



# SHIP'S COOK 1c & CHIEF COMMISSARY STEWARD

NAVY TRAINING COURSES

NAVY PERS 10512



**SHIP'S COOK 1c**  
**and CHIEF COMMISSARY**  
**STEWARD**

PREPARED BY  
STANDARDS AND CURRICULUM DIVISION  
TRAINING  
BUREAU OF NAVAL PERSONNEL



**NAVY TRAINING COURSES**  
**EDITION OF 1946**

UNITED STATES  
GOVERNMENT PRINTING OFFICE  
WASHINGTON: 1946



VO 353  
A3  
1245

## PREFACE

1917  
This book is written as an aid in the preparation of men for promotion to the ratings of Ship's Cook first class and Chief Commissary Steward. It is realized that nothing can take the place of practical experience in the galley, bakery, and butcher shop.

The book is designed to cover the qualifications of Ship's Cook first class and Chief Commissary Steward; and the qualifications in turn have been determined from the actual "on board" analyses of these rates. The qualifications, in accordance with Part D, Chapter V, Section 2 of the Bureau of Naval Personnel Manual, are included in the Appendix at the back of this book. Since the examinations for promotion to Ship's Cook first class and Chief Commissary Steward will be based exclusively on these qualifications, it is suggested that men refer to them frequently for guidance.

This book takes up the organization of work in the general mess. It contains a discussion of the highly important task of planning the bill of fare and the procuring, inspecting, stowing, and issuing of the provisions needed to provide the bill of fare. An explanation of the different types of rations is given. The book also includes sections on field cooking, food conservation, safety regulations, the control of insects, and the prevention of food poisoning.

The photographs used in Chapter 13 were furnished by the U. S. Department of Agriculture, Bureau of Entomology and Plant Quarantine.

As one of the NAVY TRAINING COURSES, this book represents the joint endeavor of the Training Courses Section in the Bureau of Naval Personnel and of Naval Establishments specially cognizant of the technical aspects of Ships Cooks' and Chief Commissary Stewards' duties.

510023



## TABLE OF CONTENTS

	Page
Preface .....	III
<b>CHAPTER 1</b>	
Meet the senior cook and the chief.....	1
<b>CHAPTER 2</b>	
Getting organized .....	5
<b>CHAPTER 3</b>	
Planning the bill of fare.....	17
<b>CHAPTER 4</b>	
Paper work of the bill of fare.....	31
<b>CHAPTER 5</b>	
Getting the provisions you need.....	41
<b>CHAPTER 6</b>	
Inspection and stowage of provisions.....	61
<b>CHAPTER 7</b>	
Getting the provisions out of storage.....	77
<b>CHAPTER 8</b>	
Rations—all kinds .....	87
<b>CHAPTER 9</b>	
More of the paper work.....	97
<b>CHAPTER 10</b>	
Cooking in the field.....	111

**TABLE OF CONTENTS—CONT'D**

Page

**CHAPTER 11**

Getting the most out of your provisions . . . . .139

**CHAPTER 12**

Safety first . . . . .149

**CHAPTER 13**

The war against insects . . . . .161

**CHAPTER 14**

Food poisoning . . . . .173

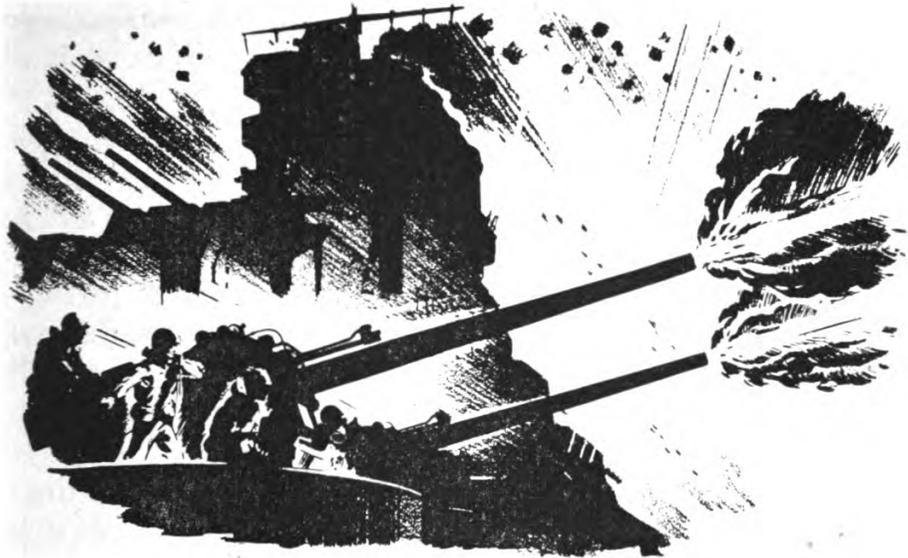
Quiz . . . . .182

Qualifications . . . . .196

Index . . . . .199

**SHIP'S COOK 1c AND  
CHIEF COMMISSARY STEWARD**





## CHAPTER 1

### MEET THE SENIOR COOK AND THE CHIEF

#### YOU—THE SHIP'S COOK

A gunner's mate gets a kick out of seeing one of his shells score a hit. A machinist's mate takes pride in the rhythmic purr of a well-cared-for engine. A signalman enjoys his responsibility in the execution of a perfect maneuver. And YOU, as a ship's cook, can enjoy ALL of these things. Why? Because you keep your shipmates in fighting trim. Their eyesight, alertness, strength, energy and morale are best only when YOU prepare the RIGHT food for them—in the RIGHT way. They depend on you.

When you came into the galley as a striker, you probably didn't know much about what you were supposed to do. How did you find out? Mostly by being told and shown what to do, and then by actually DOING the job. And who told you and showed you how to use the coppers, how to prepare steaks, or how to bake bread? Some ship's cook, of course.

#### GOOD WORK MAKES FOR HAPPINESS

As you get into a higher rating, you're going to have to do more and more of the TELLING and less and less of the asking. Your job becomes more of the SUPERVISING and ORGANIZING and less of the actual doing.

As a Ship's Cook 2c or 1c, you've become familiar with that satisfied feeling that comes after a job has been well done. Your good work makes your superiors happy, too. When YOU become the cook in charge of the galley—or, if you're already in that spot, when you advance to Chief Commissary Steward—YOU have to take the rap for any POOR work of the men under you. Learn to DIRECT, SUPERVISE, and INSTRUCT these men in their various duties so that they will do their work well. Sometimes that's easier said than done. But when you're successful, that satisfied feeling will be even more pleasant. And there'll be more folding money to go with these higher rates.

The detailed qualifications you must meet in order to get a Ship's Cook 1c or Chief Commissary Steward's rating are printed in the back of this book as they appear in Part D, Chapter 5, Section 2 of the *Bureau of Naval Personnel Manual*. Here's what they cover.

### SHIP'S COOK FIRST CLASS

First of all—a Ship's Cook 1c must be able to meet all the requirements set up for a Ship's Cook 2c. Just to remind you of what these qualifications cover—

A Ship's Cook 2c is able to COOK satisfactorily. He knows how to use standard Navy recipes. He is able to operate and care for all the mechanical equipment in the galley. He knows how to cut meat the Navy way. He knows something about the theory of foods and how to plan menus.

He understands the organization of the general mess in his own ship or station. And he knows the regulations concerning the issuing of provisions. In addition, he is able to supervise the delivery, inspection, and stowage of provisions and fresh meats. He can figure the quantity and cost of each item of provisions and the cost of a ration per man per day. He's familiar with the regulations and instructions pertaining to the Navy ration, surveys, and sales to messes.

These qualifications cover a lot of ground—but most of them are old stuff to you. If you're a little rusty on some of the skills and procedures, get the Navy training course for *Ship's Cook 3c and 2c* and do a bit of studying. Better still, notice particularly how some of the jobs men-

tioned in the qualifications are handled in your commissary department.

A Ship's Cook 1c has to be able to TAKE CHARGE of the galley. Since he's pretty much on his own, he has to be sure of himself. He needs a complete knowledge of all cooking processes and the ability to pass this information on to the men working with him. And he'll need to know IN DETAIL the current regulations and instructions governing the general mess.

He must also know something about landing force cooking. This means he should be able to lay out a field kitchen so that the camp ice box, kitchen pits, kitchen fires, camp ovens, and incinerators are put in the proper places. He must know how to set up and operate a field range, a field bake oven, and a camp ice box. In addition, there are certain combat duties to be performed by the ship's cooks in a landing party.

### **CHIEF COMMISSARY STEWARD**

If you're already a 1c man seeking advancement to Chief Commissary Steward, you must, to begin with, meet all the qualifications for either Ship's Cook 1c or Baker 1c. Then you must be able to take COMPLETE charge of the delivering, handling, storing, and issuing of provisions on your ship. This includes estimating capacities of storerooms, including cold storage spaces. And you should know how to DIRECT the preparation and cooking of food—both in the galley and in the bake shop. You'll need to know the current prices and the normal seasonal changes in prices of the various foods listed in the Navy ration and other foodstuffs you use.

Your knowledge should include Navy regulations about subsistence allowances, commuted rations, and ALL the regulations and instructions pertaining to general messes. In addition—you need to know how to keep accurate records and make correct reports of all transactions having to do with the general mess.





## CHAPTER 2

### GETTING ORGANIZED

#### LIKE A WELL-OILED MACHINE

Under all conditions aboard ship, a well-planned commissary organization works like a well-oiled machine—everything runs smoothly and efficiently. Everybody knows exactly WHAT he is supposed to do and HOW to do it. Where do you fit into the picture?

YOU may be the guy who helps set up this smooth-running organization for the galley, bakeshop, butcher shop, and other commissary spaces. And, once the organization is set up, you may be the one who makes things click. Or—you may be the one who snafus the whole works.

#### COMMISSARY ORGANIZATION

Figure 1 shows the commissary organization aboard one of the larger ships of the fleet.

On board ship the supply officer is responsible for the operation of the general mess. He assigns one or more of his assistants to commissary duty—the number depending on the size of the mess.

At shore stations, especially the larger ones, the commissary work is organized as a separate department with a commissary officer in charge.

Many of the smaller ships have no Supply Corps officer on board. In such cases the CO assigns a line officer to act as supply officer. This officer—usually the first lieutenant—is then responsible for the operation of the general mess. These smaller ships generally do away with the job of galley captain and make the watch captains directly responsible to the CCS.

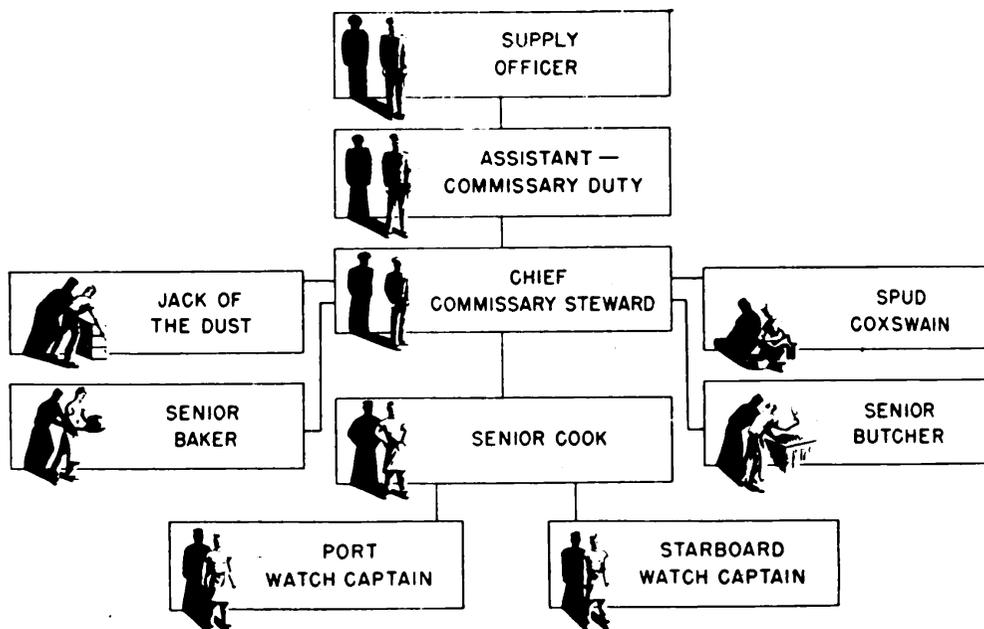


Figure 1.—Commissary organization.

Notice in figure 1 how the whole organization revolves around the CCS. He is in a position to make the general mess a good one or a poor one. Now—how does this organization operate?

### THE SUPPLY OFFICER (COMMISSARY OFFICER)

As head of your department, the supply officer is responsible for the organization and administration of the whole outfit. It is his duty to see that you and all the other members of the department observe all regulations which apply to the department.

The officer or pay clerk assigned to duty as assistant to the supply officer performs any duties given to him by his boss. Ordinarily he is put in charge of the records and the books and is RESPONSIBLE for the preparation of all orders, reports, and returns.

## **CHIEF COMMISSARY STEWARD**

A Chief Commissary Steward is in **DIRECT** charge of the galley, the bakeshop, the butcher shop, and the commissary issue room. This CCS sets up and regulates the watches and musters the enlisted men working under him each morning. The Chief often takes personal charge of the galley when the food is being prepared. And he pays particular attention to the issuing of food.

A couple of desk jobs keep the Chief busy much of the time. He sees that the weekly bill of fare is prepared about a week in advance. This menu is then sent to the commissary officer, who sends it to the CO for final approval. Once the bill of fare has been approved by the CO, it cannot be changed without his consent. A **WORK-SHEET** indicating the exact amount of provisions needed to prepare the meals listed on the bill of fare is prepared each day by the CCS. The Chief is also responsible for making out the **STATEMENT OF ISSUES TO THE GENERAL MESS AND COST OF RATIONS DAILY**.

Here's another thing to remember—the Chief Commissary Steward must **NOT** have custody of or control over the **RECORD OF PROVISIONS RECEIVED** nor shall he prepare **PUBLIC VOUCHERS** or **RATION RECORDS**.

## **THE SENIOR COOK**

The senior cook—often called the leading man or galley captain—is the right hand man for the CCS. He is directly responsible for carrying out orders relayed to him by the Chief. The senior cook must see that the watch standers going off duty have completed their work properly. And he must be sure that the men coming on watch are clean and fit for duty.

The senior cook in charge of the galley is directly in charge of **BOTH** watches. Technically, he is always on duty when work is being done. To fulfill this duty, the senior cook should inspect each dish prepared just before it is issued to be sure that the food has been properly prepared and seasoned. And—during the serving—the leading cook sees that proper quantities of food are served in the most attractive manner possible. Complaints as to shortage or poor quality are handled by the senior cook if possible.

## **WATCH CAPTAINS**

The watch captain works directly under the senior cook (or the CCS). He must set the morning watch and see that the daily routine is properly carried out by the men under him. It is up to the watch captains to see that the bill of fare is carefully followed. No deviations are allowed without the consent of the CO.

The watch captain issues the necessary instructions for lighting the ranges in the morning. In doing this, he makes sure that safety precautions are understood and observed. It's also his job to supervise the preparation, proper cooking, and serving of all the food in an appetizing manner. At the same time, he tries in every way possible to prevent waste or loss of provisions.

Finally, the watch captain has to keep his eyes open to prevent the unlawful removal of food from the galley or storage spaces.

## **SENIOR BUTCHER**

The senior butcher—in charge of the butcher shop detail—is responsible for the preparing of meats for the galley. This detail stands watch only when it is necessary to prepare meats. The butcher in charge learns from the Chief Commissary Steward's worksheet what meats are required. These meats are usually withdrawn from the refrigerated space by an issue room detail. The senior butcher GIVES a receipt for the gross weight of the meats withdrawn and then OBTAINS a receipt from the captain of the watch in the galley for meats turned over to the galley.

The senior butcher must exercise extreme care that all meats are handled in an absolutely sanitary manner. This means that the butcher shop, meat block, and other equipment must be kept clean at all times. And he must see that no unauthorized personnel are allowed in the butcher shop. Anybody not on duty must have permission from proper authority before being admitted.

## **SPUD COXSWAIN**

The spud coxswain is responsible for preparing all fruits and vegetables that are needed to carry out the daily menu. He gets the details from the Chief's work sheet.

As the men assigned to the spud coxswain are likely to be entirely inexperienced, he has an important job of training. These men must be shown economical and proper methods of preparing the fruits and vegetables.

The equipment and utensils in the vegetable preparation room must be kept clean and ready for inspection. The spud coxswain has charge of all this equipment, including the knives. He must see that it is properly used. This means that all safety precautions are observed. Only those who know the safety precautions should be permitted to operate the equipment.

### **SENIOR BAKER**

The senior baker is in charge of the ship's bakery. If possible, and necessary, he may designate two watches to handle the work of the bakery.

The senior baker carefully supervises the preparation of bread and other bakery items specified on the menu. When the CCS so orders, he must prepare a daily work sheet indicating what he needs. Then he gives a receipt to the jack of the dust for all provisions drawn for use.

As he must use nothing that shows the slightest sign of being bad, the senior baker inspects the flour, lard, and other raw materials issued to him. He takes every precaution possible to prevent roaches, mice, and flies or other insects from getting into the bakery spaces.

The senior baker must make sure that the bakery, bread, and flour rooms and equipment are kept clean at all times. And he must show his crew the proper way to handle and operate all bakery equipment and machinery. This includes safety precautions.

### **JACK OF THE DUST**

The jack of the dust is in charge of the issue room. Therefore, he must make sure that there are always enough supplies on hand to meet the needs of all the messes. At the same time, it's his duty to see that nothing is given out without proper authority.

Issues are made on stub requisitions (NavSandA Form 307). See page 79. Issues to the galley must be receipted for by the watch captain, and issues to the butcher shop are receipted for by the butcher in charge. The senior baker receipts for issues to the bakery and the spud cox-

swain does the same for issues to the fruit and vegetable preparation room.

### **ORGANIZATION OF THE GALLEY**

As CCS or Ship's Cook 1c, you may not have much to say about the overall organization of the commissary department. But—when it comes to the detailed organization of the galley and bakeshop, you may have a great deal of influence. Organization is important in order that each man will know exactly what he is supposed to do.

Organizations will differ from ship to ship and station to station. That is to be expected. You may need to experiment a bit before you hit upon the best set-up for your ship or station.

The need for organization may be as great on a small ship as on a large one. On a small ship, one man has to do a greater variety of jobs. Hence he needs to have his work carefully organized so he will be able to get ALL these jobs done on time.

Before you can set up a good work organization for the galley, you must have clearly in mind WHAT NEEDS TO BE DONE. Usually the work of the galley falls into the same general pattern—day after day. Soups and salads are prepared, meats and vegetables are cooked, and coffee or other drinks are made. The preparation of special desserts or other special foods may break up the usual routine somewhat.

Figure 2 shows a work organization which has been used successfully on a large ship. Even though it may not be the kind you want on your ship, it is one way of organizing the work of the galley.

The COPPER KING in this organization is in charge of the cooking of all foods prepared in the coppers and steamers. The RANGE KING handles the work on the ranges. And the COFFEE KING is in charge of preparing coffee and other drinks. A cook is placed in charge of preparing salads indicated on the bill of fare. Another cook is assigned to the serving line to instruct and assist the mess cooks in making proper servings. Still another prepares all foods which require deep fat frying. Special jobs are handled by cooks who are available.

All hands turn to and help with certain duties that affect all these jobs. Keeping the galley and everything

in it clean is one of them. The control of insects is another problem for all cooks. The conserving of food, the preventing of food poisoning, and the observing of safety regulations are also responsibilities of all hands.

### ASSIGNING MEN TO JOBS

An organization on a piece of paper isn't going to mean much unless it's made to work. And whether or not it works will depend a great deal on how the men are as-



RANGES



COFFEE



SALADS



DEEP FAT FRYING



COPPERS



SERVING

Figure 2.—Organization of the galley.

signed to the various jobs. How are you going to do this assigning? Before you can do it properly, you will have to know more about them than their names and what they look like. And after assignments have been made, you may have to do some shifting around in order to get the best results. Here are some of the things you need to consider—

The RATE a man holds gives you some idea of where he

might be assigned. It usually doesn't work to put a 3c in charge of a 2c.

ABILITY to do certain types of work is another good indication. A man may be excellent in handling the deep fat fryer but not so good in doing work on the range. Or a baker may be able to make excellent bread and yet be a failure at making good pies. And—try not to place a man who knows very little about a certain job over a man who knows more about that same job, regardless of rates. They may have a hard time getting along well together.

The LIKES and DISLIKES of the men for the various kinds of duties should be given some consideration—not only because you want to please them but because you will generally get a better job done.

A man's QUICKNESS IN LEARNING how things should be done is another consideration—particularly with strikers. Give the man who is quick to "catch on" a chance to learn some of the more difficult jobs.

And give the fellow who has a "knack" for getting along with other fellows and training them a chance to do some training. Don't put him on a job where he is all by himself. Give him a job where he can supervise and instruct some of the strikers or some of the lower rates.

ROTATE your men as often as practicable so that each one becomes able to handle any job in the galley. In the long run, you'll find it will pay. And if rotation is carried on gradually and only after proper instructions are given, the immediate work of the galley will be benefited rather than harmed. The men will be more enthusiastic about their work—and the job won't become monotonous.

### **ROUTINE DUTIES**

After the organization has been set up and the men have been assigned to their jobs, most of the Chief Commissary Steward's duties are routine—that is, they occur over and over again. And remember—as a Ship's Cook 1c, you may have to fill in for the Chief. These routine duties can be divided into three parts—PREPARING THE BILL OF FARE; taking care of the necessary PAPER WORK; and SUPERVISING the work of the cooks, bakers, strikers, and mess cooks. All of Chapters 3 and 4 of this book are devoted to the bill of fare. Paper work is explained wherever necessary.

## **SUPERVISING**

As Chief Commissary Steward, your first daily supervising job will be to take the morning muster of your men. At that time see that your men are clean and ready to perform their various duties. And when the watches change, you or your senior cook had better be on deck to see that the watch going off duty leaves everything in good shape for the watch coming on. If possible, be around when the chow is ready for serving to be sure that everything is all right. Take a turn around the galley, bakeshop, and storerooms once in a while during the day to be sure everything is going along properly. During all of these inspections be sure the rules and regulations of the department are being followed. Have them posted somewhere so everyone knows what they are, so there'll be no excuse for disobeying them.

## **RULES AND REGULATIONS**

All cooks and bakers must keep themselves clean and neat at all times.

The deck, bulkheads, and overhead spaces must be kept clean.

The washing or stowing of clothes in the galley or bakeshop shall not be permitted.

Smoking in the galley or bakeshop is forbidden.

No one shall be allowed in the galley, bakeshop, or storage spaces except those on watch or those having authority to make inspections.

No one who is ill should be allowed to work on the preparation or serving of food. See that personnel who are ill are sent to sick bay.

Doubtful provisions must not be used until they are cleared by the medical department. Doubtful food should be placed aside for a survey. This includes cans that are "blown" (figure 3) or any food that doesn't look or smell right.

## **SPECIAL DUTIES**

Many of your duties as Chief Commissary Steward may be called special duties, occurring only once in a while.

You may have a good deal to do with the procuring of provisions. And you may be called upon to supervise the inspection of them as they come aboard. You may also

be asked to give advice in the stowage of the provisions, and you may have to lend a hand in the taking of inventories and the recording of the results of surveys.

### **GETTING THE JOB DONE RIGHT**

You've heard people say that the only way you can get a job done right is to do it yourself. That's all right when it's small enough for you to do alone. But the job of

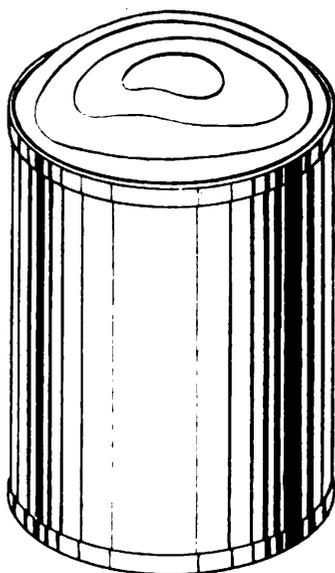


Figure 3.—A "blown" can.

feeding the men aboard most ships of the fleet is more than a one-man job.

After the working organization has been set up and your men have been assigned to their various posts, you have the job of seeing that they do their work—AND DO IT RIGHT.

### **MAKE YOUR INSTRUCTIONS CLEAR**

You can't expect men to follow instructions they don't understand. If you're giving your orders orally, be sure your men hear you and understand what you say. If the instructions are long and detailed, better put them in writing so there will be no misunderstanding. Use simple, easy-to-understand language in both oral and written instructions.

Your men will be more apt to do a good job if you explain the purpose of the work you ask them to do. For

example—if you can convince your men that the usual cause of food poisoning is carelessness in the preparation and handling of food, you'll find that they'll be more enthusiastic in following your rules for careful food handling. If you point out to them what might easily happen if safety regulations are not obeyed, they'll be more apt to take the regulations seriously.

### **SETTING A GOOD EXAMPLE**

Above all, set a good example yourself. Observe ALL regulations laid down for the galley, including your own. Your men will respect you for it and be more willing to observe the regulations themselves. And—if you expect your men to know their jobs, see that YOU know your job thoroughly. If you want them to keep fit and clean, see that you do the same yourself. If you don't want your men to criticize you behind your back, be sure you don't criticize YOUR superiors behind their backs.

You can help develop a fine working atmosphere by being cheerful and controlling your temper. You set the pace here as in other things.

And here's another way you can set a good example. If your men are having trouble cutting meat in the correct Navy style, or in any other task, step in and show them how to do the job. Give them a first-rate demonstration. It will mean more than the thousand words you might use to describe the same process. Of course, you must know your stuff or the demonstration will be worthless—and perhaps harmful.

### **KNOW YOUR MEN**

You'll find it helpful to know something about your men—their problems, their hobbies, their likes and dislikes. Take a personal interest in their welfare. They'll appreciate it and do much better work for you.

And when a man does a good job—whether it be cleaning the deck or baking a fancy pie—tell him about it. Let some of the other men hear you praise him, too. Those who do a poor job should be told about that also—**BUT IN PRIVATE**. Try to find out what made the man do a poor job so that the necessary corrections can be made. Maybe your instructions were not clear; perhaps the man did not know how to do the job; or possibly he was careless

and slovenly. It's your business to get at the source of the trouble so that the poor work will not be repeated. Dress the man down only if he was at fault and if you believe the dressing down will do some good.

And when you put a man in charge of a certain job, such as preparing all the soups, **HOLD HIM RESPONSIBLE** for fulfilling this job. Don't feel that you must direct his every step. You'll only destroy his self-confidence.

If a man deserves an advance in rate, encourage him to take the necessary steps to get this better rate even though he may have to be transferred when he gets it. You're helping the man, the Navy, and yourself by boosting deserving men. The word soon gets around and your men will work that much harder.

Be absolutely fair yet tactful in your dealings. Giving one man the breaks at the expense of the others will soon discredit you as a leader. Your rate as Ship's Cook 1c or CCS will give you certain privileges the men under you don't enjoy. But don't abuse these privileges or you'll lose some of the cooperation your men would otherwise give you.



### CHAPTER 3

## PLANNING THE BILL OF FARE

### YOUR MOST IMPORTANT JOB

The test of well planned meals is in the eating. The Navy buys the best food available. Some of these foods—ham and eggs, for example—go very well together, whereas other foods such as potatoes and rice are too much alike to be served together. Good meals—the kind your men go for—depend therefore upon the planning, the making of the bill of fare. Planning the menu is the most important job you'll have. **LEARN TO DO IT WELL.**

The weekly bill of fare is made out and handed in to the SO by Wednesday of the week before it is to be used. The SO carefully examines this bill of fare before sending it on to the CO for final approval. You as CCS or SC1c may be doing the real planning, however. Your SO and CO merely check your work. Now—what things do you have to consider in your planning?

First of all, you must see that enough of the various TYPES of food are provided. All foods do not have the same value. Some foods are especially good for providing energy, others build up the muscles and worn out tissues, and still other foods furnish the front line of defense against various diseases. In other words, a **WELL-BALANCED DIET** is necessary (figure 4). You'll need to know

something about the types of food that go into such a diet.

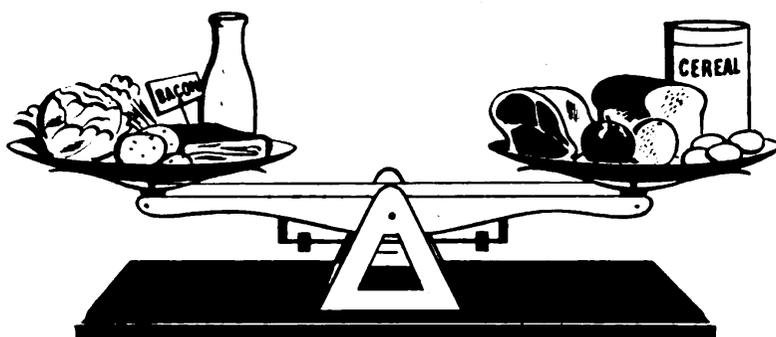


Figure 4.—Diets must be well balanced.

### **CARBOHYDRATES AND FATS—THE ENERGY FOODS**

CARBOHYDRATES and FATS, the energy foods, give the men pep and fit them for a good day's work. Carbohydrate foods are easily digested and low in cost.

White potatoes provide much of the needed carbohydrates—sailors like them and they can be stored easily for long periods of time. Bread and breakfast cereals are also good carbohydrate providers, as are honey, sirups, candy, jams, and ice cream. Sweets of any kind give a quick pick-up because the carbohydrates they contain are in the form of sugar. Sugar is used by your body soon after it is eaten. Dried fruits—dates, figs, prunes, and apricots—also are high in energy-producing value.

FATS provide energy for immediate use as well as help build up a reserve energy supply. Besides that, fats help give flavor to your chow. Also—if you provide enough fats, your men won't feel hungry between meals.

Bacon and other meats are excellent sources of fat. Milk, butter, eggs, lard, peanuts, soy beans, and salad dressings also furnish considerable quantities of fat.

### **PROTEINS AND MINERALS—THE BUILDER-UPPERS**

PROTEINS build up your muscles and the other soft tissues of your body. They also lend a hand in providing energy and in aiding digestion. They provide an important part of the blood. In fact, proteins affect most of the body functions in one way or another. But—don't depend upon the proteins for furnishing everything needed. They're to be used mostly as builder-uppers.

Meat does a good job of providing proteins, as do milk,

eggs, cheese, fresh fish, and poultry. Legumes such as dried beans—kidney, lima, soy, Navy—and dried peas also furnish large amounts. As these legumes are not as complete a protein as meat, serve them in addition to the meat ration once or twice a week—never as substitutes for meat.

**CALCIUM** and **PHOSPHORUS** are **MINERALS** needed to keep your bones and teeth strong and healthy. Calcium also promotes the clotting of your blood—so important in case of injury. And together with the minerals sodium and potassium, calcium contributes to the steady working of the heart and muscles.

Milk is the best mineral food available. In fact, milk is the most nearly complete of all foods. This means that it contains all of the necessary food elements—carbohydrates, proteins, fat, minerals, and vitamins. Of course, milk alone doesn't provide enough of all these elements. Milk products—cheese, butter, and ice cream—are also good mineral providers. And the green leafy vegetables—especially kale, broccoli, turnips and mustard greens, and collards—contain large amounts of calcium.

**IRON** is needed in the blood of every sailor. Iron builds up the red coloring matter in your blood and enables this blood to carry oxygen to all parts of your body. Without this oxygen in your body, you could not live. Here are some of the best iron providers—liver, dried beans, beet greens, enriched bread, eggs, green leafy vegetables, dried apricots and peaches.

**IODINE** is needed to keep the thyroid gland operating properly. (Your thyroid gland is in your throat—it affects growth, weight, and, in extreme cases, mental balance). Iodine is provided in the iodized salt used by the Navy. Iodine is also found in seafood, especially oysters, and fish caught in salt water. To supply iodine and to add variety to your menu, plan to serve seafood and fish more often than on the usual days of fasting.

### **VITAMINS—THE DISEASE FIGHTERS**

**VITAMIN A** is the good eyesight vitamin. It helps keep your eyesight sharp—particularly your night vision. By aiding in the upkeep of the skin and inner linings of the body organs, vitamin A also helps to guard you against infections.

Vitamin A is found in all green and yellow fruits and vegetables, especially in the dark green leafy vegetables and in the deep yellow fruits and vegetables. Butter, cheese, eggs, liver and fish oils are good sources, too. Liver and variety meats such as giblets and beef kidneys are other valuable providers of vitamin A.

VITAMIN B is the name given to a whole family of vitamins. THIAMIN—a member of the B family—is the pep vitamin. It helps give your men good appetites so they can really appreciate their food. Thiamin prevents or corrects the deficiency disease, beriberi, a disorder of the nervous system. Milk, lean pork, nuts, liver, enriched bread, fish, and poultry provide substantial amounts of thiamin.

NIACIN—another B vitamin—keeps you free from pellagra, a nervous or gastrointestinal disease. Liver, lean meats, fish, milk, yeast, eggs, nuts, potatoes, corn, and tomatoes are rich in niacin.

RIBOFLAVIN—a third B vitamin—is needed for proper growth and for maintaining a healthy condition of the eyes and skin. Riboflavin is found in whole wheat or enriched bread, whole grain and restored cereals, milk, eggs, green leafy vegetables, liver, beef heart, and various other meats.

VITAMIN C—also known as ASCORBIC ACID—helps make good teeth and gums. It also builds up resistance to infections and helps you maintain a feeling that “all’s right with the world.” So provide plenty of fresh fruits and vegetables every day. Citrus fruits (lemons, oranges and grapefruit), tomatoes, green leafy vegetables, and especially cabbage contain large amounts of vitamin C.

VITAMIN D is often called the sunshine vitamin because something in your skin changes to vitamin D when it is exposed to the sun. Your blood then carries vitamin D to all parts of your body. This vitamin helps your body make use of the calcium and phosphorus in your food and so helps build good bones and teeth. All of your men are not going to get enough vitamin D through action of the sun. You’ll have to provide some in their food. Foods such as liver, butter, and eggs contain some vitamin D. The same is true of salmon and sardines. Other foods, milk for example, may have vitamin D added to them to supplement their natural content.

## PROVISIONS AVAILABLE

The kinds and quantities of provisions on hand will have a strong effect on your meal planning. That means you'll have to know what is in your storerooms. Suppose you had 2,850 pounds of frozen beef suitable for roasts or steaks. The complement of your ship is 225 and it is expected that you will be unable to get any more beef for 90 days. How often should you plan to serve beef roasts or steaks?

First of all—find out how many beef steak or roast meals you can provide with the 2,850 pounds available. Refer to the *Navy Cook Book*. It states that 42 pounds of boneless beef is necessary to provide 100 portions of beef steaks or roasts. Divide 42 by 100 to get the amount needed for 1 portion. When dividing by 100 all you need do is to move the decimal point 2 places to the left. So .42 pounds is the amount needed for 1 portion. Now multiply .42 by 225 to get the amount of beef needed to serve 225 portions—like this—

$$\begin{array}{r} 225 \\ \times .42 \\ \hline 900 \\ 450 \\ \hline 94.50 \end{array}$$

Notice that the decimal point is two places in from the right. So—you need 94.5 pounds for each meal of steaks or roasts. Now divide 94.5 into 2,850 to get the number of meals you can provide. Here it is—

$$\begin{array}{r} 30. \\ 94.5 \overline{) 2850.0} \\ \underline{2835} \\ 150 \end{array}$$

The 2,850 pounds of frozen beef will be enough for 30 meals. If this is to last the 90 days of the cruise you will be able to serve beef steaks or roasts for one meal once every 3 days ( $90 \div 30 = 3$ ).

## LENGTH OF TIME CERTAIN PROVISIONS LAST

Some of your provisions—fresh fruits for example—won't last indefinitely under the best of storage condi-

tions. You'll have to use them wisely in order to obtain full value from them, even though that may mean using them for more than one meal per day. Use fresh fruits first and leave the dehydrated and canned goods out of your meals until the fresh products have been used. Try to hold on to some fresh provisions as long as possible to use with the canned or dehydrated foods. It will make these meals more interesting.

### **SEASON AND CLIMATE**

You'll have to consider the season of the year and the climate in which you find yourself. Light soups, cold plates, and cold drinks are suitable for hot weather. Heavier meals featuring rich soups, roasts, and hot drinks are desirable during cold weather. You may find it wise to make supper the main meal in the tropics and during the extremely hot weather.

### **MEN AND MACHINES**

The skills and abilities of the men working under you as cooks and bakers will make a big difference in your planning. Plan to serve fancy pies and other fancy desserts only if you have men who can prepare them really well.

The equipment you have on board also makes a difference. You can't have French-fried potatoes or doughnuts unless you have some deep-fat frying equipment, and you can't steam potatoes or other vegetables unless you have steaming equipment.

### **VARIETY—THE SPICE OF LIFE**

Variety is the spice of life—so you've heard. That goes for meal planning. Anyone gets tired of eating the same kind of food over and over again no matter how good that food tasted the first time. The whole meal may seem different if you change one vegetable. And you can get all kinds of variations by changing the method of preparation.

Take potatoes for example. You can plan to serve them cooked with jackets on, mashed, creamed, baked, roast browned, home-fried, hash-browned, parsleyed, au gratin, escalloped, French-fried, or stuffed and baked. You can probably add other ways to this list.

And you can prepare other foods in many ways. Knowing several "styles" of preparing one food is most helpful, especially when the supply of food is limited and variety not very great.

Variety of FLAVOR is important. The appetite is sharpened by foods with contrasting flavors and deadened by foods that taste too much alike. Sour or sweet pickles, chili sauce, and other condiments help provide these contrasts. The use of sauces or cooked meats and fish and dessert sauces on plain desserts makes these foods more attractive.

Contrasts in the form and texture of the chow make it more appetizing. Plan to have some of the food in each meal in solid form and some in soft form. Lima beans and stewed tomatoes set each other off effectively. Baked lima beans and baked potatoes make a combination that is unattractive both to look at and taste. They are too much alike in texture and flavor.

### **COLOR COMBINATIONS**

Plan meals that combine colors attractively. Color contrasts that you get with WHITE mashed potatoes, BROWN gravy, and GREEN peas are excellent. Avoid having too many things of about the same color in any one meal. White potatoes, white cauliflower, and a white pudding look uninteresting. Salads made of fresh vegetables or fruit or of combinations of fruits and vegetables will help you get good color contrasts.

### **OTHER CONSIDERATIONS**

Consider the COST; it's important. You can't have steaks, roasts, and other high cost meats all the time. You'll have to use stews and chopped meats some of the time. Remember this, however—CONSIDERATION OF COST IS NO EXCUSE FOR PLANNING POOR MEALS.

Emergencies may occur that will force you to change some of your best plans. Be prepared to change your bills of fare in order to make use of provisions that start to go bad or to meet such unexpected happenings as a breakdown of part of the refrigeration system. The supply officer will have to be notified of any such changes, of course, and he will need the approval of the commanding officer to make the change.

If there are leftovers, refrigerate them as soon as possible. Hot leftover food should be placed in the refrigerator as soon as it is cool enough to handle. Place cold food in the refrigerator immediately following the service of food to the mess. Leave all leftover food in the refrigerator until time to prepare it for the meal. Use this leftover food **WITHIN 36 HOURS**. Remake it into attractive and appetizing dishes for serving. Plan to change the dishes completely so that the food won't be recognized as leftovers. Combinations such as rice and stewed tomatoes, carrots and peas, cooked vegetables made into a salad, and meat and potatoes made into a hash are a few examples of how leftover foods may be used.

Arrange menus so that the men will never know just when to expect certain dishes. You can do this by planning menus for a period of ten days, all at one time, then repeating this series of menus with necessary changes to take care of any new food items which come along. If this is done, the same dish will not appear on every Monday or Wednesday, but will be staggered throughout the month.

### **GUIDES FOR PLANNING THE BILL OF FARE**

The **NAVY RATION** can be used as a guide for planning menus that will insure a well-balanced diet. The Navy ration indicates what should be fed each sailor in **ONE DAY**. This means three meals. Follow it if you possibly can. Here's the **NAVY RATION** plan as given in the Bureau of Supplies and Accounts Manual—

**BREAD**—12 ounces soft bread or flour or 8 ounces biscuit.

**MEAT**—12 ounces preserved meat or 14 ounces salt or smoked meat or 20 ounces fresh meat or fresh fish or fresh poultry.

**VEGETABLES**—12 ounces dried vegetables or 18 ounces canned vegetables or 44 ounces fresh vegetables.

**FRUIT**—4 ounces dried or 10 ounces canned or 6 ounces preserved or 16 ounces fresh, or 6 ounces canned fruit or vegetable juices or 1 ounce of powdered fruit juices or  $\frac{6}{10}$  of an ounce of concentrated fruit juices.

**COFFEE**—2 ounces of coffee or cocoa or  $\frac{1}{2}$  ounce tea.

**MILK**— $\frac{1}{2}$  pint fresh or 1 ounce powdered or 4 ounces evaporated.

**BUTTER**—1.6 ounces.

**CEREALS**—1.6 ounces cereals or rice or starch foods.

**CHEESE**— $\frac{1}{2}$  ounce.

**EGGS**—1.2 per day.

**LARD**—1.6 ounces lard or lard substitute.

**SAUCES**— $\frac{2}{3}$  gill oils or sauces or vinegar.

**SUGAR**—5 ounces.

**AS REQUIRED**—baking powder and soda, flavoring extracts, mustard, pepper, pickles, salt, sirup, spices, and yeast.

The *Navy Cook Book* gives you another good guide for setting up a well-balanced bill of fare. You may find this easier to follow than the Navy Ration. In this plan, foods are divided up into several basic classes—milk products, eggs, butter, meat, poultry or fish, legumes, cereals and bread, fruits and vegetables. Again, quantities given refer to what should be given **ONE SAILOR IN ONE DAY**. Pages 26 and 27 show you the guide set up under this plan.

### **BREAKFAST**

Start the day off right by serving a good breakfast. Serve fruit—fresh, if possible—to begin with. Apples, pears, or melons are good. Use citrus fruits often. Fruit juices are desirable as alternatives.

Then provide some kind of cereal. Cereals are effective fuel and energy foods and a good source of minerals and vitamins. Remember, cereals also serve as carriers for another important food—milk. Plan to serve hot or cold cereals depending on the supply, the climate, the likes and dislikes of the men, and the need for variety. Sometimes, to add variety, serve a fruit which can be sliced over the dry cereal, as a first course.

Provide milk and hot coffee every day. Variety in the bread ration can be obtained by serving toast, hot cakes, rolls, muffins, hot biscuits, or French toast. The addition of jams, jellies, or sirups to any of these makes them more attractive and appealing.

The main dish for breakfast may be eggs one day, and hot cakes and sausage the next. When you serve eggs a second time, have them prepared in a different manner.



Figure 5.—Milk and milk products.

**MILK**—One pint of milk per day should be provided. This can be fresh, or reconstituted, evaporated, or dehydrated. It can be used in cooking or served as a drink. Milk products can be used to furnish the same nutrients as milk. Two and one-half ounces of American cheddar cheese, for example, are about equal in mineral and protein content to one pint of milk.

