations operate flight galleys under an instruction which outlines the organization and mission of the flight galley according to the "BUSANDA Manual." This clarifies who is entitled to receive flight rations and at what charges, when collections and refunds are to be made, and also gives information on what, when, and how meals and service are to be provided by the flight galley.

Another—an internal organization instruction—spells out the operative procedures of the flight galley. Specific responsibilities and duties for personnel, including watch schedules and guidelines for operation of the galley should be listed. Safety and sanitation measures, suitable menus for flight meals, production and packaging techniques, and directions for issuing the ration are also included. Each flight-galley commissaryman must assume personal responsibility for reading and following these instructions. When seen in relationship to his flight galley duties, these instructions take on new meaning. An example of an internal instruction follows.

EXAMPLE OF SHIP OR STATION] (SUPPLY OR COMMISSARY DEPARTMENT) INSTRUCTION FOR FLIGHT FEEDING

(COMMISSARY, SUPPLY) 4061.1A
(Date) _____

(COMMISSARY, SUPPLY) INSTRUCTION 4061.1A

From: (Commissary, Supply) officer
To: (Commissary, Supply) Department Personnel

Subj: Flight Feeding

Ref: (a) (Ship or Station) INST 4061.1A
(b) BUSANDA Manual
(c) Manual of Naval Preventive Medicine (NAVMED P-5010)

1. Purpose. To publish flight feeding instructions and operating procedures for the flight galley in accordance with reference (a).
2. Cancellation. _____ Instruction 4061.1 is canceled and superseded by this Instruction.

3. Flight Feeding

a. General. As reference (a) points out, "the importance of nutritious, appealing flight meals cannot be overstressed. The meals provide many intangible benefits in addition to the nutritive value. . . . Only the highest quality flight meals . . . will bear the label of this (ship, station). To protect this standard of excellence, these flight meals will be issued and used only as authorized . . ." Reference (a) also outlines the mission of the flight galley and places responsibility on certain officers while stressing the need for cooperation by all personnel to attain a topnotch flight feeding program.

b. Entitlement, Charges, Cash Collection, and Refunds for Flight Meals. As stated in reference (a), the Air Terminal Officer, Squadron or Operations Duty Officer, or Plane Commander is responsible for determining eligibility, applicable charges, and submitting proper forms with cash collected to the (Supply, Commissary) Officer. Enclosure (1) of reference (a) provides a useful summary of charges for their guidance. The (Supply Commissary) Officer is accountable for all cash collected for flight meal sales until transferred to the Disbursing Officer. He also is responsible for the inspection of flight meals returned in event of flight cancellations and approval of refunds.

c. Request and Issue Procedures for Flight Meals. The procedures outlined in reference (a) will be closely followed. Every telephone request will be recorded on a memo and attached to the applicable Flight Meal Request/Receipt (NAVSANDA Form 340) when the latter is received in the flight galley. All unfilled requests on these memos and/or NAVSANDA Forms 340, as well as information on the progress made on filling the request, will be passed to the oncoming watch. Every effort will be made to supply complete, high quality flight meals for late requests without disputes with the "customer." Questions or complaints that cannot be readily answered by flight galley personnel will be referred to the (Supply, Commissary) Officer. All complaints, as well as recurring late requests, will be reported to the (Supply, Commissary) Officer. Flight meals will be issued only to authorized personnel who will sign acknowledging receipt of the meals on a copy of the NAVSANDA Form 340. These signed "proof of receipt" copies of the NAVSANDA Form 340 will be forwarded, at the end of each watch, to the (Supply, Commissary) Officer for matching with the originals received there with any cash collected. Cash will be accepted by personnel designated by the (Supply, Commissary) Officer only when accompanied by a signed original NAVSANDA Form 340. Food items and meals returned to the flight galley should be carefully inspected and information on their condition relayed immediately to the (Supply, Commissary) Officer in case refunds may be involved. These returned items will be handled separately and disposed of (reissued, returned to stock, thrown out) as directed by the Leading Commissaryman.

d. Records. Flight meal records will be maintained in the (Supply, Commissary) Office in accordance with reference (b). The following records will be maintained in the flight galley:

(1) A looseleaf Flight Galley Log containing this instruction, other pertinent instructions and notices concerning the operation of the flight galley, safety regulations, sanitary precautions, orders of the Leading Commissaryman, current menus, preparation and packaging directions, watch lists, etc. All flight galley personnel will be familiar with the contents of this log.

(2) A Flight Meal Issue Record showing along the margin mess issue numbers and in succeeding columns—"Issued to," "Flight meal type," "Menu," and "Quantity issued."

(3) A file of Flight Meal Evaluation Questionnaires and other comments on the flight meals or the flight galley.

4. Flight Galley

a. Organization. The flight galley will be operated in accordance with this instruction, other pertinent instructions and notices, and reference (b) as a separate unit of the general mess under the direction of a Leading Commissaryman reporting directly to the (Supply, Commissary) Officer. Although it may share facilities with the general mess . . . (or outline what spaces or facilities it is allocated and directly responsible for) . . . requiring close coordination, stores of items for exclusive use in flight meals should be accounted for separately.

b. Personnel. The flight galley personnel and their general duties are:

(1) Leading Commissaryman. In overall charge of the flight galley, reports directly to the (Supply, Commissary) Officer on duty during peak workload periods and regular working hours.

(2) Watch Captains. In charge of the watch under the direction of the Leading Commissaryman.

(3) Assigned Commissaryman. Responsible for flight meal preparation, packaging, and issue as directed by the Watch Captain.

(4) Assigned Strikers and Messmen. Assist commissarymen as directed.

c. Watches. The following flight galley watches are established on the basis of peak periods in flight operations:

Port (0600-1800), _____ CS2, _____ CS3, _____ SN.
Starboard (0600-1800) _____ CS2m, _____ CS3, _____ SN.
Night (1800-0600), Duty Flight Galley CS.

A watchlist will be prepared monthly by the Leading Commissaryman, approved by the (Supply, Commissary) Officer, and a copy posted in the flight galley.

d. Safety Regulations. Pertinent safety regulations and/or operating instructions will be conspicuously posted by each machine or device and strictly followed.

e. Sanitary Precautions. Sanitation is especially important in handling flight meals. Sanitary precautions will be conspicuously posted and followed. The Leading Commissaryman will conduct a daily inspection of all flight galley spaces and personnel and stand by in the flight galley for the (Supply, Commissary) Officer's, Medical Officer's, and Commanding Officer's periodic material inspections. All food handling personnel will report as requested by the Medical Officer for check-ups. All sanitary regulations such as those set forth in reference (c) and other pertinent instructions and notices will be strictly followed.

5. Flight Meals

a. Menus. The menus for flight meals will be prepared by the Leading Commissaryman, approved by the (Supply, Commissary) Officer, posted in the flight galley, and distributed to flight personnel as directed by the (Supply, Commissary) Officer. These menus will be reviewed and revised at least once a month.

b. Preparation and Packaging. Flight meals will be prepared using reference (c) as a guide. Due to the perishable nature of most of these meals, it is stressed that the meals must be prepared to order. All perishable flight meals must be date/time stamped before issue. The Leading Commissaryman will prepare the initial meal of a new menu to use as a guide or pattern by flight galley personnel in preparing and packaging similar subsequent flight meals. Careful portion control is especially important in preparing flight meals. The finished product must be as attractive and appealing as possible—this largely depends on careful packaging. Preparation and packaging checkups by the Leading Commissaryman using random samples will be used not only for quality control, but also as a training device for flight galley personnel.

c. Evaluation and Improvement. A responsive program of better service through close cooperation with flight operations personnel is our goal. The food needs of aviators are unique and our job is to satisfy these needs—within limits. Flight Meal Evaluation will be packed with every flight meal. The filled in and returned questionnaires will be carefully tallied, analyzed, and periodically reviewed with the (Supply, Commissary) Officer by the Leading Commissaryman. These tallies should be retained for discussion to evaluate the flight feeding program at meetings with flight operations and medical personnel. Meetings should be held at least monthly as prescribed in reference (a). The Leading Commissaryman and other commissarymen designated by the (Supply, Commissary) Officer will attend these meetings. The purpose of these meetings, as well as flight galley indoctrination tours given flight personnel and indoctrination flights given commissary personnel, is the improvement of the flight feeding program.

6. Responsibility. The responsibility of the Leading Commissaryman will be to thoroughly familiarize all flight galley personnel with the requirements of this instruction, and to require compliance by those personnel with the provisions thereof. The Leading Commissaryman will report as required, to the (Supply, Commissary) Officer in compliance with this instruction and recommend changes as deemed necessary.

7. Action. All flight galley personnel will read and sign the master copy of this instruction to indicate that they have read and do understand the contents thereof. A copy of this instruction will be permanently posted in the flight galley.

Submitted:

(Supply, Commissary) Officer

Approved:

Commanding Officer

1903-c—FLIGHT GALLEY EQUIPMENT AND LAYOUT—Equipment and layout permanently influence flight galley management. Ideally, the flight galley should be a well-equipped, separate unit located near flight operations. The flight galley would include food preparation, meal assembly, packaging, and issue areas as well as storage space (dry and refrigerated) laid out to save time and motion. An ideal flight galley is a neat, easily maintained, well-lighted space with adequate, conveniently located electrical outlets, water supply, and drains. See illustration 1.

Practically, flight galleys differ widely in location, space, layout, and equipment. The needs also vary greatly. Large shore stations prepare hundreds of flight meals of different types, carriers prepare only sandwich meals, while smaller ships and stations receive requests for a few flight meals daily. In all cases, do the best with what facilities and equipment are available. Balance equipment capacities or sizes and numbers with need. The following suggested list of flight galley

equipment can be tailored to the individual needs of your command:

Refrigerator
Frozen food cabinet¹
Lavatory (for hand washing)
Sink
Meat slicing machine
Deep fat fryer
Food mixing machine
Meat tenderizer
Griddle or grill
Oven
Steam jacketed kettle
Coffeemaker or urn
Table
Table, wheeled, or food cart
Desk and chair
Sealing iron
Storage shelves and gear locker
Utensil racks and holders
Wrapping material dispensers
Garbage can
Food preparation and service equipment and utensils (see table A, p. D19-7.)

¹ For larger operations (i.e., MATS support).



Illustration 1
A Well-Planned Flight Galley With Storage Shelves Near Work Tables

TABLE A
FLIGHT GALLEY EQUIPMENT
(Minimum Stock Items Recommended for Use in the Flight Galley)

Item	Item		
BASKET, woven-wire, frying.....	7330	MEASURE, liquid, quart.....	7240
BOARD, food-chopping.....	7330	MEASURE, liquid, gallon.....	7240
BOARD, food-slicing.....	7330	MEASURING SPOON SET.....	7330
BOX, index-card.....	7520	OPENER, can.....	7330
BRUSH, injector cleaning (for steam kettle pipes and spigots).....	7920	PADS, bakery, cotton 11 $\frac{1}{2}$ x 8 $\frac{1}{2}$ in.....	7330
BRUSH, pipette (for cleaning coffee urns).....	7920	PANS, baking (aluminum), 25 $\frac{3}{4}$ x 17 $\frac{1}{2}$ x 1 $\frac{1}{4}$ in.....	7330
BRUSH, wire, butcher block.....	7920	PANS, baking (aluminum), 8 x 8 x 1 $\frac{1}{2}$ in.....	7330
BUTCHER STEEL.....	7330	PANS, frying, 6-in diameter.....	7330
CLEAVER, meat, 8-in blade.....	7330	PAN, muffin, 12 cup.....	7330
CLOTH, cleaning, nonwoven fabric.....	7920	PAN, pie, 10-in diameter.....	7330
DIPPER, kitchen.....	7330	PEELER, potato, hand.....	7330
DISHPAN, 20 qt.....	7330	SCALES, trip, baker's.....	6670
DISPENSER, condiment.....	7350	SCOOP, ice cream (12 per quart).....	7330
DISPENSER, paper napkin.....	7350	SCOURING BRICK.....	7920
DISPENSER, paper towel.....	4510	SCRAPER, baker's.....	7330
DISPENSER, soap, metal.....	4510	SERVER, pie and cake.....	7340
DISPENSER, sugar.....	7350	SHAKERS, pepper.....	7350
EGG WHIP.....	7330	SHAKERS, salt.....	7350
FOOD CONTAINER, delivery and storage.....	7330	SIEVE, flour.....	7330
FOOD TURNER, wood handle.....	7330	SKIMMERS, 15-in handle.....	7330
FOOD TURNER, steel handle.....	7330	SOAP, scrubbing, alkaline.....	7930
FORK, food preparation.....	7340	SOAP, toilet.....	8520
GRATER, food.....	7330	SPATULA, 7 $\frac{1}{4}$ -in blade.....	7330
KNIVES, boning, 6-in blade.....	7340	SPATULA, 13 $\frac{3}{4}$ -in blade.....	7330
KNIVES, butcher, 10-in blade.....	7340	SPONGES, cellulose.....	7920
KNIVES, butcher, 14-in blade.....	7340	SPOON, food service, basting, 13 in.....	7340
KNIFE, cook's, 12-in blade.....	7340	SPOON, food service, mixing, 13 in.....	7340
KNIFE, mincing and chopping, 6-in blade.....	7340	SPOON, food service, straining, 13 in.....	7340
KNIFE, paring, 3 $\frac{1}{4}$ -in blade.....	7340	STONE, sharpening.....	5345
KNIFE, slicing, 12-in blade.....	7340	STRAINER, pot.....	7330
LADLE, 2 oz.....	7330	THERMOMETER, deep fat.....	6685
LADLE, 7 oz.....	7330	THERMOMETER, meat.....	6685
LINER, baking cup (muffin tin).....	7330	THERMOMETER, oven.....	6685
MEASURE, liquid, 1 cup.....	7240	TONGS, food serving, 6 in.....	7330
		TONGS, food serving, 12 in.....	7330
		TOWEL, paper, single fold.....	8540
		TWINE, wrapping (butcher's).....	4020

1903-d—FLIGHT GALLEY MANAGEMENT—
 Basic to efficient flight mess operations is a systematic scheme. Try out different systems of management and adopt one that proves best for you. Good management reduces waste in both food materials and commissary effort.

The following phases of operation require special management:

1. Handling orders,
2. Estimating and breaking out supplies,
3. Controlling costs,

4. Controlling quality.
5. Assembling food and accessory items.

1903-d(1)—Handling Orders—The commissaryman who prepares the flight ration needs to have the following information to properly identify the order:

1. Aircraft number (BUWEPS, MATS, etc.);
2. Scheduled flight departure time;
3. Number and type of meals required;
4. Scheduled pickup time.