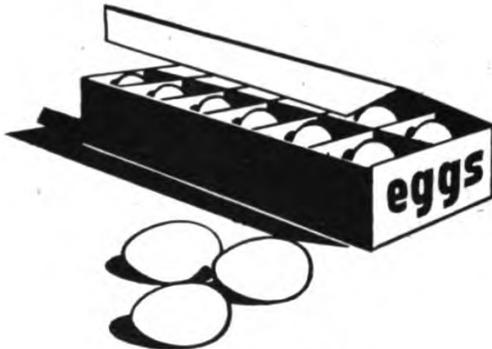


Figure 6.—Eggs.

**EGGS**—An egg a day is a good rule to follow. Eggs are especially valuable for their protein, mineral, and vitamin A content.

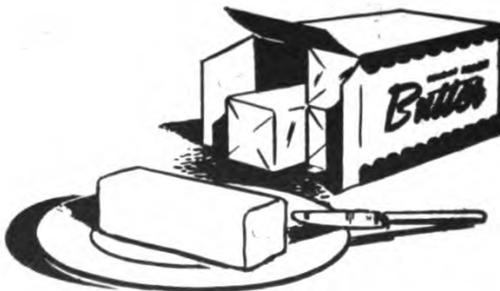


Figure 7.—Butter.

**BUTTER**—One to two ounces of butter daily will help furnish the requirement of fat and vitamin A.



Figure 8.—Meat, fish, poultry.

**MEAT, FISH, OR POULTRY**—One or more servings of meat, fish, or poultry will help provide the daily requirement of proteins, minerals, thiamin, and riboflavin.

**LEGUMES**—Dried beans — kidney, lima, soy or Navy — or dried peas can be served as a supplement to the meat ration once or twice a week. But don't serve them as a substitute for meat. Legumes are important sources of proteins, minerals and thiamin.



Figure 9.—Legumes.

**CEREALS AND BREAD**—Two or more servings of cereals and bread are necessary EVERY DAY. Bread made of enriched flour and cereals are excellent sources of energy, protein, roughage, and minerals, as well as the B vitamins.



Figure 10.—Cereals and bread.

**FRUITS**—Two or more servings of fruit daily are necessary. Fruits supply vitamins, minerals, and roughage. Use citrus fruits such as oranges or grapefruit often because they are among the best sources of vitamin C. If possible, plan to serve at least one fresh fruit.



Figure 11.—Fruits.

**VEGETABLES**—Plan to use at least TWO servings of vegetables besides potatoes. These should include at least one green or yellow vegetable each day—they supply vitamin A and iron. Serve greens often—either cooked or in salads. Bring in tomatoes for their vitamin C content.



Figure 12.—Vegetables.

Other good breakfast foods for active sailors include hash, fried mush, baked beans, or fried potatoes. Combinations of ham and eggs, bacon and eggs, or sausage and eggs are popular but the cost runs pretty high. Eggs can be combined with hash, or sausage with hot cakes without excessive cost.

## DINNER

Always plan to make the main meal of the day—usually noon chow—something for the men to look forward to. Soup is a good starter. If the meal is to be heavy, serve a light soup—and vice versa. When vegetable soup is planned, you may omit the salad if you wish.

Make the main meat dish for the day a roast or broiled meat, or baked ham. Seafoods or poultry may be used for variation. Fish may be used any day, although tradition calls for its use on Friday. Plan to use gravy or sauce with most meats. But be sure to make a good, well-seasoned gravy.

Potatoes are the main carbohydrate vegetable. Since they are popular and can be served frequently, plan to prepare them in different ways. Commonly used alternate dishes for potatoes are beans (white, lima, or kidney), rice, noodles, hominy, sweet potatoes, and spaghetti.

Include in the menu a leafy or succulent vegetable such as spinach or broccoli, green beans, carrots or peas, and a salad. Serve salads frequently. A great variety of salads can be made from all types of vegetables. Once in a while, you can replace the salad with relishes such as radishes, celery, olives, and pickles.

Desserts are used to top off the meal. Cream and gelatin desserts are inexpensive, simple to make, and highly popular. Serve these frequently, especially in hot weather. Bread pudding can be delicious and it's economical because leftover bread can be used. But don't overdo it. Other puddings are good, too.

The bakers can provide tasty pies, cakes, and pastries for dessert. These always make a hit, but are comparatively rich and heavy, so serve them with light meals. Fresh or canned fruits may be used as desserts to be served with heavy meals and to offer a change from a diet of cooked desserts.

Serve hot beverages during the winter months. During the summer months, serve either hot or cold beverages for dinner or supper. For breakfast, even if the weather is hot, the men generally prefer hot coffee.

You can add a lot of variety to a meal if you vary the kinds of bread. Serve hot rolls of different forms, or cornbread, or hot biscuits in place of ordinary bread.

### SUPPER

In the tropics—or for variety in any climate—make supper the main meal. On such occasions, the dinner suggestions apply for supper also.

For supper (or for a light noon meal), you can use low cost cuts of meats, or trimmings from meat cut for roasts and steaks. From these trimmings, you can make hamburgers, stews, meat loaves or meat balls, as well as meat sauce to serve with spaghetti, rice or noodles, and chop suey or chili con carne.

Macaroni au gratin, creamed fish or a fish salad can often be used as the main course in the supper meal. Use rice, spaghetti, or some of the other starch foods in place of potatoes. Here again the leafy or succulent vegetables must be served. Leafy vegetables and green salads should be used—especially if none was served for dinner. The supper meal is a good time to use leftovers from dinner. But meals should be planned to reduce leftovers to a minimum.

Gingerbread or similar hot breads—with a sauce, jam or sirup—make excellent supper desserts. Use cocoa, or fruitade, as a change from coffee. If possible, ice the drinks during hot weather.

### PRACTICE MAKES PERFECT

The sample menus given in the 1944 *Navy Cook Book*, pages 8 to 11, are good examples of the kind of meal to serve. Use them as they are given and also as a basis for planning all your menus.

Try PLANNING some meals on your own, even though you may not actually have a chance to use them. Then ask yourself a few questions—

Are these meals balanced?

Is there a good color combination?

How about the form and texture? Are there good combinations?

Do the flavors go well together?

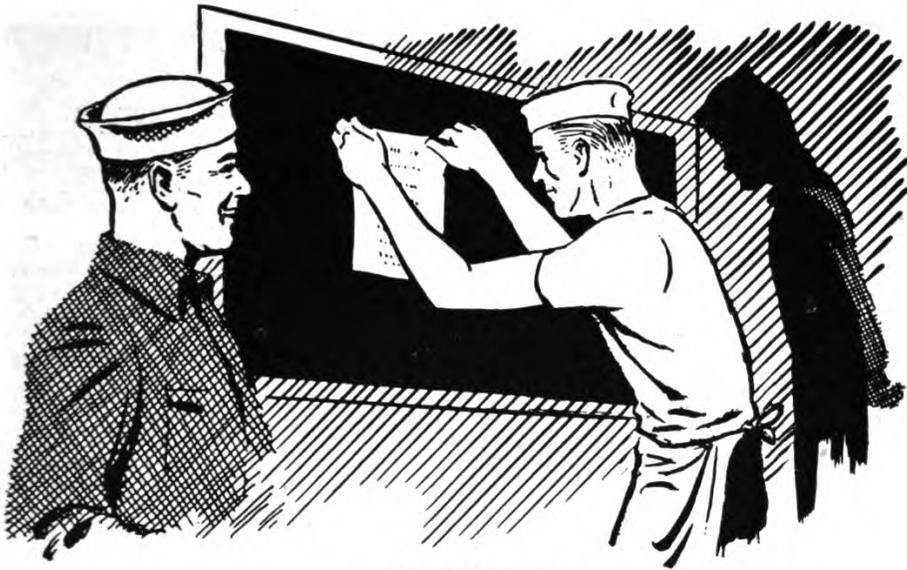
Are the meals economical? Does the cost stay within the ship's limit?

Are all the foods available?

Is variety provided for?

Are the meals suitable for the season of the year?

Be satisfied only when you can answer yes to all these questions. Get a good cook or commissary steward to check your TRIAL MENUS. He will be glad to do it, and undoubtedly will be able to give you some good suggestions.



## CHAPTER 4

### PAPER WORK OF THE BILL OF FARE

#### HOW GOOD IS YOUR MEMORY?

How's your memory? Is it good enough to remember the menus you have planned for 21 meals in advance? Probably not. So you'll want to get your plans down in writing. Besides—there are other people who want to know something about these plans. Your supply officer wants to know what is being planned in his department. And the skipper must give final approval to your bill of fare.

#### NAVSANDA FORM 333

The BILL OF FARE FOR THE GENERAL MESS, NavSandA Form 333 (figure 13), is to be filled out and given to the supply officer by Wednesday of the week before the bill of fare is put into effect. This bill of fare is carefully checked by the SO before he signs it and turns it over to the skipper for final approval. After the CO has okayed it, no changes may be made without his further approval. The CO may give the SO permission in advance to make any desirable changes in the menu. This advance permission must be in writing.

Take a look at the reverse side of the bill of fare sample shown in figure 14. Here you'll find the STATEMENT OF ISSUES TO GENERAL MESS AND COST OF RATION DAILY. This must be filled in with the ESTIMATED quantities, unit

**BILL OF FARE FOR THE GENERAL MESS**

U. S. S. MINNEAPOLIS

Week beginning 17 December, 1945

	BREAKFAST	DINNER	SUPPER
MONDAY	Chilled Fresh Fruit Prepared Cereal Fresh Milk & Sugar Minced Beef on Toast Hash Brown Potatoes Hot Rolls Butter Coffee	Vegetable Soup Crackers Pot Roast of Beef Vegetable Gravy Washed Potatoes Baked Hubbard Squash Fresh Vegetable Salad Banana Cream Pie Bread Butter and Coffee	Grilled Salisbury Steak Onion Gravy Potatoes Au Gratin Plain Boiled Navy Beans Shrimp Salad Bread Pudding with Chocolate Sauce Bread Butter and Coffee
TUESDAY	Chilled Fresh Fruit Prepared Cereal Fresh Milk & Sugar Scrambled Eggs with Diced Bacon Cottage Fried Potatoes Apple Cake Butter & Coffee	Rice of Tomato Soup Crackers Brown Gravy Grilled Pork Chops Pot Applesauce Boiled Sweet Potatoes Buttered Carrots, Bread Butter & Coffee Cabbage & Pineapple Salad Fresh Apple Pie, Sliced Cheese	Veal Fricassee Washed Potatoes Buttered Peas Combination Salad Vegonnaise Dressing Fresh Fruit Bread Butter and Coffee
WEDNESDAY	Chilled Fresh Fruit Rolled Oats Fresh Milk & Sugar Oven Baked Beans Tomato Catsup Hot Corn Bread Butter Coffee	Puree of Navy Bean Soup Crackers, Pan Gravy Chicken Fried Steak Potatoes, Washed Creamed Cauliflower Carrot & Apple Salad Ice Cream & Sugar Cookies Bread Butter and Coffee	Beef Croquettes Tomato Sauce Hash Brown Potatoes Creamed Cabbage Fresh Vegetable Salad Cream Puffs Bread Butter & Coffee
THURSDAY	Chilled Fresh Fruit Prepared Cereal Fresh Milk & Sugar Fresh Meat Hash Medium Boiled Egg Tomato Catsup Hot Rolls Butter and Coffee	Macaroni Soup Crackers Oven Roast Beef Brown Gravy Washed Potatoes Stewed Corn Combination Salad Cherry Pie Bread Butter and Coffee	Baked Meat Loaf Brown Gravy Washed Potatoes Fried Eggplant Lettuce Salad Fresh Fruit Bread Jam and Tea
FRIDAY	Chilled Fresh Fruit Steamed Rice Fresh Milk and Sugar Fried Pork Sausage Country Gravy Hash Brown Potatoes Coffee Cake Butter & Coffee	Clam Chowder, Crackers Grilled Sea Bass Tartar Sauce Washed Potatoes Stewed Tomatoes Lettuce Salad Chocolate Weringue Pie Bread Butter and Coffee	Beef Stew with Fresh Vegetables Baked Macaroni and Cheese Carrot & Apple Salad Fresh Fruit Bread Jam Coffee
SATURDAY	Stewed Prunes Prepared Cereal Fresh Milk and Sugar Copper Baked Beans Tomato Catsup Iced Cinnamon Rolls Bread Butter and Coffee	Puree of Pea Soup Crackers, Cranberry Sauce Baked Spiced Ham Boiled Potatoes Boiled Cabbage and Carrots Cottage Cheese and Pineapple Salad Iced Marble Cake Bread Butter and Coffee	Grilled Beef Liver with Fried Bacon Brown Gravy Washed Potatoes Fried Onions Salmon Salad Iced Cup Cakes Bread Butter and Coffee
SUNDAY	Chilled Fresh Fruit Prepared Cereal Fresh Milk and Sugar Fried Eggs and Bacon Hash Brown Potatoes Hot Rolls Butter Coffee	Cream of Tomato Soup Crackers Gibley Gravy Southern Fried Chicken Boiled Sweet Potatoes Sage Dressing Buttered Asparagus Waldorf Salad Bread Butter and Coffee Ice cream, Chocolate Cake	Assorted Meats, Cold Potato Salad with Egg Dressing Sliced Cheese Beans, Lima, Boiled Combination Salad Fresh Fruit Bread Jam & Cocoa

Total estimated cost \$3114.13

Total estimated rations 7126

Estimated ration cost per day \$4.370

APPROVED:

Respectfully submitted,

*F. L. Mitchell*

*J. R. Booth*

Capt., U. S. N.,  
Commanding.

Lt. Comdr., Supply Corps, U. S. N.,  
Supply Officer.

16-11900-1

Figure 13.—Bill of fare for the general mess.



prices, and amounts of the different kinds of provisions you are going to need in order to prepare the 21 meals listed on the bill of fare. This estimate will take a bit of arithmetic.

Copies of the approved bill of fare are posted in the galley, issue room, butcher shop, bakeshop, vegetable preparation space and supply office so that everyone who has work to do in connection with preparing and serving the food can make proper plans for performing his duties well and efficiently. The arrows in figure 15 indicate the route the bill of fare takes before it is ready for use.

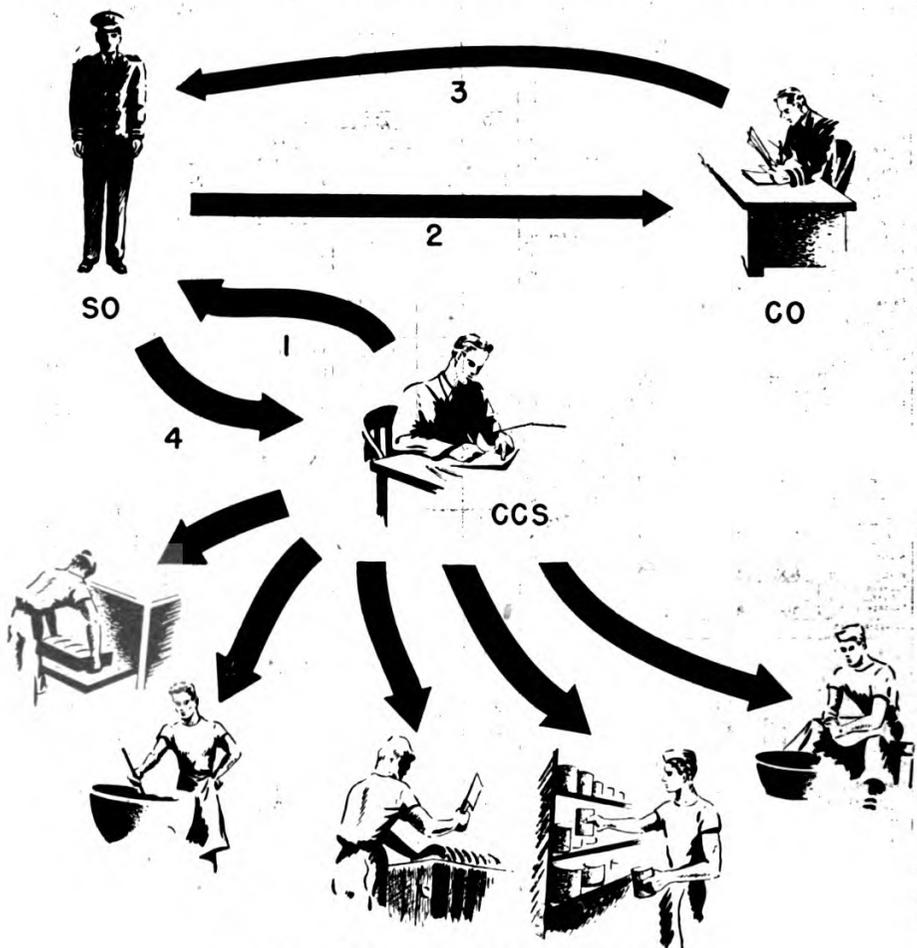


Figure 15.—Route of bill of fare.

### THE ARITHMETIC OF ESTIMATING

The recipes in your *Navy Cook Book* furnish you with a GUIDE for estimating the quantities of provisions you are going to need. Check carefully on how your estimates work out so you will be able to improve them as you gain experience.

Each *Navy Cook Book* recipe is designed to serve 100 portions. So—if you're feeding 250 men in your general mess, all you'll need to do is to multiply the quantities given in the recipes by  $\frac{250}{100}$  or 2½. If you're feeding 162, multiply the recipe quantities by  $\frac{162}{100}$  or 1.62.

When your general mess feeds between 500 and 1,000, reduce the quantity you would normally expect to use by 5 percent. Here's one way of working this out. Suppose your mess subsists 750 men.

$$\frac{750}{100} = 7\frac{1}{2} \text{ or } 7.5$$

Now multiply this by 5 percent (.05):

$$\begin{array}{r} 7.5 \\ \times .05 \\ \hline .375 \end{array}$$

Then subtract the product from the 7.5:

$$\begin{array}{r} 7.5 \\ - .375 \\ \hline 7.125 \end{array}$$

So—you'll find the quantity of each of the provisions needed to serve 100 portions and then multiply that quantity by 7.125 in order to get the amount you'll need for 750 portions. This 7.125 is sometimes called the **WORKING FACTOR**.

When your mess feeds more than 1,000 men, reduce your estimates based on 100 portions by 10 percent. Here's a sample.

Suppose your mess feeds 1,600 men. Then do this:

$$\begin{array}{l} (1) \quad \frac{1600}{100} = 16 \qquad (2) \quad \begin{array}{r} 16 \\ \times .10 \\ \hline 1.6 \end{array} \qquad (3) \quad \begin{array}{r} 16 \\ - 1.6 \\ \hline 14.4 \end{array} \end{array}$$

Notice that this is the **SAME PROCESS** as you used for 750 men. The only difference is that you reduce by 10 percent instead of 5 percent. Multiply the quantity of each of the provisions needed to prepare 100 portions by

14.4 in order to get the quantities you'll need for 1600 portions. Follow through on this. Say this is your menu for dinner—

Navy bean soup  
 Fried pork chops  
 Hominy spoonbread  
 Buttered green peas  
 Cole slaw salad  
 Vanilla ice cream  
 Bread - Butter - Coffee

What provisions are you going to need in order to serve this menu to 1,600 men? Look up the recipes for the foods in your *Navy Cook Book*. Then multiply each of the quantities given by 14.4, like this—

**NAVY BEAN SOUP—**

Navy beans	5.5 lb. $\times$ 14.4 = 79.2 lb.
Onions, dry	1 lb. $\times$ 14.4 = 14.4 lb.
Flour	5 lb. $\times$ 14.4 = 72 lb.
Pepper, black	2 teaspoons $\times$ 14.4 = 28.8 teaspoons
Suet	4 oz. $\times$ 14.4 = 57.6 oz. or 3.6 lb.

**PORK CHOPS—**

Pork chops	60 lb. $\times$ 14.4 = 864 lb.
------------	--------------------------------

**HOMINY SPOONBREAD—**

Milk, liquid	3.75 gal. $\times$ 14.4 = 54 gal.
Hominy grits	5 lb. $\times$ 14.4 = 72 lb.
Suet	.5 lb. $\times$ 14.4 = 7.2 lb.
Baking powder	3.75 oz. $\times$ 14.4 = 54 oz. or 3.38 lb.
Eggs	60 $\times$ 14.4 = 864 eggs or 72 doz.
Butter	2.75 lb. $\times$ 14.4 = 39.6 lb.

**BUTTERED GREEN PEAS—**

Green peas	20 #2 cans $\times$ 14.4 = 288 cans.
------------	--------------------------------------

**COLE SLAW SALAD—**

Cabbage	20 lb. $\times$ 14.4 = 288 lb.
Onions, dry	5 oz. $\times$ 14.4 = 72 oz. or 4.5 lb.
Peppers, green	1 lb. $\times$ 14.4 = 14.4 lb.
Suet	$\frac{1}{2}$ oz. $\times$ 14.4 = 7.2 oz. or about .5 lb.

**“BOILED” SALAD DRESSING—**

Milk, liquid	1 gal. $\times$ 14.4 = 14.4 gal.
Flour	5 lb. $\times$ 14.4 = 72 lb.
Sugar	12 oz. $\times$ 14.4 = 172.8 oz. or 12.7 lb.
Mustard, dry	1.5 oz. $\times$ 14.4 = 21.6 oz. or 1.35 lb.
Suet	2 oz. $\times$ 14.4 = 28.8 oz. or 1.8 lb.
Eggs	15 $\times$ 14.4 = 216 or 18 doz.
Butter	4 oz. $\times$ 14.4 = 57.6 oz. or 3.6 lb.
Vinegar	1 qt. $\times$ 14.4 = 14.4 qts. or 3.6 gal.

**VANILLA ICE CREAM—**

Ice cream mix, dry 9 lb.  $\times$  14.4 = 129.6 lb.

**BREAD—**

24 lb.  $\times$  14.4 = 345.6 lb.

If your bakers are baking the bread, you'll have to make an estimate of the ingredients needed rather than of the pounds of bread needed. Get your senior baker to make this estimate, if possible.

**BUTTER—**

The Navy ration (see page 25) furnishes you with a guide for estimating the amount of butter you'll need for ONE DAY. This guide indicates that 1.6 oz. per man per day is needed.

1600  $\times$  1.6 = 2,560 oz. or 160 lb.

The spoonbread and salad dressing will use up about 44 pounds of this total.

**COFFEE—**

3 lb.  $\times$  14.4 = 43.2 lb.

**SUGAR FOR COFFEE—**

4 lb.  $\times$  14.4 = 57.6 lb.

**EVAPORATED MILK FOR COFFEE—**

3 #1 tall cans  $\times$  14.4 = 43 cans.

Naturally, you're not going to order 14.4 pounds of onions or 3.6 pounds of suet. You'll have to use some judgment in rounding off these figures. Here's a good rule to follow—

If the decimal is .5 or over, add one whole unit; if it is less than .5, forget about it. So the 14.4 becomes 14 and

the 3.6 is considered to be 4. BUT don't do this rounding off until AFTER you've done your multiplying.

Now—what about the 28.8 teaspoons of black pepper? You'll find a helpful table on pages 307 to 311 of your *Navy Cook Book*. This table indicates that  $3\frac{1}{2}$  tablespoons of pepper is equal to about 1 ounce. As there are 3 teaspoons in a tablespoon, divide the 28.8 teaspoons by 3 and you'll get 9.6 tablespoons. Then as  $3\frac{1}{2}$  tablespoons are equal to 1 ounce, divide the 9.6 by  $3\frac{1}{2}$ . To do this change the  $\frac{1}{2}$  to a decimal ( $\frac{1}{2} = .5$ ). Now divide—

$$\begin{array}{r} 2.7 \\ 3.5 \overline{)9.6} \\ \underline{70} \\ 260 \\ \underline{245} \\ 15 \end{array}$$

You'll need about 3 ounces of pepper. As there are 16 ounces in a pound, 3 ounces is equal to  $\frac{3}{16}$  pounds.

When you have thus estimated what you need for every meal, you must get the figures together so as to know what you need for the whole week.

### GETTING THE FIGURES TOGETHER

A WORKSHEET will be a great help to you. This worksheet doesn't need to be at all complicated. Figure 16 gives you a sample of part of one. Notice that a column is provided for each of the 21 meals covered by your bill of fare. The provisions listed along the left-hand side are the same ones you find on the reverse side of Form 333. The order of listing is also the same. The complete worksheet should contain all the provisions listed on the 333. You'll need to use several worksheet pages in order to get a complete listing. If you have your worksheet pages mimeographed, that won't be much of a problem.

Now—how do you use this worksheet? First of all—insert in the proper columns of the worksheet the quantities of the various provisions you figured you would need for each meal. ADD ACROSS to get the total quantity of each item you need for the week. Write in these totals in the total column. Look at figure 16 again. Notice that the 210 in the total column is found by adding the six figures found on the CRACKER line.

Your next job is to transfer these totals to the 333. Look again at the sample 333 given on page 32. This is just a copy job. Then get the unit prices for each of the provisions to be used from the provision ledger. Insert these prices in the UNIT PRICE column. Notice that these prices are carried out to four decimal places if necessary,

	MON			TUE			WED			THU			FRI			SAT			SUN			Total	
	B R E A K F A S T	D I N N E R	S U P P E R																				
BISCUIT																							
CRACKERS			70							70			70										210
TOTAL																							
GRAHAM BREAD																							
RYE BREAD																							
WHEAT BREAD																							
TOTAL																							
BUCKWHEAT FLOUR																							
CORN MEAL																							
GRAHAM FLOUR																							
WHEAT FLOUR	200	200	200	200	200	200	200	300	300	400	200	200	200	200	200	200	200	200	200	200	200	4,000	
TOTAL																							
BACON, CANNED																							
BEEF, DRIED																							
BEEF, CORNED									100														100
CODFISH, HADDOCK																							
HEADCHEESE																						50	50
LUNCH, MEAT																						200	200
SALMON																	100						100
SARDINES																							

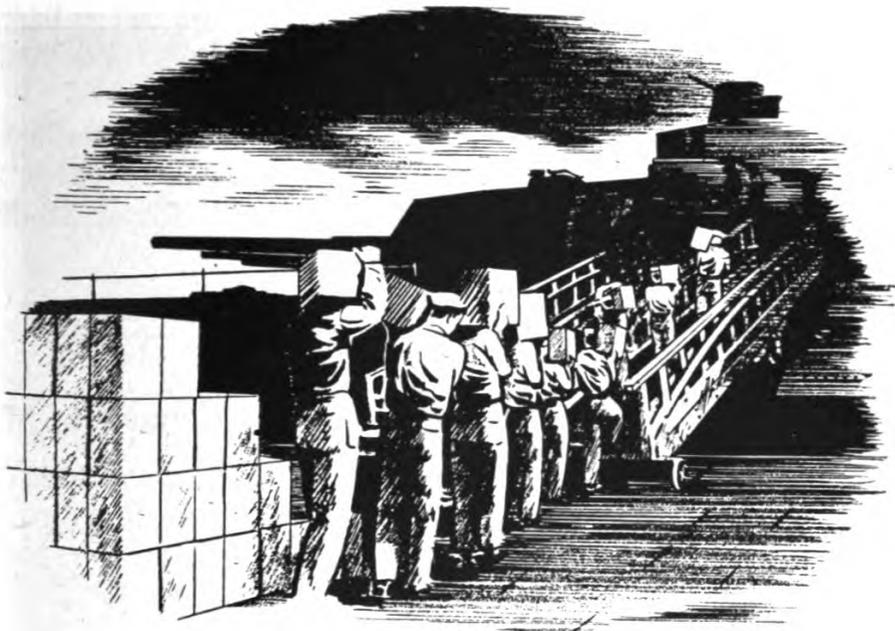
Figure 16. Worksheet for CCS.

as in the case of celery. (Where four decimal places are not shown, the missing numbers are zeroes.)

Now—multiply each quantity by the unit price in order to get the ESTIMATED cost. Insert this figure in the AMOUNT column. Then get the totals of the quantity and amount columns wherever the form calls for them. Add these totals together to get the ESTIMATED total cost. This

total is entered on the other side of the form (see the bottom of figure 13). Divide this estimated total cost by the estimated daily rations to get the ESTIMATED COST OF RATION PER DAY. Insert these figures on the appropriate lines in the lower right-hand part of the 333 (figure 14.)

You've now seen that NavSandA Form 333 is used both for your bill of fare and for showing quantities and costs of provisions that will be needed to fulfill this bill of fare. Form 333 has a third use which is described on pages 97 to 98.



## CHAPTER 5

# GETTING THE PROVISIONS YOU NEED

## YOUR JOB

The supply officer is **RESPONSIBLE** for getting the proper provisions aboard. But many times he has to depend on his Senior Cook or CCS for suggestions and advice as to what should be ordered. And **YOU** may be that CCS or Senior Cook.

Sometimes there isn't a regular supply officer aboard. In that case the commanding officer appoints a line officer to perform the duties of the supply officer. This line officer will certainly need your help. In some cases you may have to take over the entire job of getting provisions.

What does it involve? **THREE** things only. **WHAT** provisions are you going to order? **WHERE** are you going to get these provisions? **HOW** are you going to order them?

## WHAT AND HOW MUCH

What you order depends on a number of things—what's available, costs, storage space you have, and how long your ship is going to be away from a source of supplies.

The normal use table, given in Chapter 1, Part D, Vol. 4 of the BuSandA Manual, will help you to figure out

what and how much you ought to order. This list is based on what is needed by 1,000 men for 30 days. So you'll need to do a bit of figuring.

If the complement of your ship is 500 (include officers in your count since you'll have to allow for sales to messes) and you're told to get provisions for a 30-day cruise, all you'll need do is to take

$$\frac{500}{1,000} \quad \text{or} \quad \frac{1}{2}$$

of each of the items listed. If your complement is 575, you'll need

$$\frac{575}{1,000} \quad \text{or} \quad .575$$

of the amounts given on the list.

And if you need to procure provisions for a complement of 1,000 to last for 45 days, take the amounts given on the list and multiply by  $\frac{45}{30}$  or  $1\frac{1}{2}$  to get an estimate of what you need.

But suppose your complement is 250 and you are ordered to get enough provisions to last for 75 days. Consider the complement first—

$$250 \text{ is } \frac{250}{1,000} \text{ or } \frac{1}{4} \text{ of } 1,000.$$

Then look at the number of days:

$$75 \text{ is } \frac{75}{30} \text{ or } 2\frac{1}{2} \text{ times } 30.$$

Now multiply the  $\frac{1}{4}$  and the  $2\frac{1}{2}$ , like this:

$$\frac{1}{4} \times 2\frac{1}{2} =$$

$$\frac{1}{4} \times \frac{5}{2} = \frac{5}{8}$$

So—take  $\frac{5}{8}$  of each of the quantities given on your standard loading list. Here's an example—

Your normal requirements table indicates that 33,800 pounds of white potatoes are needed for 1,000 men for 30 days. Take  $\frac{5}{8}$  of this amount to get what you'll need for 250 men for 75 days—this way—

$$\frac{5}{8} \times 33,800 = \frac{169,000}{8} = 21,125 \text{ lb.}$$

You'll need to order about 211 crates of potatoes—each crate weighing 100 pounds.

Follow through one more problem. Your complement is 430 and you need to take aboard enough provisions to last for 90 days. Here's the solution—

$$\frac{430}{1000} \times \frac{3}{30} = \frac{43}{100} \times 3 = \frac{129}{100} \text{ or } 1.29$$

Therefore, multiply the quantities given for each of the types of provisions by 1.29.

You may not be able to get all the provisions given in the normal requirements table. Or—for one reason or another—you may not wish to get some of the items suggested. Make substitutes that will furnish pretty much the same food values as those furnished by the items left out. You may want a wider assortment of vegetables. This will mean that you may have to cut down on some of the vegetables listed to make room for the additional varieties. Whatever you do, be sure that you get enough white potatoes to make up at least 40 percent of the total weight of fresh vegetables. And—if you're taking some bread aboard, you can cut down on the amount of flour you need—.65 of a pound for every loaf.

### WHAT'S AVAILABLE

Most Navy supply activities ashore have the following provisions available—

Baking powder	Milk, evaporated
Baking soda	Mustard
Biscuits, canned	Oils, sauces and vinegar
Cocoa, coffee	Pepper
Cornstarch	Pickles
Flavors	Rice
Flour, wheat	Salt
Fruits, dried and preserved	Syrup
Fruit juices, canned	Spices
Lard substitutes	Sugar
Lemon juice, powdered	Tea
Macaroni	Vegetables, canned and dried
Meats, preserved	Vegetable juices, canned

Many Navy supply activities make up lists of other provisions they have available from time to time. Get one of these lists if you can before you make out your order. Thoughtful use of such a list will enable you to procure articles which will vary your menus and provide new ideas.

Contracts are made by supply officers ashore with dealers for the following provisions—

Bread	Gelatin
Butter	Ice cream
Cakes	Meats, fresh, frozen, salt, smoked
Cereals	Milk
Cheese	Nuts
Clams	Olives
Cornmeal	Oysters
Crackers	Poultry, fresh or frozen
Eggs	Spices and seasoning
Fish	Sugar, powdered
Flour, buckwheat and graham	Vegetables
Fruits, canned, dried, and fresh	Yeast

Contract bulletins issued by these supply officers will tell you who these dealers are and where you will be able to find them.

It may be necessary to call on several dealers before you can get what you want. Use some common sense in your ordering. Don't expect to be able to get fresh strawberries or fresh eggs in ALL ports at any time during the year.

### SEASON OF THE YEAR

The season of the year will make a difference in what fresh fruits and vegetables you order. Out-of-season fresh products are not usually of good quality. Furthermore, they cost too much. The following table shows you the months when the most common fruits and vegetables are the most plentiful on the market. The "suggested period for requisitions" column in this table indicates the months during which requisitions to Navy supply activities are most likely to be filled—

COMMODITY	NORMAL RANGE OF MARKETING SEASON	SUGGESTED PERIOD FOR REQUISITIONS
<b>Fruits:</b>		
Apples, late .....	Sept.—June	Sept.—June
early .....	June—Aug.	July—Aug.
Apricots .....	May—Aug.	June—July
Avocados .....	All year	Mar.—Nov.
Bananas .....	All year	All year
Cherries .....	May—July	June—July
Cranberries .....	Sept.—Jan.	Oct.—Dec.
Grapefruit .....	All year	Oct.—June
Grapes, California ...	June—Jan.	Aug.—Nov.
Grapes, American type	July—Oct.	Aug.—Oct.
Lemons .....	All year	All year
Limes .....	All year	May—Nov.
<b>Melons:</b>		
Cantaloupes and		
Honeyballs .....	May—Sept.	June—Sept.
Casabas and		
Persians .....	July—Nov.	Aug.—Oct.
Honeydews .....	June—Dec.	June—Oct.
Watermelons .....	May—Oct.	June—Sept.
Oranges .....	All year	All year
Peaches .....	June—Oct.	July—Sept.
Pears .....	July—April	July—Mar.
Plums .....	June—Sept.	July—Sept.
Prunes .....	Aug.—Oct.	Aug.—Sept.
<b>Vegetables:</b>		
Asparagus .....	Feb.—July	April—June
Beans, Lima .....	All year	June—Oct.
Beans, snap .....	All year	All year
Beets .....	All year	All year
Broccoli .....	All year	Sept.—May
Cabbage, late Danish	Sept.—Mar.	Oct.—Feb.
other .....	All year	All year
Carrots .....	All year	All year
Cauliflower .....	All year	Sept.—June

COMMODITY	NORMAL RANGE OF MARKETING SEASON	SUGGESTED PERIOD FOR REQUISITIONS
Celery . . . . .	All year	All year
Corn, green . . . . .	May–Oct.	June–Sept.
Cucumbers . . . . .	All year	May–Oct.
Eggplant . . . . .	All year	May–Oct.
Garlic . . . . .	All year	July–April
Lettuce, iceberg . . . . .	All year	All year
Onions, late . . . . .	Aug.–May	Aug.–April
early . . . . .	April–July	April–July
Parsley . . . . .	All year	All year
Parsnips . . . . .	Aug.–May	Sept.–Mar.
other . . . . .	June–July	None
Peas, green . . . . .	All year	Feb.–Oct.
Peppers, sweet . . . . .	All year	All year
Potatoes, late . . . . .	Sept.–June	Sept.–June
intermediate . . . . .	June–Oct.	July–Sept.
early . . . . .	Jan.–July	April–July
Radishes . . . . .	All year	All year
Rutabagas . . . . .	All year	Sept.–April
Spinach . . . . .	All year	Oct.–June
Squash, winter variety	Aug.–Mar.	Oct.–Jan.
summer variety . . . . .	All year	April–Sept.
Sweet potatoes, cured	Nov.–June	Nov.–April
uncured . . . . .	July–Oct.	Aug.–Oct.
Tomatoes . . . . .	All year	All year
Turnips, late . . . . .	Sept.–April	Sept.–April
other . . . . .	May–Aug.	None

### WHAT'S THE COST

What you order is also limited by the cost only if your ship is operating on MONEY RATION. If you're on the RATION IN KIND system, there's no limit except common sense. The following table shows you the amounts allowed per day per man in messes of different sizes.

In addition to the amounts given in the table, submarines are allowed 10 cents extra per day per man. Also,

a newly commissioned ship may use an additional 5 cents per day per man for 30 days from the time the general mess is opened.

Now, notice how this works out. Suppose you are on a DD that has 250 men usually eating in the general mess. If your ship is operating in the South Pacific (or any other place outside the continental limits of the United States), you are allowed 76 cents per man per day for

Average number subsisted daily	Continental United States	Outside Continental United States	Average number subsisted daily	Continental United States	Outside Continental United States
	Cents	Cents		Cents	Cents
25 & under	89	94	151-200	75	80
26-50	87	92	201-350	71	76
51-75	85	90	351-500	67	72
76-100	83	88	501-1000	63	68
101-125	81	86	1001 & over	60	65
126-150	79	84			

provisions. This does NOT include any provisions that are surveyed. That means you are allowed

$$250 \times .76 \text{ or } \$190.00$$

per day for provisions. If your ship is to be operating away from a source of supply for 30 days you should take about

$$30 \times \$190. \text{ or } \$5,700$$

worth of provisions aboard.

### STORAGE SPACE AVAILABLE

What and how much you order depends not only on the total amount of storage space available but on the KINDS of storage space you have. The amount of FROZEN meats, vegetables, and fruits you take aboard is strictly limited by the amount of FREEZING (10° F. to 20° F.) STORAGE space you have. If you can't keep these products FROZEN SOLIDLY, they will become unfit for use in a short time.

Fresh shell eggs won't keep very long unless you store them at a temperature of 30° to 32° F. Most fresh fruits and vegetables must be stored at a temperature around 45° F. if they are to last. If you have to use deck lockers and other places where the temperature can't be controlled, you'll have to depend a great deal on such things as potatoes and root vegetables. If you don't have a great deal of storage space and if you're going to be away from a source of fresh provisions for a long time, you'll have to stock up on dehydrated and canned products. Dehydrated provisions take up only about  $\frac{1}{6}$  as much space as the fresh products. They also keep well for a long time (6 to 9 months) in a COOL temperature. Refrigeration is not necessary.

### THE ARITHMETIC OF STORAGE SPACES

You'll have to use a little arithmetic in order to find the actual capacity of any storage space. The capacity of a compartment shaped like figure 17 is found by multiplying the length by the width by the height—

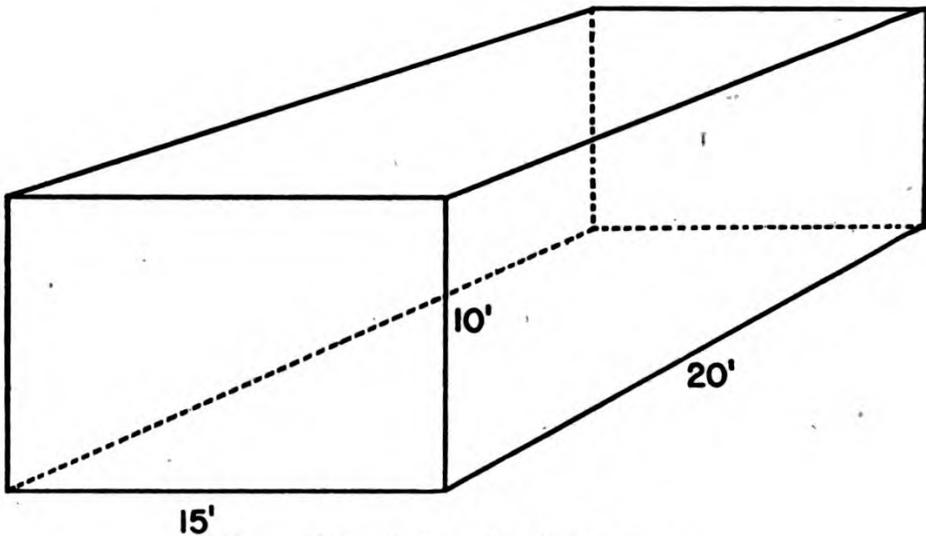


Figure 17.—Rectangular storage space.

$$20 \times 15 \times 10 = 3,000 \text{ cubic feet.}$$

Unfortunately, the dimensions aren't usually in even feet. Suppose you had a storage space 20 feet 8 inches long, 15 feet 9 inches wide, and 10 feet 9 inches high. Change the inches to fractions of a foot. Eight inches is  $\frac{8}{12}$  or  $\frac{2}{3}$  of a foot and 9 inches is  $\frac{9}{12}$  or  $\frac{3}{4}$  of a foot.

So here's your problem:

$$20\frac{2}{3} \times 15\frac{3}{4} \times 10\frac{3}{4} =$$

Now change your mixed numbers to improper fractions and cancel as much as possible—

$$\frac{\overset{31}{\cancel{62}}}{\underset{1}{3}} \times \frac{\overset{21}{\cancel{63}}}{\underset{2}{4}} \times \frac{43}{4} =$$

Next—multiply the numerators together and then do the same with the denominators. This will give you:

$$\frac{27,993}{8} \text{ or } 3,499\frac{1}{8} \text{ cubic feet.}$$

Many times there are interferences such as coils, pipes,

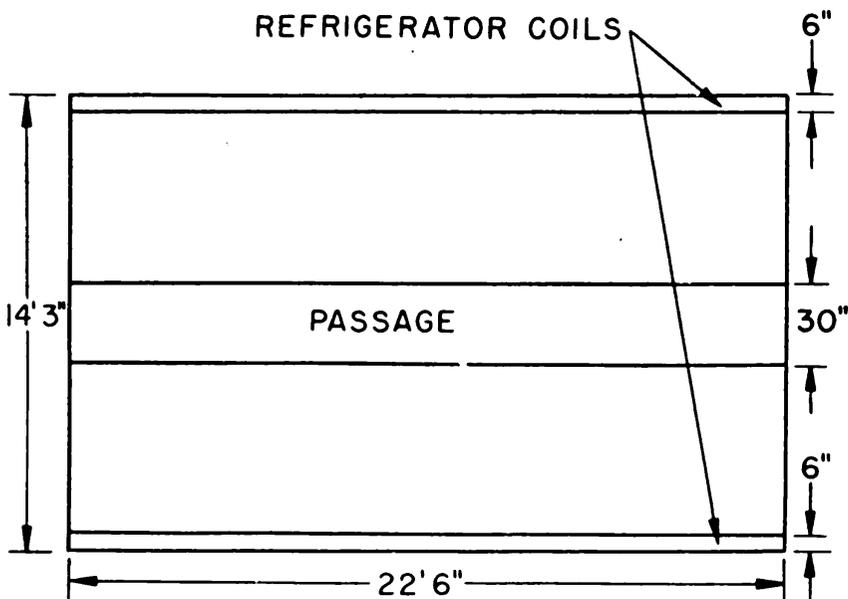


Figure 18.—Deck view.

lights, and passageways that prevent you from using all the storage space. And you can't pack the provisions in from deck to overhead and from bulkhead to bulkhead, because you'll need to leave room for ventilation and for getting at the provisions.

Take a look at this problem. Suppose you had a storage space 22 feet 6 inches long, 14 feet 3 inches wide, and 9 feet 9 inches high. There are coils extending out 6 inches from the bulkhead along both the long sides of the com-

partment. Also—a 30-inch passageway down the center of the space must be provided.

Figure 18 shows you a deck view of this space. Notice the allowances that will have to be made for the coils and the passageway. Dunnage 8 inches high is to be placed on the deck, and lights extend down 7 inches from the overhead, as shown in the side view of the space (figure 19).

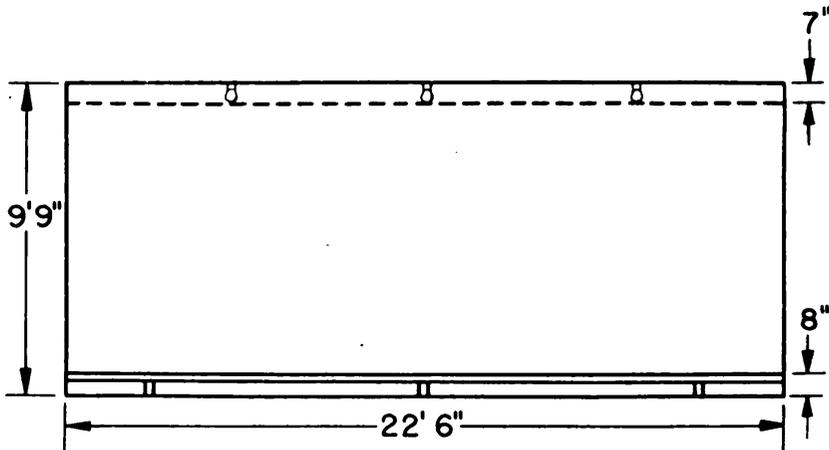


Figure 19.—Sideview.

Here's the way to find the usable cubical contents of this storage place. First—write down the dimensions of the space. Then subtract the dimensions of the allowances you'll need to leave—like this:

Length	Width	Height
$22'6''$	$14'3''$	$9'9''$
	— $\left\{ \begin{array}{l} 2'6'' \\ 6'' \\ 6'' \end{array} \right.$	— $\left\{ \begin{array}{l} 7'' \\ 8'' \end{array} \right.$
$22'6''$	$10'9''$	$8'6''$

Using these new dimensions, proceed as before:

$$22\frac{1}{2} \times 10\frac{3}{4} \times 8\frac{1}{2} =$$

$$\frac{45}{2} \times \frac{43}{4} \times \frac{17}{2} = \frac{32,895}{16} \text{ or } 2,055 \frac{15}{16} \text{ cu. ft.}$$

Now to find the cubic contents of a storage space shaped like figure 20. Notice that the ends are in the

shape of a triangle. In this case, multiply the length by

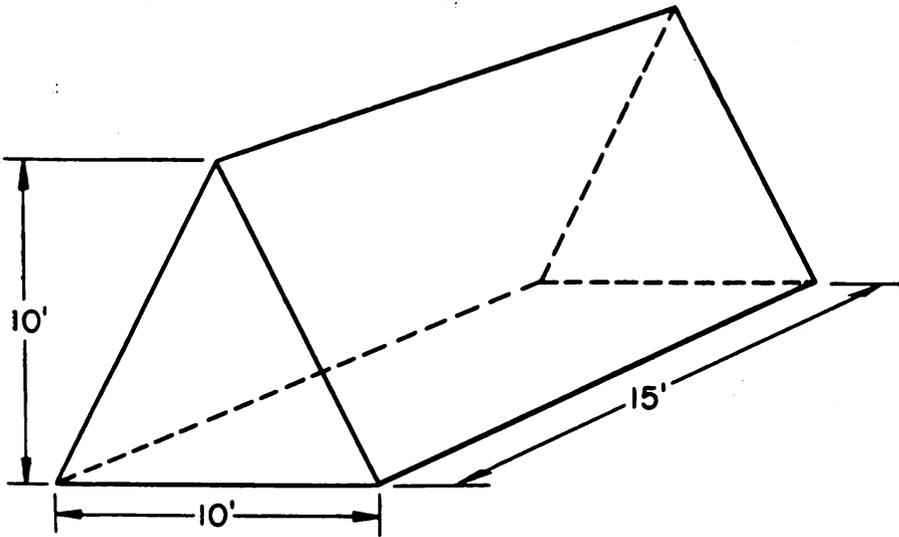


Figure 20.—Triangular storage space.

the width by the height and divide this answer by 2:

$$\frac{15 \times 10 \times 10}{2} = \frac{1,500}{2} = 750 \text{ cubic feet.}$$

And sometimes you'll have a storage space shaped like figure 21.

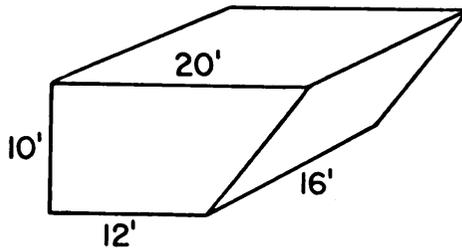


Figure 21.—Trapezoidal storage space.

Here you'll have to get the average width by adding the 2 widths together and dividing by 2. Look:

$$\frac{12 + 20}{2} = \frac{32}{2} = 16 \text{ feet.}$$

Then complete your work by multiplying this average width by the length and by the height—like this:

$$16 \times 12 \times 10 = 1,920 \text{ cubic feet}$$

Now try a few of the storage space problems given on page 183. Check your answers with the answer given. Be satisfied only when you can figure the cubic content of any storage space accurately.

## LOADING FROZEN MEAT LOCKERS

Here's another problem you may have to solve. Suppose you were ordered to load your frozen meat lockers to capacity. You have already determined that your lockers will hold 985 cubic feet of frozen meats. Your table of normal requirements for 1,000 men for 30 days gives you this information—

ITEM	Normal requirements (pounds net)	Container No.	Type	Gross weight (pounds)	Cubic contents (feet)
<b>Meat, fish or poultry</b>					
<b>Fresh, frozen:</b>					
Beef, boneless	9,600	192	50-lb. box	10,944	213.1
Fish, fillets	900	12	Package of 5		
			15-lb. flats	1,068	34.0
Liver, beef	500	10	50-lb. box	570	11.1
Pork	2,600	52	50-lb. box	2,964	57.7
Poultry, dressed					
undrawn	2,700	50	54-lb. box	3,100	104.0
Sausage, pork	1,200	24	50-lb. box	1,416	52.3
Veal and/or lamb	2,600	52	Side or		
			carcass	2,652	104.0
<b>Total</b>	<b>20,100</b>			<b>22,714</b>	<b>576.2</b>

Notice that the total space required for all the frozen meats is 576.2 cubic feet. Now divide the total space you have available by the 576.2 cubic feet:

$$\begin{array}{r}
 1.70 \\
 576.2 \overline{) 985.0} \\
 \underline{5762} \\
 40880 \\
 \underline{40334} \\
 5460
 \end{array}$$

Your space for frozen meats will hold 1.7 times as much as the amounts suggested in your table of normal requirements. Now all you need do is to multiply the 1.7 by the number of pounds given for each of the kinds of frozen meats listed and you will have a good estimate of the quantities you should order.

Here's the way it works out—

Beef, boneless . . . . .	9,600 lb.	× 1.7 =	16,320 lb.
Fish, fillets . . . . .	900 lb.	× 1.7 =	1,530 lb.
Liver, beef . . . . .	500 lb.	× 1.7 =	850 lb.
Pork . . . . .	2,600 lb.	× 1.7 =	4,420 lb.
Poultry . . . . .	2,700 lb.	× 1.7 =	4,590 lb.
Sausage, pork . . . . .	1,200 lb.	× 1.7 =	2,040 lb.
Veal and/or lamb . . . . .	2,600 lb.	× 1.7 =	4,420 lb.
			<u>34,170 lb.</u>

These figures will have to be rounded off to fit the type of container used. Beef, boneless, comes in boxes weighing 50 lb. each on the average. So, order 16,300 pounds instead of 16,320.

### ORDERING FOR A LONG CRUISE

If you're going on a long cruise, you may have to take aboard more than the normal requirements of canned meats, canned fruits and vegetables, and dehydrated provisions. Put yourself in this situation. Your ship's complement is 350. Your storage facilities for handling fresh frozen meats are sufficient only for a 30 days supply. You can store only the normal requirements of smoked meats. And yet—you are ordered to take enough provisions aboard to last for 60 days. That means you will have to bring aboard enough canned meats to take up the slack. But how much is this?

Obviously, canned meat will have to be substituted for fresh frozen meat for 30 days of the cruise. So first of all, determine how much fresh frozen meat is needed for 30 days—

$$\frac{35\cancel{0}}{100\cancel{0}} \times \frac{1\cancel{0}}{\cancel{30}} =$$

$$\frac{35}{100} \times 1 = .35$$

Multiply this .35 by 20,100 lb., the amount of fresh frozen meat called for in the normal use table.

$$20,100 \times .35 = 7035 \text{ lb.}$$

Now the Navy ration (page 24) indicates that 12 ounces of canned meat constitutes 1 meat ration whereas it takes

15 ounces of fresh boneless meat to make up 1 ration. So you'll need to order only

$\frac{12}{15}$  or  $\frac{4}{5}$  as much canned meat as fresh frozen boneless meat. Here's the final step

in the problem:

$$\frac{4}{5} \times 7,035 = 5,628$$

You'll need to order 5,628 EXTRA pounds of canned meat.

### WHERE FROM

The easiest and best way to get your provisions is from your BASE or your TENDER. But sometimes this is impossible.

The next best way to get provisions is through a DISTRICT SERVICE ORGANIZATION. Most of the Naval districts have set up these organizations in various parts within their districts. The addresses and telephone numbers of the district service organizations are given in Volume 4 of the *BuSandA Manual*. Those on duty in the organization will take your provision order and see that you get the required items. If necessary they will place orders with contract dealers. The organization people will also help supervise the deliveries and assist with the paper work involved. They're a big help. Make use of them whenever you can.

But—maybe you're away from your base or tender and no district service organization is available. What then? In this case, order your provisions, if possible, directly from a Navy yard, station, or depot.

All activities issuing supplies to ships have a SHIPS' SERVICE SECTION (not Ship's Service Store). This section is a part of the outgoing stores group of the supply department. The ships' service section personnel will do several things to help you get provisions. In the first place, they'll get in touch with you as soon as your ship gets into port. You won't have to call them. All your requisitions for provisions will then be collected. It's a good idea to have these requisitions ready before you hit port. The provisions will then be assembled and delivered to the ship. If some of the provisions you ordered are not available, the ships' service section will suggest substi-

tutes or alternate provisions. Yard equipment and labor will be used for delivering the provisions to the ship.

Maybe the nearest and best source of provisions is a SUPPLY SHIP (not your own tender). Then get your provisions from it.

**REQUISITION AND INVOICE**

NAV. S. and A. Form 48  
Revised June 1944

(IMPORTANT.—Vessel shall include only items in one stock class on this form)

Requisition No. 146-45

Invoice No. 3A17

To: Supply Officer, <b>MOB Norfolk, Virginia</b>	U. S. S. <b>(4389) MINNEAPOLIS CA 36</b>
The following articles, which are not in excess, are required.	Date <b>4 Dec 1945</b>
Deliver to <b>U.S.S. MINNEAPOLIS</b>	Bureau <b>BuSanda</b>
By <b>30 December 1945</b>	Appropriation chargeable <b>17X0806 (NSP)</b>
Package to be marked <b>SUPPLY OFFICER, U.S.S. MINNEAPOLIS</b>	Title <b>P. P. X. Y. or V -178</b>
	Account
	Date of shipment
	Bill of Lading No.
	Shipped via

Remarks:

*J. R. Smith* **Lt. Comdr. (SC)** U. S. N.  
(Supply Officer or Commanding Officer or Store Officer)

Item No.	Standard Stock Catalog No. or Class No.	Description of Article CLASS.....	Unit of Quantity	Quantity Required	Quantity Furnished	Unit Price	EXTENSION
	<b>Class 26</b>						
1	B-8350	BEANS, navy	Lbs.	6,000			
2	B-9740	BEEP, corned, canned	Lbs.	3,000			
3	C-14110	CORN, canned	Lbs.	8,400			
4	C-17075	CRACKERS, soda	Lbs.	1,500			
5	J-1130	JAMS, assorted	Lbs.	5,600			
6	P-1750	PEAS, canned	Lbs.	8,800			
7	T-9740	TOMATOES, canned	Lbs.	8,200			

**TOTAL**

Checked by	Packed by	Posted and priced	Received the above mentioned articles Date .....
Rechecked	Extended	Verified	
Issued by			
			By ..... U. S. N.

U. S. GOVERNMENT PRINTING OFFICE: 1944 O-34346-2

Figure 22.—Requisition and Invoice.

Sometimes you'll need to get at least some of your provisions directly from contract dealers. Contracts are made with provision dealers by supply officers ashore. Informa-

tion about these contracts is published in a CONTRACT BULLETIN. If your ship doesn't have such a bulletin aboard, get one from the nearest supply office.

Finally, if there is no other way, you can get provisions from ANY dealer in provisions, providing you get an OK from your commanding officer.

### THE "HOW" OF GETTING PROVISIONS

#### RECEIPT/EXPENDITURE INVOICE

Nav. S. and A. Form 187  
Revised July 1944

INVOICE NO. 56-45

FROM	SO USS WISCONSIN (3064)	DATE	12/26/45	RECORD NO.	
TO	SO USS MINNEAPOLIS (4389)	TITLE FROM WHICH EXPENDED	11-V-178		
AUTHORITY	BuSanda Manual, Article 1308-5	TITLE AND ACCOUNT TO WHICH EXPENDED	11-V-178		
DELIVERY DESIRED BY	1 January 1946	APPROPRIATION CHARGEABLE			
DELIVER TO	Pier 19	BILL OF LADING NO.			
PACKAGES TO BE MARKED	Supply Officer USS MINNEAPOLIS	DATE OF SHIPMENT	28 December 1945		
		SHIPPED VIA			

ITEM NO.	STANDARD STOCK CATALOG NO. OR CLASS NO.	DESCRIPTION OF ARTICLE	QUANTITY DELIVERED	UNIT OF QUANTITY	UNIT PRICE	EXTENSION
	<u>C12as 56</u>					
1	A-9360	ASPARAGUS, canned	1,920	lbs.	.10	192 00
2	B-7650	BEANS, kidney	2,000	lbs.	.04	80 00
3	B-8350	BEANS, navy	2,500	lbs.	.038	95 00
4	C-3530	CARROTS, canned	990	lbs.	.03	29 70
5	C-14110	CORN, canned	4,200	lbs.	.085	357 00
6	F-4400	FLOUR, wheat	46,158	lbs.	.029	1,338 58
7	M-4720	MILK, evaporated	16,800	lbs.	.055	924 00
<b>TOTAL.</b>						<b>3,016.28</b>

CHECKED BY	PACKED BY	POSTED AND PRICED	Received the above-mentioned articles accompanied by priced invoices. DATE 28 December 1945
RECHECKED BY	EXTENDED	VERIFIED	
ISSUED BY			<i>J. R. Booth</i> J. R. BOOTH, Lt. Comdr. (SC),

☆ U. S. GOVERNMENT PRINTING OFFICE : 1944 10-00727-2

Figure 23.—Receipt/Expenditure Invoice.

You'll want to know HOW to go about getting provisions in different situations. In most cases a REQUISITION AND INVOICE (BuSandA Form No. 43) is filled out and sent to the source of the provisions. Figure 22 shows how this form is filled out.

This requisition is used when you order provisions from a tender, base, Navy yard, station, supply depot, or supply ship. It is also used when getting provisions through a district service organization unless they are to be procured from dealers.

The Naval activity supplying the provisions makes out a RECEIPT EXPENDITURE INVOICE (NavSandA Form No. 127) showing how much your ship is being charged for the provisions supplied. Figure 23 shows you how this form is filled out.

If contract dealers are involved at all, the ORDER AND INSPECTION REPORT (NavSandA Form No. 48) is used. See figure 24.

When it's necessary to make purchases from dealers with whom no contracts have been made, a different procedure is used. If the purchase is for less than \$500, the MANNER COMMON AMONG BUSINESS MEN (MCABM) method is used. This way of buying is authorized by law ONLY when the purchase is for less than \$500. MCABM purchases may be made without advertisement and without written bids or awards. Here's what you do—

Get in touch with as many dealers as you can in order to determine where you can get the lowest prices and the best quality. You may do this by telephone, by calling on the dealers personally, or by writing them. Personal contact is usually the best method.

When you've decided where you are going to place your order, use the ORDER AND INSPECTION REPORT (NavSandA Form No. 48). Turn back to figure 24 for a sample. Get your SO's approval, of course. These purchases may be paid for at the time of delivery out of the SO's spot cash purchase fund. If this is done, be sure you get a RECEIPT from the dealer.

If you need to buy over \$500 worth of provisions from a dealer, there must be a contract between the dealer and the Federal Government. If there is no contract, one will have to be made out by a supply officer and signed properly.



fresh in appearance, smooth, well-shaped, and of good color. The diameters are between  $1\frac{1}{2}$  and 3 inches and they are at least 3 inches long.

Copies of these specifications should be aboard ship. Order according to the specifications when you order from dealers.





## CHAPTER 6

# INSPECTION AND STOWAGE OF PROVISIONS

## INSPECTIONS

Matériel inspections—personnel inspections—locker inspections—all of these are enough to make you a little tired of inspections. But here are two more in which you will be interested, and you'll admit their importance even if you do grouse about all the inspecting that goes on.

Provisions are given a **QUALITY** and a **QUANTITY** inspection when they are delivered to a Navy ship or activity. The **MEDICAL DEPARTMENT** is responsible for the quality inspection. This check-up is complete when the inspector is sure that no provisions come aboard which might be harmful to the health of the crew. The inspector from the medical department isn't interested in whether or not the potatoes meet the specifications as to size and type or whether any of the other provisions fulfill the terms of the contract under which they were purchased. He gives his OK if the provisions are not a health menace.

The **SUPPLY DEPARTMENT** makes the quantity inspection. As a member of this department **YOU** may be asked to help with this job. You'll probably supervise the loading of the provisions at the same time. Organize your working

party so that the items delivered can be checked with the invoice that accompanies the delivery. This checking should be done **BEFORE** the provisions are brought aboard.

You must be interested in more than quantity alone. You must also be sure that the provisions delivered to your ship meet the specifications laid down for them. When the provisions come from another naval activity you can be fairly sure that the specifications have been met. But be doubly careful if the provisions are coming directly from a dealer.

Federal specifications are set up to cover most of the items of provisions used by the Navy. These specifications give sizes, grades, appearances, and types of acceptable products. Here's part of a sample spec for potatoes—

E-3. No. 1 Grade.—Shall consist of potatoes of one variety or similar varietal characteristics which are fairly well shaped, free from freezing injury, black-heart, blight, and soft rot or wet break-down, and from damage caused by dirt or other foreign matter, sunburn, second growth, growth cracks, air cracks, hollow heart, internal discoloration, cuts, shriveling, sprouting, scab, dry rot, rhizoctonia, other disease, wireworm, other insects, or mechanical or other means. Not more than 6 percent by weight of the potatoes may fail to meet the prescribed requirements (except size, damage by hollow heart and internal discoloration) but not more than one-sixth of this tolerance, or 1 percent of the total potatoes shall be allowed for potatoes affected by soft rot or wet breakdown. In addition to tolerance otherwise prescribed herein, not more than 5 percent by weight may be damaged by hollow heart and internal discoloration.

You'll find copies of the specs in the supply office. Refer to them when necessary.

Inspect the provisions carefully to see that no insects come aboard. Webs or silky tubes on sacks or boxes, holes in the container, or brownish specks in flour or sugar, are evidence that insects might be present. Also—be sure the storage spaces are clean and free from insects before you let your men stow the provisions away. Check on the

condition of the storage spaces ahead of time so the stowing of provisions is not delayed.

### STOWAGE OF MEATS

Most of the meat and poultry taken aboard ship is frozen. Frozen meat and poultry keep fairly well at temperatures as high as 20° F., but temperatures of 0° F. or below are much better (figure 25). These products will remain good for a long time if kept frozen solid.

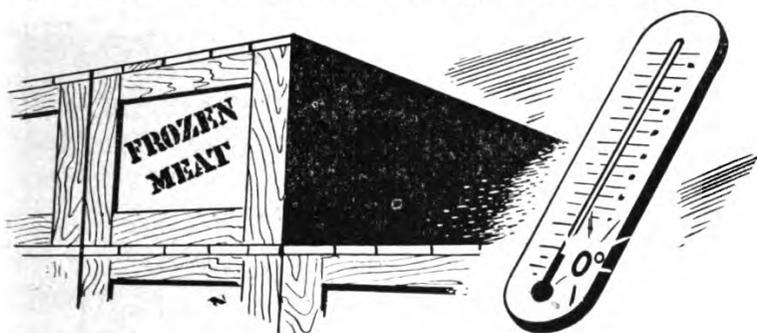


Figure 25.—Stowage of frozen meats.

In hot weather, try to load frozen meat during the early morning or after sundown. Have hard frozen beef quarters, sides of veal, etc., hung on rails if possible. Pack them tightly together, if necessary, but leave the wrappings on. Stack hard frozen packages or tins of meat any way that you find convenient.

Fresh, unfrozen meat may stay good for only a few hours in the chill room (where the temperature is around 45° F.). So, instead of using the chill room, keep this fresh meat where the temperature is from 32° to 36° F. Chilled beef quarters and other unfrozen meat should never be piled if the meat is to be held for several days. Hang the meat on hooks or lay it on racks to permit free circulation of air.

Keep bacon and cured meats between 0° and 45° F. At 45° F. these meats remain good from 2 to 4 months. At 0° F. they keep much longer. Smoked sausage does best at about 45° F.

### STOWAGE OF CANNED GOODS

Have most canned goods stowed in a DRY place where the temperature is around 50° F. (figure 26). Allow sufficient space for ventilation in order to keep the storage compartment dry. Use dunnage. Wet or damp cans may

rust out, thus letting air into the cans. As soon as the air gets in, the contents of the cans begin to spoil. **INSIST ON CAREFUL HANDLING.** Rough handling may cause dents that develop pinholes through which air can enter.

Cans of evaporated milk require special handling. Have the cases of this type of milk turned over at least once every three months—once a month is better—in order to prevent the separation of butter fat. A 60° F. storage temperature is best suited for evaporated milk, but 70° F. does not harm the quality of the product if it is not kept too long.

If glass containers are sealed with corks, have your men lay the bottles on their sides to prevent the stoppers from



Figure 26.—Stowage of canned goods.

drying out. Light is sometimes harmful to the color of exposed bottled goods, so leave the bottles in the carton and lay the carton on its side in a cool place.

### **STOWAGE OF FRESH FRUITS AND VEGETABLES**

All fresh fruits and vegetables are perishable—they spoil very quickly if they are not stowed properly. Under the best conditions, their storage life varies from about a week for such things as green corn or strawberries to as long as 8 months for such items as late crop potatoes or apples. Here are some things to remember when stowing fresh fruits and vegetables—

If possible keep the relative humidity of the storage space at from 85 percent to 90 percent.

Use dunnage or deck racks and pile the goods in such a way that there is free circulation of air. When fresh fruits and vegetables are stored in a tight compartment at temperatures over 40° F., enough carbon dioxide may be

given off to make it dangerous for men to work in the storage space until a supply of fresh air has been introduced. Don't stack the containers too close together. Always have the items stowed so that the oldest items can be used first. Don't allow odd lots of fruits and vegetables to accumulate.

Cleanliness of the storerooms will help prevent the growth of mold and other causes of decay. Have the storeroom decks scrubbed and the bulkheads cleaned as often as practicable—especially before you let a working party bring in a new lot of provisions.

The temperature of storage spaces should be strictly regulated. Most fruits and vegetables freeze at temperatures ranging from 28° to 31° F. And some items are damaged by temperatures which are above freezing. For example, white potatoes sometimes become too sweet when stored at temperatures below 40° F., and green bananas will never ripen properly if held at temperatures below 55° F. even for a few days.

NEVER stow citrus fruits, onions, tomatoes, cabbage, cantaloupes, or celery with eggs or butter or in spaces where it is possible for their odor to penetrate into egg or butter storage spaces. The butter and eggs absorb the odors readily.

For all practical purposes, fresh fruits and vegetables suitable for shipboard use may be divided into three major groups based upon their temperature requirements. The first and largest group should be stored at temperatures from 32° to 33° F. This group includes—

Apples	Beets
Cranberries	Cabbage
Grapefruit	Carrots
Grapes, California	Cauliflower
Oranges	Celery
Pears	Lettuce, iceberg
Plums	Parsnips
Prunes	Peppers, sweet
Beans, snap	Rutabagas
Beans, lima	Tomatoes, ripe and turning
	Turnips

The second group includes potatoes, honeydew melons,

and onions. These items keep best if stored at temperatures of 40° to 42° F.

And the last group does well at 55° to 58° F. Here you'll find lemons, winter squash, sweet potatoes, and mature green tomatoes.

### HOW LONG CAN YOU KEEP THEM?

The length of time you can expect to keep fresh fruits and vegetables also helps you decide where to stow them. The items that spoil most quickly should be stowed so that they are most easily accessible.

Fresh fruits and vegetables can be divided into five groups according to the length of time they will last. It is assumed that the fruits and vegetables are received in good condition and kept according to the instructions already given. Here's a group of fruits and vegetables that will last 80 or more days—

Apples, late	Parsnips, late
Pears	Potatoes, late
Cabbage, late Danish	Rutabagas
Carrots, topped	Sweet potatoes
Onions, late	Turnips, late topped

California grapes, lemons, oranges, topped beets, and intermediate potatoes may be expected to last from 50 to 80 days.

Cranberries, grapefruit, cabbage, celery, early potatoes, and winter squash normally last from 30 to 50 days.

Honeydew melons, prunes, early onions, sweet peppers, sweet potatoes, and mature green tomatoes will keep from 20 to 30 days.

Plums, snap beans, lima beans, and cauliflower will last only from 10 to 20 days.

Avocados, peaches, and asparagus are not recommended for general shipboard use because they bruise and decay very easily. Green bananas have a longer storage life than ripe bananas. American type grapes are not recommended for general shipboard use since the European type from California is available at the same time and has a better keeping quality. Lemons are more suitable than limes for export use. If lemons are not available, limes may be substituted. Watermelons are not recommended because they are injured and spoiled so easily by handling.

Here are a few additional tips you'll want to know about—

For best ripening, pears should be held at about 65° F. for 2 to 5 days before you intend to use them.

Topped beets, carrots, celery, parsnips, and potatoes keep much better if they have not been washed when packed.

The storage life of lettuce is lengthened when the heads

Commodity	Recommended temperature (°F.)	Approximate Length of storage period
<b>Fruits:</b>		
Apricots .....	31-32	1-2 weeks
Avocados .....	45	2-3 weeks
Bananas, ripe .....	56-60	7-10 days
Berries .....	31-32	7-10 days
Cantaloupes .....	32-34	7-10 days
Cherries .....	31-32	10-14 days
Grapes, American type....	31-32	3-8 weeks
Limes .....	45-48	2-4 weeks
Melons, Casaba and Persian	36-40	4-6 weeks
Peaches .....	31-32	2-4 weeks
Watermelons .....	36-40	2-3 weeks
<b>Vegetables:</b>		
Asparagus .....	32	1-3 weeks
Beets with tops.....	32	10-14 days
Broccoli .....	32-35	7-10 days
Carrots with tops.....	32	10-14 days
Corn, Green .....	31-32	4-8 days
Cucumbers .....	45-50	10-14 days
Eggplant .....	45-50	10 days
Garlic .....	32	6-8 months
Kale .....	32	10-14 days
Parsley .....	32	10-14 days
Peas, green .....	32	1-2 weeks
Radishes with tops.....	32	10-14 days
Spinach .....	32	10-14 days
Tomatoes, ripe and turning	40-50	10-20 days
Turnips with tops.....	32	10-14 days

are trimmed closely and wrapped individually in parchment paper.

Don't stow onions with such items as apples and grapefruit. These fruits will take on an undesirable onion flavor.

Keep compartments in which you stow potatoes and onions just as dark as possible.

Squash and sweet potatoes bruise easily. See that your men exercise extreme care in handling.

Mature green tomatoes will not ripen satisfactorily at temperatures lower than 50° F.

### **STOWAGE OF QUICK-FROZEN FRUITS AND VEGETABLES**

Get quick-frozen fruits and vegetables into a low temperature storage space as soon as possible. When you intend to use these products in a short time, a temperature of 10° F. is satisfactory. If you intend to keep them for more than 90 days before using, get these quick-frozen products into a compartment where the temperature can be kept at 0° F.

If the temperature of the product is higher than that of the storage space, have the shipping crates scattered loosely about the compartment on handtrucks or on the deck. Leave space between individual cases so that the temperature of the products will be lowered rapidly. If possible, use a portable fan to create an air current to help lower the temperature rapidly.

When the temperature of the fruits and vegetables is the same as the storage compartment, have the cases piled compactly together. The piling should start from the bulkhead toward the center of the space. Leave 4 inches between the bulkheads or bulkhead coils and the first pile. Pile the cases on dunnage to permit proper air circulation under the pile. If 2 by 4 lumber is used for dunnage, have the lumber laid on the deck lengthwise in the direction of the air flow in the compartment. At least 2 feet should be allowed between the top of the pile and the overhead of air ducts that may be present.

When quick-frozen fruits and vegetables **MUST** be left in exposed places for several hours before proper stowage, cover them with a tarpaulin to protect them from warm air currents and the direct rays of the sun. When several truckloads of provisions are to be picked up, quick-frozen

products should be loaded from the freeze space directly into the LAST truck leaving the warehouse. This truck should then be unloaded FIRST.

### **STOWAGE OF DAIRY PRODUCTS**

**MILK** must be stowed in absolutely clean, covered containers. If kept just above freezing, fresh milk will keep for several days. But milk for Navy use should not be held longer than 60 hours. The higher the temperature goes above freezing, the quicker the milk spoils—this is an important point to remember.

**BUTTER** frozen solid, kept at 0° F. and where the humidity is 80 percent will keep for one year. Butter kept at 50° F. holds for two weeks. As butter picks up odors readily, see that it is stored away from onions, citrus fruits, melons, cabbages, and apples.

**CREAM CHEESE** left wrapped and in the box in which it was delivered stays good for several months at temperatures of 32° F. to 34° F.

**AMERICAN AND BRICK CHEESE** crumble if the temperature gets below 30° F. Undesirable flavors develop if the temperature rises much above 70° F. Put these cheeses in the butter and egg box but be sure they are tightly wrapped or your butter and eggs will take on a cheesy flavor.

**ICE CREAM** lasts for several weeks at 0°, and for three months at -10° to 0° F. Chocolate and maple walnut ice creams keep the best—strawberry ice cream is the poorest keeper.

### **STOWAGE OF EGGS**

Fresh shell eggs need to be stored in a refrigerated, well ventilated place free from odors. Ordinary sanitary measures are sufficient. Stow the cases of eggs on dunnage and put wood strips between the cases for ventilation. Leave at least 18 inches between the top of the highest case and the overhead.

The best storage temperature for fresh shell eggs is the freezing point (32° F.)—and not below 29° (figure 27). They freeze if the air gets much colder than this and they spoil quickly if it gets much warmer. Use fresh eggs within three to four weeks' time. Do not store them with citrus fruits, apples, onions, and members of the cabbage family.

## STOWAGE OF DRY PROVISIONS

Stow BAKING POWDER, CORNSTARCH, CRACKERS, MACARONI, SPAGHETTI, and SODA in a dry place having a moderate temperature. These products will last five months at least under good conditions. See that your men are careful not to damage the containers. If any of the containers do become damaged, have them placed where the contents can be used immediately.

DRIED BEANS and BARLEY keep best in a dry, cool place. Good ventilation keeps the beans from sweating—use fans if necessary. Cross-pile the bags on dunnage in rows two bags wide. Leave aisles between the rows for ventilation. Under good conditions dried beans and barley can be kept safely for one year.

BREAKFAST FOODS must be stowed in a particularly dry

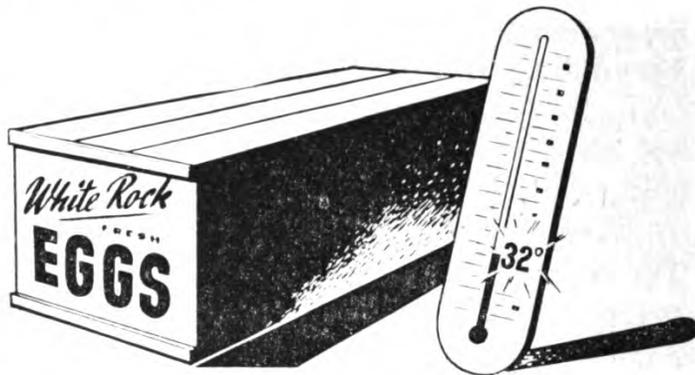


Figure 27.—Stowage of Eggs.

place. Under such conditions they ought to last at least six months.

CORN MEAL and HOMINY GRITS belong in a cool, dry place. Provide plenty of ventilation and they'll last from 6 to 18 months. The type of corn meal known as "water ground" gets rancid after about three months.

EGG NOODLES keep for a period of one to two years in a dry, cool place.

FLOUR keeps best if stowed on dunnage in a cool, dry storeroom. Have the sacks piled no more than six high. The extra weight of a higher pile harms the flour in the lower sacks. And see that products with strong odors are kept away from the flour. Flour keeps well for more than a year.

PRUNES, RAISINS, and other DRIED FRUITS require dry storage conditions. If these products are stored at a tem-

perature of 70° F., they'll last about a year. If you can keep them at about 35° F., they'll stay good for two years. Relative humidity of about 75 percent is best.

RICE in sacks should be piled on dunnage in a cool dry place. Rice dries out in storage and loses some weight. This does not affect its eating qualities. Good ventilation is required to keep the rice from becoming musty. In hot climates highly milled rice may become musty after six months. Brown or unmilled rice is good for only three months under similar conditions.

### **STOWAGE OF DEHYDRATED PRODUCTS**

Dehydrated products keep indefinitely if stowed in a DRY, COOL place. The temperature is extremely important. Many dehydrated products keep twice as long when stowed around 60° F. as they do when stored in a place where the temperature is 98° F.

### **STOWAGE OF DRINKS**

COFFEE and COCOA keep best under dry and cool conditions. Cocoa remains good for several years if kept below 70° F. Dampness causes coffee beans to become soft and to lose their flavor and aroma. Under proper storage conditions, all green coffee except Brazilian Santos improves with age up to five years. Have the sacks piled on dunnage in such a way that there will be plenty of ventilation between the sacks. Coffee absorbs other odors very easily. So keep it away from freshly painted places, kerosene, onions, and other things that give off strong odors.

TEA should also be stowed in a dry, cool place. Have your men handle the tea carefully. Tea leaves break up under rough handling. Black and Oolong teas can be kept for two years—green teas for one year.

### **STOWAGE OF SWEETS**

SUGAR requires a clean, dry place—away from flies, ants, and roaches. Granulated sugar absorbs moisture and becomes hard at temperatures over 80° F. or where the air is damp. Powdered sugar is apt to cake up badly if kept for more than three months. Mold or dust on sugar sacks may affect the flavor of the sugar. The sacks should be inspected frequently so that the mold and dust will be discovered and proper steps taken.

SUGAR CANDY requires the same storage conditions as sugar.

CHOCOLATE CANDY needs to be kept in a cool place in order to prevent melting and softening. Milk mixed with the chocolate, or nuts and fruits added to it, make the candy harder to preserve.

SOFT CANDIES must be stored at a temperature of less than 60° F. Chocolate stored in fluctuating temperatures over 70° F. develop a white "bloom" but can still be eaten.

SIRUPS last for a long time if kept in airtight containers. A moderate temperature is best. To prevent leakage, be sure your men handle the cases carefully.

JAMS and JELLIES remain usable for over two years if air doesn't get into the containers and the temperature does not go over 70° F. Take care of these as you do other canned provisions.

### STOWAGE OF YEAST

COMPRESSED YEAST retains most of its baking strength if kept under 40° F.—around freezing is best. If yeast is to be stored longer than two weeks, be sure it is fresh and in excellent conditions when you get it. Then freeze the yeast solidly and leave it that way until you are ready to use it. Let the yeast thaw out gradually by placing it in the chill room.

DRY YEAST needs a cool, dry, well-ventilated place. It will keep well for six months at 70° F., but will last over a year if kept in the chill room. Since dry yeast contains no moisture to expand while freezing, it is not harmed by freezing. If the yeast is frozen, thaw it out slowly in the chill room for best results.

### STOWAGE OF SEA FOOD

Live OYSTERS in the shells may last for about two months at 32° F. If you plan to use them in a week or two, have them packed in cracked ice and put them in the chill room. Add more ice as it melts. Lay the oysters with the deep shell down so that the liquid will not run out if the shell opens a little. Only live oysters should be used—that is, oysters with shells that are tightly closed.

If the oysters have been taken out of the shells, keep them in tightly covered tin containers at a temperature of from 30° to 32° F. Use these freshly shucked oysters

within six days. Quick-frozen shucked oysters can be held much longer if they are kept solidly frozen.

**LOBSTER, CRAB AND SHRIMP** must be alive at the time you intend to use them. **FISH** must be frozen hard if you intend to keep them for more than a few days. If possible, place them in a compartment where the temperature is below zero.

### **STOWAGE OF MISCELLANEOUS THINGS**

**SALT** requires stowage on dunnage in a dry place. Otherwise it will cake up and harden. Under proper conditions it lasts indefinitely.

**CUCUMBER PICKLES** last from nine months to a year—then they begin to get soft. If the pickles are in glass containers, keep them away from the light or they will become discolored.

**FLAVORING EXTRACTS** also need to be kept away from the light or they will lose their strength. Be sure that the containers are kept airtight. Under the best conditions, the extracts will begin to lose strength after several months.

**SPICES** require careful handling. Air admitted through a damaged container permits the flavor to evaporate.

**VINEGAR** keeps best when stored on racks in a dry compartment. The best temperature for vinegar is around 45° F. Keep vinegar away from provisions put up in sacks.

**MAYONNAISE, MUSTARD, SALAD DRESSING, TOMATO CATSUP, and CHILI SAUCE** keep well if stored at a moderate temperature. Rough handling is particularly bad for mayonnaise. Warn your men to be careful.

**LARD and LARD SUBSTITUTES** should be stowed in a place where the temperature is around freezing. Keep cooking and salad oils at the same temperature. Stow these products on racks or gratings above the deck. And keep them away from provisions packed in sacks.

### **INVENTORIES**

Frequently you may be asked to assist with the taking of the inventories. **COMPLETE** inventories of the provisions in the bulk storerooms, the cold storage spaces, and the issue room are taken at the end of each quarter (31 Mar., 30 June, 30 Sept., and 31 Dec.). Such inventories are also

taken when the supply officer is detached and also at some other time during the quarter, preferably about the middle. And when a person in charge of storeroom is relieved, an inventory of the provisions in his care must be taken.

The form used is the INVENTORY OF PROVISIONS, NavSandA Form 84. See figure 28. Notice that most of the provisions are measured in terms of pounds. Just counting the number of containers isn't going to be enough unless each container holds exactly one pound. You'll have to determine the number of pounds on hand. For example—you may have 32 No. 10 cans of peas. To get the quantity to be recorded on the inventory sheet, you'll have to multiply the 32 by 6 pounds 10 ounces, the net weight of one No. 10 can of peas. Here it is—

10 ounces is equal to  $10/16$  or  $5/8$  pounds.

$$\text{So—}6\frac{5}{8} \times 32 = \frac{53}{8} \times \frac{32}{1} = 212 \text{ pounds.}$$

Be sure no empty cans or empty cases are counted when taking inventory.

After all the quantities have been recorded, the unit prices are inserted. This usually is done by a storekeeper. He gets his information from the provision ledger. The figures for the amount column are determined by multiplying the quantity by the unit price.

After the inventory has been prepared and checked, it is written over at least in duplicate—preferably on the typewriter. It is then signed by the person in charge of the storerooms and by the officer who was responsible for taking the inventory. A certified copy of inventories taken at the end of the quarter or those taken when the supply officer is detached must be sent to BuSandA. The original of other inventories is kept under lock and key by the supply officer.

SPOT INVENTORIES are sometimes taken in order to get a more frequent check on the accuracy of the provision records. A spot inventory is one taken in just a few spots. It can be done quickly. If the count taken of these few provisions checks with the stock tally card and provision ledger records, the chances are good that the records for the rest of the provisions are also accurate.







## CHAPTER 7

### GETTING THE PROVISIONS OUT OF STORAGE

#### THE EXEC'S ORDER

It's four bells in the morning watch. Time for a messenger to bring down the DAILY RATION MEMORANDUM, NavSandA Form 27A, from the executive office. Look at figure 29.

The item of greatest importance to you on this form is the TOTAL NUMBER OF RATIONS TO BE ISSUED IN KIND. This information tells you the number of men you must plan to feed on the following day. Notice in figure 29 that you must plan to feed 970 Navy men and 19 Marines. The number standing night watches may also be of interest to you as you may be ordered to prepare night rations for them. The order will come to you from the exec by way of your supply officer. But remember—the issuing of food to night watches must not bring your provision costs above the cost limit set for your ship.

You know WHAT foods you're going to serve because you made out the bill of fare about a week ago. But at that time no one knew exactly how many men were to be fed. Now that the 27A has given you this information, it's up to you to start the ball rolling and get the needed provisions into the galley and bakeshop where they can be properly prepared.