This data comes to the flight galley on a **FLIGHT MEAL REQUEST/RECEIPT** (NAVSANDA Form 340 (1-55)). Usually, this form is delivered personally to the commissary officer by a member of the squadron that is requesting rations. (See illustration 2.) The air terminal or squadron duty officer has determined which

men are entitled to the ration and this, translated into the number of meals required, is given on the form. For detailed administrative procedures see BuSandA Manual.

1903-d(2)—Estimating and Breaking Out Supplies—Since inflight meals are prepared as individual rations, estimating and breaking out supplies are simple in most aspects. Many foods used are individually portion packaged, requiring only a count of items needed.

Well-stocked storerooms are important to a good flight feeding operation. Items authorized only for special meals should be separated from general mess stocks. Flight meal items should be issued on Request for Issue or Turn-In (DD Form 1150) or Subsistence Report (NAVSANDA Form 1059-I (4-63)). These forms should be carefully filed and tallied.

FLIGHT MEAL REQUEST/RECEIPT NAV. S. AND A. FORM 340 (REV. 1-55)										
TO: COMMISSARY OFFICER										
REQUEST REQUEST TO BE ISSUED AT GOVERNMENT EXPENSE	FROM		REQUESTED (Date) (Time)			SCHEDULED FLIGHT PLANS				
	TO BE ISSUED (Date) (Pick-up time)		PLANE NO. (Specify BUAER, MATS, etc.)			ETD	ETA			
	BOX LUNCHES	RATION COMPONENTS	REQUESTED BY (Signature)			(Rank)		(Title)		
ITEM	USN	USMC	USNRA	USMCR	TOTAL	USA	USAF	USCG	TOTAL	
BOXED MEALS										
RATION COMPONENTS										
TO BE SOLD FOR CASH	TYPE		NUMBER OF MEALS		CHARGE	SURCHARGE		EXTENSION		
	ENLISTED, ON LEAVE									
	OFFICERS AND CIVILIANS									
SIGNATURE (Rank) (Title)					TOTAL CASH					
RECEIPT	NUMBER OF MEALS	DELIVERED ON (Date) (Time)		AMOUNT OF CASH	<input type="checkbox"/> NAV. S. AND A. FORMS 341 ATTACHED					
	REPRESENTATIVE OF REQUESTING OFFICER (Signature)				REPRESENTATIVE OF COMMISSARY OFFICER (Signature)					
	RATE:	SERVICE NO.		RATE:	SERVICE NO.					

Illustration 2
Flight Meal Request/Receipt

To estimate quantities of food needed for a particular menu, consult the Planning Guide (table E). This guide is intended as a means of checking kinds, amounts, and/or numbers of food items required for 25 (or multiples of 25) meals.

1903-d(3)—Controlling Costs—Measures which aid in controlling food costs of inflight meals are portion control, waste control, and precost control of the menu.

Portion Control. This is probably the most important means of holding the cost of the meal within planned limits of precosted menus. Inflight meal items require portion control attention just like general mess meals. The Watch Captain decides upon a suitable portion size for each menu item and this data accompanies recipe information and flight galley instructions.

Consult the Navy-Marine Corps Recipe Service for guidance in determining appropriate portion sizes to allow inflight rations. In box lunches, for example, the "N. Sandwich" cards show portions for meat and other fillings to be used in sandwiches. Additional information is given in Sandwich Meal, paragraph 1905. The Planning Guide (table E) provides information on other components for use in bulk issue meal.

A standard gram or ounce scale is a necessary piece of equipment in the flight galley for portion control. Weigh portions of meats to keep a close control over food costs. An excess amount of meat in a sandwich can spell the difference between a high cost and a reasonably priced meal. Dessert items, while less expensive than meat, also require portion control. Measure, count, and portion out relishes and other items that are not individually portion packaged.

Portion control will aid requisitioning and prevent overordering and waste. Uneven distribution of food in outgoing packages leads

to crew dissatisfaction with the meal. In short, adequate portion control helps make possible accurate cost control.

Waste Control. This begins with planning a menu and ends with salvaging uneaten foods at the end of a flight mission. In between these two phases of operation, the following contribute to controlling waste: (1) Standardization of the amount of food or number of items on the inflight menu; (2) keeping a close check over the size portions (as already mentioned); and (3) preparing excellent food in the galley that will be palatable, attractive, and acceptable to the aircrew.

The number of different menu items also should be standardized so that all outgoing meals of the same type have an equal number of components. Keep the meal patterns uniform to insure a fair distribution of food between aircraft. Make sure that meals are acceptable to aircrews, but also guard carefully against putting out excessive food. Uneaten food is wasted food. Food is less likely to be wasted when well prepared, so require the best of preparation techniques for inflight meals of maximum acceptance. Cookies and cakes are good examples of items that are usually superior in flavor and quality if galley baked and help to keep costs within the authorized rate for flight rations.

Salvage of unused food prepared for flight rations is necessary in the event of flight cancellations. Unused rations should likewise be salvaged from the flight time and plans, but perishable components should never be reissued to flight crews. All returned perishable items (except unpeeled fruits, milk, and individually packaged condiments) which cannot be used in the general mess before expiration of the safe consumption time should be surveyed. Use returned milk for cooking. Types of items which are reusable for flight meals include:

Canned foods of all types
Candy

Accessory items (nonconsumable)

Individual portion packages of:

Catsup ¹	Salt
Mustard ¹	Pepper
Salad dressing ¹	Sugar

Perishable foods such as sandwiches, cooked eggs, and fried chicken, which have not been issued and have been held under constant refrigeration in the flight galley, must be used for the general mess or otherwise disposed of before a 24-hour period has lapsed. Rotate foods promptly so that storage period mistakes do not occur.

Precost Control of Menus. Economy follows a close second to quality as an important goal to achieve in flight feeding operations. These two important goals go hand in hand in planning and producing good inflight meals.

Develop menus ahead of time. Precost each in order to arrive at a series of standardized portions and menus. Base pricing on 100-portion breakout values to arrive at a per ration cost. One excessive meal cost may not show damaging effects on monthly reports, but keeping down daily menu costs means less juggling in overall cost accounting. Keep a close control over costs of the meal. Make periodic precosting checks—it will readily show where costs are excessive and changes should be made in the menu.

Meat is the most expensive menu item and requires careful control to keep costs proportionate. Select popular meats, but use cuts that give the best cooked yields possible. Refer to the list of Ration Components and Allowances in the Bureau of Supplies and Accounts Manual. Special meal items change as new items are added or replace less desirable ones.

If menus are running over set limitations, have a look at prices paid for baked items obtained

¹ Do not salvage these foods if portioned into individual containers in the galley. Commercially purchased portion packs are salvageable.

from commercial sources. Galley-baked items are not only more palatable—but usually less costly.

Availability and quality of fresh fruit varies by season and is more costly at some periods. Many times canned fruits can be used more economically.

Well-trained personnel and good supervision not only contribute to a smooth-running flight galley, but the results of their efforts show up in the products prepared for the flight ration. Standardized recipes and use of good cooking techniques are basic operations in flight meal preparation.

1904—PLANNING FOR FLIGHT MEALS

Before, during, or following a flight, aircrews need additional food for energy. Nervous tension builds up in anticipation of the coming flight mission and stays high while flying; normal activity plus this tension burn up energy. Fatigue develops rapidly as stores of body energy ebb, and these stores must be kept up for a man's best performance at the controls of a plane or for other duties when airborne. Fatigue of this nature may very well account in part for some aircraft accidents.

Crews often fly planes on irregular schedules. Grabbing a bite on the run or substituting a cup of coffee for a meal easily becomes a fixed pattern, which triggers poor eating habits. Inflight rations provide food for energy needed for a specific flight mission and, usually, are regarded as supplementary meals. A well-balanced diet eaten routinely by aircrews helps reap physical benefits aloft and prevents fatigue.

When aloft, aircrews also look on food for reasons other than the actual physical benefit they receive from it. Food has unusual im-

portance during long, strenuous flight missions; it is a means of relaxing, breaking the monotony of a watch, and is an honest reward for a job well done.

1904-a—HOW TO PLAN FOR SPECIAL FOOD NEEDS—Joint planning between commissary and squadron personnel results in good inflight meals. Squadron personnel know the food preferences of their crews as well as their flight schedules. Commissary personnel plan the menu and prepare the food.

Many inflight food problems are best solved by the joint efforts of the Supply Officer and Medical Officer or Flight Surgeon. Special food requirements can be worked out by these specialists from which both commissary and squadron personnel can plan proper food for aircrews.

The flight schedule is the first consideration in such joint planning. Deciding how many meals are needed precedes all other steps in planning. (See table B, p. D19-12.) Crews should eat about every 3 hours to keep up energy. On short flight missions under 3 hours, there is probably no need for a meal aloft unless it was not possible for the crew to attend a regular mess before takeoff. A second meal will be required for flights of over 5 or 6 hours.

Once a schedule has been decided upon, commissarymen can plan menus that meet the special food needs of aircrews. Use the following guidelines in choosing foods for inflight meals.

1904-a(1)—Foods to Include—Select foods for inflight meals that supply a generous amount of energy-yielding or high-caloric foods. "BUS-ANDA Manual" lists authorized subsistence items. Sugar and starch foods are best for this

purpose. Quick-energy foods such as the following are suitable examples:

Amount	Item	Number of Calories (Approximately)
1.....	Candy bar w/nuts.....	256
3.....	Butterscotch cookies.....	348
1.....	Sandwich (ham).....	357
2.....	Sweet rolls.....	256
2.....	Brownie squares.....	282
4.....	Soda crackers plus peanut butter.	186
1 pc.....	Cake, iced.....	290
1 cup.....	Chocolate beverage.....	239
2 cups.....	Milk.....	332
1 can (6 oz).....	Fruit juice (pineapple).	90

The body uses sugars and starches efficiently. Protein foods such as meats and fats like butter also supply generous amounts of energy, but the bloodstream takes up sugar and starch foods faster and converts these into usable energy more quickly.

If aircrews eat about every 3 hours as suggested, energy will be kept at a peak.

1904-a(2)—Foods to Exclude—Avoid using certain food in menus to prevent aircrew's discomfort aloft. Foods generally known to cause intestinal gas expansion at high altitudes are—

1. beans (dried or canned such as navy, pinto),
2. onions (raw),
3. cabbage (all forms),
4. carbonated beverages.

These foods do not affect every person the same and other foods not included in the list,

TABLE B
GUIDE IN SCHEDULING MEALS ALOFT

Mission Length (Hours)	Number Meals Aloft	Type of Meals Recommended			
		Snacks (Select Single Food Items)	Sandwich Meals (Eat 3 Hours After Preparation)	Meals Cooked Aloft From Bulk Issues	Foil Pack Meals
1.....	0.....	(¹)	.....	.....	.....
1-3.....	1.....	(¹)	X.....	.....	.....
4-5.....	1 + snack.....	X.....	X.....	X.....	X.
6-7.....	2.....	.....	X.....	X.....	X.
8-11.....	2 + snack.....	X.....	X.....	X.....	X.
12.....	3 + snack.....	X.....	X.....	X.....	X.

¹ Light meal before takeoff.

may produce gas pressure. The crew can judge for themselves whether to consume foods that may be questionable by trying and eliminating one food at a time.

Airsickness from plane motion, fatigue, or lack of oxygen may also cause distress aloft. Starch, sugar, and liquid foods included in the meal will be helpful in such cases. Highly spiced, greasy foods are best avoided at all times in flight meals.

Foodborne infections are ever-present threats in flight feeding operations. Food spoilage will result from mishandling in the flight galley and improper treatment in transit and on the plane. Maintain good sanitation in the ground galley and observe regulations on food handling.

Generally, deterioration and spoilage occur more rapidly in cooked food mixtures and in combinations such as the following:

Sandwiches made of ground meat or salad-type fillings;
Egg salad mixtures (with mayonnaise);
Fish and shellfish;

Pies made of custards and similar type fillings;
Creamed sauces or soups;
Leftover cooked poultry.

These and many other fresh foods are highly perishable and will spoil if there is a lag in time between preparation and consumption. Eliminate all foods in these categories from inflight menus. See the "Manual of Naval Preventive Medicine" (NavMed P-5010), Chapter I on "Food Service Principles" for paragraphs relating to flight rations. Holding times and temperatures, particularly for all protein foods, must be adhered to rigidly. The Bureau of Medicine and Surgery has ruled that not more than 3 hours cumulative time should elapse between preparation and consumption of flight rations unless the items are refrigerated below 40° F or heated above 140° F. Any deviation from this ruling will greatly increase the risk of foodborne illnesses.

Difficult, hard-to-eat foods are especially unsuitable for inflight menus. Meats that require cutting, fruits that need peeling, crumbling breads and desserts are examples of problem foods that should be excluded from the menu.

Beware of leftovers from the general mess, and never use foods that have been out of refrigeration for long periods of time. Hold all foods requiring refrigeration at the proper storage temperature in the galley. Survey of food items often becomes necessary when flights are canceled or delayed takeoffs occur. (See "BUSANDA Manual.")

1904-a(3)—Fluids Required Aloft—Proper fluid intake is equally as important as solid food to the aircrrew. In point of fact, the human body is able to survive for longer periods of time without food than without water.

The amount of water needed per man per day is based upon a set of conditions which is individual to each person. Thirst itself is usually an excellent indication of how much water is required and when it is needed. About 3 pts of liquid have been suggested as a suitable amount of water for adults to use daily in addition to the amount obtained from solid foods which contain important amounts of fluid. If, however, the crew is subjected to extreme heat and very dry air, thirst is not an efficient indicator of water needed. Extra fluid becomes essential under these conditions.

On many Navy aircraft, the atmosphere aloft is the same as found any place else; on other aircraft, electronic gear and engines increase temperature and decrease the humidity of the plane. Body water is lost through excessive sweating and this water loss needs replacing. Include a wide variety of beverages in the form of coffee, tea, hot chocolate, milk, fruit juices, and fruit-ade drinks, as well as soup, in all menus to care for this special fluid need among aircrews.

There is a limit on the amount of water stowed on aircraft; take this into consideration in planning menus. Select with care items such as dehydrated soups and concentrated juices that require extra water for reconstituting or avoid using them on menus if information on aircraft water supply is not available.

1904-a(4)—Other Factors to Consider—the type of plane, the number of crewmembers (plus passengers), the food service facilities aboard the plane, and the personnel who will prepare and serve the food aloft will affect the number and types of meals to prepare. Use this guide to judge the suitability of foods for different flight situations:

IN-FLIGHT FOOD SELECTOR GUIDE

Flight Situation	Food Characteristic Needed
1. Flight duration: Short term.....	Quick energy foods.
Long term.....	Stable and stowable foods.
2. Space and equipment limitations: Stowage.....	Lightweight, minimum bulk foods.
Preparation equipment.....	Quick cooking or ready-prepared foods.
Serving facilities.....	Portion packaged, single items.
Eating space.....	Bite size of foods eaten out-of-hand.
Waste disposal.....	Foods w/minimum inedible trim and waste.
3. Altitude and speed stresses: Intestinal gas pressures in crew. Extremes of temperature. Restrictive personal equipment.	Bland, simple foods. Hot and cold foods and beverages. Ease in consuming.