## PROVISIONS TO THE GENERAL MESS GALLEY

How do the provisions get to the galley? Figure 30 gives you the picture. The dry provisions are issued by the storekeeper in charge of the bulk storeroom to the jack of the dust who is in charge of the issue room. The jack of the dust has made plans to have on hand what you need. He based these plans on your bill of fare. So he

NAV. B. AND A. FORM 27A  
(Revised April 1944)

**DAILY RATION MEMORANDUM**

---

U. S. S. **MINNEAPOLIS**

---

DATE **10 December 1945**

FROM Executive Officer  
TO Supply (Commissary) Officer

---

Total enlisted crew and marines attached to vessel		1024
Number absent	With leave	15
	Without leave	0
	Insert on duty	0
Total number crew and marines on board		1009
Total supernumeraries on board	Navy	0
	Marine	0
Total number of rations to be issued in kind	Navy	970
	Marine	19
Total number of rations to be commuted	Navy	17
	Marine	3
Number standing night watches between 8 p. m. and 8 a. m.		
DECK FORCE	46	
ENGINEER FORCE	54	

---

*F. C. Carniey*  
(Signature)  
Comdr., (USN)

This form to be made out in duplicate daily and original sent to the Supply Officer by 10 a. m. Men on liberty and others taking one or more meals on board are not to be considered absentees.

---

★ GPO 16-29488-1

Figure 29.—Daily Ration Memorandum.

issues the provisions to the galley as needed. The cook in charge of butchering prepares and issues the meats directly from the cold storage compartments to the galley. The spud coxswain supplies the galley with prepared fruits and vegetables as ordered.

It may be up to you to see that the proper orders are made out to get the provisions into the galley. The STUB REQUISITION, NavSanda Form 307, is used for the actual ordering. Figure 31 shows you how much of the 307 you need to fill in when you're placing your orders. Frequently, all these stub requisitions are routed through the jack of the dust who sees that the senior butcher and the spud coxswain are notified of the provisions to be supplied by them. Signatures by the watch captains are obtained when the provisions are delivered to the galley. These signatures serve as proof that the provisions were actually issued. Occasionally the cook in charge of the butcher

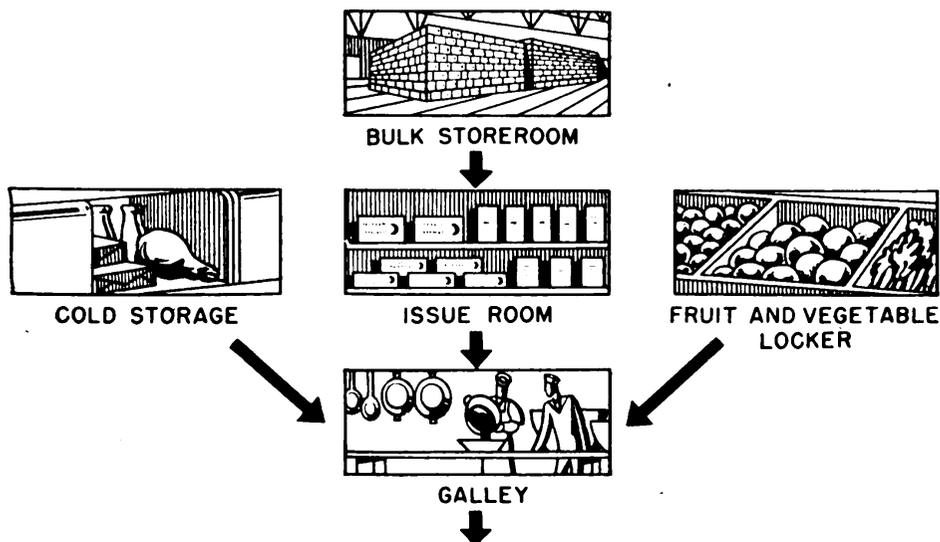


Figure 30.—How provisions get to the galley.

shop and the spud coxswain handle their own 307's, thus relieving the jack of the dust of this job.

### HOW MUCH ARE YOU GOING TO ORDER?

Determine the amounts you order in the same way you made your estimates of the quantities of provisions needed for your weekly bill of fare. Do you remember how this was done? Follow through these examples—

Suppose the menu calls for roast lamb. You have boneless lamb in storage. The 27A tells you that you will need to provide enough for 415 men. Your *Navy Cook Book* recipe indicates that 42 pounds of boneless lamb are needed to provide 100 portions of roast lamb. Here's the arithmetic involved—



roast lamb to feed 1,824 men. Remember—for messes over 1,000, you are to reduce the quantity determined in the usual way by 10 percent. Here's the way it works:

<p>(1) <math>\frac{1824}{100} \quad 18.24</math></p> <p>(2) <math>\frac{18.24}{.10 \text{ (10\%)}} \quad 1.8240</math></p>	<p>(3) <math>\frac{18.24}{- 1.824} \quad 16.416</math></p> <p>(4) <math>\frac{16.416}{42} \quad 32832</math>  <math>\frac{32832}{65664} \quad 689.472</math></p>
--	--

You'll need 689 pounds of boneless lamb to provide 1,824 portions of roast lamb.

### SALES TO MESSES

Some of the provisions brought aboard are for the special messes—they don't get to the general mess galley at all. SPECIAL MESSES are set up on most ships—the number depending on the size and complement of the ship. Some of the larger ships of the fleet have flag officers' mess, a cabin mess, a wardroom mess, a junior officers' mess, and a chief petty officers' mess.

Sales of provisions to these special messes are made at regular cost price. Deliveries of provisions are made only at the regular times and places of issue. As far as is possible, fresh meats are sold in original pieces—beef in quarters, veal in sides, and lamb in carcasses. If for any reason this is not practicable, sales are to be made in as large units as possible. Tables are published in Volume 4 of the *BuSandA Manual* showing the percentage of the quarters, sides, and carcasses of certain cuts of beef, lamb, and veal, together with the percentage of the average cost price to be charged for these cuts.

Sales of frozen meat to special messes should be made in unbroken packages if possible. Each special mess should be charged with the appropriate percentage of the average cost price. These percentages are also found in Volume 4 of the *BuSandA Manual*. For example, beef, fresh frozen, boneless, to be used for roasting or frying is worth 145 percent of the average cost price. Beef, fresh frozen, boneless, to be used for ground beef is worth only

55 percent of the average cost price. How does this work out?

Suppose the average cost of beef, fresh frozen, boneless, is \$.24 per pound. The roasting and frying beef must then be sold for  $24 \times 1.45 = \$.348$  per pound.

$$\begin{array}{r} 1.45 \quad (145\%) \\ \times .24 \\ \hline 580 \\ 290 \\ \hline .3480 \end{array}$$

The ground beef must be sold for  $.24 \times .55 = \$.132$  per pound.

$$\begin{array}{r} .55 \quad (55\%) \\ \times .24 \\ \hline 220 \\ 110 \\ \hline .1320 \end{array}$$

The special messes must buy equal amounts of the various types of meat cuts. They are not allowed to buy only the preferred cuts—the poor must be taken with the good. This is true of both fresh and frozen meats.

### THE PAPER WORK OF SALES TO MESSES

Provisions are ordered by the special messes on the STUB REQUISITION, NavSanda Form 307. Look back at figure 31 for a sample. Be sure that receipted stub requisitions are received for all provisions issued.

At the end of each month, the business done with each special mess is shown on a RATION VOUCH AND STATEMENT OF SALES TO MESS, NavSanda Form 42. Look at figure 32.

Settlement by each special mess is made promptly at the end of every month. Here's the way it works out—

The executive office originates the 42 by filling in the name of the ship or station, date, the mess involved, the period covered, and the number of rations commuted. See page 88 for an explanation of commuted rations. Then the 42 is sent to the supply office where the VALUE OF PROVISIONS issued to the special mess is filled in. This amount is determined by adding up the totals of all the stub requisitions turned in for the particular mess involved.

The value of commuted rations is determined by the disbursing officer. All he needs to do is multiply the number of commuted rations by the value of one commuted ration—it was 65¢ in 1945. Now—if the value of commuted rations is greater than the value of the provisions issued to the mess, the mess has money coming. This amount is recorded by the DO in the DUE MESS space and paid. If the value of provisions is greater than the value

**RATION VOUCHER AND STATEMENT OF SALES TO MESS**  
NAV. S. AND A. FORM 12

D. O. VOU. NO. 316-45

PAID BY

J. C. JAMES  
 Lieut. (SC), USN  
 DO USS MINNEAPOLIS  
 31 December 1945

ACTIVITY		DATE			
U. S. S. MINNEAPOLIS		31 December 1945			
MESS					
CPO					
PERIOD (1)	NUMBER OF RATIONS COMMUTED (2)	VALUE OF COMMUTED RATIONS (3)	VALUE OF PROVISIONS (4)	DUE MESS (5)	DUE UNITED STATES (6)
December	600	390.00	450.65		60.65

A. TO THE DISBURSING OFFICER: Rations in the number shown in column (2) are to be commuted to the above specified mess for the period shown in column (1), which number agrees with record of rations commuted (NAVPERS Form b14), and the value thereof will be paid to the treasurer of the mess. I certify that the individuals whose rations are to be commuted were on duty at this activity, and not absent on duty, with or without leave, or sick in hospital, were not subsisted in the general mess, and were not entitled to subsistence allowance or commuted in their own right for the days for which their rations are to be commuted.

SIGN ORIGINAL ONLY J. C. James Comdr., U. S. N.  
(SIGNATURE OF OFFICER (NAV. S. (1) N. R.))

B. TO THE DISBURSING OFFICER: Provisions were drawn from the Supply Department by the above specified mess during the period shown in column (1) to the value shown in column (4), as represented by receipt issue slips in my custody.

SIGN ORIGINAL AND MESS TREASURER'S COPY J. R. Booth Lt. Comdr. (SC) U. S. N.  
(SIGNATURE OF SUPPLY OFFICER)

C. I hereby acknowledge receipt of cash in the amount shown in column (3) and provisions to the value shown in column (4), and certify that I have paid to the disbursing officer the amount shown in column (4).

SIGN ORIGINAL AND SUPPLY OFFICER'S TWO COPIES A. B. Dockrill CMM (PA), U. S. N.  
(SIGNATURE OF MESS TREASURER)

D. I hereby certify that I have paid to the mess treasurer the amount shown in column (3), and acknowledge receipt of cash in the amount shown in column (4).

SIGN ORIGINAL, MESS TREASURER'S COPY AND SUPPLY OFFICER'S TWO COPIES J. C. James Lieut. (SC) U. S. N.  
(SIGNATURE OF DISBURSING OFFICER)

☆ U. S. GOVERNMENT PRINTING OFFICE: 1944 10-28500-1

Figure 32.—Ration Voucher and Statement of Sales to Mess.

of commuted rations, the mess treasurer pays the DO for the difference. This amount is recorded in the DUE UNITED STATES space.

There is a reason for each of the four signatures shown on the form. The exec's signature indicates that the number of commuted rations is accurately stated. The SO's signature testifies to the accuracy of the value of provisions withdrawn. The mess treasurer's signature is a receipt for the money and provisions received by the mess.

And the DO signs to certify that a proper money settlement has been made.

### SURVEYS

Even with the best of care, some provisions are going to spoil and become unfit for use. Be sure your men are always on the alert to discover this. Then what?

Have spoiled provisions set aside so that they will not be used. The commanding officer appoints an officer—usually the junior medical officer—who is responsible for surveying provisions. The surveying officer must inspect the spoiled provisions before they are disposed of.

It may be up to you to see that the necessary record is made in the SURVEY RECORD BOOK. See figure 33. Get

NO	ARTICLE	VALUE	FROM	INV. NO.	DATE	SURVEY	CONDITION	CAUSE	RESPONSIBILITY	DISPOSITION	SURVEY	SURVEY OFFICER
				CONTNO.	INSP	NO.					DATE	
1	Flour wheat (744.26)	21.00	Jos Barry Co	70966	5/5	16	Unfit for use	Poor Ventilation	None	Burned	1/6	W. J. Shabby, 2d Grade (MC)

Figure 33.—Survey record book.

the signature of the surveying officer over his rank and title as illustrated. This record is always examined by officers conducting supply department and general mess inspections. Keep it in good shape.

Notice that your survey record book contains a column calling for the name of the contractor or activity from whom the surveyed provisions were received. Why? Because it is required that survey reports covering items of provisions other than fresh must contain the name of the contractor who furnished them. The record must also include the contract number, date of inspection, and place (if known) where inspected. From this information it

may be possible to determine who was at fault in connection with the spoiled provisions.

At the end of each quarter (31 Mar., 30 June, 30 Sept., or 31 Dec.) or oftener if ordered, a report of all the pro-

NAV. S. AND A. FORM 154 Revised June 1944		SURVEY REQUEST, REPORT, AND EXPENDITURE			
SHIP OR ACTIVITY <b>(4389) U.S.S. MINNEAPOLIS</b>		DATE <b>16 Dec 1945</b>	NO. <b>16</b>		
REQUEST (To be prepared by supply officer, or head of Department) It is requested that the items listed below be surveyed in accordance with Arts. 1906-1918, N. R.					
REASON <b>Unfit for use</b>	APPROPRIATION <b>1750802 PS &amp; TN</b>		SIGNED <i>J. P. Booth</i>		
ACCOUNT <b>178</b>	TITLE <b>11-V</b>	RANK <b>Lt. Comdr. (SC)</b>			
ITEM	QUANTITY	ARTICLE	IDENTIFYING MARKS, ETC.	DATE AND FROM WHOM RECEIVED	VALUES AT WHICH CARRIED
<b>1</b>	<b>724 lb.</b>	<b>FLOUR, wheat</b>	<b>Contract 70966</b>	<b>12/15 J. Barry &amp; Sons Contractor 12/2</b>	<b>21.00</b>
REPORT (To be prepared by head of Department, or by surveying officer(s) if so directed below)					
ITEM	CONDITION, CAUSE, RESPONSIBILITY, AND RECOMMENDATION				APPRAISED VALUE
<b>1</b>	<b>CONDITION:</b> Weevil-infested. All sacks of provisions broken out of compartment D-407. Other products not infested. <b>CAUSE:</b> Storeroom is poorly ventilated and with high temperature has aided in development of weevils. Eggs apparently in flour when delivered to ship 12/10/45. <b>RESPONSIBILITY:</b> None. Incident to service. <b>RECOMMENDATION:</b> Burn. Expend from books.				<b>NONE</b>
The above items have been carefully surveyed in accordance with Sec. 3, Chap. 49, N. R., and report is made thereon as indicated above.					
DATE <b>15 Dec 1945</b>			<i>E. S. Eyster</i> Lt. Comdr. (MC), USNR (Signed by surveying officer or board, or by head of Department)		
ACTION OF COMMANDANT OR COMMANDING OFFICER					
Expend without formal survey, in accordance with Arts. 1909, 1914, N. R.		DATE <b>16 Dec 1945</b>	COMMANDANT OR COMMANDING OFFICER <i>F. L. Mitchell</i> Captain, USN		
on formal survey is required and					
U. S. N. U. S. N.					
U. S. N. (is) (are) hereby designated as surveying officer(s) for the above articles or material, in accordance with Art. 1910, N. R.					
(Date)			(Commandant or Commanding officer)		
ACTION BY REVIEWING OFFICER AFTER FORMAL SURVEY					
ITEMS APPROVED	ITEMS DISAPPROVED	DATE	SIGNED		
NAME OF BUREAU TO WHICH FORWARDED FOR ACTION					DATE
The above articles have been expended from the records at		FINAL EXPENDITURE			
AMOUNT <b>\$21.00</b>	CHARGE TO TITLE <b>11-V</b>	AMOUNT <b>\$ 21.00</b>	APPROPRIATION <b>1750802 PS &amp; TN</b>		
TRANSFERRED TO					
SPACE FOR BUREAU APPROVAL IF NECESSARY		EXPENDED MONTH <b>16 Dec</b> to <b>45</b> the above-mentioned articles <i>J. P. Booth</i> Lt. Comdr. (SC)			

Figure 34.—Survey request, report, and expenditure.

vision surveys is made on a SURVEY REQUEST, REPORT, AND EXPENDITURE form (NavSandA Form 154). See figure 34 for a sample.

The 154 is originated by the supply officer. He fills in the upper portion of the form down to the REPORT part. He gets his information from the provisions record book. The surveying officer is responsible for the report section of the form. And before the surveyed provisions can be finally charged off, the CO must sign the 154 in the appropriate place. Notice where he has signed on the sample.

The 154 then comes back to the SO. It now serves as authority to charge off the surveyed provisions. The SO sees that the necessary entries are made on his records. He indicates that this has been done by filling in the section near the bottom of the form as shown on your sample.

FORMAL SURVEYS are hardly ever used for provisions. Article 1909 of *Navy Regulations* indicates when the formal survey is required.

At yards and stations having provisions for general issue and on store ships issuing bulk provisions, the procedure is sometimes a little different. If missing provisions and provisions determined to be unfit for food amount to a total of less than \$100, these provisions may be charged off on a RECEIPT EXPENDITURE INVOICE (Nav-SandA Form 127) without any further formality. Volume 4 of the *BuSandA Manual* gives further details about this.

### GARBAGE DISPOSAL

Aboard ship, the first lieutenant is responsible for disposing of the garbage. At shore stations it is the responsibility of your boss, the commissary officer. Some ships have chutes, down which the garbage is poured; on other ships, the garbage must be tossed over the side. In danger areas, such disposal is always made at night. Wooden barrels, packing boxes, or any article that will float for a long period of time must not be thrown overboard. Metal cans must be pierced so that they will sink rapidly. Floating objects are apt to reveal the presence of your ship to the enemy.

In port, where tossing garbage overboard is a health menace to the people living nearby, disposal must be taken care of by other means. Burning is the best method.

In all ports regularly visited by ships of the fleet, contracts are made with local concerns for the disposal of the garbage in a clean, efficient manner.



## CHAPTER 8

### RATIONS—ALL KINDS

#### FEEDING THE NAVY

During the recent war emergency, over two million dollars were spent **EVERY DAY** in feeding Navy personnel. That's no small amount.

Regulations have been laid down showing how the tremendous job of feeding the still large peace-time Navy is to be handled. You'll want to know something about them. All the regulations can be divided into two groups—those involving the furnishing of food by the Navy and those involving the payment of money to buy food.

#### MONEY ALLOWANCES

Officers are usually given a **MONEY ALLOWANCE** to buy their own food. This allowance is called a **SUBSISTENCE ALLOWANCE**. The amounts paid are \$.70, \$1.40, or \$2.10 a day, depending on the officer's rank and whether or not he has dependents. On board most ships and at some shore stations, special officers' messes are set up. Cooks, stewards, and steward's mates are provided by the Navy for these messes. But the officers **BUY** the food. Enlisted personnel are entitled to subsistence allowance **ONLY** when there is **NO** general mess available for them. This situation exists at only a few shore stations and on small craft

with complements under 25 men. Enlisted men's subsistence allowances range from \$1.20 to \$3.00, depending on the situation. See the *BuSandA Manual* for the details.

**COMMUTED RATIONS**—another type of money payment—are available only to enlisted personnel, and then only when the CO gives the order. An enlisted person's rations are commuted when he is allowed to eat somewhere other than in the general mess provided for him. There are three cases where this permission is usually granted.

In the first place, enlisted men such as steward's mates, who work in officer's messes, have their rations commuted because they eat chow purchased by the officers. The money payment is made by the disbursing officer of the ship or station to the treasurer of the officers' mess involved.

Secondly—CPO's are sometimes allowed to set up their own mess and buy their own food. In this case, the rations are commuted and paid to the mess treasurer.

Finally—the CO of a station may allow an enlisted person to have his ration commuted so he can eat with his family or at some other place away from the general mess. But remember, if there is a general mess available, the enlisted person may not be given subsistence—he can be given commuted rations only. And a commuted ration is worth much less than a subsistence allowance—65¢ in 1945, as compared with \$1.20 to \$3.00.

### **THE GENERAL MESS—WHO EATS THERE?**

You'll want to know who has the right to eat in your general mess. Each **ENLISTED MAN** of the Navy attached to your ship or station is entitled to a food ration unless his rations are commuted, or unless he is receiving subsistence. **NONCOMMISSIONED** officers, **PRIVATEs**, and **MUSICIANS** of the **MARINE CORPS** attached to a ship of the Navy are also entitled to rations. All personnel not regularly assigned to the ship or station who eat in the general mess are classified as supernumeraries.

Navy officers, civilians, enlisted army personnel and refugees may be fed in the general mess only if the skipper gives **WRITTEN** permission. In the case of civilians, the CO gets his authority from BuPers.

Naval officers are to be charged 70 cents per day if they eat in the general mess. The officers are **NOT** charged for

messes on the day of reporting unless they reported early enough to have all three meals. They ARE charged for the day of detachment if one or more meals were eaten aboard on that day. Officers who are absent for less than 48 hours are charged for the day they are absent unless they are on temporary or detached duty during their absence. If an officer is absent on authorized leave over 48 hours, he is NOT charged for food rations during his absence unless he failed to notify the officer in charge of the general mess that he would be absent. If the officers are buying meals on a cash basis, 20 cents is charged for breakfast, 30 cents for dinner, and 20 cents for supper.

A separate monthly ration memorandum is prepared by the exec's office to cover the rations furnished non-naval personnel. For Army enlisted personnel or civilian personnel, this memo must be certified by the officer or person in charge of the personnel who get the rations. This monthly ration memorandum for Navy civil employees must have attached a statement signed by the CO showing the number of rations chargeable to each appropriation.

MIDSHIPMEN are entitled to a ration of food unless their rations are commuted. Also, HONORABLY DISCHARGED MEN who choose to live on board receiving ships are entitled to one ration (three meals) per day for a period of three months from the date of discharge. This ration cannot be commuted.

Your CO must see that all PRISONERS OF WAR are properly fed. When the prisoners are not assigned to an officers' mess, you must allow them one ration each in the general mess. PILOTS messed in the general mess or by themselves are allowed one ration each. Again a CO order is necessary. Rations are furnished DESTITUTE AMERICAN SEAMEN if the skipper so orders. The same is true of REFUGEES who are messed in the general mess or by themselves. If your CO so orders, they are to be furnished one ration each.

There are also three special cases. Special authority is necessary before you ration NAVAL MILITIA. So when personnel belonging to some State's Naval Militia come aboard, request instructions through your supply officer as to how they shall be handled. Ordinarily, arrangements are made between State authorities and the Navy

Department to pay for the rations issued to these militiamen.

Enlisted personnel of FOREIGN governments are allowed one ration each if circumstances indicate they should be fed by a Navy mess. Each copy of the monthly ration memoranda must be certified by the officer or other person in charge of these personnel. This certification serves as a receipt that the rations were received.

Enlisted personnel of the COAST GUARD are allowed one ration each. Again, a separate monthly ration memorandum certified by the person in charge of the Coast Guard personnel must be prepared. If no Coast Guard personnel is in charge, the exec can make the certification.

### NUMBER TO BE FED

You've got to know the number of men to be fed in the general mess every day so that you can see that the proper amount of food is prepared. This number may change from day to day. You get the dope from the supply officer—who in turn gets it from the exec. Here's the way it works—

The executive officer prepares the daily ration memorandum every day. Look back at figure 29. The TOTAL NUMBER OF RATIONS TO BE ISSUED IN KIND indicates just how many rations should be prepared. This form gets to the supply office by 1000 each morning so you will know how much food to prepare for breakfast, dinner, and supper the next day.

In general, one ration is allowed each day for each person on board ship except members of officers' and CPO messes and persons eating in those messes. Rations are allowed for enlisted men granted liberty not exceeding 48 hours and for men absent for any reason who take at least one meal aboard.

In the case of a transfer, credit for the day of transfer is taken by the ship from which the man is being transferred unless he leaves before breakfast.

Men temporarily absent from the ship for duty with a working party, target repair party, or a boat crew sometimes are fed in some other general mess during this duty period. In this case, the ship to which the men are attached takes credit for only the ACTUAL number of meals served. One ration equals three meals. For exam-

ple, if 15 men are furnished breakfast only, credit can be taken for  $15 \div 3$  or 5 rations only. The ship furnishing the remaining meals takes credit for  $15 \times 2$  or 30 meals. Reduced to rations this is  $30 \div 3$  or 10.

The rations of a sick enlisted man subsisted by an officers' mess are not checked if the Med. O. indicates that such subsistence is given IN ADDITION to the regular Navy ration.

Rations for enlisted men serving with the landing force are not checked unless these men are subsisted otherwise than by the Navy.

### THE NAVY RATION

The Navy Ration was set up by Congress to help make sure that every sailor gets a well-balanced, healthful diet. The kinds and amounts of foods listed in the Navy Ration refer to the foods that are to be fed ONE man in ONE day.

The list of those foods just as it appears in Volume 4 of the *BuSandA Manual* is given on page 24.

The Secretary of the Navy is authorized by Congress to increase these allowances if necessary, for vessels and stations with an allowed complement of less than 150 men and operating under unusual conditions.

It is also permissible to have an over-issue of any article in the Navy Ration providing there is an under-issue of the same value in some other article or articles. For example—50 ounces instead of 44 ounces of fresh vegetables may be prepared and issued to each man during the day if the amount of meat or any other part of the ration is cut enough to make up for the cost of the extra 6 ounces of vegetables.

During a war emergency, the Navy Ration is followed only at shore stations within the United States where a supply corps officer is in charge of the general mess. It is SUGGESTED, however, that the Navy Ration be used as a guide at all times in order to insure well-balanced meals at all times.

A table showing a further breakdown of the parts of the Navy Ration is given in Volume 4 of the *BuSandA Manual*. For example, this table shows you how the fresh meat component of 20 ounces is broken down into the KINDS of meat that might be provided, depending on available supplies. Here's the list—

Beef  
Fish  
Hearts, beef  
Lamb  
Liver, beef  
Mutton  
Pork

Poultry  
Chicken  
Duck  
Turkey  
Sausage, pork fresh  
Scrapple, fish  
Veal

Here's some other information provided by this table—15 ounces of boneless beef is equal to 20 ounces of beef containing bones. Also 4.4 ounces of dehydrated vegetables or 16 ounces of frozen vegetables are equal to 18 ounces of canned vegetables or 44 ounces of fresh vegetables. Dried eggs weighing 0.6 of an ounce or frozen eggs weighing 1.9 ounces may be substituted for the 1.6 ounce fresh egg component.

The table also has a list of miscellaneous articles that can't be included in any of the ration components already given. This list includes such things as candy, clams, cream, honey, ice cream, and nuts. The value of these miscellaneous issues must not exceed 2 cents per ration per quarter.

### LEAVE RATIONS

Enlisted men on leave are entitled to an allowance of money for the time of their leave, during which they are not being fed in the general mess. The leave must be authorized and for more than 72 hours. The value of a leave ration is usually the same as the value of a commuted ration—65 cents for the year 1945. This amount is subject to change. Volume 4 of the *BuSandA Manual* gives you the details.

### MEN STANDING NIGHT WATCHES

If the CO considers it necessary, you may furnish food to the deck and engineer forces standing night watches between 2000 and 0800. The exec notifies the supply officer of the number on night watches on the *Daily Ration Memorandum*. See figure 29. Here's the thing to remember, though. THESE ISSUES DO NOT GIVE YOU AN EXCUSE FOR RUNNING OVER YOUR RATION ALLOWANCE.

## ABANDON SHIP RATIONS

The abandon ship ration for ONE man for ONE day is made up of—

- 5 ounces of canned biscuit
- 4 ounces of canned meat
- 1 ounce of canned malted milk tablets

These items are packed in watertight metal containers which hold enough rations for 25 men for one day. One ration has about 1,000 calories of food value.

The number of abandon ship rations that you should make available is based on three days' ration per man for each life raft and five days' ration per man for each life boat. Figure it out this way—

Suppose you wanted to provision a raft designed to hold 50 men. You need  $50 \times 3$  or 150 abandon ship rations for this raft. Divide this number by 25—the number of rations in a container—to get the number of containers you need—

$150 \div 25 = 6$ , the number of containers you need in this case.

## HAVERSACK RATIONS

If a landing force from your ship is directed to carry provisions in their haversacks, here's what you should furnish each man for a two days' supply of rations—

- 2 pounds hard bread
- 2 pounds of canned meat
- 8 ounces of sugar
- 4 ounces of coffee in bags

Haversack rations should not be used for expeditions lasting longer than two days.

## FLIGHT RATIONS

Flight rations may be furnished to officers, enlisted men, and civil employees of the Navy while they are actually engaged in flight operations, while they are on duty traveling aboard aircraft, or on watch in an airplane at anchor during regular meal hours and therefore cannot eat at their regular mess. Written authority of the squadron commander is necessary, or in his absence

or by his direction, the authority of any subordinate flight commander, air transport officer, or squadron transportation officer.

Volume 4 of the *BuSandA Manual* gives you a suggested list of items for use in flight rations.

This article also provides more details about flight rations as well as a few sample menus. You'll find these samples helpful when you first need to prepare flight rations. But remember—they are samples only; you don't need to follow them. The important thing is to prepare a healthful ration that does not run over the ration allowance.

### **AIRCRAFT EMERGENCY RATIONS**

The aircraft emergency ration is made up of—

- 5 sucrose – citric acid tablets
- 8 sucrose – malted milk tablets
- 10 sucrose – lipid-citric acid tablets
- 2 multivitamin tablets
- 2 chewing gum tablets.

These items represent an emergency ration for one man for one day. They are packed together as a unit in a metal container. Your job is to furnish five days' rations per man. The number of men depends on the number of planes carried and the number of men assigned to these planes. So—if you have 150 men aboard who are assigned to planes on your ship, you should have  $150 \times 5$  or 750 aircraft emergency rations available.

### **ARMY RATIONS**

When Navy or Marine Corps personnel act on shore in cooperation with the Army, the chow is usually furnished by the Army. That makes it easy for you.

### **HOSPITAL RATIONS**

When officers are subsisted in a naval hospital, their pay records are checked for these hospital rations at the rate prescribed in Volume 4 of the *BuSandA Manual* (80 cents per day in 1945).

When enlisted men are subsisted in a naval hospital, their rations aboard ship are stopped. Commuted rations and subsistence also stop.

### **SUBSISTENCE DURING TRAVEL**

ence allowance up to \$7 per day. This subsistence allowance is supposed to cover MEALS, LODGING, and TIPS.

When less than five enlisted men are traveling, cash for meals or Navy meal tickets—whichever seems best—are issued. If cash is furnished, it will be on the basis of \$1 per meal. For drafts of five or more men, Navy meal tickets are issued. However, if a large draft is trans-

OFFICERS on a travel status may be allowed a subsistence allowance for a considerable distance by special train, arrangements are made to equip a baggage car with cooking equipment and to subsist the men from Navy provisions.

Here's another angle—when enlisted men travel on duty that includes detentions up to 31 days at any one place, they may be granted a daily allowance of \$5. This is only true when sleeping car, stateroom accommodations, or other quarters and RATIONS are NOT furnished.

### **SUBSISTENCE WHILE ON SHORE PATROL**

When it is difficult for the members of a shore patrol to return to their regular ship for meals or lodging, they are given money to buy their meals ashore. CO orders listing the names of those on patrol are given to the officer or enlisted man in charge of the patrol. These orders direct the disbursing officer to advance money for the purchase of meals and lodging. The orders must show the time of leaving and the approximate time of returning so that the amount of the advance can be determined. When the patrol gets back, final settlement is made.

Officers and midshipmen on shore patrol are allowed actual and necessary expenses up to certain maximum amounts. In most cases officers and midshipmen are allowed—

\$1.75 per meal and \$3 per day for lodging. The total for meals and lodging must not be over \$7 per day. Officers and midshipmen on shore patrol from a SHORE station are not entitled to these allowances.

Enlisted men are usually allowed 75 cents per meal and \$1.25 per night for lodging while on shore patrol. These rates apply only when the men are stationed on a ship. They are allowed nothing for subsistence of lodging if they are based at a shore station.

### **SUBSISTENCE OF SICK (SPECIAL DIETS)**

Enlisted men on the binnacle list on board vessels are subsisted by the general mess if no special foods are required. The medical officer may order a special diet for a sailor on the binnacle. If this diet is furnished ENTIRELY by an officer's mess or by some other means, the sailor's food ration from the general mess is cancelled for the time he is on the special list. If the special diet is given in ADDITION to his general mess ration the regular ration is counted as usual. The cost of special diets is charged to the appropriation, Medical Department, Navy.

### **SUBSISTENCE WHILE ON TEMPORARY DUTY**

Enlisted men on shore duty where quarters or subsistence are not furnished are entitled to a money allowance for subsistence and quarters. The rates are given in Executive order 9386. You can find this order in the *BuSandA Manual*. These same rates apply to enlisted men on sea duty, while absent from their ships on temporary duty not involving travel.



## CHAPTER 9

### MORE OF THE PAPER WORK

#### PAPER WORK IS NECESSARY

Too much paper work? Sometimes it may seem that way. But each bit of paper work you have to do serves a definite purpose. It's needed to keep things running smoothly. And if you know the reasons for the paper work you have to do, you won't mind it so much. So—find out. Here's some of the dope—

#### NAVSANDA FORM 333

You've already seen in Chapter 4 of this book how NavSanda Form 333 is used for the weekly bill of fare and as a means for recording the ESTIMATED quantities and costs of provisions needed to fulfill this bill of fare.

The STATEMENT OF ISSUE TO GENERAL MESS AND COST OF RATION DAILY part of the 333 is also used as a means for letting the supply officer know EXACTLY what provisions were used during the previous day. This THIRD use of the 333 will give you as CCS a daily job. Check again with figure 14 on page 33. This form is filled out just as it was when you made estimates of provisions needed for the bill of fare. Only this time the figures are ACTUAL

amounts already used in one day rather than ESTIMATED amounts to be used for a week.

Get the facts from the properly approved and receipted STUB REQUISITIONS turned in to the jack of the dust. The supply officer usually gives the CCS authority to approve stub requisitions for provisions needed by the general mess. The galley watch captains usually RECEIPT the requisitions when the provisions are delivered to the galley. The stub requisitions are turned over to the SO with the daily statement of issues to back up the quantities shown on the statement.

This daily statement of issues is further backed up by

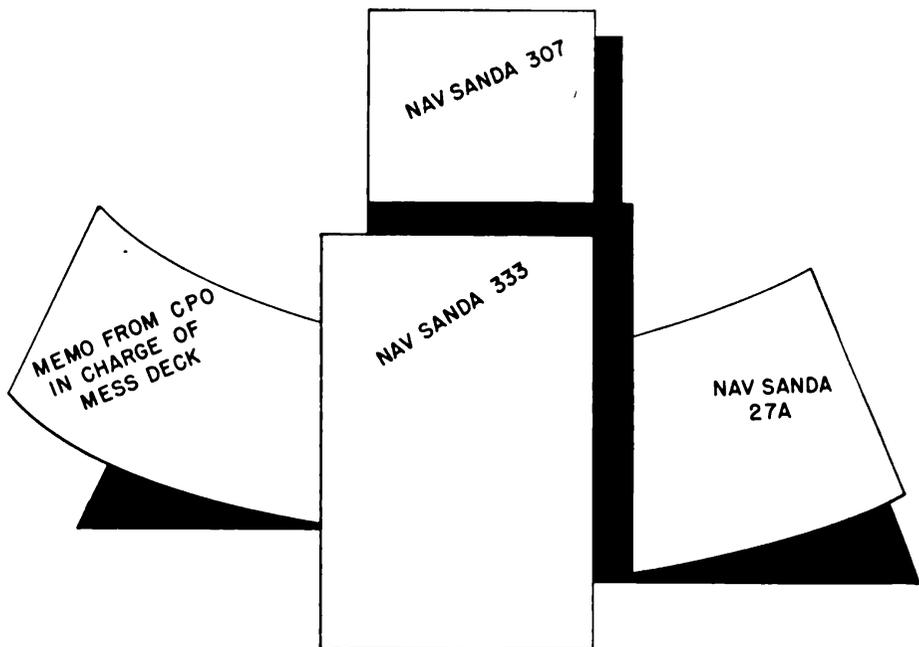


Figure 35.—Backing up the 333.

the DAILY RATION MEMORANDUM, NavSandA 27A, which comes down the exec's office every morning before 1000. Turn back to figure 29 for a sample. Remember—the important thing about the 27A as far as you are concerned is the TOTAL NUMBER OF RATIONS TO BE ISSUED IN KIND. This figure is the one you put on your STATEMENT OF ISSUES TO GENERAL MESS AND COST OF RATION DAILY—in the lower right-hand corner opposite NUMBER RATIONS DAILY. The COST OF RATION PER DAY is determined by dividing the total cost of all the provisions actually issued by the number of daily rations.

Another thing—your statement of provisions issued

must also be backed up by a memorandum from the CPO in charge of the mess deck. This memo should show the exact number of men fed at each meal.

Therefore, your daily report to the SO includes the documents pictured in figure 35.

**GENERAL MESS CONTROL RECORD**  
NAV. S. AND A. FORM 338  
(Revised May 1944)

NAME OF SHIP OR STATION U. S. S. MINNEAPOLIS						MONTH December 1945		
DATE (1)	RATIONS		RATION COST			ALLOWANCE		
	DAILY (2)	TOTAL (3)	DAILY (4)	TOTAL (5)	AVERAGE (6)	DAILY (7)	TOTAL (8)	
1	1012	1012	602.15	602.15	.5950	607.20		
2	1015	2027	586.25	1188.40	.5863	609.00	1216.20	
3	985	3012	562.14	1750.54	.5828	591.00	1807.20	
4	1002	4014	526.82	2277.36	.5674	601.20	2408.40	
5	991	5005	487.13	2764.49	.5523	594.60	3003.00	
6	979	5984	465.10	3229.59	.5397	587.40	3590.40	
7	965	6949	442.18	3671.77	.5284	579.00	4169.40	
8	972	7921	476.17	4347.94	.5237	583.20	4752.60	
9	983	8904	486.10	4634.04	.5304	589.80	5342.40	
10	942	9846	415.20	5049.24	.5128	565.20	5907.60	
11	950	10796	422.83	5472.07	.5069	570.00	6477.60	
12	946	11742	446.17	5918.24	.5040	567.60	7045.20	
13	938	12680	468.90	6387.14	.5037	562.80	7608.00	
14	978	13658	526.84	6913.98	.5062	586.80	8194.80	
15	982	14640	558.20	7472.18	.5104	589.20	8784.00	
16	980	15620	564.91	8037.09	.5145	588.00	9372.00	
17	985	16605	554.16	8591.25	.5174	591.00	9963.00	
18	988	17593	586.28	9177.53	.5217	592.80	10555.80	
19	990	18583	574.10	9751.63	.5248	594.00	11149.80	
20	989	19572	594.95	10346.58	.5286	593.40	11743.20	
21	995	20567	626.38	10972.96	.5330	597.00	12340.20	
22	993	21560	615.46	11588.42	.5375	595.80	12936.00	
23	994	22554	608.15	12196.57	.5408	596.40	13532.40	
24	996	23550	612.62	12809.19	.5439	597.60	14130.00	
25	1004	24554	1218.62	14027.81	.5713	602.40	14732.40	
26	1002	25556	562.10	14589.91	.5709	601.20	15333.60	
27	1003	26559	624.17	15214.08	.5721	601.80	15935.40	
28	1000	27559	648.60	15862.68	.5756	600.00	16535.40	
29	1001	28560	656.93	16519.61	.5784	600.60	17136.00	
30	1002	29562	661.15	17180.76	.5812	601.20	17737.20	
31	1005	30567	674.10	17854.86	.5841	603.00	18340.20	

Figure 36.—General mess control record.

### THEN WHAT HAPPENS?

When your daily 333 gets to the supply officer, the GENERAL MESS CONTROL RECORD, NavSandA Form 338, is made out from it. Although you're not responsible for making out the 338—that being the SO's job—you'll be in-

interested in how it's done, as it shows you the average cost of the rations you are providing from day to day. Thus you'll know whether or not you're keeping within any cost limits that may have been set up for your ship. Keep a 338 for yourself if you have time—just to see how it works out. You'll find it interesting. Now—examine the sample 338 given in figure 36. Here's the way it's filled in—

Column (2) entitled DAILY is the same number you listed on the 333 as NUMBER RATIONS DAILY. This is the same figure that appears on the DAILY RATION MEMORANDUM sent down by the exec.

Column (3) is a cumulative column—that is, you always add the number of rations for the day to the total rations provided up through the previous day. Look at the sample again. The 2027 given in column (3) opposite 2 in the date column is made up of the 1012 in column (3), date line 1, and the 1015 in column (2), date line 2. Also—the 3012 in column (3), date line 3, is made up of the 2027 in column (3), date line 2, and the 985 in column (2), date line 3. Check the figures for yourself.

Column (4) shows the COST of the daily rations. This is the total cost of all the provisions issued during the day as shown on your STATEMENT OF ISSUES TO GENERAL MESS AND COST OF RATION DAILY.

Column (5) is another cumulative column. Look at your sample again. The 1750.54 in column (5), date line 3, is made up of the previous total cost 1188.40 shown in column (5), date line 2, added to the 562.14 shown in column (4), date line 3.

Each entry in column 6, AVERAGE COST, is determined by dividing the total cost shown in column (5) by the total rations shown in column (3). The quotient represents the average cost of all the rations issued up through the date on which the work is being done. Thus—the .5828 shown in column (6), date line 3, of your sample represents the average cost of the 3012 rations issued during the first 3 days of the month.

### MORE RECORDS

The PROVISION LEDGER, NavSandA Form 335, is another commissary record you'll want to know about. Each page of this ledger is made up of three identical divisions

—each one covering a month. Figure 37 shows you one of these divisions.

Notice that no money amounts are used—only quantities. You'll find the unit of measure used given in the upper right-hand corner of each page (not shown in the illustration). The pound is the unit used most commonly. Gallons, quarts, and dozens are used for a few things.

NAV. S. AN. A. FORM 335  
(Revised September 1944)

10-22007-3

MONTH OF <i>July</i>		19 <i>45</i> UNIT ISSUE PRICE <i>.0347</i>					MONTH OF	
DATE	RECEIPTS	ISSUES					ON HAND	DATE
		SALES TO MESSES						
		TO GM	CABIN	WARDROOM	CPO	OTHERS		
1						3234	1	
2	6000					9234	2	
3		400		40	25	8769	3	
4		450		40	20	8239	4	
5			15			8234	5	
6		400		35	25	7764	6	
7		400	20		15	7349	7	
8				40		7309	8	
9		380	15		30	6864	9	
10		450	35	45	20	6334	10	
11		400		25	15	5894	11	
12		450	30	35	20	5359	12	
13		375		40	15	4929	13	
14		400	20	45	10	4454	14	
15		425		40	20	3969	15	
16		400	10	30	15	3514	16	
17		375			25	3114	17	
18		450	20	30	25	2589	18	
19		400		20		2169	19	
20	6000		20		35	8114	20	
21		400		20		7694	21	
22		375	25		20	7274	22	
23		425		25		6824	23	
24			20		30	6769	24	
25		400		20		6399	25	
26		375	25		25	5924	26	
27		400		30		5494	27	
28		425	30		20	5019	28	
29		400		25		4594	29	
30		375	25		25	4169	30	
31		400		30		3739	31	

Figure 37.—Section of provision ledger.