1904-b—MEETING THE FOOD NEEDS OF AIRCRAFTS—Alert commissarymen who man flight galleys will plan inflight menus that reflect their knowledge of the basic food needs of aircrews. The resulting effort will provide

meals that are not only enjoyed by the crew but, also, are safe and convenient for inflight consumption.

Flight meals may not include the wide variety of foods that would be expected in the messhall or at home. This is not to say that flight meals are inadequate, but that factors such as those listed in the Inflight Food Selector Guide limit the variety of foods suitable for flight rations. This limited variety will not be injurious if the daily meals eaten at home and in ground messes add up to well-balanced rations.

The often-heard expression, "The proof of the pudding is in the eating," offers a real challenge to flight galley commissarymen. Fly a mission—eat a box lunch yourself to find out how it is to receive a flight ration that you have packaged.

1904-c—ABOUT FEEDING IN JET AIRCRAFT—Navy flight galleys at present have few requests from aviation squadrons for rations suitable for use on high-performance aircraft such as jet fighter planes. Information, therefore, on meals of this type is not included.

Operational testing of foods and food containers suitable for use by crews flying with oxygen masks at high altitudes have been evaluated by the Naval Research and Development Facility, Bayonne, N.J. Information on feeding systems for high-altitude aircraft may be obtained from the Facility, if desired.

1905—THE SANDWICH MEAL

The Sandwich Meal or "box lunch" as it is popularly termed, is by far the most common type of special meal ration used in the Navy (see illustration 3, p. D19-15). This is a cold meal, but hot foods such as soup or beverages may supplement the Sandwich Meal if the area

at which the meal is to be used has equipment for preparing and/or space for stowing these items.

The Sandwich Meal is adaptable for use on most types of Navy aircraft and flight missions because it does not require refrigeration, if eaten within 3 hours after preparation, or special preparation equipment—it is **READY TO EAT**.

The food items issued as Sandwich Meal components are those easily eaten out of the hand or with a minimum of gear, enabling the crew to eat in shifts or at their stations.

Sanitation and refuse control of the Sandwich Meal is easily managed as all mess gear and food containers are disposable.

Although the list of advantages far outnumber the limitations, the Sandwich Meal has points on the negative side of the ledger.

From the crewmembers' point of view, the main criticism leveled at this type of meal is **MONOTONY OF DIET**. Consuming cold lunches made of the same ingredients every day over a period of time is monotonous. On the other hand, the commissaryman writing menus may find difficulty in including a wide variety of foods that appeal to an equally wide number of appetites—not an easy chore in the case of Sandwich Meals. For example, the number of meats suitable for sandwiches or the choice of less perishable items place limitations on the type of menus possible. According to the Bureau of Medicine and Surgery, a maximum of 3 hours' time without refrigeration must be adhered to rigidly. This is particularly true of meats and other protein foods, but it applies to other foods as well.

1905-a—MEAL PATTERNS AND MENUS—The meal patterns and menus for the Sandwich Meal are different from other special meals because of the limitations just described.

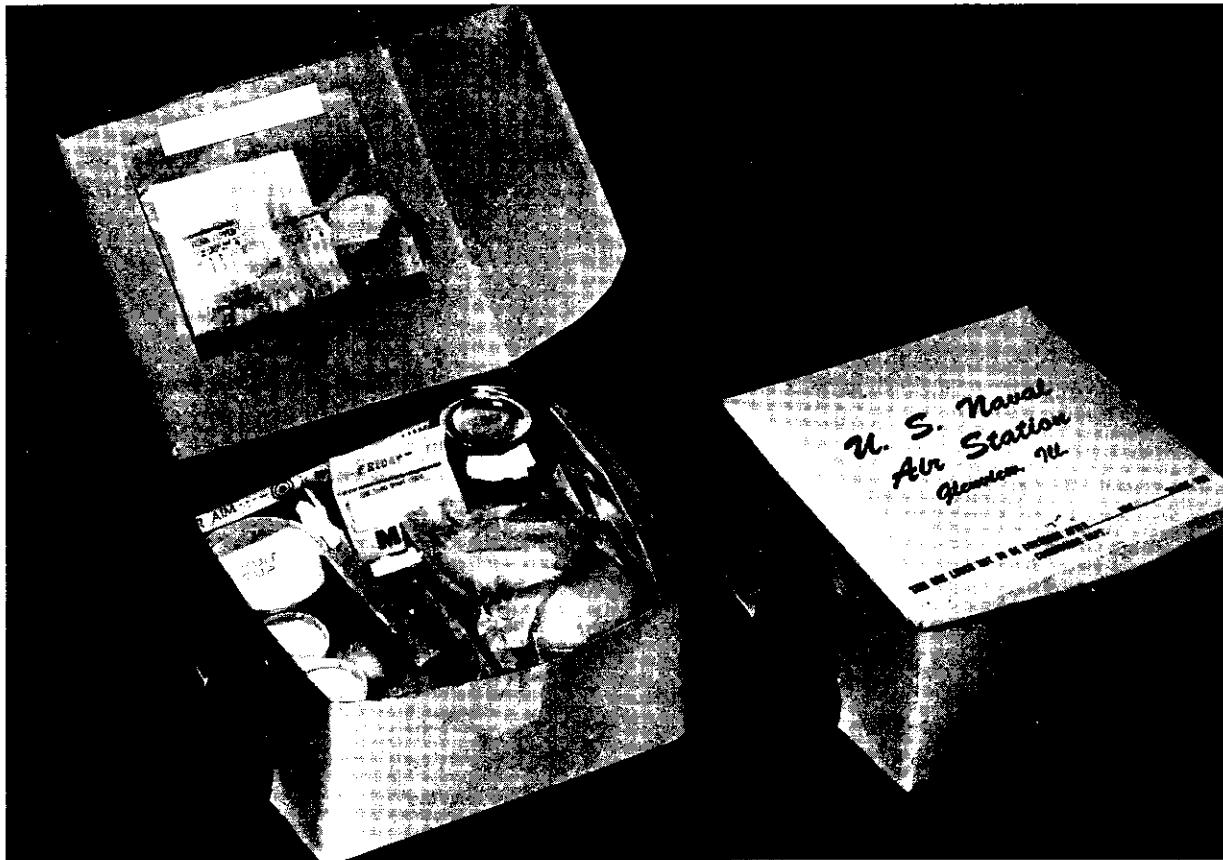


Illustration 3
The Sandwich Meal

The easiest way to design a suitable meal is to use a pattern as a guide—just as a building contractor uses a blueprint. A pattern of foods to be included in the Sandwich Meal depends on available stores, preparation time, and the length of the flight.

Breakfast and Dinner-Supper meal patterns are suggested as a convenient basis for choosing food components to be included in the Sandwich Meal, as follows:

Breakfast

Fruit or juice
Cereal (hot¹ or cold)
Meat
Bread or pastry
Egg(s) or potatoes
Sweets²
Beverages (hot¹ or cold)

Milk

Consumable accessory items (such as salt, pepper, sugar, dry cream, catsup, salad dressing, and mustard)

Dinner-Supper

Soup¹ or juice
Meat (or meat substitute)
Bread
Egg or cheese
Fruit
Relish
Dessert
Beverages (hot¹ or cold)
Milk
Consumable accessory items (such as salt, pepper, sugar, dry cream, catsup, salad dressing, and mustard)

¹ For meals on planes equipped w/ hot cups.

² Optional items.

A special meal issued in lieu of a regular breakfast should resemble it as closely as possible. If there is reason to plan for more than one meal aloft, the breakfast pattern can be adjusted according to this need.

Most planes capable of a flight sufficiently long to justify two meals aloft are equipped to provide some hot food items or to use another type of inflight ration. On planes that are equipped with a hotcup and/or hotplates, hot beverages can be prepared to replace or supplement the cold ones, or thermoses of hot coffee may accompany an order. Other hot food items such as cereal could possibly be cooked aloft.

On planes lacking galley equipment, two cold meals may have to be eaten. Restrict the components of the second meal to foods such as listed below. Items in this sample menu have good keeping qualities. All items on the menu are considered safe for consumption as a second nonrefrigerated meal on longer flights lasting over 3 hours.

- 1 Can (5½-6 ounce) tomato juice
- 1 Cheese sandwich
- 1 Peanut butter and jelly sandwich
- 2 Eggs, hard-cooked, unpeeled
- 1 Sweet pickle and 3 olives
- 1 Apple
- 2 Cupcakes
- 1 Candy bar

Mark these boxes to show the perishable meal which must be consumed within the 3 hours after preparation.

Build suitable menus by using the suggested meal patterns for Breakfast or Dinner-Supper. Choose food items for menus that are simple and easily prepared, hold quality, and keep safely for the 3-hour period—and that have eye appeal. Menu balance, while important, may be difficult to achieve in meals of this type; stress starch and sugar foods and include plenty of liquids such as the following:

Starch and Sugar Foods

- Candy, all types
- Pastries, all types
- Breads and crackers
- Cereals
- Cakes
- Cookies
- Jellies, jams, honey

Liquids

- Fruit juices, all types
- Coffee, instant or regular type
- Tea
- Chocolate beverages or cocoa
- Milk, all forms
- Lemonade or other similar drinks

Consider individual tastes and preferences of the crew wherever possible when writing menus. Give popular items high priority, but strive for a balance between a variety of acceptable foods and popular items. See sample menus that follow:

SANDWICH MEAL BREAKFAST MENUS

Menu No. 1

- 1 cn (6 oz)..... Grapefruit juice
- 1..... Baked ham sandwich
- 1..... Blackberry jam and butter sandwich.
- 2..... Eggs, hard-cooked, peeled
- 1..... Danish pastry
- ½ pt..... Milk

Menu No. 2

- 1..... Banana
- 1 ind pg..... Ready-to-eat cereal, plain or sugar-coated.
- ½ pt..... Milk
- 1..... Sliced bacon sandwich
- 2..... Eggs, hard-cooked, peeled
- 1..... Cinnamon bun
- 1 ind pg..... Apple jelly

SANDWICH MEAL DINNER-SUPPER MENUS

Menu No. 1

1 cn (8 Z tall)	Tomato soup ¹
1 ind pg	Saltine crackers
2 pc	Fried chicken
1	Roast beef sandwich
1	Cube cheddar cheese
1	Pear
2 leaves	Lettuce
3	Celery sticks
2	Sweet pickles
2	Chewy nut bars (cookies)
½ pt	Milk

Menu No. 2

1 cn (5½-6 oz)	Grape juice
1	Turkey sandwich
1	Roast pork sandwich
1	Egg, hard-cooked, peeled
1 ind cn	Sliced peaches
3	Ripe olives
2 leaves	Lettuce
1	Candybar
½ pt	Milk

Menu No. 3

1 cn (5½-6 oz)	Apple juice
1	Baked ham and cheese sandwich.
1	Corned beef sandwich
1	Egg, hard-cooked, peeled
2	Pickles, dill
3	Stuffed olives
2 leaves	Lettuce
1 sm ind	Peach pie
½ pt	Milk

Menu No. 4

1 cn (8 Z tall)	Vegetable w/beef soup ¹
1 ind pg	Saltine crackers
2 pc	Fried chicken
1	Sliced cheese sandwich
1	Roll w/butter
1	Egg, hard-cooked, peeled
2	Carrot sticks
3	Green pepper rings
2 leaves	Lettuce
1	Apple turnover
3 pc	Hard candy
½ pt	Milk

¹ For planes or boats carrying heating equipment.

NONCONSUMABLE ACCESSORY ITEMS FOR EACH MENU

Paper napkins, cup, straw. Plastic knife, fork, spoon; can opener.

CONSUMABLE ACCESSORY ITEMS FOR EACH MENU

Individual portion packages of: Dry cream, sugar, salt, pepper, and salad dressing, catsup, and mustard where appropriate.

Hot coffee, sugar, and evaporated milk to be issued in bulk form with all Sandwich Meals unless individual packets of instant coffee are used.

One excellent way to build a popular menu is to accumulate a file of information based on crews' comments on the meal. Solicit comments. Put a questionnaire and self-addressed envelope or checkoff list on a postcard in each boxed meal. (See illustration 4, p. D19-18.)

Eliminate monotonous menus. Avoid a set daily menu or a weekly menu that remains unchanged for long periods of time. Crews dislike roast beef sandwiches on the menu every Tuesday and fried chicken in every box every day.

1905-b—HOW TO PRODUCE THE SANDWICH MEAL—Excellent box lunches are the end product of good commissary management and preparation techniques—a supreme test of commissary ingenuity. Commissarymen have to manage two time extremes—short-order and delayed-food service. Neither circumstance, however, gives license to lessen commissary effort; observing simple techniques makes the difference between high- and low-quality boxed meals.

Suggestions for producing top-quality sandwiches, fried chicken, relishes, fruits, desserts, and beverage items are discussed.

(Reverse is stamped and addressed to Supply or Commissary Officer)

ITEM	YES	NO
Did this box lunch appeal to you?		
Was menu satisfactory?		
Were items properly marked?		
Was lunch eaten within time specified?		

WHAT ITEMS
LACKED FRESHNESS?

WHAT ITEMS DID YOU EAT?
WERE THEY SATISFACTORY?

WHAT ITEMS DID
YOU NOT EAT? WHY?

PLEASE MAKE ANY OTHER COMMENTS PERTAINING TO THE LUNCH THAT YOU THINK WILL ENHANCE ITS APPEAL.

SIGNATURE	(RANK/RATE)	SERVICE
DESTINATION		DATE

Illustration 4
Sample Box Lunch Questionnaire

Aside from the danger of food infection, quality loss—usually due to allowing sandwich ingredients to dry out or become soggy—also is risked. Handle breads, fillings, and spreads carefully. Use the Navy-Marine Corps Recipe Service; heed weights and measures and adjust quantities to avoid overproduction and waste.

1905-b(2)—Preparing Sandwich Ingredients—
Sandwich preparation is discussed as a separate subject. See Section D, "Food Production," Part VIII, "Sandwiches," paragraphs 801 through 804.

1905-c—PRODUCING OTHER COMPONENTS—A discussion of other components of the Sandwich Meal follows.

1905-c(1)—Fried Chicken—Each person will receive more edible meat from separately cut parts of the fryer (one piece of breast plus one leg or one thigh) and will have less difficulty in eating the separate parts.

Flight galleys are authorized to use separate chicken parts—that is, breasts and thighs which are standard stock items. These parts are convenient to use and are an excellent means of controlling portion sizes.