Each page of the ledger is for one particular item of provisions. The stock number, correct name of article, unit price, and where the provisions are stored are also

given. Now look at the main part of the ledger (figure 37). The figures for the RECEIPTS column are taken from the delivery invoices that accompany every delivery. The data for the ISSUES column are taken from the 307's that are made out for each issue. And here's how you determine what to put in the ON HAND column—

RATION RECORD	
MAY 5, AND A FORM 45—Rev. 1-22 March 1944	
U. S. S. HAZEL FROM 1 Jan. TO 31 Mar. '45	
VALUE OF BALANCE OF STORES FROM LAST REPORT <span style="float:right">\$ 1216.29</span>	
RECEIPTS	
BY PURCHASE (LISTED ON ATTACHED ABSTRACT (S. AND A. FORM 147))	1245.33
BY TRANSFER (LISTED ON ATTACHED ABSTRACT (S. AND A. FORM 147))	460.29
BY TRANSFER FROM SHIP'S STORE	100.00
BY TRANSFER FROM WAR SHIPPING ADMINISTRATION	400.00
BY	
BY	
BY	
BY	
TOTAL	\$ 3421.91
EXPENDITURES	
SALES TO MESSSES	153.79
CONDEMNED BY SURVEY	6.59
TRANSFERRED TO U. S. S. DOOEY	33.80
TRANSFERRED TO COAST GUARD	100.00
TRANSFERRED TO ARMY	400.00
TRANSFERRED TO	
VALUE OF STORES ON HAND (BY INVENTORY ATTACHED)	1092.85 <span style="float:right">\$ 1787.03</span>
VALUE OF STORES ACTUALLY CONSUMED	1634.88
TOTAL	\$ 3421.91
MESS STATEMENT	
NUMBER OF RATIONS ALLOWED 3406 AT \$ .50	1703.00
UNUSED ALLOWANCE FROM PREVIOUS REPORT	230.00 <span style="float:right">\$ 1933.00</span>
VALUE OF STORES ACTUALLY CONSUMED	1634.88
UNUSED ALLOWANCE	298.12
AVERAGE DAILY COST OF RATION \$ .48 <small>(i.e., in value of stores actually consumed by number of rations)</small>	
AVERAGE NUMBER SUBSISTED DAILY 37	
<i>P. J. Miller</i>	Engr.

Figure 38.—Ration record.

Whenever there is a receipt, ADD the quantity of the receipt to the previous ON HAND quantity. Whenever there is an issue, SUBTRACT that quantity from the previous ON

HAND quantity. If you have both receipts and issues on the same day, subtract one from the other. If the RECEIPTS are larger than the issues, ADD the difference to the previous ON HAND quantity. If the ISSUES are larger than the receipts, SUBTRACT the difference from the previous on hand quantity.

The UNIT ISSUE PRICE must be kept up to date (except at U. S. shore stations where a Supply Corps officer is in charge). Here's how—suppose your first receipt of beef, fresh frozen, weighed 1,200 pounds and cost 16¢ a pound. Your first unit issue price is 16¢, of course. After you issue 900 pounds of this receipt, you receive 1,500 pounds more of beef, fresh frozen. The cost of this new receipt is 17¢ per pound. At what price are you going to charge the issues that are now made? First—find the total cost of what you have left of the old lot of beef—like this—

$$300 \times .16 = 48.00$$

Then get the total cost of the new lot—

$$1500 \times .17 = 225.00$$

Add these two amounts together—

$$\begin{array}{r} 48.00 \\ + 225.00 \\ \hline 273.00 \end{array}$$

Divide this amount by the total number of pounds now on hand.

$$273 \div 1800 = .1517$$

Charge your issues off at \$.1517 per pound until receipts at a different cost change this price.

### THE FINAL REPORTS

The RATION RECORD, NavSandA Form 45, gives an overall picture of what provisions are received and what happens to these provisions. This form is used for final reports afloat, abroad, and ashore within the continental United States where the general mess is NOT operated by an officer of the Supply Corps. Usually, the record covers a period of three months. Other periods of time are used only when it is necessary to prepare the ration record due to the detachment of either the SO or the CO at some time other than the end of a three-month period.

Now look at the sample given in figure 38. Notice that the form is in three main divisions—one for RECEIPTS, one for EXPENDITURES, and one for a MESS STATEMENT. The first amount listed on the receipts side is the value of the provisions you had on hand at the beginning of the period. Then receipts of provisions by purchases, by transfers, and by other means are listed. Abstracts are made of the purchases and of the transfers on separate NavSandA Form 147's. See figure 39 for a sample abstract.

**ABSTRACT OF VOUCHERS**  
 NAV. S. AND A. FORM 147  
 Revised April 1944

CHARACTER OF  RECEIPT  EXPENDITURE  **Purchase** TITLE: ~~XXXXXXXXXX~~ ~~XXXXXXXXXX~~ **11-V-178**

ACTIVITY OR SHIP **U.S.S. MINNEAPOLIS** FOR THE { MONTH } { QUARTER } ENDING **31 July 1945**

VOUCHER NO.	DATE OF VOUCHER	APPROPRIATION CHARGEABLE	Title and Account Chargeable	RECEIVED FROM OR EXPENDED TO—	AMOUNT
32-48	3/15	1740802		Weems and Co.	326 15
45-48	4/15	1740802		T. Donahoo Corporation	115 10
51-48	4/26	1740802		F. Frank	56 18
62-48	5/6	1740802		Standard Products Co.	86 14
71-48	5/21	1740802		M. May	126 10
84-48	6/12	1740802		C. Carey, Inc.	85 16
92-48	7/14	1740802		A. Ames and Co.	24 18
101-48	7/28	1740802		B. Barnes and Son	426 32
				Total	1,245 33

10-3040-2 U. S. GOVERNMENT PRINTING OFFICE: 1944

Figure 39.—Abstract of vouchers.

Notice the type of things listed as expenditures on your sample 45. The sales to messes figure is taken from the RATION VOUCHER AND STATEMENT OF SALES TO MESS, NavSandA Form 42. See page 83 for a sample. The CONDEMNED BY SURVEY amount is backed up by a SURVEY RE-

MONTHLY RATION MEMORANDUM

NAV. S. AND A. FORM 27  
Revised March 1944

U. S. S. MINNEAPOLIS

DAY OF MONTH	TOTAL ENLISTED CREW AND MARINES ATTACHED TO VESSEL (1)	NUMBER ABSENT (2)	TOTAL NUMBER CREW AND MARINES ON BOARD (COL. 1 LESS COL. 2) (3)	NUMBER OF SUPER-NUMERARIES ON BOARD		TOTAL (COLS. 4, 5, 6) (8)	TOTAL NUMBER OF RATIONS TO BE ISSUED IN KIND (COL. 8 LESS COLS. 9 AND 10)		TOTAL NUMBER OF RATIONS TO BE COMMUTED	
				NAVY (4)	MARINES (5)		NAVY (7)	MARINES (9)	NAVY (10)	MARINES (11)
1	1013	0	1013	0	0	1013	968	20	22	3
2	1007	5	1002	3	0	1005	960	20	22	3
3	1006	8	998	3	2	1003	959	19	22	3
4	1021	12	1009	3	2	1014	969	20	22	3
5	1021	18	1003	6	4	1013	966	22	22	3
6	1024	20	1004	6	4	1014	971	23	17	3
7	1029	20	1009	6	4	1019	976	23	17	3
8	1026	15	1011	6	0	1017	976	21	17	3
9	1024	15	1009	0	0	1009	970	19	17	3
10	1024	15	1009	0	0	1009	970	19	17	3
11	1024	10	1014	0	0	1014	969	20	22	3
12	1025	5	1020	10	0	1030	989	17	22	2
13	1025	5	1020	10	0	1030	989	17	22	2
14	1025	5	1020	10	0	1030	989	17	22	2
15	1025	0	1025	10	5	1040	990	25	2	3
16	1025	0	1025	0	5	1030	980	25	22	3
17	1020	0	1020	0	0	1020	975	20	22	3
18	1020	0	1020	0	0	1020	975	20	22	3
19	1020	0	1020	0	0	1020	975	20	22	3
20	1015	15	1000	7	0	1007	969	15	20	3
21	1015	15	1000	7	2	1009	969	17	20	3
22	1015	15	1000	7	2	1009	969	17	20	3
23	1015	10	1005	7	0	1012	974	15	20	3
24	1017	2	1015	0	0	1015	972	20	20	3
25	1017	2	1015	0	0	1015	972	20	20	3
26	1017	2	1015	0	0	1015	972	20	20	3
27	1015	0	1015	5	5	1025	975	25	22	3
28	1020	1	1019	5	5	1029	980	25	22	2
29	1020	1	1019	0	0	1019	975	20	22	2
30	1020	0	1020	0	0	1020	975	20	22	3
31	1020	0	1020	0	0	1020	975	20	22	3
TOTAL	31610	216	31394	111	40	31545	30192	621	643	88

TO SUPPLY OFFICER:

I certify that the above is a correct recapitulation of the Daily Ration Memorandum (S. and A. Form 27a), for the month ending 31 December, 1945.

*F. C. Carney*  
F. C. Carney, Comdr.

\* U. S. GOVERNMENT PRINTING OFFICE: 1944 16-36027-1

Figure 40.—Monthly Ration Memorandum.

QUEST, REPORT, AND EXPENDITURE, NavSandA Form 154. See page 85. This form is prepared by the SO from your Survey of Provisions book (page 84).

The figures for the transfers are taken directly from

the RECEIPT/EXPENDITURE INVOICES, NavSandA Form 127, which were used for expenditures. See page 56 for a sample.

The value of stores on hand figure is backed up by the INVENTORY OF PROVISIONS, NavSandA Form 84. See page 75. The quantities listed on the inventory are determined by ACTUAL COUNT of the provisions on hand. The value of these provisions is found by multiplying the quantity by the unit cost price shown on the provisions ledger.

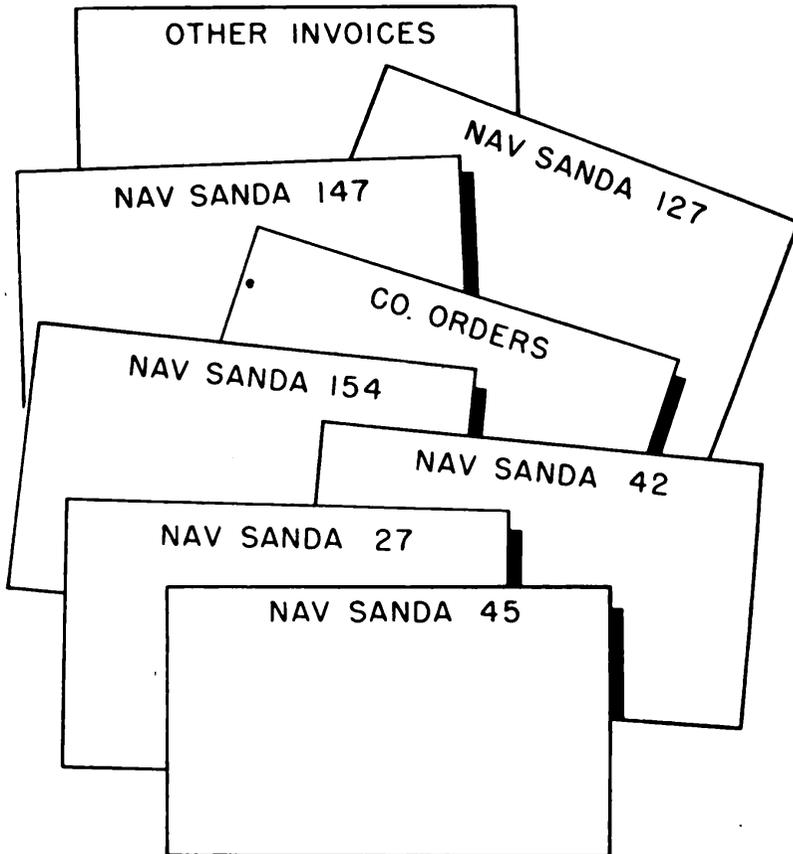


Figure 41.—Backing up the 45.

The VALUE of stores actually consumed is determined from the issues columns of the PROVISIONS LEDGER.

In the mess statement section, the number of rations allowed is determined from the GENERAL MESS CONTROL RECORD. The last figure in the TOTAL RATIONS column is the one to use. The MONTHLY RATION MEMORANDUM (NavSandA 27) prepared in the exec's office from the Daily Ration Memoranda backs up the number of rations allowed. See figure 40.

The daily cost of rations is figured by dividing the value

## COMBINED QUARTERLY INVOICE, RETURN OF PROVISIONS AND STATEMENT OF OVER AND UNDER ISSUES

Ship or station USS DE (5629), from 1 Jan to 31 Mar 1945.

ITEM NO. (A)	ARTICLES (B)	RATION ALLOWANCE (C)	TOTAL QUANTITIES (D)	RATION FACTOR (E)	NUMBER OF RATIONS (F)	TOTAL VALUES (G)	DAILY RATION VALUE (H)
1	Biscuit.....	8 oz.	173 lb.	2	346	\$ 23.89	
2	Bread, fresh.....	12 oz.		1.3333			
3	Flour.....	12 oz.	7,830 lb.	1.3333	10,440	304.16	
4	TOTAL BREAD RATIONS.....				10,786	328.05	.0304
5	Meat, preserved.....	12 oz.	642 lb.	1.3333	856	285.16	
6	Meat, salt and smoked.....	14 oz.	1,965 lb.	1.1429	2,446	562.18	
7	Meat, fresh.....	20 oz.		.8			
8	Meat, fresh, boneless.....	15 oz.	9,860 lb.	1.0666	10,517	3,975.15	
9	TOTAL MEAT RATIONS.....				13,619	4,822.49	.3541
10	Vegetables, dried.....	12 oz.	180 lb.	1.3333	240	14.85	
11	Vegetables, canned.....	18 oz.	3,640 lb.	.8889	3,236	518.15	
12	Vegetables, fresh.....	44 oz.	14,512 lb.	1.3636	5,277	1,295.22	
13	Vegetables, frozen.....	16 oz.	3,816 lb.	1.0000	3,816	849.18	
14	Vegetable juice, canned.....	6 oz.	1,094 lb.	2.6667	2,917	80.75	
15	TOTAL VEGETABLE RATIONS.....				15,486	2,758.15	.1781
16	Fruit, dried.....	4 oz.	402 lb.	4	1,608	104.10	
17	Fruit, canned.....	10 oz.	6,501 lb.	1.6	10,402	1,010.08	
18	Fruit, preserved.....	6 oz.	456 lb.	2.6667	1,216	52.10	
19	Fruit, fresh.....	16 oz.	3,216 lb.	1	3,216	336.25	
20	Fruit juice, canned.....	6 oz.	820 lb.	2.6667	2,187	84.26	
21	Fruit juice, concentrated.....	.6 oz.		26.6667			
22	Fruit juice, powdered.....	1 oz.	18 lb.	16	288	7.15	
23	TOTAL FRUIT RATIONS.....				18,917	1,593.94	.0843
24	Cocoa.....	2 oz.	32 lb.	8	256	3.16	
25	Coffee.....	2 oz.	624 lb.	8	4,992	124.80	
26	Tea.....	1/2 oz.	24 lb.	32	768	11.81	
27	TOTAL BEVERAGE RATIONS.....				6,016	139.77	.0232
28	Milk, evaporated.....	4 oz.	705 lb.	4	2,820	84.20	
29	Milk, fresh.....	1/2 pt.	708 gal.	18	11,328	272.15	
30	Milk, powdered.....	1 oz.	252 lb.	16	4,032	112.60	
31	TOTAL MILK RATIONS.....				18,180	468.95	.0258
32	Butter.....	1.6 oz.	1,122 lb.	10	11,220	564.82	.0503
33	Cereals, rice, starch foods.....	1.6 oz.	810 lb.	10	8,100	105.18	.0130
34	Cheese.....	1/2 oz.	426 lb.	32	13,632	102.14	.0075
35	Eggs.....	1.2 egg	1,532 doz.	10	15,320	714.95	.0467
36	Lard or lard substitute.....	1.6 oz.	1,268 lb.	10	12,680	182.10	.0144
37	Oils, sauces and vinegar.....	1/4 gill	142 gal.	80	11,360	155.16	.0137
38	Sugar.....	5 oz.	2,820 lb.	3.2	9,024	158.36	.0175
39	Baking powder and soda.....	As required	55 lb.			4.16	
40	Extracts, flavoring.....	As required				20.10	
41	Mustard.....	As required				5.16	
42	Pepper.....	As required	10 lb.			1.65	
43	Pickles.....	As required				82.95	
44	Salt.....	As required	480 lb.			4.80	
45	Sirup.....	As required					
46	Spices.....	As required	18 lb.			12.55	
47	Yeast.....	As required	135 lb.			16.20	
48	TOTAL VALUE (39-47).....					147.57	.0068
49	Miscellaneous.....						
TOTAL.....						12,241.63	.8658

RECAPITULATION OF CHARGES TO "PAY, SUBSISTENCE AND TRANSPORTATION, NAVY"	
Value of issues to general mess.....	\$ 12,241.63
Value of ice and cold storage charges.....	86.20
Value of losses by survey.....	126.40
<b>TOTAL.....</b>	<b>12,454.23</b>

STATEMENT OF GENERAL MESS	
Number of daily rations allowed.....	15,400
Average daily cost of subsistence per man.....	\$ .7949
Allowed value of issues.....	13,333.32
Increase, Act March 2, 1933.....	0
<b>TOTAL.....</b>	<b>13,333.32</b>
Actual value of issues (column G).....	12,241.63
<b>NET UNDER/EXCESS ISSUE.....</b>	<b>1,091.69</b>
Allowed complement.....	180

I CERTIFY to have received from the supply officer provisions to the value of \$12,241.63 (column G).

*R. L. Moore* Lt., (SC) USNP  
Commissary officer.

NOTE.—Instructions for use of this form, method of preparation and distribution, see S. and A. Manual and S. and A. Memoranda  
U. S. GOVERNMENT PRINTING OFFICE : 1942 16-27701-1

Figure 42.—NavSandA form 36.

of stores actually consumed by the number of rations allowed.

The average number subsisted daily is found by dividing the number of rations allowed by the number of days covered by the rations report—usually 90, 91, or 92 days.

Figure 41 shows you the papers that must be sent in with the 45 as substantiating vouchers.

### NAVSANDA FORM 36

The COMBINED QUARTERLY INVOICE, RETURN OF PROVISIONS AND STATEMENT OF OVER AND UNDER ISSUES (NavSanda Form 36) is ONE form. See figure 42. It is used when the general mess is operated on the basis of the Navy Ration instead of on a money allowance.

As an INVOICE, the 36 is prepared by the supply officer and given to the commissary officer to show just what provisions were turned over to the commissary department. The commissary officer signs at the bottom of the form to indicate that he received the provisions. When used as an invoice, the supply officer fills in only columns (D) and (G).

As a RETURN, the 36 is sent into BuSanda within 15 days after the end of each quarter and upon detachment of the supply or commissary officer in charge of the general mess.

Volume 4 of the BuSanda Manual gives information about the papers backing up the 36.

### PREPARING THE 36

Preparing the 36 is the supply or commissary officer's job. But you'll understand the work of the commissary department better if you know how the form is prepared.

Turn to the sample 36 in figure 42. The provisions listed in the ARTICLES column are those specified in the Navy Ration. The RATION ALLOWANCE column indicates the quantities given in the Navy Ration for each of the articles.

The entries for the TOTAL QUANTITIES column are determined from the provision ledger.

The RATION FACTORS given in column (E) show how many rations each unit of each article provides. For example—the ration allowance for biscuits is 8 oz. or  $\frac{1}{2}$  pound. Therefore, each pound of biscuits provides two

rations. The ration allowance of fresh meat is 20 oz. Therefore, each pound of meat provides 16/20 or .8 of a ration. You can find any ration factor by dividing the unit of measure for any particular article by the ration allowance for that article.

To get the number of rations for column (F), all you need do is multiply the figure in column (D) by the ration factor in column (E).

The TOTAL VALUES for column (G) are determined from the provision ledger.

The DAILY RATION VALUE for each section is determined by dividing the total value amount in column (G) by the number of rations in column (F).

Now look at the STATEMENT OF GENERAL MESS section in the lower right-hand part of the 36. The NUMBER OF RATIONS ALLOWED figure is taken from the MONTHLY RATION MEMORANDUM (NavSandA 27,), which is prepared in the executive office from the 27A's and sent to the supply office at the end of each month.

The AVERAGE DAILY COST OF SUBSISTENCE PER MAN is the sum of the total values column divided by the number of daily rations allowed.

The ALLOWED VALUE OF ISSUES is found by multiplying the total daily ration value (column H) by the number of daily rations allowed.

Your ship may be granted additional ration allowances under the act of March 2, 1933. This will usually be true only if your complement is less than 150 and you're working on the basis of the Navy Ration rather than on a money allowance. Your SO or your CO will know about this.

The ACTUAL VALUE OF ISSUES is the total of column (G). Get the NET UNDER/OVER ISSUE by subtracting. If the actual value of issues is greater than the allowed value, you have an over-issue—so cross out the word UNDER. If the allowed value is greater than the actual value issued, you have an under-issue. Cross out the word OVER.

The part of the 36 headed Recapitulation of Charges to "PAY, SUBSISTENCE AND TRANSPORTATION, NAVY" is also made out in the supply office. The VALUE OF ISSUES TO GENERAL MESS is the total of column (G). The value of ICE AND COLD STORAGE CHARGES is determined from invoices on hand. The VALUE OF LOSSES BY SURVEY shows

up in the provisions survey book or on the NavSandA 154 made out from that book.

After adding these three amounts together, you get a total that represents the total cost of subsisting the men who eat in the general mess.



## CHAPTER 10

### COOKING IN THE FIELD

#### GOING ASHORE

The Navy operates on the sea, in the air, and on LAND. In wartime, these inland operations may be in the forward battle zones. The beach battalions must keep beaches clear and traffic moving in any landing operation. They must be among the first to hit the beaches. The construction battalions have to get ashore fast in order to get air strips and roads built. And no matter what the operation, men must eat. **YOUR JOB IS TO SEE THAT THEY HAVE SOMETHING TO EAT.**

During actual battle operations, you may be called upon to do other things besides preparing food. You may be helping with first aid. Better be up on what the *Blue-jackets' Manual* has to say about this important subject. Oftentimes commissary personnel are ordered to reinforce the stretchermen in bringing in wounded men to the dressing station or hospital. Those who assist these stretchermen should lay aside their arms and wear the Red Cross arm badge. Sometimes you may be ordered to recover the arms and ammunition of the dead and wounded. Hold yourself ready to perform any duties your superiors may order. You're not only a cook—you're a fighting man as well. But always **BEFORE** and **AFTER**—

and sometimes DURING—an engagement, your duty is to furnish that indispensable weapon, FOOD. Meals that are well prepared—no matter what materials are on hand—will do a great deal to keep up the morale of the men.

In the heat of battle it may be impossible to prepare ANY food for a long period of time. That's where the K rations, C rations and other types of field rations fit in. These battle rations have been carefully prepared so that the necessary food values are provided in a form that can be used under battle conditions. You'll want to know something about them.

### C RATIONS

The C RATION consists of previously cooked or prepared food, packed in hermetically sealed cans. One day's ration consists of the following—

3 cans per day or 1 can per meal containing an "M-Unit".

3 cans per day or 1 can per meal containing a "B-Unit".

1 Accessory Packet per day.

An "M-Unit" can may be made up of ham, eggs, and potatoes; meat and beans; chicken and vegetables; frankfurters and beans or any one of other available combinations.

The "B-Unit" contains biscuits, compressed cereal, a beverage such as coffee, cocoa, or lemonade; sugar, and some confection such as candy-coated peanuts or raisins, hard candy, and coconuts or jam in a variety of flavors.

The ACCESSORY PACKET may contain matches, cigarettes, chewing gum, halozon tablets, and toilet tissue.

Eight complete rations—48 cans—are packed in one box. They are packed in two layers, 24 cans to a layer. The space between the cans is used for the accessory packets. The packing is done so that you can distribute the rations easily—even in the dark.

As new discoveries are made, the C rations are changed. The present C ration contains approximately 3150 calories of food and may be eaten hot or cold. This provides sufficient food value for one day. Each C ration weighs a little over four pounds.

## FIELD RATION D

FIELD RATION D is strictly an emergency ration and should be used only as a last resort and then for as short a period as possible. One of these rations consists of three 4 oz. bars made up of a combination of chocolate, sugar, skimmed milk powder, cocoa fat, oat flour, and flavoring. Each bar is enriched with thiamin. The ration of three bars contains about 1,725 calories of food value.

Because the D ration is a concentrated food, it must be eaten slowly to prevent ill effects. It can be dissolved by crumbling it into a cup of boiling water if you would rather drink it.

## K RATIONS

For all around use, the K RATION is the best field ration developed so far. This ration consists of only three units—one for each meal of the day. The units are labeled BREAKFAST unit, DINNER unit, and SUPPER unit. The ration is light in weight (less than 3 pounds); compact, and its components will withstand long periods of storage with little change in flavor, texture, and appearance. The processed components are pre-cooked and may be eaten either hot or cold. Here's a typical K ration menu—

BREAKFAST	DINNER	SUPPER
K biscuits	K biscuits	K biscuits
Egg and meat product	Cheese product	Meat product
Fruit bar	Caramels	Chocolate bar
Coffee	Lemon juice powder	Bouillon
Sugar	Sugar	

The present K ration contains approximately 3,000 calories—enough for the average man for one day. A good cook can make appetizing meals with this type of ration even under adverse conditions.

## TEN-IN-ONE RATION

The TEN-IN-ONE RATION consists of canned and processed foods, packed in one box and sufficient to subsist ten men for one day. Due to its variety and food values, this ration may be used satisfactorily for as long as five to six weeks if necessary. To afford variety there are five different menus. Here's a typical one—

BREAKFAST	DINNER	SUPPER
Cereal	Egg and meat product	Roast beef
Bacon	K biscuits	Corn
Biscuits	Fruit bar	C biscuits
Jam	Lemon powder	Army spread
Coffee	Sugar	Hard candy
Milk		Coffee
Sugar		Sugar

The caloric value of a ten-in-one ration is approximately 3,900—more than adequate for the average man for one day.

But—remember—all of these special rations are designed for use only when you can't provide regular chow. You're to see that good Navy chow is provided whenever possible. Ashore, one of your first jobs may be the selection of a suitable spot for your galley.

### WHERE TO LOCATE THE GALLEY ASHORE

There are a number of things to look for when you are picking out the site for your shore galley. If there is danger from bombing or other enemy action, select a place having good natural cover, well shielded from observation. High, dry ground near a slope that provides good drainage is also desirable. A good natural water supply such as a lake, stream, or a spring should be nearby. And a road network sufficient for the free movement of mess vehicles may be essential. Above all—insist that your galley be located on the opposite side of the camp from the latrines.

### STOWAGE OF FOOD ASHORE

Ordinarily, you'll get most of your food from the supply of provisions aboard ship. If it becomes necessary to procure additional provisions ashore, be sure the required quality inspection is made by somebody from the medical department. You'll need some means of stowing whatever provisions you have for a little while at least.

Dry provisions including canned goods won't give you much trouble. Keep them in as cool a place as possible. And watch out for insect trouble. If mechanical refrigeration is available, you won't have any trouble with perishables. But sometimes this equipment is not available or

if it is, it may not be operating properly under field conditions. What then?

Figure 43 shows an underground food box which, if properly built, will serve well for storage of perishables for some time.

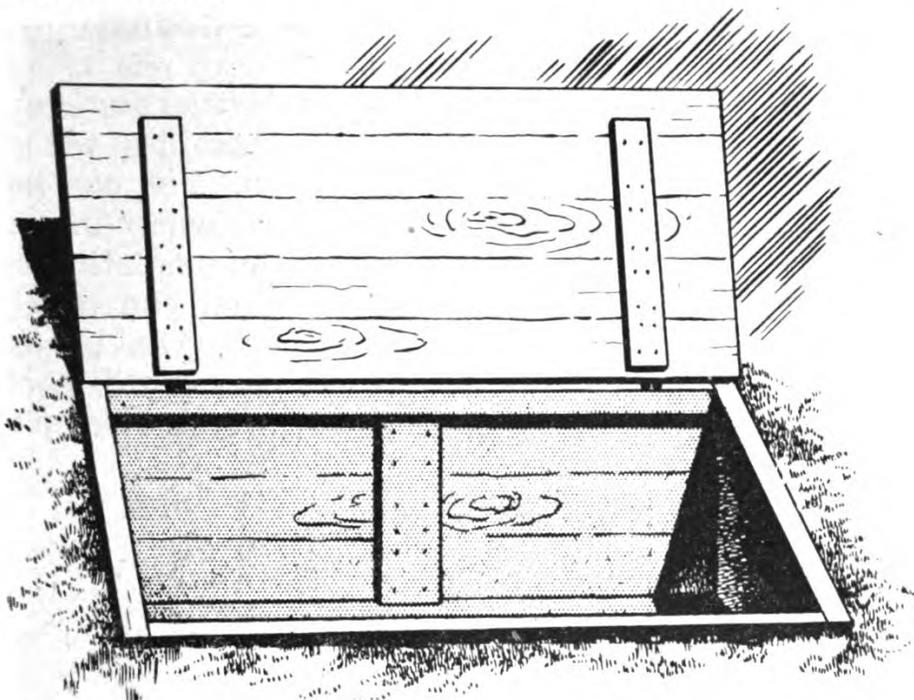


Figure 43.—Underground food box.

This simple type of storage box is made by digging a pit the size of a packing box and lowering a packing box into it. Cover the box carefully and well. If frozen meats are stored in this box, they will help keep other products cool. When received this frozen meat is about 20° F. colder than ice.

If your camp is going to be more permanent, you'll find it wise to build a more efficient food box. Here's a way you can do this—

Take a large packing box and punch a number of holes in the bottom. Cover the outer sides with waterproof paper or other waterproofing material. Then dig a pit slightly larger than the box and fill the bottom with loose rocks and gravel. Sink the box in the pit so that the top of the box is several inches below the level of the ground. Inside this box, place a smaller one which will allow a space of three or four inches between the two boxes on all sides. On the bottom and between the sides of the boxes, place straw, grass, sawdust or similar material for

insulation. Build a fairly heavy top and fasten it with hinges. Be sure the top is large enough to cover both boxes. Covering the top with a wet blanket will add to the effectiveness of the storage compartment. To prevent seepage during heavy rains, it may be advisable, depending on the terrain and the type of soil, to dig a drainage ditch around the box.

If you do a good job, this box may be used for fruits, vegetables, milk, butter, and other perishables without the aid of frozen meats for refrigeration. You can keep the storage temperature lower by pouring water into the sides from time to time—thus keeping the insulation material damp. Many variations of this box can be constructed for different uses. Similar boxes can be used for highly perishable storage if the compartment is cooled with ice or by the use of frozen meats. Be sure to keep the

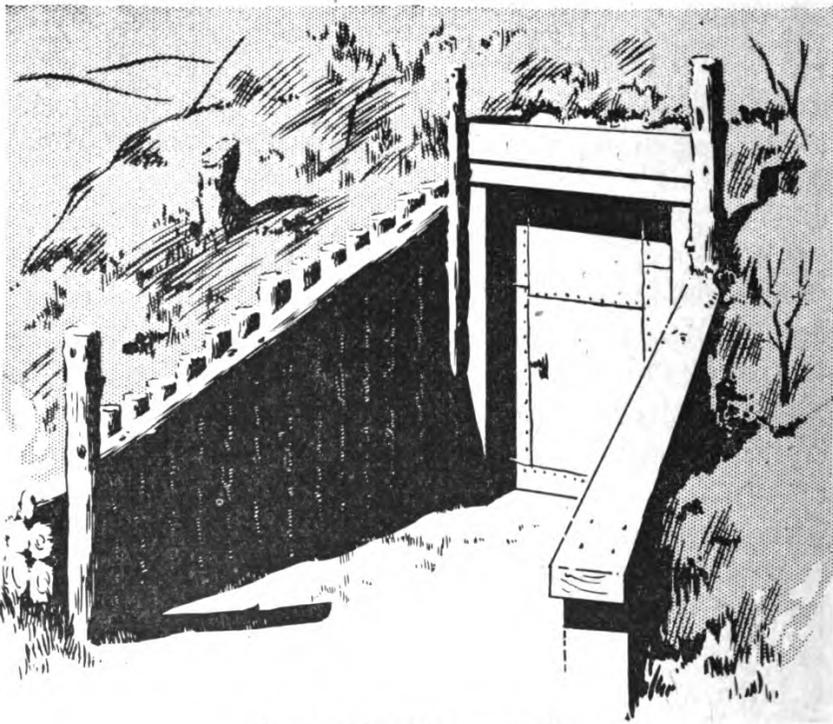


Figure 44.—The root cellar.

ice in a separate compartment from the perishables.

### THE ROOT CELLAR

The ROOT CELLAR is recommended for the stowage of many fruits and vegetables—particularly the root crops. Because of the convenience of approach and because

drainage will be better, dig the cellar into the side of a hill on a slope, as shown in figure 44. Line the sides with waterproof material and reinforce as much as is necessary to prevent cave-ins. Cover the top with heavy boards or logs and canvas in a way that will give complete protection from the elements. Be sure to provide some ventilation at the top. Be certain you have good drainage. And always stow your provisions on dunnage. Naturally a door needs to be added. Make it large enough to admit

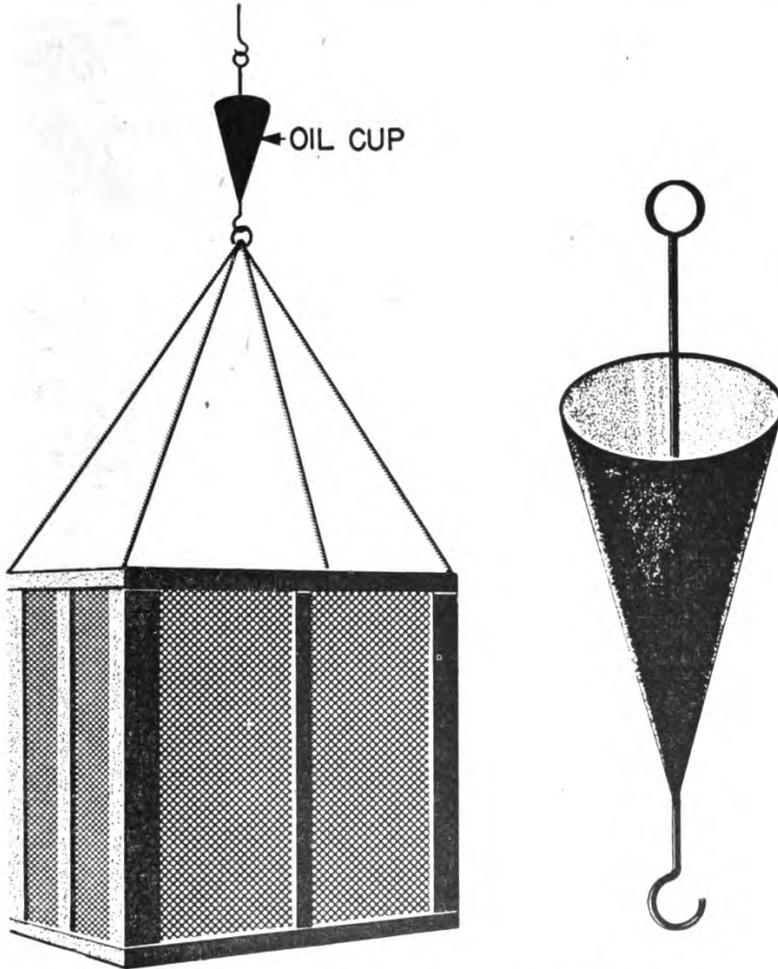


Figure 45.—Swinging cage food box.

containers without too much crowding. When the door is not in use, keep it securely closed and covered with canvas.

### OTHER WAYS OF STOWING PROVISIONS

There are many other ways that provisions may be stowed in the field.

In temporary camps, food can be put in water-tight containers and placed in springs or streams.

For a short time, supplies may be simply buried in the ground. Dig a hole. Line it with burlap sacks and boards. After you have placed your provisions in this hole, cover it with soil, straw, or leaves.

For small amounts of provisions, a food box like the one shown in figure 45, screened with wire or cloth netting and suspended from the branch of a shade tree, can be effective. This provides plenty of ventilation and if you

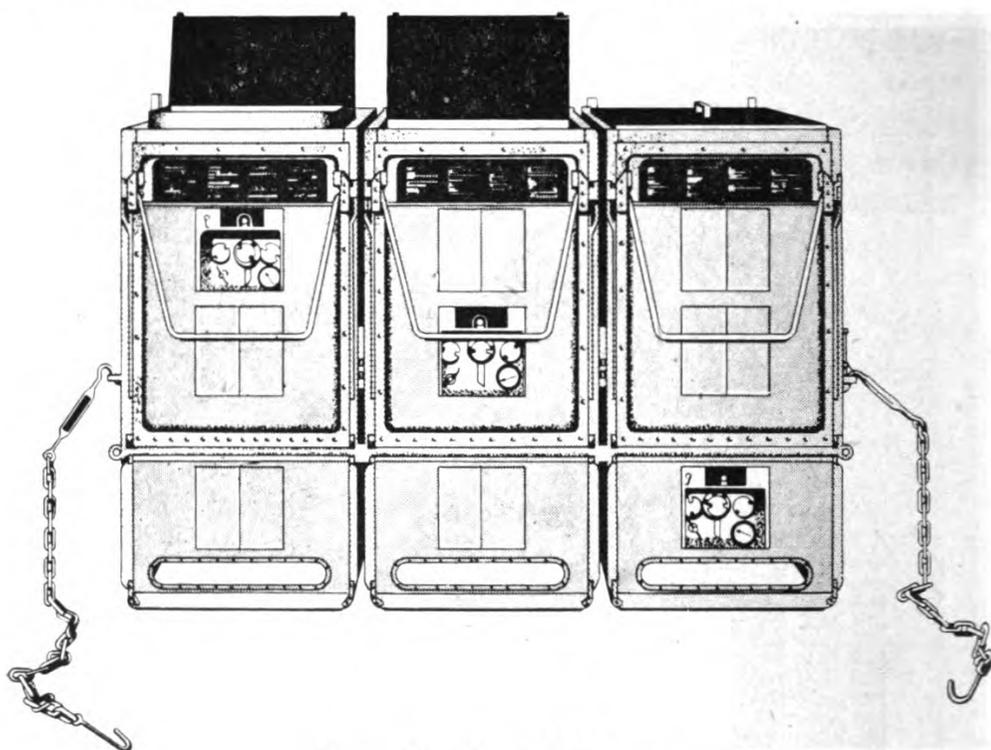


Figure 46.—The M1937 range.

use the little oil cup device shown at the right of the illustration, you won't have any trouble with insects. Just fill the cup with oil. The cooling effect of the box can be increased by wrapping it in cloth material which is kept damp by sprinkling frequently with cold water. Meat, dairy products, fruits and vegetables can be stowed TEMPORARILY in this container.

#### **COOKING EQUIPMENT—THE M1937 RANGE**

For best results in field cooking, get as many units of the M1937 range as you need. This range is standard Army equipment, and it is the most satisfactory appliance available for preparing meals in the field. It can be used

for boiling, roasting, frying, and griddle cooking. In addition, it can be adapted to function as a bake oven. The range is constructed in small cabinet units. Three of these units are shown in figure 46.

Notice that the gasoline fire unit is shown in a different position in each of these range sections; it can be placed in either the top, center, or bottom positions for different purposes, as you will see shortly.

One unit of the M1937 is adequate for 50 men or less. Two units are needed for 50 to 100 men and three units will be enough for as many as 225 men. Equipment that comes with the M1937 is shown in figure 47. Notice particularly the gasoline fire unit, and the wood burning grate which can be used instead of the regular fire unit if gasoline is not available.

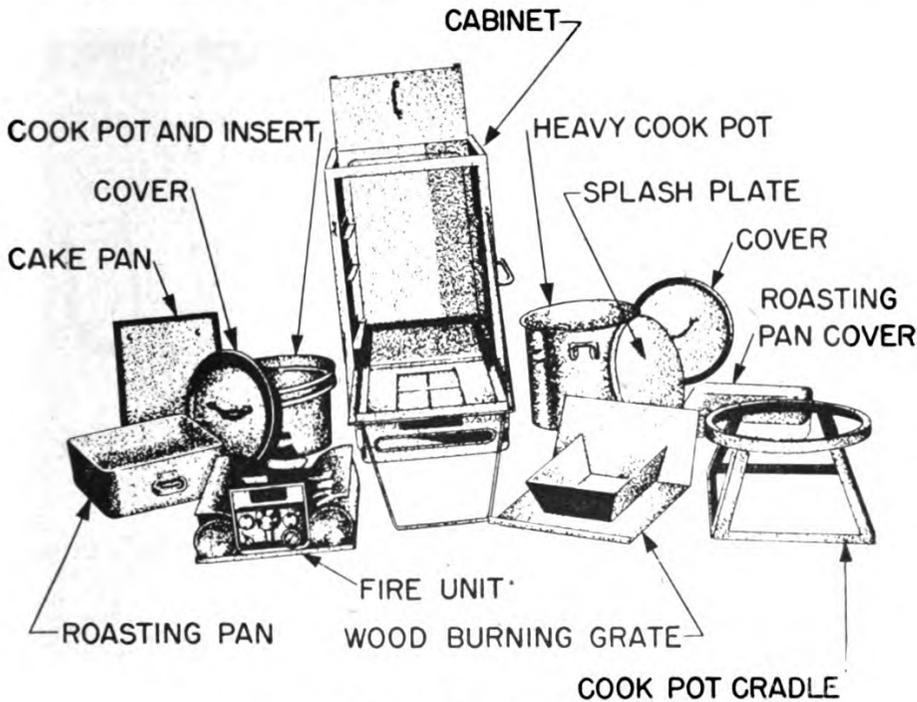


Figure 47.—M1937 range equipment.

The cooking vessels for the range include a 10-gallon roasting pan, a pan cover which can be turned over and used as a griddle, a cake pan which may be placed inside the roasting pan, a 15-gallon cooking pot with cover, and a 10-gallon insert with cover. This insert may be used independently or set in the larger part of the cook pot to form a double boiler. A cook-pot cradle is also included. Handles for lifting are provided on the range cabinet, the fire unit, and on all cooking vessels. Two hay hooks

are included for pulling out the cook-pot cradle and lifting hot vessels from the range.

With the M1937 range you get the accessories shown in figure 48.

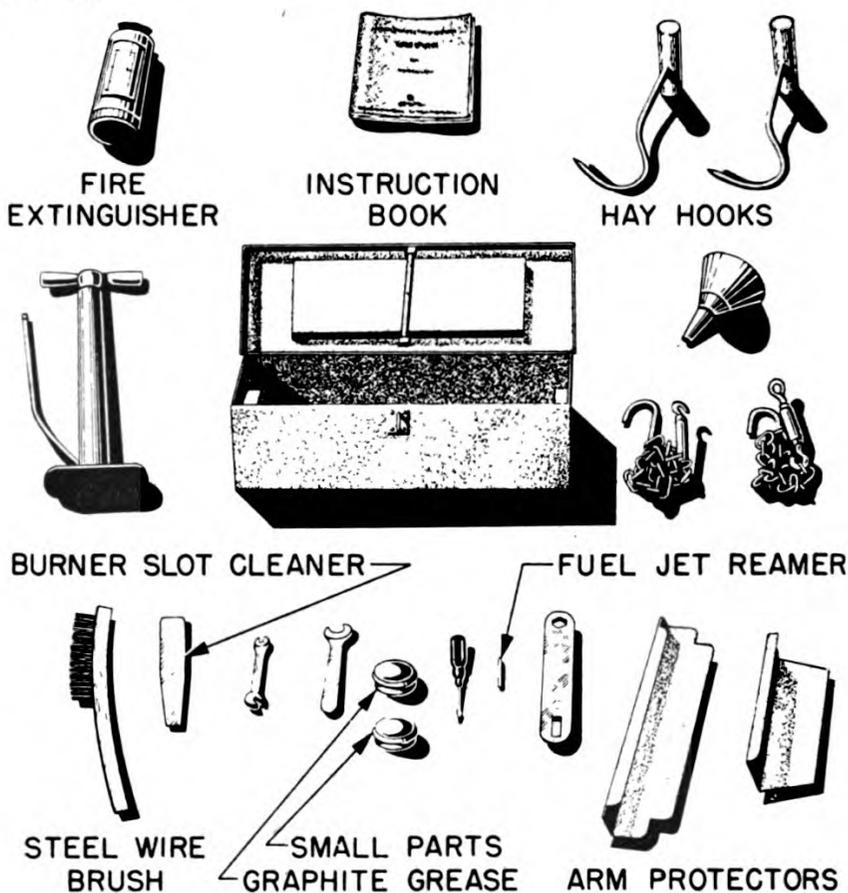


Figure 48.—Accessories for M1937 range.

Also—you ought to get the complete set of cooking utensils shown in figure 49.

### COOKING WITH THE M1937 RANGE

BOILING is done in the cook pot with the fire unit in the bottom position. Twelve gallons of water can be boiled in 30 minutes with each range. Either of the cook pots may be placed in the cradle or the two may be fitted together to form a double boiler. Use the heavy cover when cooking with either of these vessels. After you open the door of the cabinet, plant the door handle firmly on the ground in order to support the door. If the handle slips, the range may be overbalanced when the cradle is pulled out, or the contents of the cooking pot may spill if the cradle does not come out easily.

ROASTING is done in the roasting pan with the fire unit in either the bottom or the middle position. If something is to be boiled at the same time as meat is being roasted, use the bottom position. Otherwise the middle position is more desirable. ALWAYS put the cover on the roasting pan when the pan is in use and keep the lid of the range closed.

FRYING is done in a roasting pan with the cover removed. Put the fire unit in the middle position. For SAFETY, use the two arm protectors (figure 48) which fit along the sides of the roasting pan or griddle. Place one of them along the front and the other along the side of the range where you are working.

For GRIDDLE COOKING, turn the top of the roasting pan upside down and fit it to the brackets in the top corners of the range. Put the fire unit in the top position and insert the arm protectors.



Figure 49.—Cooking utensils supplied with M1937 range.

Some BAKING can be done in the covered roasting pan or in the cake pan placed inside the covered roasting pan. Pies bake well in the roasting pan alone but for all other baked foods, use the cake pan. If you need to do a great

deal of baking with the M1937 range, make a few adaptations.

### ADAPTING THE M1937 RANGE FOR BAKING

The most satisfactory method of adapting the range for BAKING BREAD is to construct three solid shelves. Put these shelves on the rails in the range as shown in figure 50. This adaptation triples the ordinary baking capacity of the range. Here's how to make these shelves—

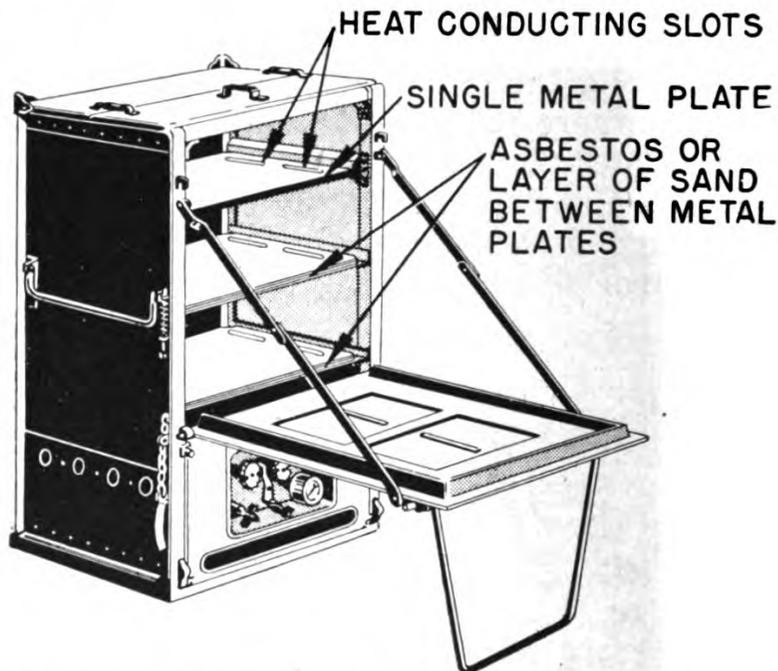


Figure 50.—M1937 range adapted for baking bread.

Construct the **BOTTOM SHELF** in the form of a “sandwich” consisting of a piece of  $\frac{1}{4}$  inch black iron plate, a  $\frac{1}{4}$  inch layer of asbestos (or sand), and a top sheet of 22 gage iron plate. Have the shelf made 19 by  $23\frac{1}{8}$  inches with two oblong circulation slots,  $9\frac{1}{4}$  by 2 inches, cut on each side,  $\frac{3}{4}$  inch from the side and  $1\frac{1}{4}$  inches from the ends.

Have the **CENTER SHELF** constructed in the form of a “sandwich” also but use two pieces of 22 gage black iron, separated by a  $\frac{3}{16}$  inch layer of asbestos or sand. Have the same type of slots cut as in the bottom shelf.

The **TOP SHELF** should consist of **ONE** piece of 16 gage black iron,  $17\frac{1}{8}$  by  $23\frac{1}{8}$  inches, with two oblong slots,  $9\frac{1}{4}$  by 1 inch, cut at each end.

In order for the oven to reach the proper baking tem-

perature of 425° to 450° F. without excessive flash heat, light the firing unit 30 minutes before you start the baking. If you have no oven thermometer, you can determine the temperature of the oven roughly by the hand count method. Here's the way this works—hold your hand in the oven 1 inch from the bottom and count slowly. If you can hold your hand in this position for seven counts, the temperature is just right for baking. If the count is less than 7, the oven is too hot; if it is more than 9, the oven is too cold.

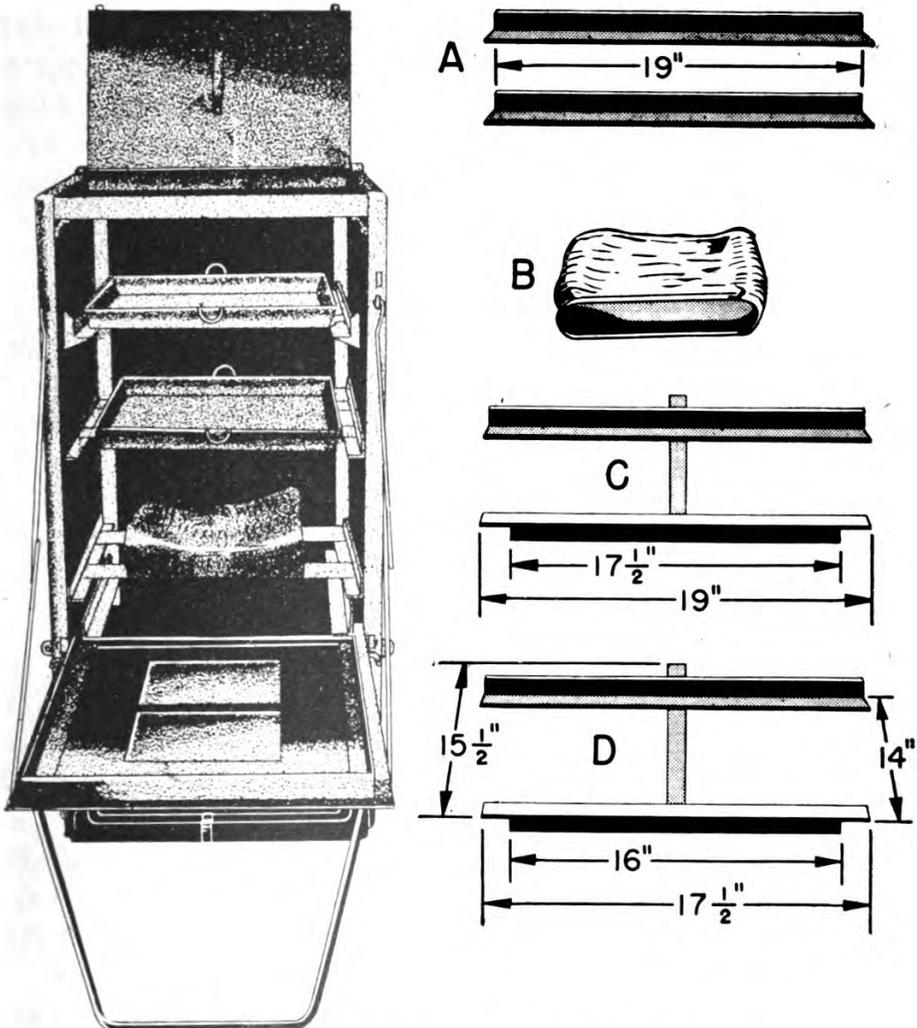


Figure 51.—M1937 range adapted for pastry baking.

This adaption of the M1937 range will bake 24 pounds of regular field bread or 30 pounds of field sheet bread at one time. During the baking, shift the pans from the bottom shelf to the top, from the top shelf to the middle, and from the middle shelf to the bottom at least four times.

Approximately 60 minutes are required to bake the sheet bread and from 100 to 110 minutes to bake the regular field bread. Biscuits, rolls, cobblers, and pies can also be baked successfully in this oven.

If you're interested in using the M1937 range for baking pastry only, a much simpler adaptation can be made. Pan RESTS rather than shelves are all you need. Look at figure 51. Have fairly heavy angle irons cut and fastened together as indicated. Lay two plain angle irons (19 inches long, like those marked *A* in figure 51) on the middle burner rails in the cabinet. Place any large flattened can (*B*) on these angle irons. This can serves to distribute the heat evenly throughout the oven. The can is more satisfactory than a single piece of metal. For the center shelf, construct an angle iron pan rest in the shape of an *H* as shown in *C*. Make the rest 19 inches wide and not more than 23 inches deep. In order to fit the pan rest to the top burner rails, a notch will have to be cut  $\frac{3}{4}$  of an inch from each end, as illustrated.

A similar rest (*D*) should be made for the top pan. But this time it should be only  $17\frac{1}{2}$  inches wide. Fit the rest for this top shelf into the rails in the cabinet which are normally used for the roasting pan. Remember—THIS ARRANGEMENT IS NOT GOOD FOR BAKING BREAD.

### **.M1937 FIRE UNIT WITH CONVERSION SET**

The M1937 FIRE UNIT with conversion set No. 2 is used to supply the heat for the M1937 range. If necessary, it can also be used with the M1942 field bake oven. Figure 52 gives you a picture of one of these units. The operation of this fire unit is simple. Refer to figure 52 and follow these instructions closely—

Fill the gasoline tank with white or ethyl gasoline. Tighten the filler tube cap moderately. **WARNING—WHEN FILLING THE TANK, BE SURE YOU ARE AT LEAST 20 FEET AWAY FROM ANY FIRE.**

Now, check over all the connections for leaks. Be sure all leaks are stopped before you light up. Tilt the unit forward to remove any excess gasoline. Check the valves. See that they are all CLOSED, including the air shutter. Place the fire unit in any one of the three positions in the range cabinet. Let it project out about 6 inches. Open the attachment for air hose one turn, attach the air hose,

and pump the pressure up to 45 pounds. Remove the hose and close the valve.

Open the flame valve TWO full turns. Pull out the burner control rod. Open the mixture valve one and one-half turns. Hold a lighted match over any arm of the burner and light the fire unit. Be careful not to hold your arm over the burner. Then push the fire unit all the way back into the cabinet or oven. Leave the cabinet door open. Maintain the flame on the burner by adjusting the air shutter. After 3 minutes, open the fuel valve ONE-HALF turn.

Now—shut off the mixture valve when it is possible to do so without losing the flame. Keep the pressure between 30 and 50 pounds by pumping in more air whenever necessary. If necessary, pressure may be reduced by opening the mixture valve one-quarter turn.

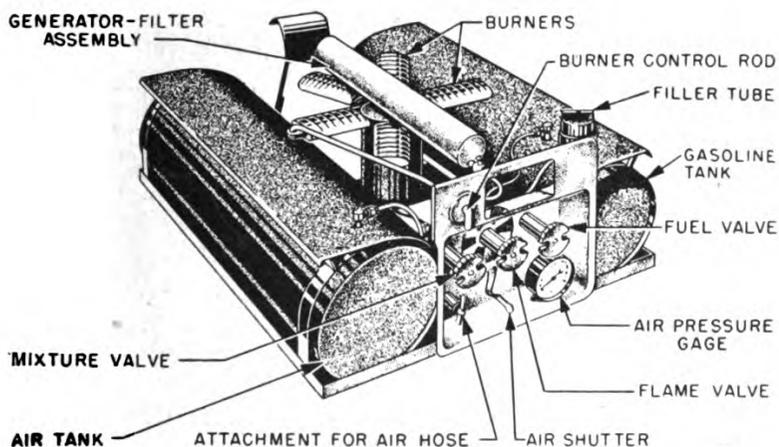


Figure 52.—The M1937 fire unit with No. 2 conversion set.

Maintain a green flame on the burner by adjusting the air shutter. Close the cabinet doors, leaving the side panels open. Push the burner control rod in. Control the size of the flame with the flame valve. **TO SHUT OFF THE FIRE,** close the fuel valve but leave the flame valve OPEN. **IN CASE OF ACCIDENTAL FIRE,** close the flame valve.

### MAINTAINING THE M1937 FIRE UNIT

For best results, you must keep the fire unit in good shape. See that you always have at least one spare filter attached. Keep the burner slots clean with the cleaning blade provided with the unit. To correct a persistent yellow flame, close and open the flame valve several times. Then relight the burner.

To correct a low flame, remove the filter tube attached over the burner. (Check with figure 52.) Clean the carbon out of the short tube on the front of the detached filter. Then pull out the flame valve and remove the orifice and packing nuts. Open the valve until the stem can be pulled out. Clean the carbon from the inside of the orifice nut, from the inside of the valve body, and from the valve stem. Screw the orifice nut back into the valve body.

Screw the valve stem back into the valve body and tighten the packing nut moderately. Now you're ready to reassemble the main parts of the unit. Before you tighten the set screw on the filter yoke, be sure that the outlet tube of the filter is fitted properly into the hole of the valve body.

If all of this doesn't correct the low flame, remove the filter and attach a new one. If the fire unit still doesn't work properly, the trouble is not in the filter set. So put the old filter back. Destroy the old filter if the new one makes the unit work properly.

### **THE FIELD BAKE OVEN—M1942**

If you are going to do a considerable amount of baking in the field, procure an M1942 field bake oven. This oven shown in figure 53, is used extensively by the Army for field baking. This large two-deck oven can produce 48 pounds of round field bread or 60 pounds of garrison field bread in a baking period of 1 to 1½ hours. The baking time depends on the type of burner used and local climatic conditions.

The M1942 oven comes in two sections that can be handled easily. Notice in figure 53 that the bottom section contains two burner chambers into which the fire units have been placed; and three proofing chambers, invaluable for the making of bread that requires proofing. The upper section of the oven contains two baking chambers, each of which will hold three standard ration pans. The two sections of the oven are easily disconnected. Each one weighs approximately 550 pounds and is equipped with round bars for lifting. Each section may be conveniently handled by four men. Here's what needs to be done in order to assemble the oven—

Pull out the round lifting bars (these bars telescope) at each side of the lower section and place this part of the

oven in a level position on the ground. Leave this lower section on its original skid to prevent dust and dirt from entering the proofing chamber. Now, pull out the lifting bars on the upper section of the oven and place the section on top of the lower section. Be sure that all the edges are

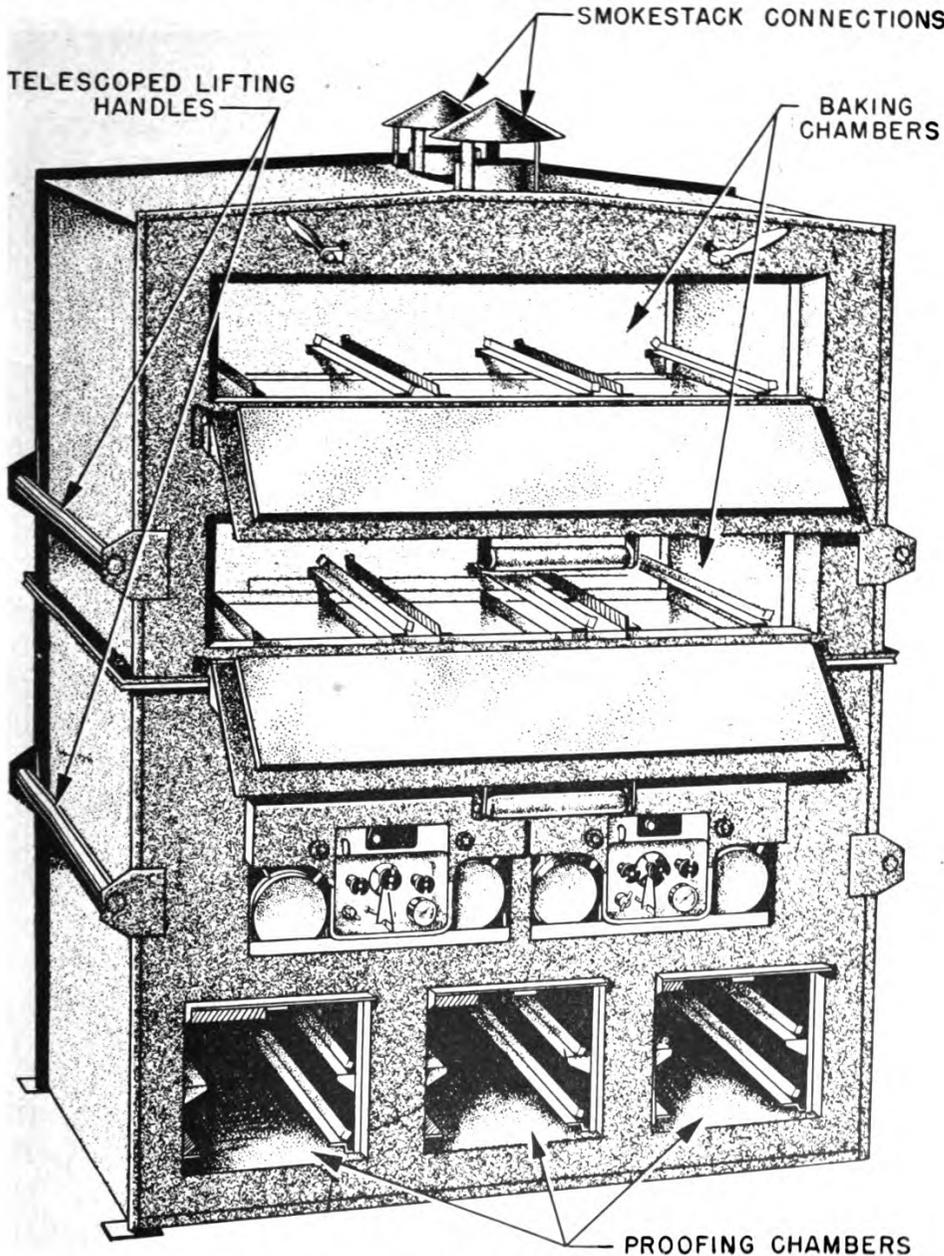


Figure 53.—M1942 field bake oven.

flush. Then clamp and bolt the two sections together. Last of all—install the fire unit. That's all there is to it.

Because the baking temperature of all parts of the baking chamber is fairly uniform, a minimum of pan shifting is required. About all you need do is to see that the side

pans in each chamber are changed once in a while during the baking.

### HEATING UNIT FOR M1942 BAKE OVEN

A gravity feed burner which is simple to install and operate (figure 54) is issued for the heating unit.

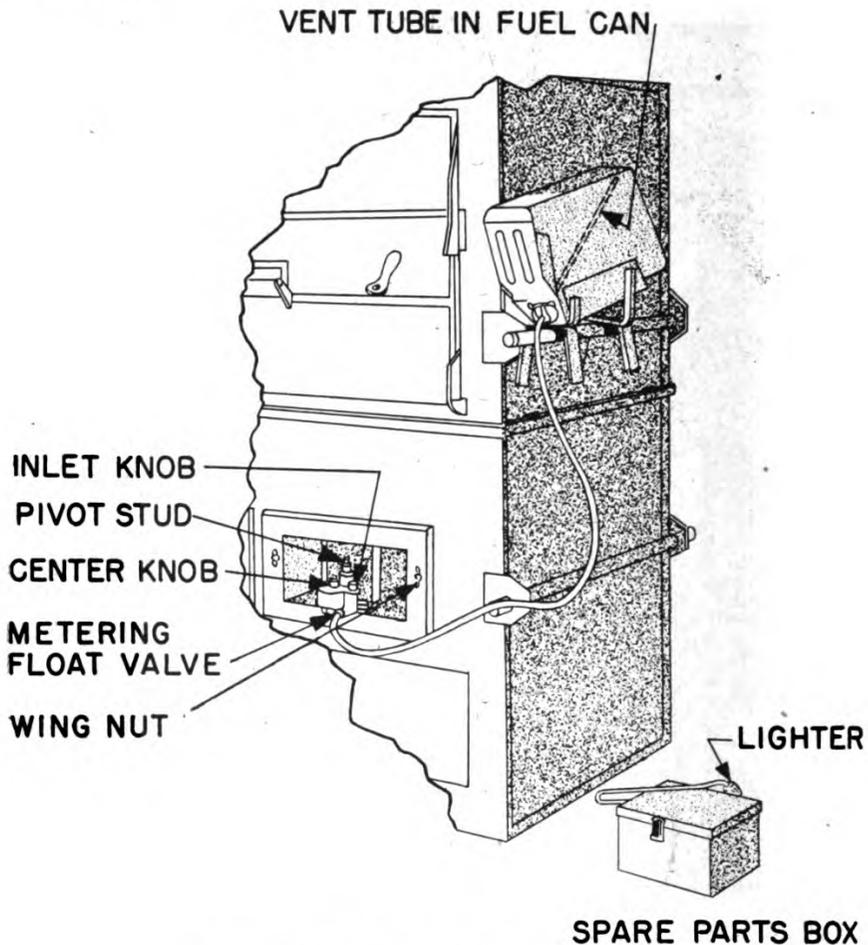


Figure 54.—Gravity feed pot type burner.

Keep the burner pot bottom reasonably clean and smooth, but do not scrape the metal. A thin layer of carbon protects the metal and makes lighting easier. If the air holes are clogged, clean them with a match stick or peg of wood—never with metal. Brush or wipe off any scale or soot covering the air holes around the top of the burner.

If dirty fuel has been used, the strainer in the bottom of the metering valve must be removed and washed in fuel oil or gasoline.

If you can't get a full flame or if the fuse is not feeding

properly, there are a number of things that may be wrong. The fuel line from the valve to the burner may be clogged. To check this, remove the plug in the pivot bracket marked "clean-out." If the line is clogged, remove the two wing screws and slide the whole burner out of the oven. Then use a wire to clean the pipe. Next, remove the top and inner ring in the burner pot by turning and lifting them out. Wipe out any accumulated soot or dirt. If the strainer in the fuel valve is dirty, wash it in gasoline or oil. When water is present in the metering valve, drain the strainer and turn the metering valve upside down to drain the bowl.

If the fuel oil used is too cold and stiff to flow, turn the center knob to "9" and lift it up until the oil is warm enough to flow. Sometimes air gets into the fuel line. Shut the burner off and let the air out at the place where the inlet hose joins with the burner valve.

### **WARNINGS**

If the flame valve goes out accidentally, shut off the inlet knob immediately. If possible, allow the burner to cool before you relight it. Always place your lighted torch in the pot through the lighter door before you turn on the fuel. When lighting a hot burner using fuel oil or kerosene, be just as careful as with gasoline. Never allow the fuel hose to touch the hot surface of the oven. And keep it out of the direct rays of the sun.

Always set the center knob on the burner so that you get a clean, smokeless flame. Do not over-fire. If too much fuel is fed to a cold burner, smoke and soot will be produced. When not in use, set the fuel tank on the ground. This will prevent accidental flooding.

### **IMPROVISED FIELD COOKING EQUIPMENT**

By using a little ingenuity, you can improvise cooking and baking equipment with a great variety of materials, from common clay to oil drums. Your *Ship's Cook 3c and 2c* training course illustrates and explains a few of the more simple improvised means of cooking and baking. Cooking over an open fire, in a trench, by means of a two-barrel clay range or oven, and with a hole-in steep-bank are discussed in that book. Here are some other suggestions—

Any large metal container such as a wash tub can easily be made into a stove, as in figure 55. All you need do is to provide an opening for tending the fire and for creating a bottom draft, and to make a chimney at the top. A tin can, with both ends removed, makes an efficient chimney.

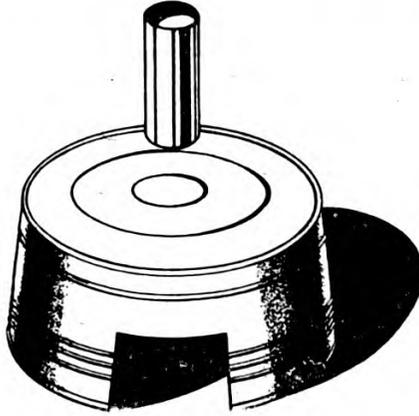


Figure 55.—Wash tub stove.

A surprisingly efficient gasoline stove can be made from two cans. See figure 56. Pierce a No. 10 can with nail holes from the top to within about one and one-half

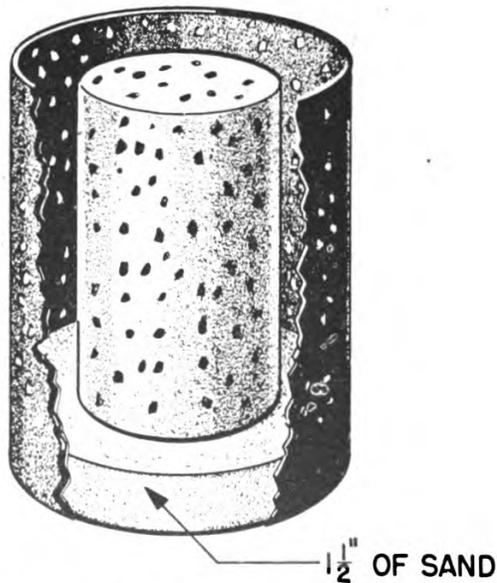


Figure 56.—Two-can stove.

inches of the bottom. Fill the bottom of the can up to the level of the lowest nail holes with clean sand. Saturate this sand with gasoline. Puncture the body and top of a smaller can with nail holes. Place this smaller can in the center of the larger can, top up. The nail holes provide

for a draft and upward direction of heat. Now all you need do is to light the gasoline.

### IMPROVISED FIELD BAKE OVEN

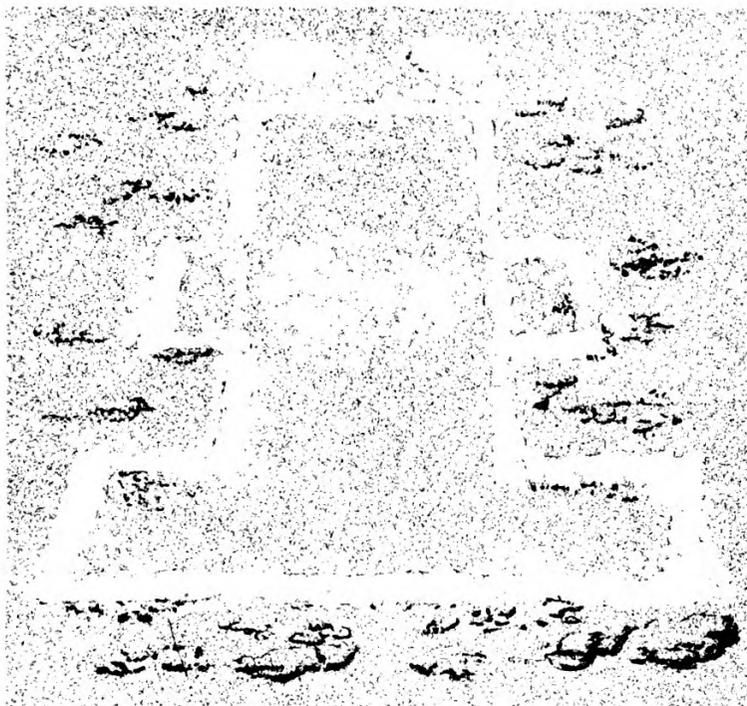


Figure 57.—Ground plan for oil drum oven.

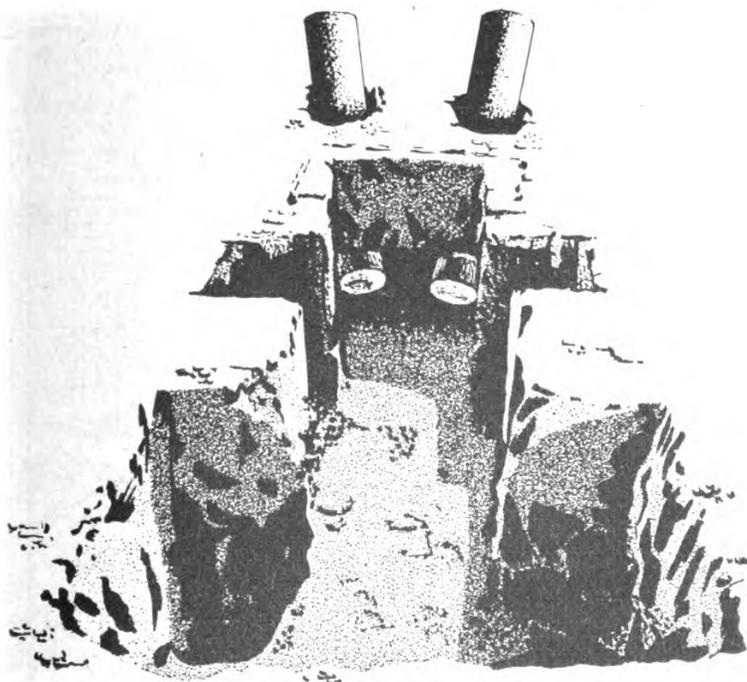


Figure 58.—Excavation for oil drum oven.

Following the ground plan carefully, dig a hole as shown in figure 58. Insert the smoke pipes as illustrated.

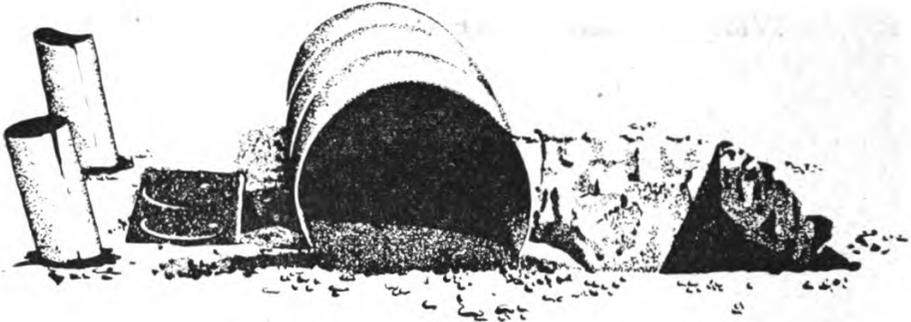


Figure 59.—Placing of oil drum and hot plate.

Baking is a relatively slow method of cooking. It must be done by indirect application of heat at **EVEN** temperatures. Any type of oven will serve your purpose as long as it has some means for providing this even and slow heat. Here's one way of building an oil drum oven that will do an efficient job of baking.

First of all, mark off the ground plan as a guide (figure

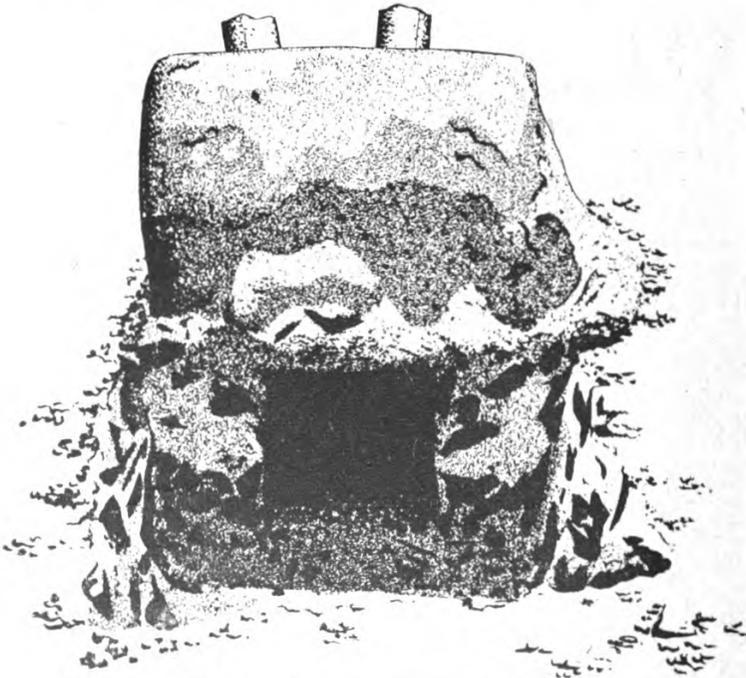


Figure 60.—Oil drum covered with clay.

57). The width of the plan will be determined by the size of the oil drum you intend to use.

Now, put your oil drum and hot plate in place. See

figure 59. Notice that the bottom of the empty oil drum is covered with clay.

Next, cover the oil drum with a layer of wet clay (figure 60).

Finally, get a piece of sheet metal that will cover the open end of the drum and serve as a door (figure 61). Build a fire underneath the oven and you are ready to bake.

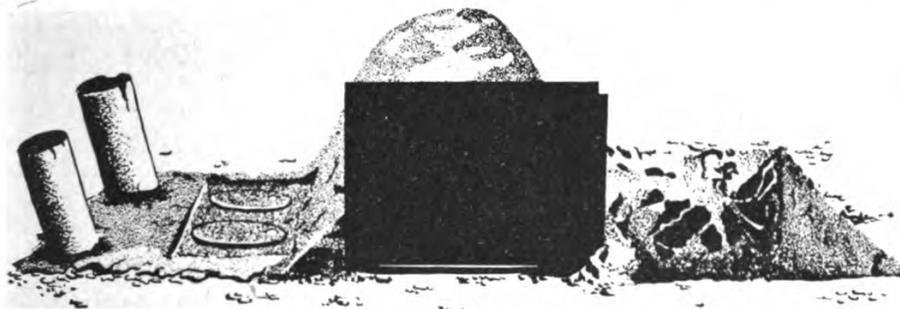


Figure 61.—Complete oil drum oven.

### SANITATION IN THE FIELD

It may be a little tougher to have clean, sanitary conditions in the field than aboard ship, but that doesn't make sanitation any less important.

See that all eating and cooking gear is cleaned and sterilized immediately after use—by washing in hot soapy water, followed by rinsing in boiling clear water. Here's one way you can do this—provide three large containers (32 gal. G.I. cans are the best) for the washing and rinsing. At least one other receptacle must be furnished for garbage. Arrange these cans in the order shown in figure

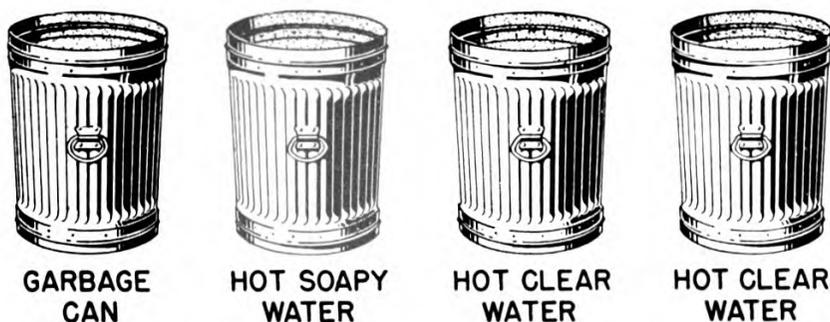


Figure 62.—Cleaning the mess gear.

62. Put the cans in a place where the men can pass on either side—thus speeding up the work.

After the men have scraped the garbage into the garbage container, they come to the can containing soapy boiling water. If possible, provide G.I. brushes near this can to help the men clean their gear. The last two cans of boiling clear water are used for rinsing. Do not permit the men to dry their gear with cloths of any kind. Mess gear must be air-dried.

Providing the boiling water furnishes a little problem, the immersion type of water heater (figure 63) has been approved for issue with the M1937 field range.

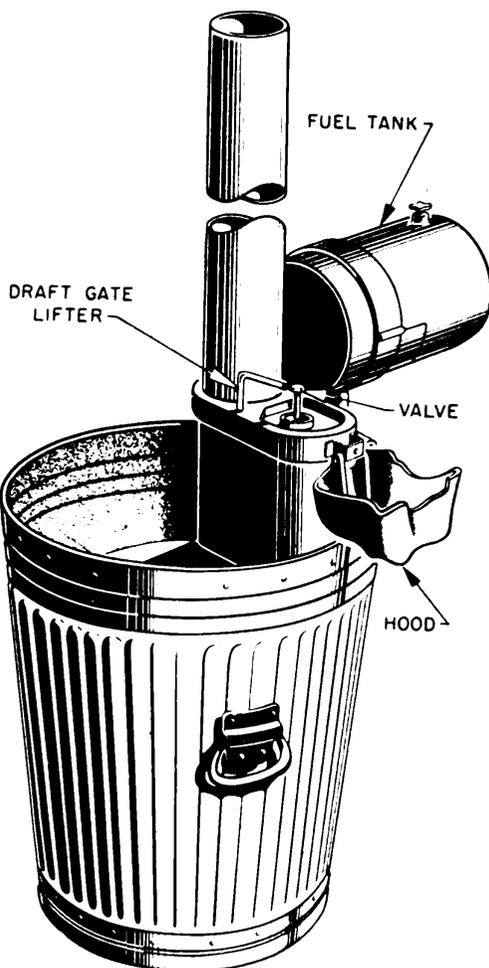


Figure 63.—Immersion type water heater.

Here's the way to operate this heater. Fill the fuel tank with gasoline, kerosene, or fuel oil. Open the hood and pull up the draft gate lifter to open the gate. Saturate the lighting torch with gasoline—then light. In order to start the draft, put the torch down the body of the heater and through the draft gate which opens into the stack. Re-

move the torch from the stack and rest it on the generating unit. Push the draft gate lifter down to close the gate. Open the fuel valve slightly for a drip flow, not a stream. The burner will light quickly. Allow the torch to burn out and then remove it from the heater. **WARNING**—Do not remove the torch while it is still burning or it will ignite the fuel at the valve. Now, open the fuel valve to adjust the flame to the desired intensity. Be sure that the burner is well heated before the valve is adjusted or it will be flooded. Last of all, close the hood. Take the burner apart occasionally and clean the dirt from the vaporizer and the burner top plate. Check the drip valve frequently to be sure that it is not stopped up.

If you have no other way of heating the water, make use of a fire trench (figure 64). Dig the trench about 8 feet long, one foot wide and one foot deep. Build a fire in this trench. Then place four or five angle irons or pieces of one-inch pipe across the top. Fill your three cans about three-fourths full of water and set them on the supports. Have the cans emptied and cleaned thoroughly after each meal.

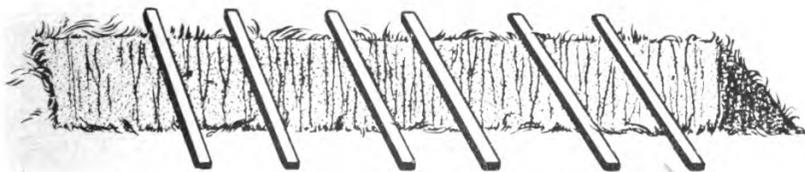


Figure 64.—Fire trench for heating water.

### THE SOAKAGE PIT

Liquid galley wastes are best disposed of by the use of a soakage pit. These pits may be dug as deep and as large as the occasion demands. Here's one that will be large enough for most cases. Dig a hole four feet deep and four feet square. Fill this hole with broken rock, bricks, or very coarse gravel. Provide a grease and garbage trap in order to collect the grease and avoid stoppage. This trap can be made from an ordinary salvage pail by punching holes in the bottom. Then fill the pail with layers of straw and ashes or gravel. See that all the galley waste liquids are run through this trap and then into the soakage pit. Figure 65 shows you a more complicated soakage pit that can be constructed if you have time and if the field camp is to be fairly permanent.

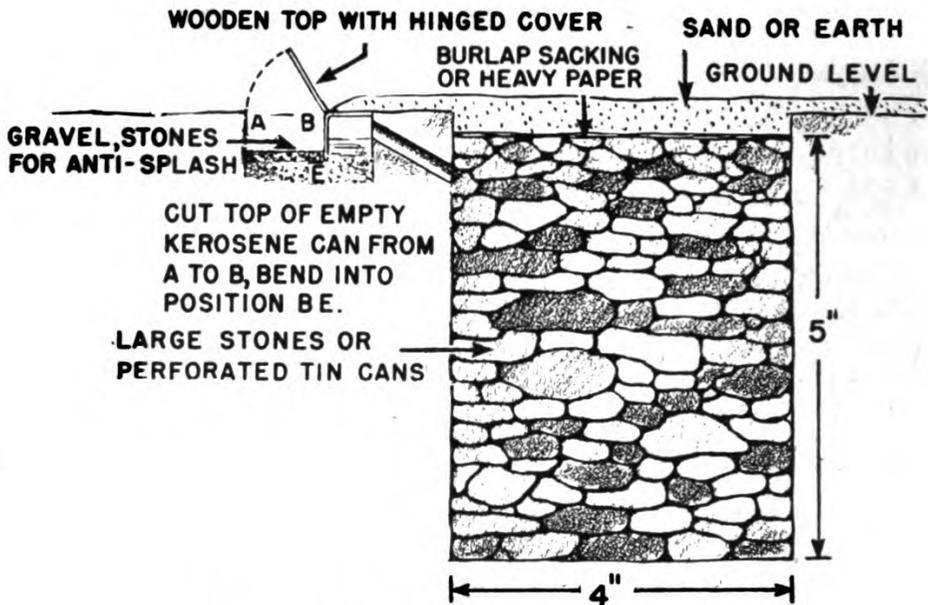


Figure 65—Soakage pit for galley wastes.