Fry chicken by either of the two following methods:

1. Wash and clean chicken parts. Add seasoning and flour pieces lightly. Fry in deep, hot fat (365° F) until brown and thoroughly done. Drain in basket or on brown paper.
2. Wash and clean chicken parts. Add seasoning and flour pieces lightly. Fry in deep, hot fat (365° F) until brown on all sides. Drain in basket or on brown paper. Place one layer of chicken in deep roasting pans. Add enough water to prevent sticking. Cover and bake at 350° F until tender.

If it is necessary to hold chicken more than a few hours before issue, refrigerate unwrapped

at 40° F or below after thoroughly cooling. DO NOT HOLD COOKED CHICKEN OVER 24 HOURS.

Wrap fried chicken in either self-sealing cellophane, glassine, or other sealable bags. (See illustration 5.)



Illustration 5
Sealing Bags of Fried Chicken

1905-c(2)—Desserts—Preparation of cupcakes, cookies, gingerbread, and similar items should proceed according to directions in the Navy-Marine Corps Recipe Service. Advance preparation of these items may ease last minute preparation pressure, but do not expose baked products to long holding periods. Unnecessary drying out can be avoided by packaging and sealing baked items as soon as they are cooled. **DO NOT STORE PACKAGED BAKED ITEMS IN REFRIGERATORS.** Either plan to prepare the amount needed daily or make arrangements in the bake shop to have a sufficient quantity on hand. Review the general mess menu regularly for baked items appropriate for use in flight rations. Order additional batches for box lunch requirements. Individual fruit pies, for example, can be baked in disposable aluminum foil containers and are excellent items for box lunches. Time permitting in the baker's schedule, these small pies can be prepared at the same time as the ones produced for the general mess and baked off in slack periods.

1905-c(3)—Beverages—As specified in the Navy-Marine Corps Recipe Service "General Principles of Coffee Brewing," and section D, part IV, the timing of preparation procedures for brewing and sanitation of equipment is extremely important to good coffee. Thoroughly wash and rinse insulated thermoses for coffee. Place thermoses in the open air when not in use. Rinse and fill each with freshly made coffee just before pickup time to insure quality coffee.

Keep cartons of milk and cans of fruit juices refrigerated until the final assembly of the Sandwich Meal.

For beverage items cooked aloft (cocoa, instant coffee, or tea), follow directions on the label of the package container.

1905-c(4)—Relishes and Fruit—All pickles and olives should be thoroughly drained be-

fore packaging and sealing in small individual cellophane or glassine bags.

Other items such as celery, radishes, carrots, and green peppers used as relishes must first be thoroughly washed with a brush, sliced to desired thickness and length, and crisped in the refrigerator. The acceptability of these items aloft depends on the preparation treatment received in the ground galley. A limp relish is best left behind for use in cooked foods.

Fresh fruits used in lunches should be carefully selected and thoroughly washed.

1905-c(5)—Eggs—Select fresh stores for palatable hard-cooked eggs. Start each batch in cold water and simmer gently for about 10 minutes; then immerse the cooked eggs in cold water immediately to drive off undesirable gases that cause discoloration and strong flavors. The cold water will also aid in easier peeling. Drain and thoroughly dry the peeled egg and place in an appropriate wrapper. Sealed cellophane bags or similar material are suitable. Refrigerate until time for final assembly.

1905-d—HOW TO PACKAGE THE SANDWICH MEAL—Last minute assembly of the Sandwich Meal before pickup time and delivery to a plane requires careful checking by mess supervisors. As an aid to efficient assembly, devise a checklist of consumable and nonconsumable items to be included. A list of recommended packaging and nonconsumable items is given in table C, p. D19-21.

Post the list where it is plainly visible to those responsible for completing Sandwich Meal orders. Check off items down the list to insure complete boxes.

Make up the folding paperboard cartons in advance and store in a convenient spot. After boxes are made up, assemble nonconsumable

TABLE C
LIST OF NONCONSUMABLE ACCESSORY ITEMS FOR INFLIGHT MEALS
(Single-Service Mess Gear)

Item	Stock No.	Description	Recommended Use
Cup, paper, cold drink...	7350	Flat bottom, treated cup, 5½ oz.	Cold beverages or food.
Cup, paper, hot drink w/handle	7350	Heavy-duty cup, 6 oz capacity.	Hot drink or food.
Cup, paper, hot drink w/handle.	7350	Heavy-duty cup, 8 oz capacity.	Hot drink or food.
Dining packet, in-flight...	7360	In cellophane envelope: white plastic spoon, knife, fork; napkin; individual salt, pepper, sugar packets; 2 toothpicks.	Appropriate for all in-flight meals requiring these items.
Dish, paper.....	7350	Glazed finish. Waterproof and greaseproof; 8 oz.	Serving food or liquid (cereals, soups).
Flatware set, plastic.....	7360	Knife, fork, spoon. Cellophane wrapping.	Appropriate for meals requiring these items.
Forks, plastic, individual.	7340	5 in.....	Serving individual items.
Knives, plastic, individual.	7340	5 in.....	Serving individual items.
Napkins, paper.....	8540	White embossed; 13 x 13½ in.	All meals.
Opener, can, throwaway.	7330	Small metal hand opener....	Opening juice cans.
Opener, can, handfolding, field-mess type.	7330	Steel, hinged, w/o corkscrew bottle opener, lever blade.	Opening cans of items other than juice.
Pan, pie, aluminum foil...	7330	Individual size 5-in dia; 1 ½ in depth.	Baking and issuing individual pies for all meals.
Plate, paper.....	7330	Waterproof, grease-resistant, 10½ in dia; 3 compartments.	Eating gear for bulk issue for foil-pack meals.
Spoon, plastic, individual.	7340	5½ in.....	Eating gear.
Towel, hand, chemically treated paper.	Open purchase.	.....	Washing hands or face.
Tray, disposable, in-flight serving.	7350	Collapsible, compartmentalized, greaseproof, paperboard; size 11½ x 1½ in.	Lap tray for foil-pack meal.
Tube, drinking.....	7350	Jumbo, straws crimped to bend; wrapped.	Hot or cold beverages.
Tube, drinking.....	7350	Not crimped; jumbo size; wrapped.	Cold beverages only.

items and meal components not needing refrigeration. These items usually include:

Nonconsumable Accessory Items

Straws, drinking
Napkin, paper
Can opener, individual
Plastic knife, fork, spoon
Acceptability questionnaire
Toothpicks

Consumable Accessory Items

Crackers
Cookies
Candy
Chewing gum
Catsup
Mustard
Salt
Pepper
Sugar
Salad dressing
Cream, dry, coffee
Coffee, instant
Jam and jellies
Milk product, dry, cocoa flavor
Teabags
Fruit (canned)
Fruit juices (canned)

Place the salt, pepper, plastic knife, spoon, and/or fork, and napkin in a bag. Tape straw to the box lid. The use of staples is discouraged because they may become mixed with the food and eaten.

Refrigerate foods such as milk, eggs, fruit, fruit juice, and lettuce until needed. DO NOT place these items in the box until the flight steward has arrived for pickup or until pickup is assured.

Stamp or mark on top of each box a statement such as the following:

This Flight Meal Has Been Prepared

At (Location) _____
By _____
Rate _____ Date _____
To Be Eaten Before _____ Date/Time _____

Consult Medical Officer to determine safe use of any foods if there is doubt about them.

Alert each commissaryman to fill in name, rate, dates, and safekeeping times on each box. As a final step in Sandwich Meal production, place the finished boxes in a lug furnished by the flight squadron. Make sure the boxes are not multiple stacked. Place on something rigid to eliminate the risk of spilling the filled boxes.

1906—THE BULK ISSUE MEAL

The Bulk Issue Meal, Ration Components, is a feeding system used aboard those Navy aircraft or small boats that have facilities for cooking. Packaged, unprepared food items, in lieu of Sandwich Meals or as second meals, are issued by the galley for missions long enough to require a supplementary meal. The meal components vary according to individual requests, food items on hand, and food service facilities.

The main advantage of the bulk issue meal is its adaptability. Bulk Issue Meals can be cooked to order and served piping hot. Cooked-to-order food eliminates a holding period, and the crew can eat in shifts but will still have hot food. The Bulk Issue Meal is a morale builder because this type of meal offers a break in the routine monotony.

The Bulk Issue Meal has many limitations as a feeding system. The use of this meal in flight ought to be discouraged if other types of meals can be used. This recommendation stems mainly from dangers in cooking aloft. For example, rough weather or sudden flight maneuvers during meal preparation may cause hot liquids or grease to spill, possibly resulting in fire. When using this type of meal, grease film accumulates on the cabin walls and plane equipment and extra cleaning work falls to the crew. Often, cooking is an "additional" duty which is resented by some of the crew.

All frozen food and fresh fruits, vegetables, meat, and dairy product items are highly susceptible to quality loss and spoilage. Avoid spoilage by including stable foods able to withstand fluctuating temperatures and lengths of time encountered in transit. For this reason, fresh fish, shellfish, and poultry entrees must be eliminated from menus. Canned foods offer a variety of menu items for Bulk Issue Meals.

Reduce hazards by writing menus that do not require cooking methods such as frying, long boiling, or simmering; these are unsuited to Bulk Issue Meals. Bad atmospheric conditions within planes result from steam, grease film from frying, or strong odors given off from food. Avoid menus that require time-consuming preparation and difficult cooking techniques. Make menus as simple as possible to minimize preparation time and effort.

Bulky, high-waste items are not suitable for meals to be cooked aloft because of the lack of dry or chill storage space and difficulty in handling waste. Select lean cuts of meat, preferably boneless pieces, and trim when necessary. Use individual portion packages of all items that are available in this form to avoid waste.

If the menu is decided upon jointly by those issuing and those receiving bulk items, the menu selected will then be more consistent with the capabilities of the crew's cook and the equipment. To facilitate menu choices, use a checklist of suitable ration items similar to the Example of Bulk Issue Checkoff List and Sample Menus which follows.

EXAMPLE OF BULK ISSUE CHECKOFF LIST

Aircraft _____

Crew _____

Pickup Date/Time _____

Number Rations _____

	Unit (Cn, Ct, Ea, Lb, Sl)	Quantity			Unit (Cn, Ct, Ea, Lb, Sl)	Quantity	
		Re- quest	Issue			Re- quest	Issue
Beverages							
Cocoa, pwd.				Cupcakes			
Coffee, brewed				Doughnuts			
Coffee, instant				Pancake mix			
Coffee, R&G				Pies			
Cream, dry				Sweet rolls			
Milk, whole							
Milk, evaporated							
Tea bags							
Bread and Rolls							
Bread, rye							
Bread, white							
Bread, W. W.							
Rolls, frankfurter							
Rolls, hamburger							
Cakes and Pastries							
Cake							
Cookies							

EXAMPLE OF BULK ISSUE CHECKOFF LIST—Continued

Aircraft _____	Crew _____					
Pickup Date/Time _____	Number Rations _____					
	Unit (Cn, Ct, Ea, Lb, Sl)	Quantity		Unit (Cn, Ct, Ea, Lb, Sl)	Quantity	
		Re- quest	Issue		Re- quest	Issue
Fruits, Cn				Jam		
Applesauce, instant, dehyd				Jelly		
Applesauce				Mustard		
Apricots				Olives		
Fruit cocktail				Peanut butter		
Grapefruit				Pepper		
Peaches				Pickles		
Pears				Salad dressing		
Pineapple				Salad oil		
Plums				Salt		
Fruits, Fresh				Sirup		
Apples				Sugar		
Bananas				Vinegar		
Grapes				Potatoes		
Oranges				Potato chips		
Pears				Potatoes, dehyd		
Juice, Cn				Potatoes, shoestring		
Apple				Soups		
Apricot nectar				Soup, cn		
Grape				Soup, dehyd		
Grapefruit				Vegetables, Cn		
Grapefruit and orange				Asparagus		
Orange				Beans, green		
Pineapple				Beans, wax		
Tomato				Beets		
Meat				Carrots		
Bacon				Corn		
Beef, corned, cn				Mushrooms		
Beef, ground				Potatoes, sweet		
Beef, steaks				Potatoes, white		
Bologna				Spinach		
Frankfurters				Tomatoes		
Ham, cn				Vegetables, Fresh		
Luncheon meat				Carrots		
Miscellaneous				Celery		
Candy				Peppers		
Catsup				Potatoes		
Chewing gum				Lettuce		
				Radishes		
				Tomatoes		

Ordered

Issued

Approved

Received

BULK ISSUE BREAKFAST MENUS

Menu No. 1

1 Pear, ripe
 1 ind pg Ready-to-eat cereal, plain or sugar coated
 2 Eggs, scrambled
 2 sl Bread, whole wheat
 2 pats Butter
 1 Doughnut
 Coffee
 $\frac{1}{2}$ pt Milk

Menu No. 3

1 Banana, ripe
 1 ind pg Ready-to-eat cereal, plain or sugar coated
 1 sl Ham, grilled
 2 sl Bread, white
 2 pats Butter
 1 Cinnamon bun
 Coffee
 $\frac{1}{2}$ pt Milk

Menu No. 2

1 ind cn (5 $\frac{1}{2}$ -6 oz) Grapefruit juice
 $\frac{1}{2}$ cup Oatmeal
 2 sl Bacon, to order
 2 Eggs, to order
 2 sl Bread, white
 2 pats Butter
 1 ind pg Jam, strawberry
 Coffee
 $\frac{1}{2}$ pt Milk

Menu No. 4

1 ind cn (5 $\frac{1}{2}$ -6 oz) Orange juice
 1 ind pg Ready-to-eat cereal, plain or sugar coated
 2 Eggs, to order
 2 sl Bread, whole wheat
 2 pats Butter
 1 pc Coffeecake
 Coffee
 $\frac{1}{2}$ pt Milk

BULK ISSUE DINNER-SUPPER MENUS

Menu No. 1

1 cn (8 Z tall) Chicken noodle soup (ready to serve)
 1 ind pg Crackers
 2 Grilled hamburgers
 $\frac{1}{2}$ cup Hashed browned potatoes
 $\frac{1}{2}$ cup Buttered peas (cn)
 2 Hamburger buns
 2 pats Butter
 2 sl Tomatoes
 2 Lettuce leaves
 1 cn (8 oz) Apricots
 2 Chocolate cookies
 Coffee
 $\frac{1}{2}$ pt Milk

Menu No. 3

1 cn (8 Z tall) Cream of pea soup (ready to serve)
 1 ind pg Crackers
 1 Grilled ham slice
 $\frac{1}{2}$ cup Buttered asparagus (cn)
 2 sl Bread, rye and white
 2 pats Butter
 1 sl Pineapple w/
 2 tbsp Cottage cheese on lettuce
 1 pc Spongeweek
 $\frac{1}{2}$ cup Applesauce
 Coffee
 $\frac{1}{2}$ pt Milk

Menu No. 2

1 ind cn (5 $\frac{1}{2}$ -6 oz) Tomato juice
 1 Grilled steak
 $\frac{1}{2}$ cup Mashed potatoes
 $\frac{1}{2}$ cup Buttered green beans (cn)
 2 Rolls
 2 pats Butter
 2 sticks Celery
 2 strips Carrots
 1 sm ind Apple pie w/cheddar cheese wedge
 Coffee
 $\frac{1}{2}$ pt Milk

Menu No. 4

1 cn (8 oz) Fruit cocktail
 2 sl Sliced corned beef
 $\frac{1}{2}$ cup O'Brien potatoes
 $\frac{1}{2}$ cup Scalloped tomatoes (cn)
 2 sl Bread, rye and white
 2 pats Butter
 1 wedge Head lettuce w/blue cheese dressing
 1 sm ind Apricot pie
 Coffee
 $\frac{1}{2}$ pt Milk

NONCONSUMABLE ACCESSORY ITEMS FOR EACH MENU

Paper napkin
Paper plate, cup, straw

Plastic knife, fork, spoon
Can opener

CONSUMABLE ACCESSORY ITEMS FOR EACH MEAL

Individual packages of salt, pepper, sugar, dry cream, and salad dressing, catsup, and mustard, where appropriate.