### GARBAGE DISPOSAL

The most satisfactory way of disposing of garbage is by burning. The cross trench incinerator is one of the best means. Dig two trenches, each eight feet long, one foot wide and one foot deep, crossing at their centers (figure 66).

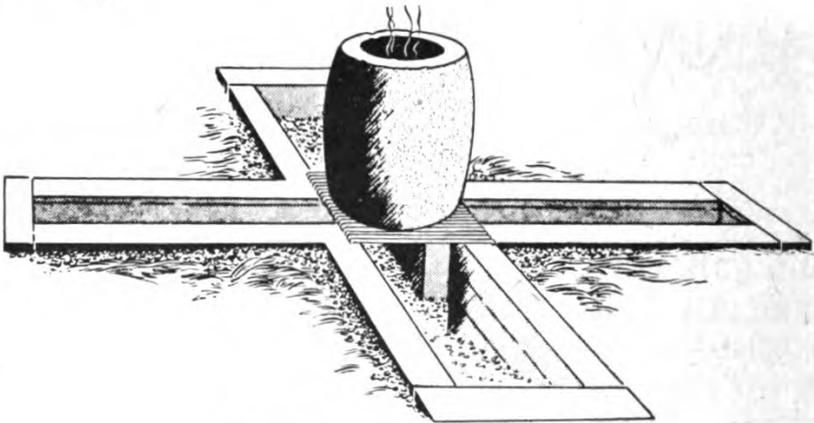


Figure 66.—Trench incinerator.

Build a grate, made of pieces of scrap iron or pipe about twenty-four inches long, over the center. Erect a stack over this grate, using brick or stones and clay. Or use an old G. I. can or oil drum from which the top and bottom have been removed. Now build a fire ON THE GRATE (inside the stack or can). Do not allow any fire in the trenches. Rubbish and drained garbage is used as fuel after the fire has become hot enough. It is necessary to keep the burn-

ing mass loosened so that all parts may continue to receive oxygen and thus keep burning. This incinerator will work best if three of the four sides of the trenches are blocked off, leaving the one open toward the direction from which the wind is blowing.

### LISTER BAGS

Lister bags for water should be installed with special attention to drainage and to overhead protection. See figure 67. Dig a small sump pit to prevent the accumula-



Figure 67.—Installation of the Lister bag.

tion of water in small puddles. Provide a support for the bag by constructing a simple framework between two trees or two poles. Cover the whole unit with a strip of canvas.

### INSECT AND PEST CONTROL

The most persistent enemy of pure food is the fly. Flies breed in warm, moist places polluted by animal and vegetable wastes. Sometimes they travel long distances in search of food. Therefore, even if the immediate area of the galley is kept thoroughly clean, flies from near-by

sections may find their way to the galley and to the food. Because flies can contaminate food and spread typhoid, dysentery, diarrhea, and many other diseases, it is necessary to keep them away from the cooking and the serving. Here's what you can do to keep the fly population under control—

Keep all food covered as much as possible.

Keep the garbage cans tightly covered.

Dispose promptly of all stale food and waste.

Use fly paper, fly tape and fly traps.

Use any fly spray available.

See that fly swatters are used.

Discourage the fly by making it impossible for him to find particles of food anywhere in the mess area.

Other common pests can be taken care of more easily. Get rid of roaches by using a liquid insecticide or commercial sodium fluoride. But be careful—these sprays and powders will spoil your food if you are not on your toes to keep them away from the food itself. Destroy ants by locating their nests and saturating these nests with kerosene or boiling water.

Keep rats and other rodents under control by using traps. But remember this—**THE BEST PREVENTIVES AND THE BEST CURES FOR ANY PEST TROUBLES ARE CONSTANT CLEANLINESS AND PERSISTENT CARE.** Get your men into the habit of looking for pest trouble so that immediate steps can be taken before the pests get too numerous for the usual eliminating methods.



## CHAPTER 11

# GETTING THE MOST OUT OF YOUR PROVISIONS

## CONSERVATION'S THE WORD

The Navy wants every sailor to have plenty of food—good, well-prepared, appetizing, healthful food. It's your job to help provide this kind of food, and to provide it in an economical manner. There's no room for waste. Food prepared and NOT EATEN is wasted. How can food waste be kept to a minimum? Here's the way—

Order only what you **NEED** and **WILL USE**.

Stow provisions properly so that **NO LOSS OCCURS** from **SPOILAGE** or **INFESTATION**.

Plan the menus so **ALL** the food will be eaten.

Have the food prepared in a **POPULAR, APPETIZING** manner.

Have the chow served in an **ATTRACTIVE** and **PLEASING** fashion.

**USE LEFTOVERS** properly and efficiently.

Remember—**conservation's the word**.

## CONSERVING WHEN ORDERING

You can save yourself many a headache by ordering only the provisions that you need and can use. If your storage facilities are such that only a 30-day supply of

fresh eggs may be kept properly, order no more than a 30-day supply. If you must use deck lockers for storing vegetables, order only a FEW DAYS' supply of the vegetables that don't keep well under such conditions. You'll have to depend mostly on potatoes and the root vegetables. And if your men just don't like kale or some other vegetable no matter how it is prepared, order another vegetable with similar food values, which they will eat.

### **CONSERVING WHEN STOWING**

All provisions brought aboard should be inspected for quality and quantity. The medical department's quality inspection does not relieve you entirely from making one. The medical department will usually OK any provisions that are fit to eat. It's up to you to see that the provisions meet the specifications laid down for them. These specifications have been made partly to help you get provisions that can be stored safely for some time.

Proper stowing calls for CAREFUL HANDLING. It's pretty obvious that rough handling of fresh fruits leads to bruises which invite rot. This rot spreads fast. But—even canned provisions should be handled carefully. A dented can may lead to rust. This rust may cause a hole to develop.

PROMPT HANDLING is also necessary for many provisions. Lettuce left standing around outside during freezing weather isn't going to remain good very long. And fresh meat or fish left standing on the dock during a hot summer day will be fit only for survey in a short time. GET THE PROVISIONS ABOARD quickly and into refrigerators if they require refrigeration.

FREQUENT INSPECTIONS of the storage compartment will help cut down waste. These inspections should be thorough and complete. Fresh fruits and vegetables must be gone over carefully so that all specimens showing any sign of rot or mold can be removed. The rot present on one apple will spread to the whole bin of apples in just a few days.

The FIRST IN—FIRST OUT principle also makes for a cutting down of waste. Have your provisions stowed so that the oldest items are issued first. Even with the best planning it may be a little harder to get at these older items. INSIST that the oldest items be used first.

## ACCIDENTALLY FROZEN CANNED GOODS

Ordinarily, "blown" cans should be surveyed. Sometimes the bulged appearance (see figure 3) may be due to the FREEZING of the contents, in which case the provisions may still be usable. Be sure that the contents were not spoiled before they were frozen. Freezing doesn't make spoiled food good.

If a lot of gas escapes when a frozen can is opened, the contents are probably no good. Discard the food. Don't take any chances. The swollen appearance in cans of unspoiled food usually disappears after the contents are thawed. Any foods with an off odor or taste should be discarded.

Sometimes the expansion due to freezing is so great that the seams of the can split open. This type of can may still be used if you are sure that the contents of the can have not gone through a thawing period and have then been refrozen. Once the contents of cans with sprung seams have been thawed, they are subject to spoilage.

When possible, thaw cans of frozen food slowly by letting them stand at warm room temperatures until thawed. After that, cook the contents in the usual way. If you don't have time to do this, submerge the frozen cans in boiling water until the contents are completely thawed and heated. Then open the cans and serve.

Do NOT place unopened cans on racks in the oven or on the back of the range to thaw. When this dry heat is used, sufficient pressure may be built up to explode the cans. This can't happen when you keep the cans under water.

Freezing changes the nature of some canned provisions. Here's what you can expect—

Upon thawing, frozen canned vegetables—especially asparagus and tomatoes—may become slightly soft and mushy. There should be no flavor or color change.

Canned fruits are not noticeably affected by freezing. After being thawed, they should show no flavor or color change.

Canned foods having large proportions of cooked starch change a great deal in texture during freezing. But this change disappears when the foods are heated again. This applies to such things as cream-style corn, corned beef hash, and concentrated soups.

Canned spaghetti and meat balls become mushy after being thawed. Most meat products, however, show no noticeable change during freezing and thawing. The same is true of dehydrated products.

During freezing, the top of a catsup bottle may be lifted and the oil in mayonnaise or salad dressing may separate from the rest of the product. The salad dressing can be restored to its original state by beating it briskly with a wire whisk. Restore the mayonnaise in this manner—first, pour off the oil from the solid part of the mayonnaise. Then add this solid part to a small amount of vinegar which has been heated to a boil. Finally, add the oil slowly to this vinegar-mayonnaise mixture, beating it continuously while so doing, until a smooth emulsion is formed.

### **CONSERVING WHEN MENU PLANNING**

You can eliminate much waste by **PLANNING YOUR MENUS** properly. You'll find it a great help to keep a record of the successes and failures of the menus you plan. Observe the amount of food that the men leave uneaten. Listen to their comments. Then find the reason for any criticism. Maybe the menu was all right. Possibly the food was prepared and served improperly. But find out the trouble so it can be remedied.

**PLAN POPULAR AND WHOLESOME MEALS.** Of course there are degrees of popularity. You can't plan to have the **MOST** popular meal every day—it would soon become heartily disliked. And sometimes a very small change in an unsatisfactory meal will make it highly satisfactory. The popularity of a meal may be due to the method of preparation rather than to the provisions used. For example—French fried potatoes may make a meal popular whereas hash browned potatoes may have the opposite effect on the same meal.

Certain provisions may be conserved if necessary. For example, meat can be left out of two breakfasts and one dinner during the week without harm. Jam can be used in place of butter at one meal during the day.

Here's another thing you must watch—be sure you immediately use up provisions that are likely to spoil quickly. It may be necessary to change the weekly bill of fare in order to do this. The **CO** usually won't object if

you are making a change to conserve provisions. Be sure to get his OK, however.

Your planning must also allow for the ability of your cooks. If these cooks, for instance, can't do a good job of shirring eggs, either teach them how to do it well or plan to have the eggs prepared in some other manner.

### CONSERVING WHEN PREPARING THE FOOD

The success or failure of a meal depends a great deal on skillful and well-timed cooking. The successful meal is the least wasteful.

Each item of food should be prepared on such a schedule that all the items will be ready for serving at the same time. That takes a bit of planning. Sometimes it's well to put these plans in writing. Here's a sample plan made out for the preparing and serving of hot rolls—

Assembling of ingredients.....	1345—1400
Mixing the dough.....	1400—1540
Punching the dough.....	1540—1600
Dividing and makeup.....	1600—1630
Rising or proofing.....	1630—1730
Placing in ovens.....	1730—1750
Removing from ovens.....	1750—1800
Serving.....	1800

Similar plans can be made out for the preparation of any foods.

The food should not be prepared so early it has to stand around for a considerable time before it is eaten. The delay causes the food to lose much of its appeal and food value. If chops or similar meats are to be served, have only enough cooked to get the meal started. Then continue preparing the chops during the serving—stay just far enough ahead of the demand from the serving line so that no delays are caused. As the end of the serving line approaches, an accurate count can be made of how much more will be needed to serve everyone.

Scrambled eggs made from dehydrated eggs get tough if they are not eaten immediately. It is preferable to prepare only 25 portions of scrambled eggs at a time. And see that these 25 portions are served immediately.

Accurate computations will enable you to have just

enough food prepared. Keep a record of how much of the various provisions are needed to serve each meal. These records will serve as a basis for future, more accurate calculations. Insist that your men carefully measure out the quantities you call for. Otherwise accurate calculations are a waste of time.

The proper cleaning and paring of vegetables will eliminate much waste. The spud coxswain must see that potatoes are not left in the potato peeler too long—2 to 3 minutes is plenty. And before the peeler is loaded, he should have the potatoes selected according to size so that each load contains potatoes of about the same size. The “eyes” in potatoes should always be carefully removed with a SMALL paring knife.

Be sure that only experienced personnel open canned provisions. The contents of each can should be examined carefully before they are dumped into a larger container. The spoiled contents of one can can easily spoil a whole coppersful of canned provisions.

The same procedure should be followed when several eggs are to be stirred, mixed, or beaten together. Have each egg broken into a small bowl so it can be examined before it is dumped into a larger container. In this way, a bad egg can be eliminated before it spoils all the rest.

Take care that vegetables are not overcooked. Cooking should end just as soon as the vegetables are tender. Long cooking destroys food value and spoils the flavor.

All foods fried in deep fat should be removed promptly when done. Have these foods placed on brown paper, a clean cloth, or in a colander to remove any excess fat.

Chill thoroughly all fresh vegetables which are to be used uncooked in salads. Hold the vegetables in the refrigerator until preparation time. Then prepare them quickly and replace them in the refrigerator to remain crisp and fresh. This makes a more appetizing salad and one which will appeal more to the men. So you can be sure the salad will be eaten and not wasted, have salad dressings added to fresh fruit or green vegetable salads **JUST BEFORE** the salads are to be served. Otherwise, the dressing will cause the fruits and vegetables to wilt.

All pork, fish and poultry must always be cooked **WELL DONE** no matter what method of cooking is used.

Soups must not be greasy. To prevent this, let soup

stock cool until the fat hardens in a solid layer on the surface of the stock. Then lift the congealed layer of fat from the stock. Use this fat in making gravies or sauces for meats.

Again—find out WHY certain items of food are not being eaten completely. If the trouble is somewhere in the preparation, see that the methods are corrected.

### **CONSERVING WHEN SERVING**

Food that is eaten is not wasted. Do everything you can to make the men eating in the general mess understand that they may have all the food they want **BUT THEY MUST EAT ALL THEY TAKE**.

If possible, assign a responsible cook to the serving stations with orders to correct all instances of waste. Also—have the mess cooks and others in the serving line grant all requests for smaller portions.

See that **EXCESS** fat is cut off all meat. And save it. The fat in many cases will not be eaten anyway. Excess fat should be rendered and used in cooking. The directions for rendering fat are given on pages 147 to 148 of this book.

Have only small amounts of bread and butter cut. The bread will be fresher and there will be less chance for wasting the butter. Cut more as needed, of course.

Be sure the lineup of food on the serving tables has **EYE APPEAL**. Believe it or not—you'll have less waste if the food looks attractive.

And if the food is supposed to be served hot, see that it is **HOT**. If it is supposed to be cold, see that it is **COLD**. Lukewarm food makes for a great deal of waste because in cooling much of the flavor of the food is altered and sometimes even the texture. All of this means the meals must be ready right **ON TIME** so the food won't have to stand around before it is served.

### **CONSERVING WATER AND FUEL**

It's absolutely necessary to keep things clean. That doesn't mean that water should be wasted. It isn't necessary to fill a 60 gallon copper entirely full of water in order to clean it. The copper can be cleaned out just as well with 10 to 15 gallons of water.

Dumping a lot of water on the galley deck for cleaning

purposes results only in waste if the water is allowed to run immediately into the scuppers.

And when water boils, remember it can't get any hotter in an open vessel. Have the heat turned down to the point where the water just keeps boiling. The same is true of oils and fats used for cooking. Excess heat is only a waste of fuel. It may also be injurious to the equipment—not to mention the fact that it may become uncomfortably hot for those working around the range: Teach your men to use just enough heat.

### **CONSERVING VITAMINS**

The vitamins in most foods are easily destroyed. Exposure to air, water, and heat is bad for them. So—if you plan to cook vegetables in water, have them cooked only to the point where they are tender—and use the smallest possible amount of water. Have the water heated to the boiling point before the vegetables are added so as to cut down the length of time the vegetables need to remain in the water. Always cook vegetables in a covered kettle, so that they will steam. Steamed vegetables have excellent flavor and texture—far better than when they are cooked in a lot of water. Well-cooked vegetables are more appealing and will be eaten, not wasted. Take great care in their preparation. Save all water in which vegetables have been cooked and use it for soups and gravies. Vegetable cooking water contains minerals and vitamins, and these will not be entirely lost if the water is used in cooking later on.

To prevent undue exposure to air, grate or chop vegetables for salads **JUST BEFORE** the salads are to be eaten. As far as vitamins are concerned, the larger the chunks, the better.

### **CONSERVING FATS**

Save all trimming fats and fat drippings. Don't throw this fat away. Use it for frying and baking and for browning meats. Cut the excess fat from uncooked beef, lamb, veal, fresh pork, and smoked hams. Save the drippings from bacon, ham, beef, lamb, pork and veal roasts; and from steaks and chops.

**SALVAGE** fat is made up of fat no longer suitable for use in frying, sausage drippings, fat from the stock pot, fat trimmings not suitable for cooking, and trap grease.

Keep your salvage fats separate from other fats by putting them in properly labelled containers. Do not add any water. This salvage fat is valuable. One pound of it will manufacture one-half pound of dynamite or one-fifth pound of nitro-glycerine.

Fat to be used for cooking purposes must be RENDERED—and immediately. If you must keep the fat overnight before you can render it, stow it in the refrigerator in as large pieces as possible. Prepare the fat properly before you render. Here's how—

Remove all lean meat, tough membranes, bones, cartilage, blood, and dirt—use only SWEET fat. Just before rendering, cut the fat into strips and run these strips through the meat grinder set up with a coarse plate. Then put the ground-up fat into a suitable container and heat it to a low cooking temperature (not over 250° F.)

The copper is good for larger quantities of fat. Keep the lid off and the steam valve wide open. Use the deep fat fryer only when you wish to render a small amount of fat and then only when the fryer is hot from previous use. Don't heat up the fryer just to render a small amount of fat.

No matter what heating device you use, stir the fat frequently to prevent it from sticking and to speed up the process of rendering. When completely rendered, the cracklings will be separated and will have become a mixture of grayish white and light brown.

Now—in draining or pouring off the liquid fat strain it through a cloth to remove the cracklings. The cracklings should then be pressed through a fine clean cloth to remove all the liquid fats. Allow the fat to cool at room temperature in a clean container. Stir occasionally while hardening in order to improve its texture. BE CAREFUL—hot fat is dangerous stuff. Avoid accidents and painful burns.

Recovering the FAT DRIPPINGS is an easier job. Have the excess fat not used for gravy poured off and then strain it through a cloth. Allow the fat to cool slowly at room temperature in a suitable container. Any water in the fat will settle to the bottom and the pure fat then can be removed easily.

When two or more kinds of fat are poured into the same container, mix them thoroughly. Cover the con-

tainers to keep out light and air—both enemies of fat. Stow the fat in a cool place. Room temperature is all right for short periods only. Use the refrigerator if the fat is to be stowed for a long period of time.

Here are some additional hints. If you have trouble with the fat sticking or burning, prime the rendering container with a little water. Also—place a few whole peeled white potatoes in the container during the rendering to help remove impurities. Always heat each batch of fat to be rendered SEPARATELY. Here's something else that will give you a better finished product. After the rendered fat has been cooled to room temperature, whip it up in a mixer until the fat is white, clear, and fluffy. Then stow it in the refrigerator.



## CHAPTER 12

### SAFETY FIRST

#### ON THE BALL

Nearly 40,000 people have been killed in the United States in one year as a direct result of automobile accidents. Most of these accidents happened because someone failed to put safety first. AND MOST ACCIDENTS ABOARD SHIP OCCUR BECAUSE SOMEONE FORGETS ABOUT SAFETY PRECAUTIONS.

As CCS or senior cook, it's part of your job to see that the men under you keep alert and on the ball. You can't afford to have them take chances with their own or other men's health and well-being. There are plenty of things aboard ship that can cause trouble—especially in the commissary department. Through instructions, orders, inspections, and most of all, by EXAMPLE, see that your men play safe.

#### SAFETY FIRST IN GENERAL

Keep YOUR men from running, pushing, scuffing, or indulging in horseplay. There isn't room for this sort of thing aboard ship. And it can result in unnecessary injuries as well as disrupting the routine and causing unnecessary delays.

SAFE FOOTWEAR helps prevent accidents. Warn your men to wear shoes that give them a secure footing on the deck. Discourage the practice of keeping hands in

pockets. The practice is unmilitary and sometimes dangerous—especially in heavy seas. The hands are needed for protection against falling.

When your men are stowing provisions or lifting heavy objects for other reasons, insist that they use their leg muscles chiefly. Improper use of the back muscles can cause serious injury. Figure 68 shows the correct way of lifting a heavy object.



Figure 68.—Lift the right way.

Notice how the knees are bent in the correct method of lifting. Most of the power for lifting is furnished when the knees are straightened, thus putting the strain on the leg muscles, which are less easily injured than the back muscles.

It's up to you to see that there are enough men in the working party so that bulky and heavy packages can be handled safely. When bulky objects are to be carried, care must also be taken to see that the line of vision isn't cut off. And warn your men to be especially careful when carrying glass or sharp objects.

When provisions and supplies are being loaded, see that

your men walk on the off-shore side of the ship (unless, of course, they're helping with the loading). No use getting tangled up with a loading crane or getting in the way of working parties.

If necessary, instruct your men in the proper way of going up and down ladders. One hand should always be kept on the life line or side of the hatch. And care must be taken so that their heels don't catch on the edge of the treads. Be sure that all ladders around the commissary department are clean, free of anything that could make them slippery, clear of obstructions, well lighted, and in good repair. Notify your commissary or supply officer if there is work to be done by the first lieutenant's department, so proper action can be taken.

### **SAFETY FIRST AND CLEANLINESS**

Absolute cleanliness is the best weapon against many disease hazards. But **CLEAN SAFELY**. Have your men wear goggles when washing the overhead and bulkheads with strong cleansers. Don't take a chance on impairing their eyesight—even for a short time. Use only approved cleansers and polishes.

Decks must be thoroughly dried after swabbing. Have **WET DECK** signs posted if the decks must be used before they are entirely dry.

Keep the galley and other commissary spaces well painted even if you must use your own men to do the painting. This may mean that you'll need to know how to calculate the amount of paint needed.

Suppose you know that one gallon of the kind of paint you wish to use will cover 400 square feet. You can get this information from a painter or possibly from the SO. Suppose also that you wished to paint a storeroom of the shape and dimensions indicated in figure 69.

Notice that each of the bulkheads, the deck, and the overhead are rectangular in shape. And the area of any rectangle can be found by multiplying its width by its length. Therefore, the area of the deck in figure 69 is

$$20 \times 15 \text{ or } 300 \text{ square feet.}$$

The area of the overhead is exactly the same as it has the same dimensions. Here's a simply way to determine the combined area of both the deck and the overhead—

$$20 \times 15 \times 2 = 600 \text{ sq. ft.}$$

The area of the two side bulkheads can be determined in the same way—

$$20 \times 10 \times 2 = 400 \text{ sq. ft.}$$

And you can calculate the area of the two end bulkheads similarly—

$$15 \times 10 \times 2 = 300 \text{ sq. ft.}$$

Now add all these areas together—

Deck and overhead	.....	600 sq. ft.
Two side bulkheads	.....	400
Two end bulkheads	.....	300
Total area	.....	1,300 sq. ft.

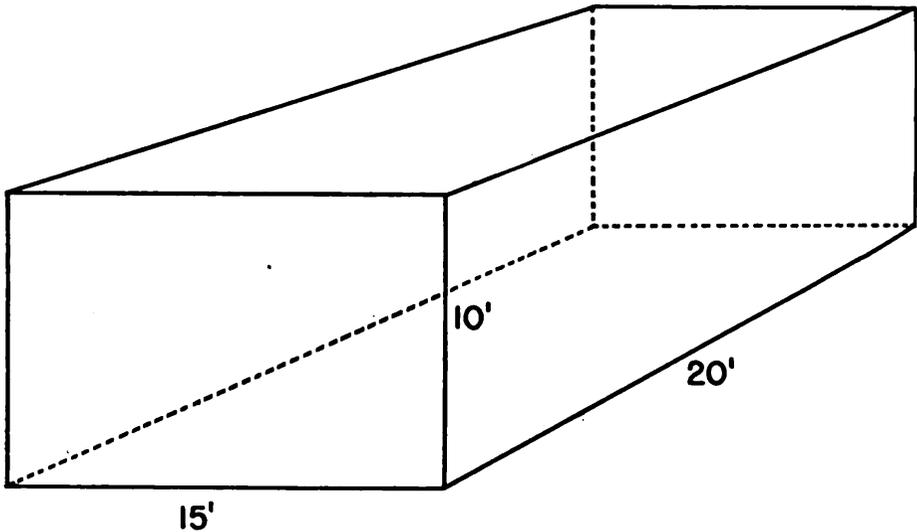


Figure 69.—Rectangular storeroom.

If one gallon of paint will cover 400 sq. ft. divide the total area to be painted by 400 in order to find out the amount of paint you are going to need. Here it is—

$$\begin{array}{r}
 3.25 \\
 400 \overline{) 1300} \\
 \underline{1200} \phantom{00} \\
 1000 \phantom{00} \\
 \underline{800} \phantom{00} \\
 2000 \phantom{00} \\
 \underline{2000} \\
 0
 \end{array}$$

You will need  $3\frac{1}{4}$  gallons of paint in this case. But sometimes the areas you wish to paint are not rectangular in shape. Consider figure 70.

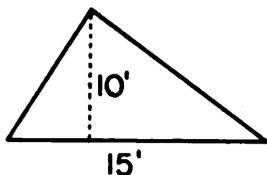


Figure 70.—Triangular bulkhead.

The area of a triangular bulkhead is found by multiplying the base by the height and dividing the product by 2:

$$15 \times 10 = 150$$

$$150 \div 2 = 75 \text{ sq. ft.}$$

Suppose you have a bulkhead shaped like the trapezoid shown in figure 71.

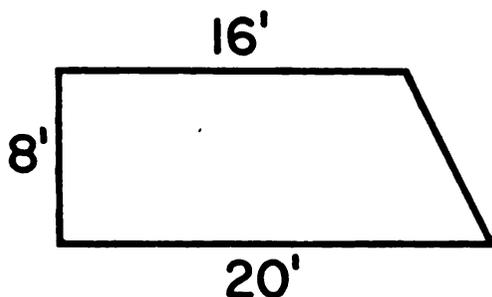


Figure 71.—Bulkhead in shape of trapezoid.

How would you determine the area of this? Simple. First, find the average length by adding the upper and lower dimensions. Then divide the sum by 2:

$$20 + 16 = 36$$

$$36 \div 2 = 18$$

Then multiply this average length by the height—

$$18 \times 8 = 144 \text{ sq. ft.}$$

### SAFETY FIRST AND FIRE

FIRE is the nightmare of a fighting ship. Warn your men about bringing "court-martial" matches aboard. Navy Regulations say that SAFETY TYPE MATCHES only are allowed. Kerosene or gasoline is NOT to be used to start a fire. Be sure responsible men light-off and secure

the ranges and ovens. This is not a job for an inexperienced man.

Have the canopy over the ranges cleaned daily—especially when grilled meats appear on the menu. This prevents fire from spreading in case the flames from the range reach the canopy. Have fans and ducts over the ranges cleaned at least once a week—oftener if necessary. Under no conditions allow grease to accumulate where it might catch fire.

Keep no inflammable materials around the commissary department. Unused paint belongs in the paint locker, alcohol in the alcohol locker, etc. Inspect the fire extinguishers to see that they are in good working order. Don't leave this job to someone else.

If a fire does break out, be sure your men know the right way to give the alarm. They should also know how to put out various types of fires. For GREASE FIRES, use a foamite extinguisher (figure 72) or sand. NEVER USE WATER. Water makes a grease fire worse. If an ELECTRIC SWITCH OR PLUG is afire, use a CO<sub>2</sub> extinguisher (figure 72). And if you have a wood or paper fire, water is an effective extinguisher. In fact, you can use most any kind of extinguisher for this type of fire.

See that your men know how to treat burns—especially grease burns; how to give artificial respiration in case of smoke poisoning, and how to stop bleeding. Sometimes you can't afford to wait for medical aid.

Cuts, bruises, and other injuries—no matter how small they may seem to be—are to be treated promptly. INSIST that this be done. Men who are sick at all are to be sent to sick bay. They are not to work around food unless the medical officer gives his OK.

### **SAFETY FIRST IN THE GALLEY**

Good COMMON SENSE and ALERTNESS is needed in the galley. There is no place for carelessness and foolishness.

KEEP FOODS PROTECTED FROM DIRT AND DUST AT ALL TIMES. Hot dishes are to be handled with special care. Have your men carry scalding hot liquids in covered containers with the lids securely fastened. Don't let them use open containers.

Alertness against steam and hot grease is necessary. Hot water should be carefully tested before putting hands

into it. Provide special holders to protect the hands from hot vessels or hot appliances.

See that your men watch out for cracks and sharp edges before washing glassware. A dust pan and brush are to be used for cleaning up broken glassware and crockery. And get spilled foods and liquids cleaned up immediately. They're a menace to health and safety.



FOAMITE  
EXTINGUISHER

CO<sub>2</sub>  
EXTINGUISHER

Figure 72.—Fire Extinguishers.

Injuries have resulted from opening cans and other containers improperly. Instruct your men in proper procedures. Then insist that these procedures be followed.

#### **SAFETY FIRST WITH SHARP INSTRUMENTS**

Knives and other sharp instruments are a constant menace if they are not properly used. KNIVES MUST BE

**HELD FIRMLY.** This can't be done if the knife handle is greasy and slippery. And a sharp knife is less dangerous than a dull one. Have the knives kept sharp by the use of a water stone or a carborundum oil stone. If a power-driven, dry stone is used for sharpening, the temper of the metal is apt to be ruined.

Knives are made in different shapes and sizes. Each size and each shape is best for certain uses. Figure 73 shows four different kinds of knives.

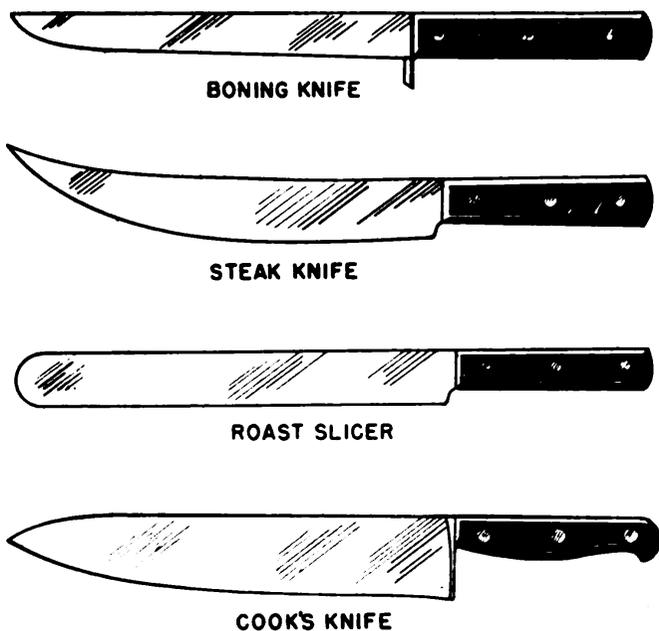


Figure 73.—Common knives.

The **BONING KNIFE** is to be used for removing bones from meat. The **STEAK KNIFE** is design for cutting steaks and roasts. The **ROAST SLICER** is used for carving cooked meat, and the **COOK'S KNIFE** (sabatier) is used for chopping vegetables, slicing fish etc. It is not used for cutting meat. Knives are never to be used for cutting through bones. That's a job for the saw.

**BONING MEAT** is a tricky operation. Have the boning knives equipped with guards. And as a safety measure—see that a hand meat hook is used when boning meat. The hand meat hook is also to be used when lifting meat. It's much safer.

Here are a few more tips about working with knives. Knives are to be kept in a drawer by themselves with all the handles pointing the same way. See that the knives are always washed in **WARM** water—not hot. Hot water is

hard on the handles. Then the knives should be rinsed and wiped with a dry cloth. Don't allow good knives to be abused by cutting strings, rope, or sacks. Nor are cleavers to be used for cutting wire, opening cans, or for driving nails.

Laying meat or anything else on top of knives is a dangerous practice. Do all you can to discourage it. If a knife or cleaver slips to the deck—JUMP. Don't try to catch it.

One more thing. Accidents can be prevented by providing plenty of working space. See that your butchers are not crowded. They need elbow room when they begin swinging their cleavers and using their knives.

### **SAFETY FIRST WITH POWER EQUIPMENT**

Power equipment is not something for a dub to fool around with. Be sure that all men who are assigned to work with power equipment know what they are doing. Here are a few tips to be observed—

Be sure the machine is properly adjusted before you turn it on. Always have the guards in place. Power tools are not to be forced. Let the machine do the work. This applies particularly to the meat saw. When anything goes wrong, turn off the switch immediately. If repairs are needed, get the proper man to make them. You're not expected to be a repair expert.

Be especially careful when you're sawing small pieces of meat. Whatever you do, don't reach around the saw. You might get caught in it. Extra care is also necessary when you're cutting frozen meat. Dull saw blades are unsafe. Use sharp blades that have plenty of set. The set keeps the blade from binding and permits you to do a smooth, even job.

The MEAT GRINDER also requires special precautions. Be sure you have the proper size plate for the job you intend to do. Then tighten the plate by means of the handwheel. Don't tighten too much—the machine might bind. Never run the meat grinder dry. The plate will be gouged out and cut. Always use a wooden plunger for feeding the meat into the machine—never your hand or a knife. OVERLOADING occurs when you try to force too large pieces of meat into the grinder. And be sure all the bones have been removed from the meat. Bread and

crackers should never be ground up in the meat grinder as no lubrication is provided by these products. Meat provides its own lubrication.

### **SAFETY FIRST AROUND ELECTRICITY**

Electricity is a great help. But it's powerful stuff and must be used sensibly. Water and electricity don't get on very well together. So keep water away from electric wires and connections.

Be sure attachments are properly connected before you turn on the switch. You may need to check with the chief electrician's mate as to how many appliances you can safely use on one circuit. Check on the oiling and greasing of electrical equipment. What little oil and grease that is required is extremely important.

Some machines are to be loaded before you turn on the switch—others must be empty. The meat grinder should be loaded; the spud peeler and the buffaloeing machine should be empty. Overloading can cause all kinds of trouble. Mixing bowls should never be filled more than about  $\frac{1}{2}$  full. Incorrect speed adjustments can also cause trouble. Be sure your men understand the uses of the various speeds that are available on some machines.

If anything goes wrong, turn off the switch immediately. But don't attempt to remove or repair fuses and don't make any other repairs. Leave that up to an electrician.

When an electrically-powered machine is in operation, have someone stay with it. Don't leave it unattended. When you're through with the machine, turn off both the machine switch and the main switch if possible. Clean and secure the machine thoroughly and properly.

### **SAFETY FIRST IN THE STOREROOMS**

Are your storerooms safe? Better check on it. If they are, all provisions are properly stowed and secured for sea. They aren't going to shift or fall. There is enough ventilation so that fires won't start from spontaneous combustion. Harmful gases will not accumulate. Proper precautions are taken against insects and everything is kept clean and in good shape.

When ice cream is delivered packed in dry ice, remove the dry ice before stowing the ice cream in the ice box. Otherwise men opening the ice box may suffocate.

If it becomes necessary to fumigate the storerooms, see that all the necessary precautions are taken. You want to destroy insects—not sailors.





## CHAPTER 13

# THE WAR AGAINST INSECTS

## A TOUGH ENEMY

**THREE HUNDRED MILLION DOLLARS**— that's real money. But that's the estimated amount of damage done by insects in the United States in one year. A tough enemy? You can say that again. And the commissary department is where they center their attack. You're in the front line in this war against insects.

**CAREFUL INSPECTIONS** and **ABSOLUTE CLEANLINESS** are your best weapons in the insect war. Careful inspections of all provisions before they are taken aboard will give you a chance to eliminate provisions containing insects. Thorough and careful inspections of the storerooms and other commissary spaces will enable you to detect your insect enemies before they get too numerous. Then you can take proper steps to eliminate them. Absolute cleanliness makes it tough for the insects to find food, and they must have food to live.

## THE ENEMY WITH FOUR LIVES

You've heard that a cat has nine lives. But did you know that the life of an insect usually is divided into four entirely different parts or stages? The change from one stage to another is known as a metamorphosis. The in-

sect begins its life as an EGG, then changes to a LARVA, then to a PUPA, and finally to a full-grown ADULT. Figure 74 shows you the last three stages in the life of a saw-toothed grain beetle.

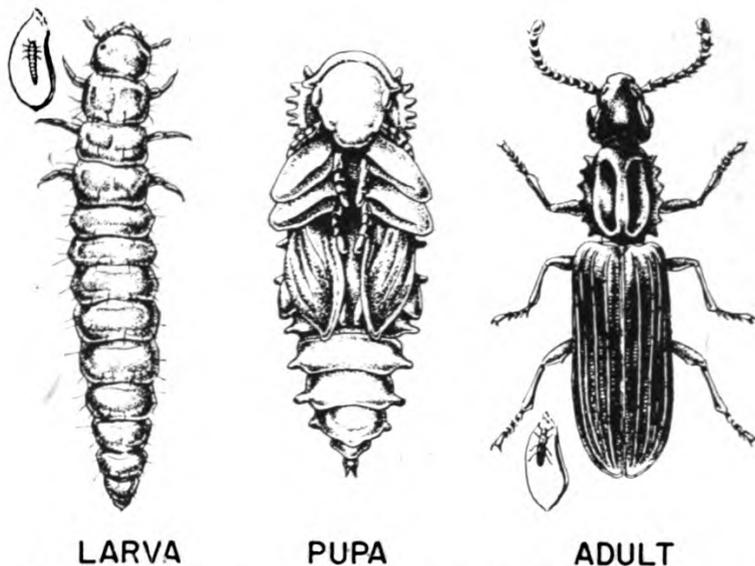


Figure 74.—Metamorphosis of a saw-toothed grain beetle.

The EGGS are usually laid near a future source of food. They hatch in periods ranging from a few days to several weeks depending on the temperature. Many insect eggs are resistant to considerable periods of dryness.

The LARVA or worm stage is the growing stage. At first the larva is small but as it eats and grows it sheds its skin and becomes larger. LARVA ARE HEAVY FEEDERS AND DO MOST OF THE ACTUAL DAMAGE TO PROVISIONS.

The PUPA stage is next. When the larva has reached its full size it continues to feed for a time. Then it sheds its skin and changes to the pupa. As a pupa, the insect rests while its wings and sexual organs develop. While these changes are taking place, the pupa remains motionless in a concealed place. You'll find it very hard to spot them. The pupa stage usually lasts about 10 days.

The fully developed ADULT emerges from the pupa. The adult insect is equipped to travel by crawling or flying. The adults mate and lay eggs—thus starting the process all over again—only now you may have several hundred insects to deal with. Some of the adult insects, such as the beetles, feed and live for about a year. Moths and other insects feed very little—if at all—and live for only a few days or weeks.

Some insects don't go through all these stages. The cockroach, for example, has an egg and an adult stage. In place of the larva and pupa stages there is a period when the roach is called a NYMPH. The nymph resembles the adult in form but is smaller and incompletely developed. Some few insects are born as adults and have no other stages.

Your insect enemies are divided up into several thousand different species or kinds. You'll want to recognize a few of the most common and dangerous ones. It will help you in your war against them.

### THE SUPERBUG

Fast, heavily armored, hard to kill—that's the cockroach, the superbug of the insect world. The cockroach has a seed-shaped, flat, waxed body that enables it to squeeze through the smallest of cracks. See figure 75.

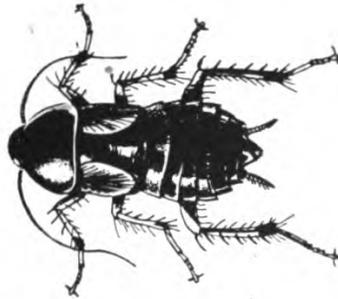


Figure 75.—The superbug (Oriental cockroach).

And—when you start swinging at it—its nimble legs carry it out of range fast. The delicate hairs on a roach catch vibrations and warn of approaching danger. Its long antennae form a supersensitive nose for smelling out hidden foods.

The cockroach is a night raider. It sleeps all day and comes out at night to get whatever food you have made available. The roach can eat more things than a goat—whitewash, hair, paint, and beer. But it likes the food you leave lying around best of all. How are you going to fight this superbug? First of all—CAREFUL INSPECTIONS and ABSOLUTE CLEANLINESS. But then what?

FUMIGATION is the most efficient means of getting rid of roaches. Unfortunately this method isn't always practical as you will have to close up the infested area from 24 to 48 hours. If you are able to fumigate, see that all

escape cracks and openings are closed up so that the fumigating gas will not escape before the roaches are killed.

Spraying or scattering SODIUM FLUORIDE or DEBRIS DUST containing one percent or more ROTENONE into ALL cracks and crevices is the most practical way of eliminating roaches. But remember—SODIUM FLUORIDE IS A DEADLY POISON. See that all food is thoroughly covered before you put the poison out as roaches might carry some of the poison into the food. It also helps to use a good fly spray. These treatments may have to be continued for some time before all the roaches are eliminated.

### **PUBLIC ENEMY NUMBER 1**

The COMMON FLY well deserves the title of public enemy number 1. The fly breeds in filth and spreads dangerous diseases by carrying germs on its feet, legs, body, and in its digestive tract. Fortunately, the fly doesn't bother you when you're at sea. But in port—be careful. Use fly spray—DDT if available—and fly swatters to keep the fly population down.

The presence of fruit flies usually indicates overripe, decaying fruit. Use care in handling and sorting all fresh fruit. Get rid of any that is decayed. And keep containers of canned fruit covered at all times.

### **THE CONFUSED FLOUR BEETLE**

Does your flour storeroom have a musty odor? If it does, confused flour beetles may be around. See figure 76. These beetles are a shiny reddish brown and are about

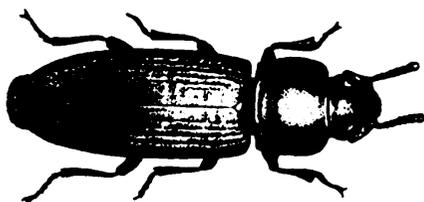


Figure 76.—Confused flour beetle.

one-seventh of an inch long. They are flat and oval in shape with the head and upper parts covered with small punctures. The wing covers have ridges. The average life of the confused flour beetle is about one year, but some have been known to live as long as three years, nine months. The females lay an average of about 450 eggs each. The small white eggs are laid loosely in flour

or other food material. These eggs are covered with a sticky substance so they become covered with flour or meal and stick to the sides of sacks, boxes, and other containers. When fresh flour or meal is placed in these containers, it becomes infested in a short time.

In five to twelve days the eggs hatch into small worm-like larvae which are slender, cylindrical, and wiry in appearance. When fully grown they are about three-sixteenths of an inch long, and are white, tinged with yellow. These larvae feed on flour or other material such as grain dust and broken surfaces of grain kernels. When full grown, the larvae transform into small naked pupae. The pupae change from white to yellow to brown and then become adult beetles. The period from egg to adult averages about six weeks under favorable summer weather conditions.