1906-d—HOW TO PRODUCE THE BULK ISSUE MEAL—Instructions on how to prepare the ration components issued from the galley will be a great aid in preparing the Bulk Issue Meal. Send along cooking tips with the menu as necessary. Obviously, difficult food preparation will not be attempted by inexperienced personnel. Simple instructions, however, such as cooking times and temperatures are desirable information; hints on seasoning and serving also will be helpful.

1906-e—HOW TO PACKAGE THE BULK ISSUE MEAL—Bulk ingredients issued require careful packaging attention. Long holding periods often result when takeoffs are delayed, exposing perishable foods to possible spoilage. Use the maximum amount of protection for this type of food before it leaves the galley. Pack perishables in insulated food carriers and portable ice chests, if available. When using other containers such as cardboard boxes or

paper bags, careful wrapping will help insulate and preserve food issued.

All meat (fresh or preserved) issued from the galley should be precut, portioned, and carefully wrapped with aluminum foil to prevent juice leakage and fat seepage and to protect other foods from moisture, fat or odor absorption. Clearly label the package as to contents and indicate that it is perishable. A warning such as "Refrigerate" will identify those items sent out unrefrigerated which require immediate chill storage.

Package dry items such as cereals or pancake mix in cardboard containers or paper bags and label, stating the amount issued in the package as well as directions for cooking the item. Keep these nonperishable items separate. Protect items like bread from damage. Packaging materials are listed in table D.

TABLE D
LIST OF PACKING AND PACKAGING MATERIALS FOR IN-FLIGHT MEALS

Item	FSC	Description	Recommended Use
Aluminum foil, rolls.....	8135	Various widths and lengths.....	Wrapping food items.
Bags, cellophane, lunch..	8105	6 x 13 in; 3½ in bellows.....	Wrapping bulk issue components.
Bags, cellophane, sandwich, self-seal.	Local purchase.	Assorted sizes.....	Wrapping box lunch components.
Bags, insulated, foil.....	8105	Square wax-laminated with foil outside; 1 pt; 4¼ x 2¾ x 10 in.	Packaging bulk issue components.
Bags, insulated, foil.....	8105	1 qt; 5¼ x 3½ x 12 in.....	Packaging bulk issue components.
Bags, insulated, foil.....	8105	½ gal; 6¼ x 4¾ x 15 in.....	Packaging bulk issue components.
Bags, plain, flat, glassine.	8105	5¾ x 7¾ in.....	Sandwiches, cookies.
Bags, plain, flat, glassine.	8105	2 x 3½ in.....	Wrapping box items.

TABLE D
LIST OF PACKING AND PACKAGING MATERIALS FOR IN-FLIGHT MEALS—Con.

Item	FSC	Description	Recommended Use
Bags, paper, grocers'.....	8105	Self opening; 1 lb; popular weight.	Litter bag for box lunches; packaging bulk issue components.
Bags, paper, grocers'.....	8105	Self opening; size No. 5 lb; popular weight.	Packaging bulk issue components.
Bags, paper, grocers'.....	8105	Self opening; size No. 10 lb; popular weight.	Packaging bulk issue components.
Bags, waxed paper, sandwich.	8105	Approx. 6 x 7 in square bottom.	Sandwiches, lettuce or fresh fruits and vegetables.
Board, prepacking.....	8135	Moisture proof and grease-resistant white boards.	Support for individual items requiring overwrap.
Box lunch cartons, folding.	8115	Chipboard; lock-end; cover attached; 10 x 6 x 4 in.	Packaging box lunch.
Box lunch cartons, folding.	8115	14 $\frac{1}{2}$ x 4 $\frac{1}{2}$ x 1 $\frac{1}{2}$ in.....	Foil-pack meal.
Cellophane sheets or rolls.	8135	Water-resistant, colorless.....	Packing food items for all in-flight meals.
Containers, aluminum, in-flight.	7350	Disposable, rectangular, w/ covers; inside coating; flat bottom; 4 $\frac{1}{2}$ x 3 $\frac{1}{2}$, x 1 $\frac{1}{2}$ in.	Foil-pack meals (individual component portions; used to reheat foods in aircraft oven).
Container, aluminum, in-flight.	7350	Disposable, rectangular, w/ covers; inside coating; flat bottom; 3 $\frac{1}{2}$, x 2 $\frac{1}{2}$ x 1 $\frac{1}{2}$ in.	Foil-pack meals (individual component portions; used to reheat foods in aircraft oven).
Cup, food packaging.....	7350	Waxed; 8 oz.....	Transporting bulk issue food components.
Lid	7350	.....	.....
Cup, food packaging.....	7350	Waxed; 12 oz.....	Transporting bulk issue food components.
Lid	7350	.....	.....
Cup, paper, cold food w/lid.	7350	Treated; 1 oz.....	Packaging bulk issue box lunch components.
Marker, felt tip.....	7520	Ready-to-use; black ink; re-fills available.	Marking and identifying packages.
Paper, wrapping, wet waxed sheets.	8135	Heavy-waxed paper; sheets 12 x 18 in.	Wrapping food items for box lunches and bulk issue components.
Paper, wrapping, waxed rolls.	8135	Lightweight waxed paper in rolls 500 yd; 18 in wide.	Wrapping food items for box lunches and bulk issue components.
Pencil, Glass and China marking, red.	7510	Spiral-paper casing 6 $\frac{1}{2}$ in (other colors available).	Marking packages and identifying in-flight meal components.
Plastic film.....	8135	25 ft roll.....	Suitable wrap for sandwiches; other foods.
Tape, transparent, cellophane.	7510	$\frac{1}{4}$ in wide; 2,592 in roll.....	Sealing boxes, cellophane or plastic bags.

1907—THE FOIL PACK MEAL

Hot inflight meals are a great boon to aviation personnel assigned to missions on large, long-range aircraft. The Foil Pack Meal is one such ration. Designed by the Air Force, it was adapted to Navy feeding operations for use on barrier patrol flights—and it holds potential for other special feeding situations.

The Navy Foil Pack is an easy, heat-and-serve-type meal. It consists of three basic dinner components—meat, potato (or potato

substitute), and vegetable—and several breakfast, bread, and dessert items which are pre-cooked, packaged separately in aluminum foil containers, sealed, and refrigerated. This part of the operation is carried out in the ground galley. As needed, these units are issued to aircraft, stowed in plane galley refrigerator, and reheated in a specially designed oven at mealtime. A 15-minute cooking cycle completes the meal, all components finishing at the same time. Other components—salads, breads, desserts, and beverages—are issued separately as prepared or unprepared bulk supplements. (See illustration 7.)

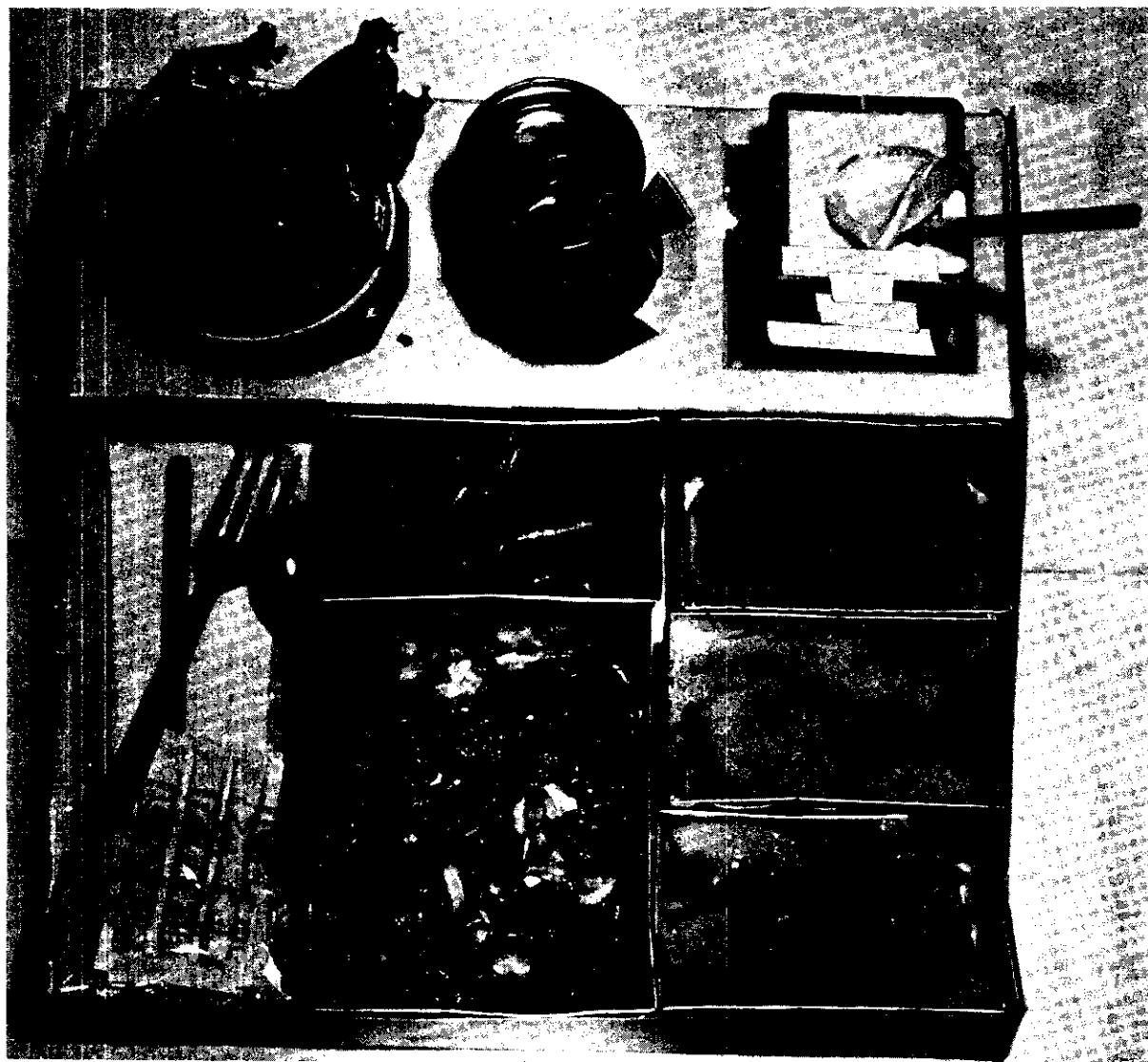


Illustration 7
The Foil Pack Meal

The Foil Pack Meal offers the combined advantage of a fresh, galley-prepared hot meal and a minimum of work in the aircraft galley. Neither special cooking techniques nor busy aviation personnel are required to make it palatable. This is a quick, no-fuss, no-muss method that spells many advantages to aviators whose training does not include food production. All that is required is serving directly from the reheated foil packages, or emptying the contents onto paper plates, and assembling the other components. Disposable lap trays and accessories simplify this service aloft.

Aloft open-fire cooking is eliminated by use of Foil Pack Meal components—the hazards, attendant grease, odor, and waste problems are thus avoided.

There are advantages in ground galley preparations, too. Foil Pack Meals do not require special stocks of food supplies. Most items used are the same as those stocked for the general mess. Ordinary (38° to 40° F) refrigerator temperatures keep the meal safely up to 3½ days. Quantities can be made up ahead of time during slack periods and requests filled as needed. Great economy in time and effort is thus realized for busy flight mess operators who package large volumes of foil meals.

A wide selection of menu items is available with the use of foil packs, and many combinations are possible. With good advance menu planning and a well-defined ordering system, aircrews may choose their own entrees and vegetables, which in itself is a high morale factor.

There are limitations as well as advantages to the use of the Foil Pack Meal.

The main limitations are as follows:

1. Expensive, especially designed equipment is needed on aircraft to complete the meal,

limiting its use. Foil containers are relatively expensive and not reusable.

2. Commissarymen must be trained in principles and techniques of Foil Pack Meal preparation. Exactness and accuracy in measuring and weighing ingredients is essential to producing high-quality meals consistently.
3. Rigid sanitation is required to minimize danger of food contamination. Because Foil Pack Meals are precooked and not frozen at any stage in production, there is a high possibility of spoilage unless handled correctly. As a precautionary measure the plane commander, pilot, and co-pilot should eat different menus or food combinations.
4. Foil Pack Meals have to be supplemented with bulk issue items for complete meal service. Two consecutive Foil Pack Meals on one flight are monotonous, and aircrews often prefer alternating Foil Pack Meals with box lunches and bulk issues.

1907-a—SPECIAL EQUIPMENT AND SUPPLIES REQUIRED—The ground and the aircraft flight galleys require special equipment and supplies to produce the Foil Pack Meal.

An ample stock of foil containers is needed. Two sizes of packages and lids are used in the Navy Foil Pack system; these are the 10-oz containers used for meat and breakfast components, and the 5-oz containers that are used for the other items. A hand crimper is used in closing the lid on the container. The foil lid prevents spilling and air bubbles, and the container remains rigid enough to allow uniform cooking. Because each course of the meal is placed in a separate container, flavors are kept distinct.

A specially designed oven, such as shown in illustration 8, p. D19-32, is required in the

aircraft galley. This oven is equipped with a thermostat, circuit-breaker switch, fan, timer, and removable rack for loading and unloading the foil packs.

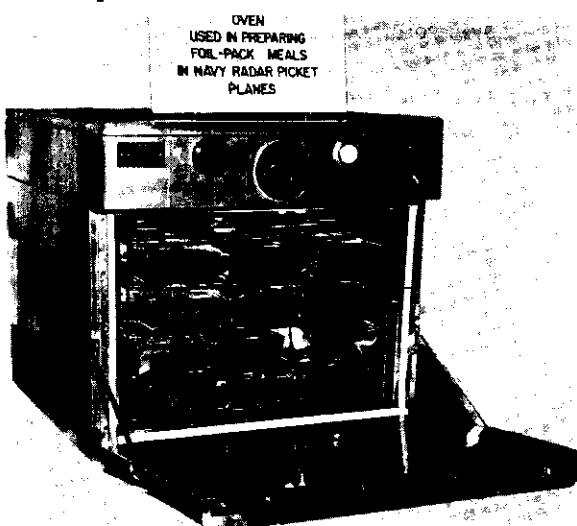


Illustration 8

Aircraft Oven With Foil Pack Meal Components Placed on Removable Racks

An electric refrigerator, illustration 9, p. D19-33, is a necessary piece of aircraft galley equipment. This appliance stows foil pack components as well as bulk issue items that accompany this and other meals.

Spices, condiments, salad oils, and dressings to make the meal components and salads more palatable and satisfying to individual tastes may also be issued by the flight galley with the foil packs. When unprepared bulk food items are issued with the Foil Pack Meals, additional food preparation and service utensils are required.

1907-b—MEAL PATTERNS AND MENUS

The pattern of foods used for the Foil Pack Meal is as follows:

Breakfast

Fruit or juice
Cereal¹
Meat
Egg(s) or potatoes
Bread or pastry

Sweets

Beverage²
Milk

Consumable accessory items (such as salt, pepper, sugar, dry cream, catsup, salad dressing, and mustard)

Dinner-Supper

Soup or fruit juice
Meat (or meat substitute)
Potato (or potato substitute)
Vegetable
Salad
Bread
Dessert
Beverage²
Milk

Consumable accessory items (such as salt, pepper, sugar, dry cream, catsup, salad dressing, and mustard)

Three of the Dinner-Supper components—meat, potatoes, and vegetables—are foil packed; bread and dessert items may be included, making excellent additions to the meal. Rolls that are heated and browned in aircraft ovens and desserts, such as hot pies, are acceptable and highly desirable items. More often than not, however, breads and desserts are bulk issued along with the soup, salad, and beverages that are to be prepared aloft.

Breakfast meat and cereal items may or may not be packaged in foil. Many of the items, such as ham slices, are simply grilled on hot-plates and items such as oatmeal may be cooked in hotcups. Ready-to-serve cereals also simplify meal preparation and are often used in place of precooked foil pack items.

Menu balance is necessary in meals of this type, and crews need one regular hot ration daily on long flight missions. The Foil Pack Meal will supply that need adequately. Sample balanced menus are provided as follows:

¹ Optional items.
² Cooked aloft.

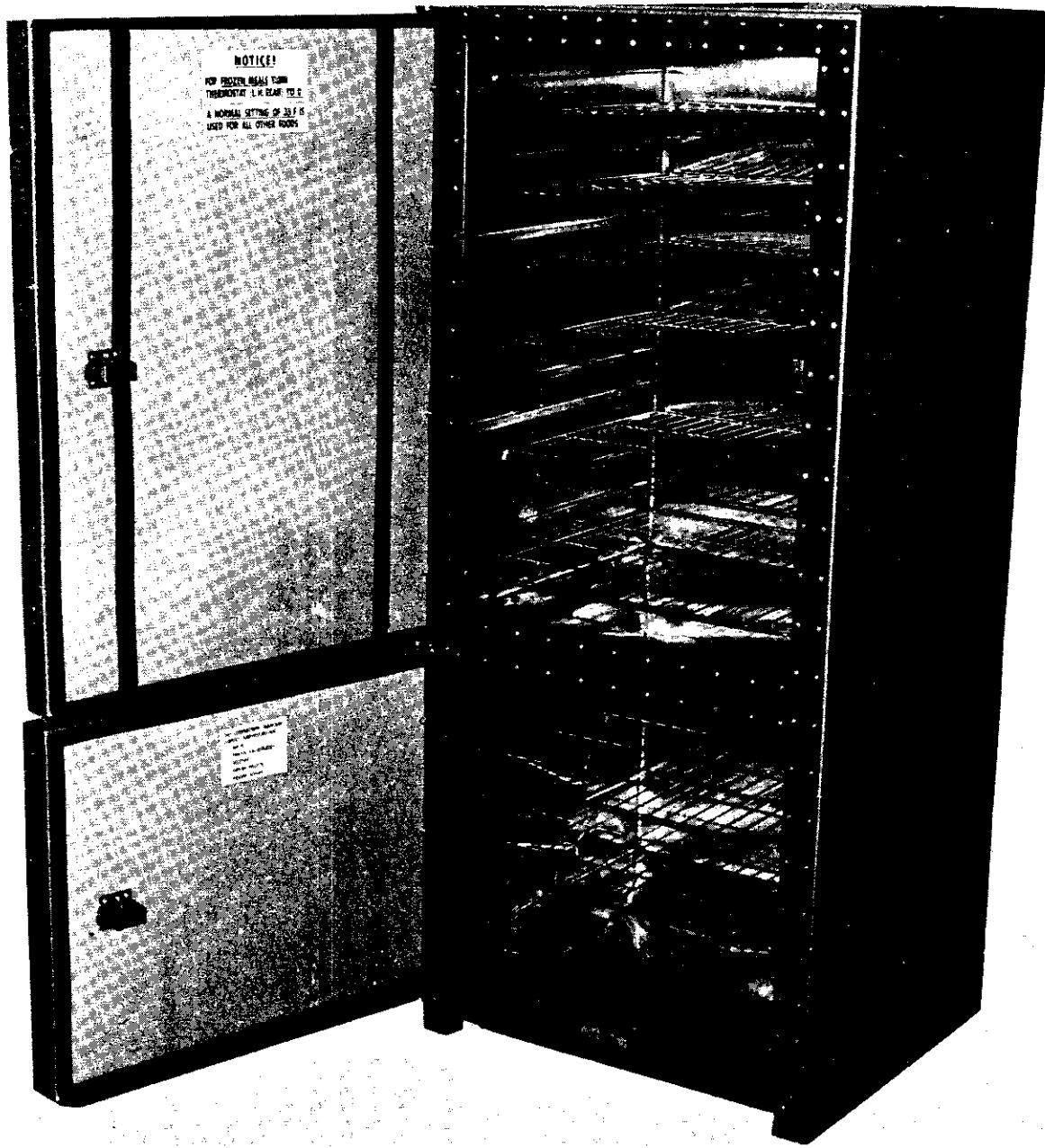


Illustration 9
Interior of Aircraft Refrigerator Used for Storage

FOIL PACK BREAKFAST MENUS

Menu No. 1

1 cn (5½-6 oz) ... Pineapple juice
 1 lg foil pack ... Ham steak—FPR J9
 2 Eggs-to-order
 2 sl Bread
 2 pats Butter
 1 ind pg Strawberry jam
 ½ pt Milk
 Coffee ¹

Menu No. 2

1 cn (8 oz) ... Peaches
 2 Eggs, scrambled ¹
 2 sl Bread
 2 pats Butter
 2 Cake doughnuts ²
 1 ind pg Apple jelly
 ½ pt Milk
 Coffee ¹

Menu No. 3

1 cn (5½-6 oz) ... Grape juice
 1 lg foil pack ... Griddlecakes—FPR C2
 Sirup
 2 pats Butter
 1 sm foil pack ... Baked pork sausage
 links—FPR J7
 ½ pt Milk
 Coffee ¹

FOIL PACK DINNER-SUPPER MENUS

Menu No. 1

1 cn (5½-6 oz) ... Tomato juice
 1 lg foil pack ... Yankee pot roast of beef—FPR J1
 1 sm foil pack ... Buttered boiled potatoes—FPR Q17
 1 sm foil pack ... Glazed carrots—FPR Q10
 Lettuce wedge salad ¹
 2 sl Bread, white
 2 pats Butter
 1 cn (8 oz) ... Pears
 Butterscotch squares ²
 ½ pt Milk
 Coffee ¹

Menu No. 2

1 ind pg Chicken w/rice soup ^{1,3}
 1 lg foil pack ... Crackers
 1 lg foil pack ... Grilled steak—FPR J3
 1 sm foil pack ... Baked potato—FPR Q16
 Stewed tomatoes—FPR Q8
 Relishes: ¹
 Green pepper rings
 Radishes
 Celery sticks
 1 sm foil pack ... Hot pan rolls—FPR C1
 2 pats Butter
 ½ pt Apple pie w/Cheddar cheese ²
 Milk
 Coffee ¹

Menu No. 3

1 cn (5½-6 oz).....	Apple juice
1 lg foil pack.....	Shrimp creole w/rice—FPR H1
1 sm foil pack.....	Buttered green beans (F)—FPR Q12
1 sm foil pack.....	Corn O'Brien—FPR Q5
	Cheese stuffed celery ²
1 sm foil pack.....	Seed rolls—FPR C1
2 pats.....	Butter
1 sl.....	Devil's food cake ² w/cocoa fudge frosting ²
½ pt.....	Milk
	Coffee ¹

Menu No. 5

1 ind pg.....	Cream of mushroom soup ^{1 3}
	Crackers
1 lg foil pack.....	Roast pork loin—FPR J10
1 sm foil pack.....	Candied sweet potatoes—FPR Q19
1 sm foil pack.....	Buttered peas—FPR Q7
	Sliced tomato on lettuce leaf salad ¹
1 sm foil pack.....	Twin rolls—FPR C1
2 pats.....	Butter
2.....	Coconut bar cookies ²
½ pt.....	Milk
	Coffee ¹

¹ Prepared aloft from bulk issues.

² Prepared foods carried aloft.

³ Canned, ready to serve.

Menu No. 4

1 lg foil pack.....	Beef stew—FPR J4
1 sm foil pack.....	Buttered noodles—FPR E3
1 sm foil pack.....	Buttered pears—FPR Q7
	Sliced pineapple and cottage cheese salad ¹
1 sm foil pack.....	Hot pan rolls—FPR C1
2 pats.....	Butter
2.....	Fruit bars ²
½ pt.....	Milk
	Coffee ¹

Menu No. 6

1 cn (5½-6 oz).....	Grapefruit juice
1 lg foil pack.....	Spaghetti w/meat sauce—FPR J8
1 sm foil pack.....	Buttered asparagus—FPR Q1
1 sm foil pack.....	Lyonnaise carrots—FPR Q9
	Lettuce salad ¹ w/French dressing ²
2 sl.....	Bread
2 pats.....	Butter
1 sm ind.....	Cherry pie ²
½ pt.....	Milk
	Coffee ¹

NONCONSUMABLE ACCESSORY ITEMS FOR EACH MENU—Paper napkin, paper plate, cup, straw, plastic knife, fork, spoon, can opener.

CONSUMABLE ACCESSORY ITEMS FOR EACH MEAL—Individual packages of dry cream, sugar, salt, pepper, and salad dressing, catsup, and mustard where appropriate.

Use these menus as guides in planning hot meals for use on long-range aircraft. Special orders and crew preferences are also valuable aids to menu planning. These crew preferences should be solicited periodically to assure that menus published by the flight galley include preferred food combinations of the flight crews. Acceptability questionnaires or food preference checkoff lists are the tools to aid the crew in recording their preferences.

Plan to include several printed menus with each outgoing order. A record of these menus is an extremely important means of eliminating duplication of Foil Pack Meal components from one mission to another. Menus also will aid in assembling the meal cloft. When proposed operational schedules are prepared a month in advance, a planned monthly menu is possible.

1907-c—HOW TO PRODUCE THE FOIL PACK MEAL—Hit-and-miss methods of production in the ground flight galley are strictly taboo in preparing Foil Pack Meals. The end products have to be of excellent quality to avoid gross waste. Expertly trained commissary personnel and close supervision are essential at all stages of production. The meal can be only as good as supervision is adequate.

As in all food preparation, accurate weights and measurements and good preparation techniques are necessary. Extreme care, however, is needed in producing the Foil Pack Meal in the ground flight galley. The following information is included to aid the cause of excellent food production.

RECIPES. Standardized recipes have been developed for this meal by the U.S. Naval Supply Research and Development Facility, Bayonne, N.J. These are similar to recipes in the Navy-Marine Corps Recipe Service, except that 25-portion batches have been used and cooking periods shortened. The Foil Pack Meal recipes may be requested from the Commanding Officer, U.S. Navy Subsistence Office, Washington, D.C., 20390. Recipes have been separated and

coded into sections in accordance with the Navy-Marine Corps Recipe Service as follows:

- C. Breads
- E. Cereals
- H. Fish
- J. Meat
- L. Poultry (including dressing)
- O. Sauces
- Q. Vegetables (including potatoes)

Foil Pack Meal dessert recipes have not been developed because of the usual practice of issuing these prepared items in bulk form from Navy bake shops. With the exception of custard-type pie fillings and pies with meringues or similar desserts, many baked items can be kept palatable and safe, if properly wrapped, without refrigeration for short periods during flights. Fruit pies, cookies, and iced cupcakes are examples of galley-baked items that are popular and stow well.

As designated on each recipe, foods are fully cooked before packaging in the foil containers. To prevent overcooking when reheated, cooking times are carefully noted on each recipe. This timing allows for reheating in a 15-minute cooking cycle at 400° F in the aircraft oven, which permits all components to be completed at the same time.

Use the Foil Pack Meal recipes and recipe variations, as printed, to obtain the best crew acceptability of the meal.

1907-c(1)—Production Steps in the Ground Galley

1. Each component is prepared, weighed out, and separately packaged in aluminum containers as shown in illustration 10, step 1, p. D19-37.
2. Seasoning and/or liquid is added, see step 2.
3. Lids are placed on the containers and sealed with a hand crimper, see step 3.
4. Each component is labeled to identify it as to contents and date of pack, see step 4. Print using a china marking pencil, felt-tip pen, or blunt pencil.



Step 1



Step 2



Step 3



Step 4

Illustration 10
Packing Foil Pack Meals

5. Transport the filled and sealed containers to the refrigerator immediately after marking, see illustration 11.

6. Maintain a consistent 38° to 40° F temperature to insure safekeeping of the components until needed.

1907-c(2)—Production Steps in the Aircraft Galley

1. When requested by a squadron, foil packs are carried to the plane and refrigerated immediately.

2. As needed, the different meal components are loaded onto the oven rack (illustration 8).

3. The oven, which has been preheated to 400° F, is set for a 15-minute cooking cycle.

4. The menu components are placed into the lap tray or emptied onto paper plates, and other items such as salads and beverages are assembled as shown in illustration 7 (The Foil Pack Meal).

5. A meal is served to four crewmembers at one time.

1908—PRECOOKED FROZEN MEALS

Precooked frozen meals are authorized for use aboard aircraft which have refrigeration and heating facilities.

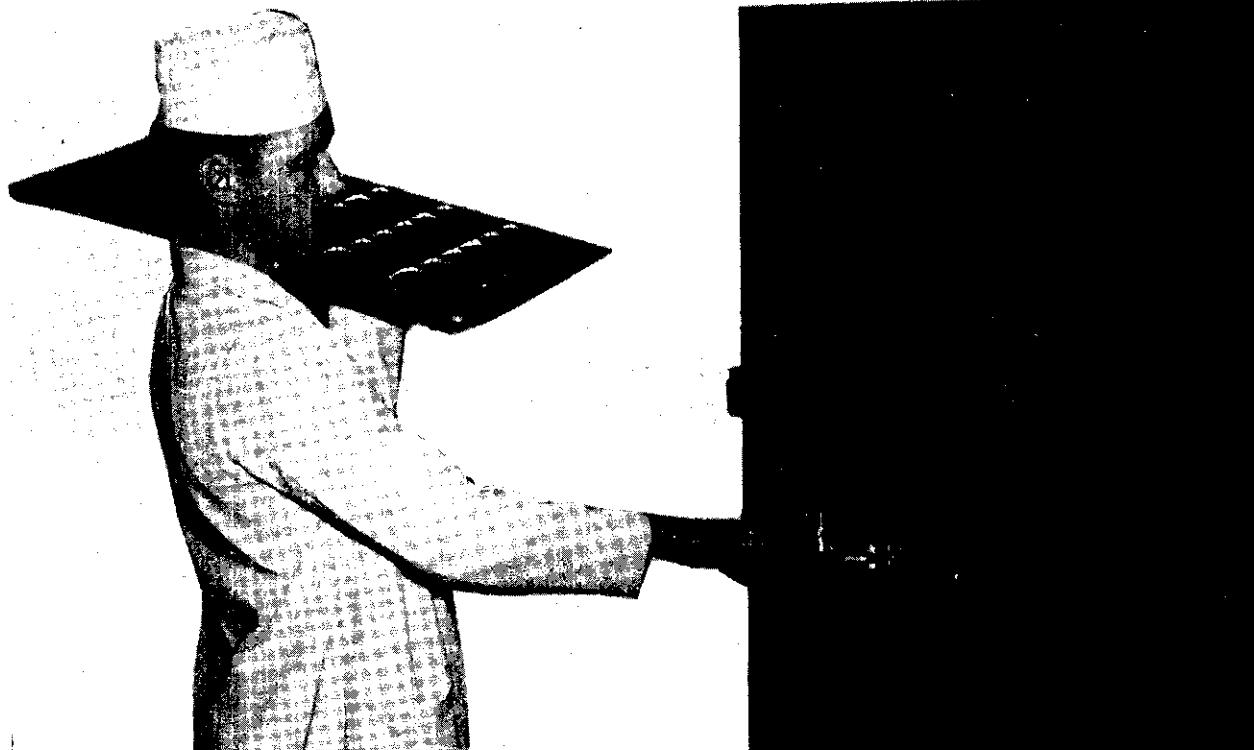


Illustration 11
The Finished Foil Pack Components Are Placed in Refrigeration Until Requested.

TABLE E
PLANNING GUIDE

Item	Container Size Weight (Lb)	Portion Size	Units to Breakout (25 Portions)	Recommended Use					
				Sandwich Meal	Bulk Issue Meal	Foil Pack Meal			
Meats, Poultry, Fish (FSC 8905)									
Chilled or frozen									
Beef:									
Corned, frozen.....	Lb.....	2 oz.....	7.5 lb.....	X (sand- wich).	.....	.....	
Diced.....	Lb.....	Varies.....	8 lb.....	.....	.....	X (stew).	
Ground (hamburger).....	Lb.....	2 patties.....	9 lb.....	.....	X (grilled).....	.....		
Ground (hamburger).....	Lb.....	4.50 oz ¹	9 lb.....	.....	.....	X (grilled).	
Ground (hamburger).....	Lb.....	5 oz ¹	7.5 lb.....	.....	.....	X (meat loaf).	
Ground (hamburger).....	Lb.....	Varies.....	3.75 lb.....	.....	.....	X (spa- ghetti).	
Roasts carcass:									
Dry heat.....	Lb.....	2 oz.....	6.50 lb.....	X (sand- wich).	.....	.....	
Moist heat.....	Lb.....	2 oz.....	7.75 lb.....	X (sand- wich).	.....	.....	
Roasts, 6-way Boneless:									
Dry heat.....	Lb.....	2 oz.....	4.5 lb.....	X (sand- wich).	.....	.....	
Moist heat.....	Lb.....	2 oz.....	5.25 lb.....	X (sand- wich).	.....	.....	
Moist heat.....	Lb.....	4 oz.....	10.5 lb.....	.....	.....	X (pot roast).	
Steaks:									
Loin, 6-way boneless (raw).....	Lb.....	8 oz ²	12.5 lb.....	.....	X (grilled).....	.....		
Loin.....	Lb.....	5.25 oz ¹	8.75 lb.....	.....	.....	X (grilled).	
Round.....	Lb.....	5 oz.....	8 lb.....	.....	.....	X (swiss).	

TABLE E
PLANNING GUIDE—Continued

Item	Container Size Weight (Lb)	Portion Size	Units to Breakout (25 Portions)	Recommended Use		
				Sandwich Meal	Bulk Issue Meal	Foil Pack Meal
Meats, Poultry, Fish (FSC 8905)						
Chilled or frozen—Continued						
Fish and shellfish: Shrimp, raw, peeled, deveined.	21-42 lb.....	4-5 shrimp.	4 lb.....			X (creole).
Pork:						
Butt, frozen						
Roasts:						
Ham, chilled.....	Lb.....	2 oz.....	5 lb.....	X (sand- wich).		
Loin (w/o chine bone).....	Lb.....	4 oz.....	12.5 lb.....			X (roast loin).
Sausage links, precooked.....	Lb.....	3 links.....	3 lb.....		X.....	X (baked).
Shoulder (diced).....	Lb.....	Varies.....	6.5 lb.....			X (chop suey).
Poultry:						
Chicken (RTC).....	Lb.....	8.50 oz.....	18 lb.....			X (acci- atore).
Chicken, parts.....	Lb.....	8.50 oz.....	6.75 lb (breasts); 5.75 lb (thighs).			X (acci- atore).
Chicken, broiler-fryers (RTC).....	Lb.....	6 oz.....	18 lb.....			X (roast).
Chicken, parts.....	Lb.....	6 oz.....	6.75 lb (breasts); 5.75 lb (thighs).			X (roast).
Chicken, broiler-fryer (RTC).....	Lb.....	9 oz.....	16.25 lb.....	X (fried).....		
Chicken, parts.....	Lb.....	5.75 oz.....	12.50 lb.....	X (fried).....		

Additionally, menus for this type of meal must be limited to a narrow choice of suitable foods.

1906-a—SPECIAL EQUIPMENT AND SUPPLIES REQUIRED—Bulk Issue Meals are used only where there is equipment for cooking. (See illustration 6, p. D19-24.) Careful checks are needed to insure that the gear is adequate for the menu selected. Consultation with the personnel who are requesting the order will eliminate any doubt about the suitability of the menu.

Mess gear may be issued in lieu of paper plates and plastic knives, forks, and spoons. Individual activities will decide who should supply equipment. A control system should be established to guarantee the return of all items. Use check form showing the number and types of items issued and the number returned. Such a list will also serve as a reminder of supplies needed and frequently forgotten—such as the can opener. Make sure that custody forms are signed by both issuing and receiving personnel.

1906-b—SANITATION—Close sanitary control of the plane galley equipment, utensils, and messgear is required. Crews must cooperate to the fullest extent in sanitary food handling, and return utensils and messgear in condition as good as originally issued. All cooking and messgear must be properly sanitized in accordance with published instructions before reissue.

1906-c—MEAL PATTERNS AND MENUS—Foods prepared from bulk issues are either Breakfast or Dinner-Supper Meal components, and items used for either of these meals vary in number and kind according to the needs of a specific mission. The following patterns are suggested as a basis for issuing ration components.

Breakfast

Fruit or juice
Cereal ¹
Meat
Egg(s) or potatoes
Bread or pastry
Beverage
Milk
Consumable accessory items (such as salt, pepper, sugar, dry cream, catsup, mustard, and salad dressing)

Dinner-Supper

Soup, fruit, or juice
Meat (or meat substitute)
Potato (or potato substitute)
Vegetable
Salad ¹
Bread
Dessert
Beverage
Milk
Consumable accessory items (such as salt, pepper, sugar, dry cream, catsup, mustard, and salad dressing)

Foods selected for the menu must be carefully chosen to—

1. eliminate possible hazards encountered in meal preparation,
2. avoid food spoilage,
3. reduce bulk and waste,
4. minimize meal preparation time and effort, and
5. suit capabilities of food preparation facilities in galleys.

Equipment for cooking varies from one or two hotplates and hotcups to long-range planes which have refrigerated units, small ovens, grills, and work storage counters. Commissarymen should keep currently informed on food service equipment aboard planes or boats where bulk issues are used.

¹ Optional components.

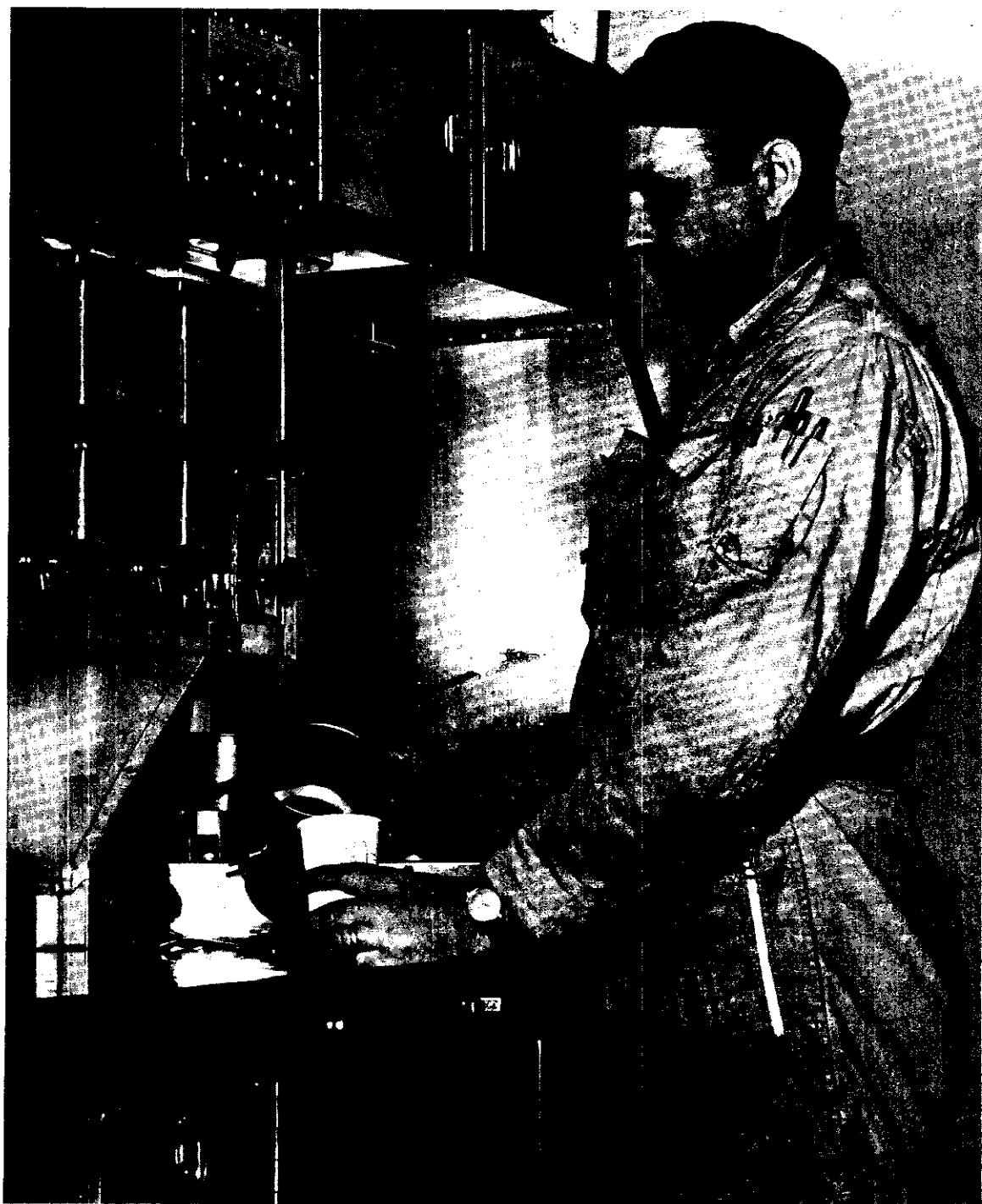


Illustration 6
Using Hot Cup in Typical Aircraft Galley

Turkey:						
Boneless, raw.....	Lb.....	2 oz.....	5.25 lb.....	X (sandwich)	.....
Whole (RTC).....	Lb.....	2 oz.....	8.75 lb.....	X (sandwich)	.....
Preserved (salted, smoked, canned):						
Bacon, prefried, canned.....	22-oz can.....	3 sl.....	1.50 lb.....		X.....	
Bacon, slab.....	Lb.....	3 sl.....	3.75 lb.....		X.....	
Beef, corned, canned.....	6-lb can.....	2 oz.....	3.25 lb.....	X.....	.....
Chicken, boned, canned.....	29-oz can.....	3 oz.....	4.75 lb.....		X.....	
Frankfurters, canned.....	22-oz can.....	2 links.....	5 lb.....		X.....	
Frankfurters, frozen.....	Lb (10).....	2 links.....	5 lb.....		X.....	
Ham, smoked, bone-in.....	Lb.....	2 oz.....	7.75 lb.....	X (sandwich).	.....
Ham, canned, pear-shaped.....	8- to 14-lb can.....	3 oz.....	7.5 lb.....		X (grilled).....	
Ham, canned, pear-shaped.....	8- to 14-lb can.....	2 oz.....	4.25 lb.....	X (sandwich).	.....
Ham, canned, pear-shaped.....	8- to 14-lb can.....	5 oz.....	9.25 lb.....		X.....	X (steak).
Hamburger, canned, w/o gravy.....	11½ oz.....	2 patties.....	7 lb.....		X.....	
Luncheon meat, canned.....	12-oz can.....	2 oz.....	3.75 lb.....	X (sandwich).	.....
Salmon, red, canned.....	1-lb can.....	2 oz.....	3.25 lb.....		X.....	
Sausage (bologna, Cervelat salami).....	Lb.....	2 oz.....	3 lb.....	X (sandwich).	X (cold cuts).	
Tuna, canned.....	No. ½ can (7 oz).....	2 oz.....	3.25 lb.....		X.....	
Turkey, canned.....	29-oz can.....	2 oz.....	3.25 lb.....		X.....	
Dairy foods and eggs (FSC 8910)						
Butter, salted, patties.....	Lb.....	1 patty.....	0.50 lb.....		X.....	
Butter, salted, print.....	Lb.....	2 tsp.....	0.50 lb.....	X (sandwich).	.....	X.
Cheese, American.....	Lb.....	2 sl ³	2.25 lb.....	X (sandwich).	.....
Cheese, Cheddar.....	Lb.....	2 sl ³	2.25 lb.....	X (sandwich).	.....
Cheese, Pimento.....	Lb.....	2 sl ³	2.25 lb.....	X (sandwich).	.....
Cheese, Swiss.....	Lb.....	2 sl ³	2.25 lb.....	X (sandwich).	.....

See footnotes at end of table.

TABLE E
PLANNING GUIDE—Continued

Item	Container Size Weight (Lb)	Portion Size	Units to Breakout (25 Portions)	Recommended Use		
				Sandwich Meal	Bulk Issue Meal	Foil Pack Meal
Chocolate milk.....	6- to 8-oz can.....	1 can.....	25 cans.....	X.....	X.....	X.....
Cream, dry, table-type.....	4-oz jar.....	4 gms.....	0.25 lb.....	X.....	X.....	X.....
Cream, dry, table-type.....	4-gm env.....	1 ea.....	25 env.....	X.....	X.....	X.....
Eggs, shell.....	Ea.....	2 ea.....	50 ea.....		X.....	X.....
Eggs, shell.....	Ea.....	1 ea.....	25 ea.....	X.....		
Milk, evaporated.....	6-oz can.....	Varies.....	1 can.....	X.....	X.....	X.....
Milk, evaporated.....	14½-oz can.....	Varies.....	½ can.....	X.....	X.....	X.....
Milk product, dry, cocoa-flavored.....	1½-oz env.....	1 ea.....	25 env.....	X.....	X.....	X.....
Milk, sterilized.....	6- to 8-oz can.....	1 ea.....	25 cans.....	X.....	X.....	X.....
Milk, whole, fresh.....	½-pt ct.....	8 oz.....	25 ct.....	X.....	X.....	X.....
Fruits and Vegetables (FSC 8915)						
Fruits, canned:						
Applesauce.....	No. 303 can.....	½ cup.....	7 cans.....		X.....	X.....
Applesauce.....	No. 10 can.....	½ cup.....	1 can.....		X.....	X.....
Apricots, halves.....	No. 2½ can.....	3 halves.....	4 cans.....		X.....	X.....
Apricots, halves.....	No. 10 can.....	3 halves.....	1 can.....		X.....	X.....
Cherries, unpitted, w/sirup.....	No. 303 can.....	½ cup.....	7 cans.....		X.....	X.....
Figs, kadota.....	No. 2½ can.....	3 med.....	4 cans.....		X.....	X.....
Fruit cocktail.....	8-2 can.....	1 can.....	25 cans.....	X.....		
Fruit cocktail.....	No. 2½ can.....	½ cup.....	4 cans.....		X.....	X.....
Fruit cocktail.....	No. 10 can.....	½ cup.....	1 can.....		X.....	X.....
Grapefruit.....	No. 303 can.....	½ cup.....	7 cans.....		X.....	X.....
Peaches, halves, w/sirup.....	No. 2½ can.....	2 halves.....	4 cans.....		X.....	X.....
Peaches, halves, w/sirup.....	No. 10 can.....	2 halves.....	1 can.....		X.....	X.....
Peaches, quartered or sliced.....	No. 2½ can.....	½ cup.....	4 cans.....		X.....	X.....
Peaches, quartered or sliced.....	No. 10 can.....	½ cup.....	1 can.....		X.....	X.....
Peaches, sliced.....	8-2-tall can.....	½ cup.....	25 cans.....	X.....		
Pears, halves.....	No. 2½ can.....	2 halves.....	4 cans.....		X.....	X.....
Pears, halves.....	No. 10 can.....	2 halves.....	1 can.....		X.....	X.....

Pears, quartered or sliced.....	8-Z-tall can.....	2 halves.....	25 cans.....	X.....	.....	.....
Pineapple, chunks.....	8-Z-tall can.....	½ cup.....	25 cans.....	X.....	.....	.....
Pineapple, chunks.....	No. 2½ can.....	½ cup.....	4 cans.....	.....	X.....	X.
Pineapple, chunks.....	No. 10 can.....	½ cup.....	1 can.....	.....	X.....	X.
Pineapple, whole slices.....	No. 2½ can.....	1 slice.....	4 cans.....	.....	X.....	X.
Pineapple, whole slices.....	No. 10 can.....	1 slice.....	1 can.....	X.....	.....	.....
Plums, whole, purple.....	No. 2½ can.....	3 plums.....	4 cans.....	.....	X.....	X.
Plums, whole, purple.....	No. 10 can.....	3 plums.....	1 can.....	.....	X.....	X.
Fruit juices, canned:						
Apricot nectar.....	5½ or 6-oz can..	1 can.....	25 cans.....	X.....	.....	X.
Juice, single strength (apple, grape, grapefruit and orange, orange, pineapple, tomato).	5½ or 6-oz can..	1 can.....	25 cans.....	X.....	.....	X.
Vegetable.....	5½ to 8-oz can..	1 can.....	25 cans.....	X.....	.....	X.
Juice, single strength (apple, grape- fruit and orange, grapefruit, orange, pineapple, tomato).	46-oz can.....	6 oz.....	4 cans.....	X.....	.....	X.
Vegetables, canned:						
Asparagus.....	No. 300 can.....	4 oz.....	12 cans.....	.....	X.....	X.
Beans, green or wax.....	No. 303 can.....	½ cup.....	8 cans.....	.....	X.....	.....
Beans, green or wax.....	No. 10 can.....	½ cup.....	1 can.....	.....	X.....	.....
Beets, whole or sliced.....	No. 303 can.....	4 oz.....	7 cans.....	.....	X.....	X.
Beets, whole or sliced.....	No. 10 can.....	4 oz.....	1 can.....	.....	X.....	X.
Carrots, sliced or quartered.....	No. 303 can.....	3 oz.....	7 cans.....	.....	X.....	X.
Carrots, sliced or quartered.....	No. 10 can.....	3 oz.....	1 can.....	.....	X.....	X.
Corn, cream style.....	No. 303 can.....	4 oz.....	6 cans.....	.....	X.....	X.
Corn, whole grain.....	No. 2 vac can.....	4 oz.....	7 cans.....	.....	X.....	X.
Corn, whole grain.....	No. 303 can.....	4 oz.....	10 cans.....	.....	X.....	X.
Corn, whole grain.....	No. 10 can.....	4 oz.....	1½ cans.....	.....	X.....	X.
Peas.....	No. 303 can.....	4 oz.....	7 cans.....	.....	X.....	X.
Peas.....	No. 10 can.....	4 oz.....	1 can.....	.....	X.....	X.
Potatoes, white.....	No. 303 can.....	2 or 3 po- tatoes.....	7 cans.....	.....	X.....	.....
Potatoes, white.....	No. 10 can.....	2 or 3 po- tatoes.....	1 can.....	.....	X.....	.....
Potatoes, sweet.....	No. 3 vac can.....	2 or 3 po- tatoes.....	6 cans.....	.....	X.....	X.

TABLE E
PLANNING GUIDE—Continued

Item	Container Size Weight (Lb)	Portion Size	Units to Breakout (25 Portions)	Recommended Use		
				Sandwich Meal	Bulk Issue Meal	Foil Pack Meal
Fruits and Vegetables (FSC 8915)						
Vegetables, canned—Continued						
Potatoes, sweet.....	No. 2½ can.....	2 or 3 po- tatoes.	5 cans.....		X.....	X.
Spinach.....	No. 303 can.....	½ cup.....	7 cans.....		X.....	
Spinach.....	No. 10 can.....	½ cup.....	1½ cans.....		X.....	
Tomatoes.....	No. 303 can.....	½ cup.....	7 cans.....		X.....	
Tomatoes.....	No. 10 can.....	½ cup.....	1½ cans.....		X.....	
Vegetables, fresh:						
Carrots, sticks.....	Lb.....	2 oz ¹	4 lb ²	X.....	X.....	X.
Carrots, sticks w/another relish.....	Lb.....	1 oz ¹	2 lb.....	X.....	X.....	X.
Celery, sticks.....	Lb.....	2 oz ¹	5.25 lb.....	X.....	X.....	X.
Celery, sticks w/another relish.....	Lb.....	1 oz.....	2.50 lb.....	X.....	X.....	X.
Radishes.....	Lb.....	1 oz.....	2.75 lb.....	X.....	X.....	X.
Radishes w/another relish.....	Lb.....	1 oz.....	1 lb.....	X.....	X.....	X.
Tomatoes.....	Lb.....	3 oz.....	3.75 lb.....	X.....	X.....	X.
Vegetables, dehydrated potatoes, white, granules.	No. 10 can.....	4½ oz.....	1 lb.....		X.....	X.
Vegetables, frozen:						
Asparagus.....	2-lb pg.....	4 oz.....	5 pg.....			X.
Asparagus.....	2½-lb pg.....	4 oz.....	3 pg.....			X.
Asparagus.....	5 lb pg.....	4 oz.....	2 pg.....			X.
Beans, green.....	2 lb pg.....	3 oz.....	2 pg.....			X.
Beans, green.....	2½ lb pg.....	3 oz.....	2 pg.....			X.
Beans.....	5 lb pg.....	3 oz.....	1 pg.....			X.
Peas.....	2-lb pg.....	3½ oz.....	4 pg.....			X.
Peas.....	2½-lb pg.....	3½ oz.....	2 pg.....			X.
Peas.....	5-lb pg.....	3½ oz.....	1 pg.....			X.

**Bakery and Cereal Products (FSC
8920)**

Baked goods:

Bread, commercial:

Loaf (white or whole wheat $\frac{1}{2}$ inch sl).	1-lb loaf.....	2 sl.....	3 loaves.....	X.....	X.....	X.
Loaf (white or whole wheat $\frac{1}{2}$ inch sl).	2-lb club loaf...	2 sl.....	2 loaves.....	X.....	X.....	X.
Loaf (white or whole wheat $\frac{1}{2}$ inch sl).	Pullman loaf...	2 sl.....	1.50 loaves..	X.....	X.....	X.

Cookies, commercial:

Filled (sandwich).....	Lb.....	2 ea.....	3 lb.....	X.....	X.....	X.
Figbars.....	Lb.....	2 ea.....	4 lb.....	X.....	X.....	X.
Gingersnaps.....	Lb.....	2 ea.....	2 lb.....	X.....	X.....	X.
Shortbread.....	Lb.....	2 ea.....	2 lb.....	X.....	X.....	X.

Crackers:

Graham.....	Lb.....	2 ea.....	2 lb.....	X.....	X.....	X.
Oyster.....	Lb.....	6 ea.....	1 lb.....	X.....	X.....	X.
Soda.....	Lb.....	4 ea.....	1.50 lb.....	X.....	X.....	X.
Soda.....	Lb.....	4 Packets..	25.....	X.....	X.....	X.

Pancake mix.....

Cereal products:

Cereal, ready-to-eat, assorted, plain, or coated.....	Ind size serv- ing ct.....	1 oz.....	25 ct.....	X.....	X.....	X.
--	-------------------------------	-----------	------------	--------	--------	----

Cereal, quick-cooking:

Hominy grits, rolled oats.....	20-oz ct.....	$\frac{1}{4}$ cup ²	1.50 lb.....	X.....	X.....	X.
Wheat, farina, whole-wheat meal.....	28-oz ct.....	$\frac{1}{4}$ cup ²	1.25 lb.....	X.....	X.....	X.

Rice, parboiled.....

**Sugar, Confectionery, and Nuts (FSC
8925)**

Candy:

Caramel.....	5-lb bx.....	1 oz.....	1.5 lb.....	X.....	X.....	X.
Coated.....	5-lb bx.....	1 oz.....	1.5 lb.....	X.....	X.....	X.
Hard.....	5-lb can.....	1 oz.....	1.5 lb.....	X.....	X.....	X.
Marshmallows.....	1-lb co.....	1 ea.....	0.50 lb.....	X.....	X.....	X.

See footnotes at end of table.

TABLE E
PLANNING GUIDE—Continued

Item	Container Size Weight (Lb)	Portion Size	Units to Breakout (25 Portions)	Recommended Use		
				Sandwich Meal	Bulk Issue Meal	Foil Pack Meal
Bakery and Cereal Products (FSC 8920)						
Sirup.....	No. 2½ can.....	2 tbsp.....	1 can.....	X.....	X.....	X.
Sugar, granulated.....	6-gm env.....	2 ea.....	50 env.....	X.....	X.....	X.
Jams, Jellies and Preserves (FSC 8930)						
Jam:						
Peach.....	½-oz cup, boat, or env.	1 ea.....	25.....	X.....	X.....	X.
Raspberry.....	½ oz cup, boat, or env.	1 ea.....	25.....	X.....	X.....	X.
Grape.....	½ oz cup, boat, or env.	1 ea.....	25.....	X.....	X.....	X.
Peanut butter.....	24-oz jr.....	2 tbsp.....	2 jr.....	X.....	X.....	X.
Peanut butter.....	No. 2½ can.....	2 tbsp.....	1 can.....	X.....	X.....	X.
Soups and Bouillon (FSC 8935)						
Soup, ready-to-serve.....	8-oz-tall can.....	1 cup.....	25 cans.....	X.....	X.....	X.
Special Dietary Foods and Food Specialty Preparations (FSC 8940)						
Potato chips.....	Lb.....	¼ oz.....	1.25 lb.....	X.....	X.....	X.
Potato sticks.....	5½-oz can.....	¼ oz.....	1.25 lb.....	X.....	X.....	X.
Condiments and Related Products (FSC 8950)						
Catsup.....	½-oz cup, boat, or env.	1 ea.....	25.....	X.....	X.....	X.
Mustard.....	½-oz cup, boat, or env.	1 ea.....	25.....	X.....	X.....	X.
Olives, green, unpitted.....	1-qt jr.....	3 ea.....	1.5 lb.....	X.....	X.....	X.
Olives, ripe, unpitted.....	No. 1 tall can.....	3 ea.....	1.5 lb.....	X.....	X.....	X.