The confused flour beetle is slow moving and can't survive temperatures over 120° F. You can get rid of them pretty well by pouring BOILING HOT water into the cracks and crevices of your flour bins. Fumigation is NOT effective. Remove beetles in the flour itself by running the flour through a sieve. A 10xx silk sieve is the best type to use as it will remove eggs as well as insects.

### **THE SAW-TOOTHED BEETLE**

The adult saw-toothed beetle is slender, flat, brown in color, about one-tenth of an inch long, and has six saw-like attachments on each side of the upper part of its body. Look back at figure 74. This beetle attacks all food of vegetable origin—especially grain and grain products such as flours, meals, breakfast foods, nuts and candies.

The adult beetles live from six to ten months on the average—some may live as long as three years. The females lay up to 285 eggs, dropping them loosely among the foodstuff. The small, slender, white eggs hatch in three to five days. The larva is very active. It becomes full grown in about two weeks during summer weather. The full grown larva then constructs a delicate cocoon-like covering by joining together small grains or parts of foods with a sticky secretion. Within this cell, the larva changes to the pupal stage, which lasts about a week. The whole development from egg to adult may take place in three to four weeks in summer.

The saw-toothed beetle is one of your worst enemies. Both the larva and adult beetle make holes in boxes and sacks in order to get at the food. In fact, this pest has been given credit for making holes in aluminum can covers. Its small size enables it to crawl into small cracks and crevices and thus escape your efforts to eliminate it.

RAPID TURNOVER and COOL, DRY storage conditions are your best weapons against this pestiferous enemy.

### THE CADELLE

The adult cadelle is a shiny black beetle about one-third of an inch long (figure 77).

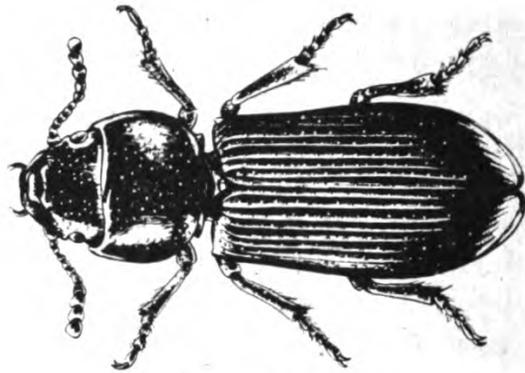


Figure 77.—The cadelle.

Sometimes the cadelle is called the "lobster bug." The larva is about three-fourths of an inch long and is easily recognized. Its fleshy abdomen ends in two dark horny points. This larva is a dirty or chalky white. Its head and the two horny points at the end of the body are black. The cadelle larva eats holes in paper sacks and other containers. And—because these larvae are large—the holes make it possible for most other insects to get to the food also. The female cadelle often lays eggs on the outside of flour sacks. When the larvae develop, they eat through the sacks in order to get at the flour. If you notice small piles of flour on the outside of flour sacks or on the deck in compartments where flour is stored, you can be pretty sure that the cadelle beetle has been at work.

The white eggs are laid in clusters and hatch in seven to ten days during warm weather. The larvae complete their growth in from two to fourteen months, then seek some secluded place in which to transform to the pupal stage. Frequently they bore into the timbers of the bin

or other container that holds the infested food. Both larvae and adults can live for a long time without food, frequently remaining hidden in the woodwork of the bins for a long time after the provisions have been removed. When new provisions are put into such a bin, they become infested in a surprisingly short time.

**A RAPID TURNOVER and CLEAN STORAGE CONDITIONS** are your best weapons against the cadelle. Fumigate if necessary and if possible.

### **MEAL WORMS**

Meal worms are the larvae of large black beetles. These larvae become full grown in about three months, but instead of transforming then to the pupal or adult stage they continue feeding and molting until cold weather. They hibernate over the winter as larvae. Consequently, there is but one generation of meal worms each year.

Meal worms thrive on decaying grain or milled cereals that are damp and in poor condition. Two kinds of meal worms are common in the United States—the yellow meal worm and the dark meal worm. About the only noticeable difference between the two is in the color. The dark meal worm is much darker than the yellowish color of the yellow meal worm. Each of these species is from one to one and a quarter inches long and looks like the worm shown in figure 78.



**Figure 78.—Yellow meal worm.**

Here's what you can do to combat these enemies—

Keep all your cereal products **DRY** and **CLEAN**. Be sure you have a **FAST TURNOVER**. Don't allow any of the stock to get old. And before you stow any new lots of flour and cereals, have the storage compartments thoroughly cleaned.

## MOTHS

Moths are part of the insect world air force. They have four wings covered with dust-like scales. The ability of moths to fly makes them a greater menace, as they can spread their damage over a wider area. There are many different kinds of moths.

The INDIAN MEAL MOTH (figure 79) probably is your most common moth enemy. This rather handsome moth

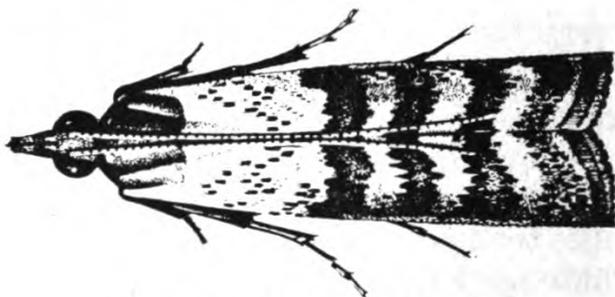


Figure 79.—Indian-meal moth.

has a wing span of nearly three-fourths of an inch. It is easily distinguished from other pests by the peculiar markings on its forewings. These wings are reddish-brown with a coppery luster on the outer two-thirds, but whitish gray on the inner or body end.

The female moth lays from 100 to 300 eggs, singly or in groups, on food material. The eggs hatch within a few days into small whitish larvae or caterpillars. These larvae feed upon grains, grain products, dried fruits, nuts, and other foodstuffs. When full grown, the larvae are about half an inch long, dirty white, varying sometimes to greenish and pinkish hues. This larva spins a silken cocoon and transforms to a light-brown pupa from which the adult moth later emerges. The Indian-meal moth may pass through its egg, larva, and pupal stages in a period of six to eight weeks during warm weather.

You'll need a good stiff brush in order to dislodge the larvae from cracks and crevices. Then have them swept up and destroyed. If these moths get very bad, you may have to fumigate to get rid of them.

The MEAL MOTH is brownish and somewhat larger than the Indian-meal moth. Its wings are of chocolate color, lighter in the middle. Two wavy lines run across the fore wings. This moth curves its tail over its back when you disturb it. Although the meal moth prefers

material that is damp and in poor condition, it may attack and severely damage sound wheat or cereal products if they are stored in moist places.

The larvae of this moth are whitish, and attain a length of about one inch. Often the body of the larva is tinged with orange toward each end. It cuts through burlap sacks without any trouble. When the larvae cut the sacks, the provisions fall out and lodge where the sacks touch one another. In such places, the provisions become heavily infested. These larvae spin peculiar tubes of silk in which are mixed particles of food. They rest in these tubes, which are very tough, and feed from the openings at the ends. When fully grown, the larvae leave the tubes, spin silken cocoons, also often covered with food particles, and transform into the pupae. Later these pupae emerge as adult moths. The female moth lives for about a week only, but during its life it lays between 200 and 400 eggs. The developmental period from egg to adult in summer requires from six to eight weeks.

The best way to fight the meal moth is to keep the storage compartment absolutely CLEAN and DRY. A FAST TURNOVER also helps.

### WEEVILS

The GRANARY WEEVIL (figure 80) is a small, moderately polished, chestnut-brown or blackish beetle. Notice how its head is prolonged into a long slender snout. The

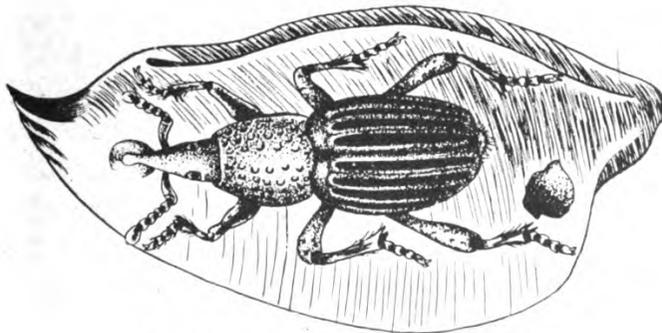


Figure 80.—The granary weevil.

weevil is no more than three-sixteenths of an inch long but it can do plenty of damage to your grain products. The granary weevil has no wings under its wing covers and the part just back of its head is marked by oblong punctures arranged lengthwise. The larva is the well

known footless, whitish grub worm. The adult weevils live from seven to eight months, the females laying from 50 to 250 eggs during this period. In warm weather the granary weevil requires about four weeks to complete its development from the egg to the adult weevil.

The **RICE** or **BLACK WEEVIL** is a small snout-beetle which rarely measures more than one-eighth of an inch in length. It varies in color from reddish brown to nearly black and is usually marked on the back with four light reddish or yellowish spots. At first glance, the rice weevil looks very much like the granary weevil. But upon closer examination, you'll find that the rice weevil has well-developed wings beneath its wing covers, it differs in color and markings, and the part in back of its head is pitted with round instead of oblong punctures. The adult rice weevil lives from four to five months, each female laying between 300 and 400 eggs during this period. It is a strong flier. During summer weather the egg, larvae, and pupae stages may be passed in as few as 26 days.

**CLEANLINESS, DRYNESS, and a FAST TURNOVER** are again your best weapons of defense.

### FLOUR MITES

Flour mites are pale, grayish-white, smooth, soft-bodied creatures so small you can't see one with the naked eye. Figure 82 shows you how flour mites look under the microscope. When you have a large number

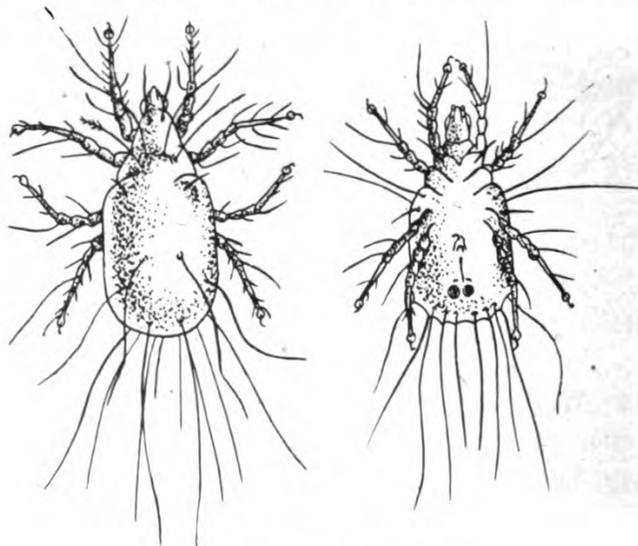


Figure 81.—Flour mite.

of mites in a storage compartment, you'll be able to smell a sweetish, musty odor. Also, if mites are present in your flour, the surface of the flour may have a brown appearance caused by the cast off skins. If you want to be sure whether or not your flour contains mites, do this—

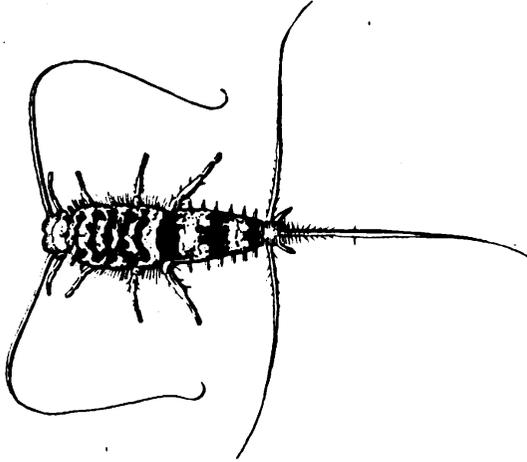


Figure 82.—Firebrat.

Make a little pile of flour under a strong light. If mites are present, they'll try to crawl away from the light. This will make your pile of flour spread out gradually.

Their small size, peculiar habits, and rapid multiplication make mites particularly fitted for living in stored food products. If living conditions get tough, the mites form a hard crust over themselves and go into a resting stage until conditions get better. In this condition of rest, they can live without food for months.

During this time they may be blown about with dust or carried from one storeroom to another by mice, flies, rats, or persons.

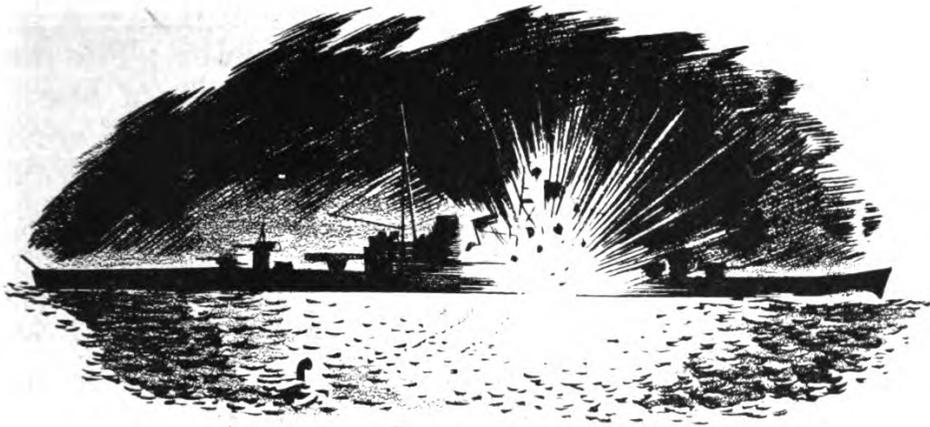
Mites are killed by intense heat but are not affected by any of the fumigants that you can use safely around flour and other food products. The best way to get rid of them is to CLEAN THOROUGHLY all corners, cracks, and crevices. Then spray these areas with a carbolic acid emulsion spray.

### SILVERFISH AND FIREBRATS

Silverfish and firebrats (figure 82) are in the lowest order of insects. They are flat, about one-half inch long, and very active. They have no wings but do have long antennae. Their color is a shiny silver and you are able

to see the three bristles at the tail. Silverfish and firebrats like best to live in flour when it is stored in a place having a constant warm temperature.

Sodium fluoride—the poison often used to get rid of cockroaches—is a good defense weapon. Also, silverfish and firebrats may be eliminated by mixing arsenic with paste or glue and daubing the mixture on pieces of cardboard. But remember—both SODIUM FLUORIDE AND ARSENIC are deadly poisons. Don't get them too close to your food products.



## CHAPTER 14

### FOOD POISONING

#### THE INVISIBLE WORLD

Living organisms called bacteria—millions of them—are all around you. **BUT YOU CAN'T SEE THEM.** They're just too small. If you get a chance, look at a drop of ordinary water under a microscope. The chances are good that you will see living, moving bacteria.

Most bacteria are harmless—some of them are actually helpful. But the relatively few that are harmful can sometimes cause more damage than a torpedo hit. Bacteria can cause damage only if you provide suitable conditions for their growth and development. Your job is to see that these conditions are not provided.

Bacteria need **THREE** conditions before they can cause trouble. **FIRST**—they must have **FOOD**. Oftentimes, they like the same food your men like. Next, they must be provided with a certain amount of **HEAT**. Temperatures between  $65^{\circ}$  F. and  $115^{\circ}$  F. are most suitable for bacteria growth. They don't grow well in refrigerated spaces. Finally—the bacteria must have **TIME** in order to multiply to a large enough number or to form sufficient toxin (poison) to cause you trouble. The colder the place or the less food present, the more time needed.

These three conditions—**FOOD**, **HEAT**, and **TIME**—give you the cue for your plan of attack against harmful bacteria—the usual cause of **FOOD POISONING**. In fact, you can successfully combat them by effectively controlling any **ONE** of the three conditions.

Before going any farther, you'll want to know a little more about some of these invisible enemies. The most troublesome bacteria are staphylococci, some of the salmonella group, the bacteria causing botulism, and certain streptococci. Don't let these two-bit words bother you. They are names of bacteria—that's all.

### **STAPHYLOCOCCI BACTERIA**

Poisoning caused by staphylococci bacteria is the most common type of food poisoning. These bacteria are present practically everywhere, especially in boils, pus from infected cuts, in the nose and throat, and in the spray from sneezing and coughing. If they are furnished a good growing temperature (65° F. to 115° F.) and if they are given several hours time, they will secrete enough of a poison called a toxin to cause illness. This toxin is difficult to destroy. It can withstand boiling water temperature of 212° F. for more than 30 minutes. There is no way to tell by the taste, smell, feel or appearance of the food whether or not enough of the bacteria or its toxin to cause illness is present in the food. **IMPROPERLY HANDLED** ham, chicken, turkey, custard filled products, hash, and puddings—in fact almost all starchy or sweet foods—open the door for staphylococci trouble.

The symptoms of this type of food poisoning appear within two to four hours after the infected food is eaten. The first thing you notice is that you have to swallow a great deal. Then you get a feeling of nausea and need to vomit. Stomach cramps may follow. Diarrhea frequently develops and sometimes a headache, excessive sweating, and weakness add to your discomfort. These symptoms usually last from 24 to 48 hours. Recovery is rapid and complete. But the poisoning is bad enough while it lasts. **IT MAY THROW MEN OUT OF ACTION WHEN THEY ARE BADLY NEEDED.**

Now—what's to be done about it? A few simple rules will help you. If possible, have food served **IMMEDIATELY** after it has reached the right degree of "doneness". If this can't be done, get the food into the refrigerator—and get it there fast. Then keep the food in the refrigerator until just before you plan to serve it. If necessary, the food may be reheated, providing you do this just before serving.

Observe the **FOUR HOUR RULE** by serving the food within four hours from the end of the cooking period. Begin timing from the minute the food is taken from the hot oven or kettle—not from the time the food is sliced or otherwise prepared for serving.

On **RARE** occasions it may be necessary to hold foods longer than four hours after cooking. Before you put this food in the refrigerator, place it in several shallow trays to a depth of not more than three inches rather than in one large deep pan. The chill may take so long to get to the center of the food in a deep pan that the bacteria and its toxin may develop enough to spoil the food.

**CAREFUL MENU PLANNING** will keep leftovers to a minimum and thus reduce your chances for food poisoning.

Have bread puddings, custards, eclairs, and foods with cream fillings **COVERED, COOLED QUICKLY**, and kept in the refrigerator or another cool place until ready to serve. If these foods can't be safely handled in this manner, **DON'T PLAN TO SERVE THEM.**

Food to be **GROUND** for hash or other dishes should be ground immediately before cooking rather than some time previous. Grinding increases the area for the introduction and growth of bacteria. Also the grinding process warms chilled foods to a point where bacteria may start developing.

**DEHYDRATED PRODUCTS** that have been reconstituted spoil just as fast as the fresh product. Bacterial growth begins as soon as water is added. Therefore, reconstitute the food no sooner than is necessary. If something unexpected makes it impossible to use the reconstituted food immediately, see that it gets thoroughly chilled at once in order to slow down bacterial growth. Take particular care when handling powdered milk products, and be sure the whole milk you use has been pasteurized.

Once **FROZEN** foods have been allowed to thaw, they also spoil just as readily or even more quickly than fresh food. So—never permit frozen foods to thaw until just before they are to be prepared or served. Here are some other precautions—

If any of your men get boils, infections, colds, diarrhea, or any other type of illness, send them to sick bay **AT ONCE.** Allow these men to work around food only if the medical officer indicates that it is all right. Warn your

men not to cough or sneeze in the commissary spaces without covering the nose and mouth with a handkerchief. See that they observe this warning.

**INSIST ON PERSONAL CLEANLINESS** on the part of all of your men. It's one of your best weapons against food poisoning. See that all galley and messing personnel keep their hands and clothes scrupulously clean. Hands should be washed several times a day—always after visiting the head. This will help prevent the spreading of salmonella and other intestinal germs from man to food.

### **SALMONELLA AND STREPTOCOCCI BACTERIA**

Some outbreaks of food poisoning are caused by salmonella and streptococci types of bacteria. When taken in with food, these bacteria infect the system directly. They do not produce toxins.

**SALMONELLA** bacteria may produce an infection which is somewhat like typhoid fever—only milder. Or it might bring on nausea, vomiting, abdominal cramping, and diarrhea. The abdominal pain is often the first symptom. This pain may be griping and severe. Muscular weakness, faintness, and thirst are present. And there is almost always a rise in temperature. The infected person gets restless and has muscular twitchings. Infection from salmonella bacteria sets in from seven to 72 hours after eating the infected food. This rather long time period is one way by which salmonella poisoning may be distinguished from staphylococcus food poisoning.

**RATS, MICE,** and the common **HOUSE FLY** are common sources of salmonella poisoning. Fight a successful war against these pests. Eliminate them. Good traps will keep the rats and mice under control. Make use of them if necessary. Poison is not recommended since the animals may eat the poison and then crawl into some hard-to-get-at place before they die. Efficient screening of commissary spaces ashore is required for fly control. Good fly sprays will help keep the air-borne house fly under control. Keep food covered at all times so that these pests will not be able to get at it.

**STREPTOCOCCUS** food poisoning also results in nausea, vomiting, coliclike pains and diarrhea. But this type of poisoning usually develops within five to 18 hours after eating the infected food. As is true in other kinds of

food poisoning, most cases of "strep" poisoning are due to the improper care and handling of food that was perfectly all right to begin with.

### **BOTULISM**

**BOTULISM** is the most deadly type of food poisoning. Fortunately there is very little of it. In fact, there has not been a reported case of botulism from commercially canned foods since 1925.

As with staphylococcus food poisoning, a toxin produced by the bacteria (*Clostridium botulinum*) causes the illness. This toxin is comparatively easy to destroy. Thorough heating of the food to 212° F. for 1 to 2 minutes will do the trick. But there's another difficulty—the botulinus organisms also produce a **SPORE** which is strongly resistant to heat. Only long heating at a high temperature will destroy it. This spore produces the toxin that usually causes botulinus poisoning in canned goods that have been stored for a long time.

The symptoms of botulism are: difficulty in swallowing, double vision, difficulty in speech, and difficulty in breathing which often results in death. The symptoms appear in a period of two hours to eight days after eating the infected food, the average being from one to two days.

The bacteria causing botulism grow only in the absence of air so you'll find them only in connection with improperly canned goods. Although commercial canners have practically eliminated botulism from their products, there have been cases every year from improperly home-canned products. Canning by the cold-pack method is extremely dangerous.

To guard against botulism, instruct your men to lay aside and discard all cans showing any degree of bulging and any canned products that have off colors or odors. Warn them not to taste questionable canned foods. A taste of food containing the botulism-causing bacteria may be enough to cause serious illness.

### **CHEMICAL POISONING**

Poisoning from chemicals such as arsenic or lead causes much less trouble than poisoning from bacteria. You'll want to know something about it, however. There may be occasions when this type of sickness occurs.

**ANTIMONY POISONING** is sometimes caused by foods cooked in cheap, gray-enameled cooking utensils. Antimony usually results in vomiting within a few minutes after the poisonous food has been eaten. Your method for preventing antimony poisoning is simple—don't use cheap, gray-enameled pots and pans.

Most cases of **ARSENIC** poisoning crop out in people who are working in metallurgical occupations or in patients under treatment with arsenical drugs. You may need to use arsenic compounds in order to get rid of some types of insects. Be careful with it. Don't leave it lying around the galley where it might be mistaken for something else and be put into food.

**CADMIUM** poisoning has resulted from preparing lemonade and other acid drinks in cadmium plated utensils. The symptoms of this type of poisoning are nausea, vomiting, cramps, and diarrhea. These symptoms usually appear within 15 to 30 minutes after the drinks have been taken.

You won't have any trouble with cadmium poisoning if you use only the galley equipment provided by the Navy and observe instructions provided with it. If it becomes necessary to purchase additional equipment, be sure you get nothing that is plated with cadmium.

**FLUORIDE** poisoning is due to sodium fluoride, which is often used to get rid of cockroaches and other insects. The poisoning is very severe. Vomiting, pains in the abdomen, and diarrhea are some of the milder symptoms. Convulsions, muscle spasms, and paralysis of hands and feet sometimes occur. The symptoms usually appear within two hours after the poison has been eaten.

Take no chances with fluoride poisoning. Sodium fluoride looks much like baking powder, so keep it away from any place where it may be mistaken for the baking powder and get into food.

**ZINC** poisoning is very rare. It occurs once in a while when apples, acid foods or beverages are cooked or kept in a galvanized iron kettle. The symptoms are pain in mouth, throat, and abdomen, followed by diarrhea.

**TIN** poisoning is practically unknown. It's perfectly safe to leave food in an opened can providing the proper storage precautions are taken. In fact, the tin container is more sterile than most dishes—even though the dish may have been thoroughly washed.

## POISONOUS PLANTS AND ANIMALS

SHELLFISH poisoning occurs once in a while from the eating of certain infected mussels found only on the Pacific Coast. The symptoms vary all the way from a trembling about the lips to complete loss of power in the muscles of the arms, legs, and neck. Death may result from an attack on the organs of breathing. Never serve mussels without the medical officer's OK. Some FISH are poisonous. So avoid serving fish you know nothing about until you are sure they are all right.

TREMATOL or milk sickness comes from white snake-root. You'll get it from drinking milk from cows that have pastured on snakeroot. The symptoms involve weakness, vomiting, and severe constipation. Pasteurization of the milk does not destroy this poison.

MUSHROOM poisoning is a tricky thing. There are over 70 kinds of poisonous mushrooms. Two or three of the *white amanita* mushrooms—the most poisonous of all—are sufficient to cause death. Only an expert can tell the difference between some of the poisonous and some of the good mushrooms. Let the expert decide for you.

WATER HEMLOCK—often called parsnip, wild parsnip, or wild carrot—is poisonous. The only time you will worry about this kind of poisoning is in landing operations. Don't use wild growing plants for food unless you KNOW that they are all right.

RHUBARB LEAVES are poisonous to some people. The stems are perfectly all right. But don't use the leaves for greens.

### SOME OTHER DANGERS

DYSENTERY may be spread by impure water or contaminated food. Your main safeguard against it is absolute cleanliness.

TRICHINOSIS is caused by a very small worm known as the trichina. The trichina sometimes comes aboard in pork. Inspectors can't be blamed for passing pork containing this worm as it is too small to be seen. But YOU have no excuse for allowing anybody to get trichinosis. See that all pork is cooked THOROUGHLY and you'll have no trouble. Raw or rare pork is dangerous—never serve it.

As freezing destroys trichinosis organisms, there is little danger of trichinosis from quick-frozen pork. And

pork frozen to 0° F. and held at that temperature for 24 hours or more will not cause you any trichinosis trouble.

All your care in food preparation may go for nothing if the eating utensils are not cleaned and cared for properly. Cracked or chipped cups and bowls are to be surveyed, as the cracked and chipped places furnish good hiding places for dangerous bacteria. Mess gear is to be washed with water so hot you can hardly keep your hands in it (140° F. at least). The rinse water is to be even hotter (at least 180° F.). And the gear is to be air-dried.

In some parts of the world night soil (human excrement) is used to fertilize crops. Food grown in such areas is NOT to be used. Steer clear of native food handlers if you possibly can. If you must use them, supervise them very closely.

**How Well Do You Know The Duties Of—**

**SHIP'S COOK 1c  
& CHIEF COMMISSARY STEWARD**

# QUIZ

## CHAPTER 1

### MEET THE SENIOR COOK AND THE CHIEF

1. For which mess must the Chief Commissary Steward be able to keep complete and accurate records?
2. To meet the qualifications, what must a Chief Commissary Steward know about provision costs?
3. What field equipment must a Ship's Cook 1c be able to set up and operate?

## CHAPTER 2

### GETTING ORGANIZED

1. Who is directly responsible for the preparation of the weekly bill of fare?
2. What should be done with doubtful foods?
3. With what types of provisions does the spud coxswain work?
4. What must be obtained by the jack of the dust for every issue made?
5. What commissary personnel should observe safety regulations?
6. How can you most effectively provide for your men learning every job in the galley?
7. On a large ship, to whom is the senior cook directly responsible?

## CHAPTER 3

### PLANNING THE BILL OF FARE

1. Which two of the following types of food provide the most energy—proteins, carbohydrates, fats, minerals?
2. Which two parts of the body are calcium and phosphorus particularly good for?
3. Iron is made most use of by what part of the body?
4. What mineral does the thyroid gland need in order to keep it operating properly?
5. Which vitamin is particularly helpful in maintaining good eyesight?
6. Which of these foods is best for providing thiamin—apples, liver, potatoes?
7. Which part of an orange contains the most vitamin C?
8. The complement of your ship is 415. You have on hand 3,735 pounds of boneless veal suitable for veal cutlets. Your Navy Cook Book indicates that 45 pounds of veal are needed for

- 100 portions of cutlets. How many veal cutlet meals are you going to be able to serve?
9. How many meals does one Navy ration cover?
  10. According to the Navy Cook Book plan, how many servings of fruit should be provided every day?
  11. What is your main carbohydrate food?

## CHAPTER 4

### PAPER WORK OF THE BILL OF FARE

1. By what day every week must the bill of fare be completed and handed to the supply officer?
2. Who gives final approval to the bill of fare?
3. At the time the bill of fare is given to the SO, what information is given on its reverse side?
4. What reduction percent may be used when estimating the amounts of provisions needed for a mess having between 500 and 1,000 men?
5. What is the final step in getting the estimated cost of a ration per day?
6. Who must approve changes in the bill of fare?
7. If you need to prepare 240 portions, what are you going to multiply the quantities given in the Navy Cook Book by?
8. How many ounces are there in a pound?
9. How many decimal places are used for expressing prices on the 333?

## CHAPTER 5

### GETTING THE PROVISIONS YOU NEED

1. Where can you find the normal use table for provisions?
2. How many men is the normal requirements table for provisions based on?
3. Suppose you were ordered to provision a ship having a complement of 1,750 for a cruise of 45 days. What part of the requirements given in the normal requirements table would you order?
4. What is the capacity in cubic feet of a rectangular storage space 22 feet long, 10 feet wide, and 8 feet high?
5. What is the capacity of a triangular storage space 15 feet long, 8 feet wide, and 8 feet high?
6. From what source does a ship usually get its provisions?
7. What form is used ordinarily for ordering provisions from contract dealers?
8. What Navy agency distributes provision specifications?

## CHAPTER 6

### INSPECTION AND STOWAGE OF PROVISIONS

1. What department aboard ship is responsible for the quality inspection of provisions? The quantity inspection?
2. At what times of the day should frozen meats be loaded during the hot weather?
3. What is the ideal temperature range for storing late apples? How long a time can you expect late apples to last if they are stored under ideal conditions?
4. Green bananas have a longer storage life than ripe bananas. Yet, the taking aboard of green bananas is not recommended. Why not?
5. Why aren't watermelons recommended for general shipboard use?
6. If the temperature of quick-frozen fruits and vegetables is higher than the storage space into which they are to be placed, the cartons should be scattered loosely about the compartment. Why?
7. What should be done if quick frozen products must be left out in the sun awhile before they can be stowed?
8. Why is it wise to have cases of evaporated milk turned over at least once every three months?
9. Why is it well to have containers sealed with corks stowed on their sides?
10. What usually happens to white potatoes if they are stored at a temperature of 35° F. for any length of time?

## CHAPTER 7

### GETTING THE PROVISIONS OUT OF STORAGE

1. What is the most important information the CCS gets from the 27A (Daily Ration Memorandum)?
2. The Navy Cook Book indicates that 42 pounds of boneless lamb are needed to provide 100 portions of roast lamb. If you are planning to serve 375 portions, how much boneless lamb will you need to order? How much would you need for 740 portions? 1,425 portions?
3. If the average cost of beef, fresh frozen, boneless, is \$.18 per lb., how much per lb. should the cabin mess be charged for this type of roasting and frying beef? (The BuSandA Manual indicates that roasting and frying beef, fresh frozen, boneless, is to be sold to messes at 145% of the average cost.)
4. When do the special messes make settlement for the provisions they purchase?
5. Who surveys provisions?

6. Where are the facts concerning a provision survey first recorded?
7. What form is used when a special mess orders provisions from the general mess issue room?
8. What form is used to make a report of provision surveys?
9. Why must empty metal cans be pierced before they are thrown overboard?

## CHAPTER 8

### RATIONS—ALL KINDS

1. Navy personnel are provided food or money with which to buy food. How is the subsistence of officers handled?
2. When are enlisted personnel entitled to a subsistence allowance?
3. What is necessary before commuted rations can be paid?
4. When an officer is permitted to eat the food of a general mess, how much is each officer to be charged for a day's ration?
5. How is the CCS informed of the number of rations to prepare each day?
6. How long must a man be on leave before he is entitled to leave rations?
7. How are steward's mates subsisted?
8. Who must approve the issue of general mess rations to non-naval personnel?
9. Which service usually furnishes the chow when Army and Navy personnel take part in joint shore activities?

## CHAPTER 9

### MORE OF THE PAPER WORK

1. What forms are turned in as substantiating vouchers for the *Statement of Issues to General Mess and Cost of Ration Daily*?
2. What form is filled out by the SO from the NavSandA 333 you turn in every day?
3. What is the most common unit of measure used in the *Provision Ledger*?
4. Where do you get the data for making entries in the issues column of the *Provision Ledger*?
5. Under what conditions is NavSandA 36 instead of NavSandA 45 used as a final return?

## CHAPTER 10

### COOKING IN THE FIELD

1. Which type of field rations should be used only as a last resort and then only for as short a time as is necessary?
2. Which is the best field ration for all around use?
3. What is the meaning of the title, TEN-IN-ONE ration?
4. How many units of the M1937 range do you need for subsisting 175 men?
5. When you wish to do some frying with an M1937 range, in what position do you place the fire unit?
6. How many men are needed to conveniently assemble the M1942 field bake oven?
7. What is contained in the bottom section of the M1942 field bake oven?
8. During the assembling of the M1942 field bake oven, when should the fire units be installed?
9. How can you maintain a green flame with the M1937 fire unit?
10. How many cans of boiling water should be provided for cleaning mess gear in the field?
11. What is the most satisfactory way of disposing of garbage in the field?

## CHAPTER 11

### GETTING THE MOST OUT OF YOUR PROVISIONS

1. In what way may careless handling harm canned foods?
2. What is the best way to thaw out canned goods that have become frozen?
3. Why is it dangerous to place unopened cans in the oven or on the back of the range?
4. How long should potatoes remain in the potato peeler?
5. When foods are removed from the deep fat fryer, how should they be handled?
6. When should salad dressings be added to fresh fruit or green vegetable salads?
7. What effect does exposure to air, water, or heat have on the B vitamins?
8. What must be done with fat to be used for cooking purposes?
9. Where should cooking fat be stowed if it is to be kept for a long period of time?

## CHAPTER 12

### SAFETY FIRST

1. When lifting heavy objects, which muscles should do most of the work?
2. What type of match is to be used aboard ship?
3. If a gallon of paint will cover 400 square feet of area, how much paint will you need to cover the deck, overhead, and bulkheads of a rectangular storeroom 18 feet long, 10 feet wide, and 8 feet high?
4. What is the area in square feet of a triangular bulkhead 15 feet wide and 10 feet high? If a gallon of paint will cover 450 square feet, how much paint will be needed to cover 4 such bulkheads?
5. What kind of a fire extinguisher should be used for a grease fire? An electric switch fire?
6. What should be used for sharpening knives?
7. If anything goes wrong with an electrical appliance, what is the first thing to do?

## CHAPTER 13

### THE WAR AGAINST INSECTS

1. What are the four stages in the life of a typical insect?
2. What is the most practical way of getting rid of cockroaches?
3. What does the presence of fruit flies usually indicate?
4. How can you get rid of the confused flour beetle?
5. How can you determine for sure whether or not your flour contains mites?

## CHAPTER 14

### FOOD POISONING

1. What kind of living things are responsible for most food poisoning?
2. What is the most deadly kind of food poisoning?
3. Which type of canned goods is most likely to cause food poisoning—commercially canned products or home canned cold-packed products?
4. What is the cause of antimony poisoning?
5. How dangerous is tin poisoning?
6. How can you prevent trichinosis?
7. What part of the rhubarb plant is apt to be poisonous to some people?

# ANSWERS TO QUIZ

## CHAPTER 1

### MEET THE SENIOR COOK AND THE CHIEF

1. The Chief Commissary Steward must be able to keep complete and accurate records for the general mess.
2. In order to meet the qualifications for a Chief Commissary Steward, you must know something about current provision prices and the seasonal trends of these same prices.
3. A Ship's Cook 1c knows how to set up and operate a field range, a field bake oven, and a camp ice box.

## CHAPTER 2

### GETTING ORGANIZED

1. Chief Commissary Steward is directly responsible for the preparation of the weekly bill of fare.
2. Always have doubtful foods put aside for a survey.
3. The spud coxswain prepares the fresh fruits and vegetables.
4. The jack of the dust must obtain a receipt for every issue he makes. This receipt is usually given on the *Stub Requisition*, NavSandA 307.
5. All the commissary personnel must observe safety regulations.
6. The best way to get your men to learn every job in the galley is to rotate them from one job to another so that they get experience in doing the various jobs.
7. On a large ship, the senior cook is directly responsible to the Chief Commissary Steward.

## CHAPTER 3

### PLANNING THE BILL OF FARE

1. Carbohydrates and fats provide more energy than proteins or minerals.
2. Calcium and phosphorus are particularly good for the bones and the teeth.
3. The blood makes most use of the iron that is eaten.
4. The thyroid gland needs iodine in order to keep it operating properly.
5. Vitamin A is particularly helpful in maintaining good eyesight.
6. Liver is a better thiamin supplier than apples or potatoes.
7. The peeling of an orange contains more vitamin C than the rest of the orange.

8. Forty-five pounds of veal is needed for 100 portions. Dividing this by 100 will give the amount needed for each portion.

$$\frac{45}{100} = .45$$

Multiplying this .45 by 415 will give the amount of veal needed for one meal of 415 portions.

$$\begin{array}{r} 415 \\ \times .45 \\ \hline 2075 \\ 1660 \\ \hline 186.75 \end{array}$$

Dividing this 186.75 into the 3,735 pounds of veal available will tell you how many veal cutlet meals you can provide.

$$\begin{array}{r} 20. \\ 186.75 \overline{)3735.00} \\ \underline{3735 \ 0} \end{array}$$

So you can provide 20 veal cutlet meals for a complement of 415 men.

9. One Navy ration includes 3 meals—breakfast, dinner, and supper.
10. Your Navy Cook Book plan provides for 2 servings of fruit every day.
11. Depend upon potatoes for most of your carbohydrates.

## CHAPTER 4

### PAPER WORK OF THE BILL OF FARE

1. The bill of fare for the next week must be completed and given to the supply officer by Wednesday.
2. The CO gives final approval to the bill of fare.
3. The estimated amount and cost of provisions needed to provide the bill of fare are given on the reverse side of the bill of fare.
4. The amounts given in the Navy Cook Book recipes should be reduced by 5 percent when you're planning for a mess between 500 and 1,000.
5. The final step in getting the estimated cost of a ration per day is to divide the total cost of all provisions used by the authorized number of rations.
6. The CO approves changes in the bill of fare.
7. If you plan to serve 240 portions, multiply the quantities given in the Navy Cook Book by 2.4.
8. There are 16 ounces in one pound.
9. Use 4 decimal places if necessary for expressing prices on the 333.

## CHAPTER 5

### GETTING THE PROVISIONS YOU NEED

1. Normal use tables for provisions are found in the *BuSandA Manual*.
2. The normal requirements tables are based on what is needed by 1000 men for 30 days.
3. Here's how you would determine what part of the provisions given in the normal requirements tables you would need for a complement of 1750 when you're planning for a 45 day cruise.

$$\frac{\overset{7}{\cancel{1750}}}{\underset{4}{\cancel{1000}}} \times \frac{\overset{3}{\cancel{45}}}{\underset{2}{\cancel{30}}} = \frac{21}{8} = 2\frac{5}{8}$$

You'll need to take aboard  $2\frac{5}{8}$  times the amounts given in the normal requirements tables.

4. A rectangular storage space 22 feet long, 10 feet wide, and 8 feet high has a capacity of—

$$22 \times 10 \times 8 = 1760 \text{ cubic feet}$$

5. A triangular storage space 15 feet long, 8 feet wide, and 8 feet high has a capacity of—

$$\frac{15 \times 8 \times 8}{2} = 480 \text{ cubic feet}$$

6. A ship usually gets its provisions at its base or from its tender.
7. The *Order and Inspection Report*, BuSandA Form 48, is used when ordering provisions from contract dealers.
8. Provision specifications are distributed by the Naval Supply Depot, Bayonne, New Jersey.

## CHAPTER 6

### INSPECTION AND STOWAGE OF PROVISIONS

1. The Medical Department is responsible for the quality inspection of provisions. The Supply Department is responsible for the quantity inspection.
2. During the hot weather, frozen meats should be loaded early in the morning or in the evening.
3. Late apples keep best if stored at temperatures of  $32^{\circ}$  F. or  $33^{\circ}$  F. Stored under such conditions these apples will last at least 80 days.

4. The taking aboard of green bananas is not recommended because the ripening of these bananas is a very tricky procedure.
5. Watermelons are not recommended for general shipboard use because they are so easily injured and spoiled during handling.
6. If the temperature of quick-frozen fruits and vegetables is higher than the storage space into which they are to be placed, the cartons should be scattered loosely about the compartment in order to equalize the temperatures quickly.
7. If quick frozen products must be left out in the sun awhile before they can be stowed, cover them with a tarpaulin.
8. It is wise to turn over cases of evaporated milk at least once every three months in order to prevent separation of the butter fats.
9. Containers sealed with corks should be stowed on their sides to help prevent the corks from drying out.
10. If stored at a temperature of 35° F. for any length of time, white potatoes are apt to become too sweet.

## CHAPTER 7

### GETTING THE PROVISIONS OUT OF STORAGE

1. The most important item on the 27A insofar as the CCS is concerned is the total number of rations authorized for the day.
2. Based on the Navy Cook Book's suggestion that 42 pounds of boneless lamb be used for 100 portions of roast lamb, you will need 157½ pounds for 375 portions, 295 pounds for 740 portions, and 539 pounds for 1,425 portions.
3. If the average cost of beef, fresh frozen, boneless, is \$.18 per lb., the cabin mess should be charged, .261 per lb. for roasting and frying beef of this type. Here's the solution—

$$\begin{array}{r}
 1.45 \text{ (145\%)} \\
 \times .18 \\
 \hline
 1160 \\
 145 \\
 \hline
 .2610
 \end{array}$$

4. Special messes make settlement for the provisions they purchase promptly at the end of every month.
5. The CO appoints an officer to survey provisions. This officer is usually the junior medical officer.
6. The facts concerning a provision survey are first recorded in a survey record book.
7. The *Stub Requisition*, NavSandA 307, is used when a special mess orders provisions from the general mess issue room.

8. Reports of provision surveys are made on a *Survey Request, Report, and Expenditure* form (NavSandA 154).
9. Metal cans must be pierced before they are thrown over board so they will sink.

## CHAPTER 8

### RATIONS—ALL KINDS

1. Officers are usually given a money allowance with which they are to buy their own food.
2. Enlisted personnel are entitled to a subsistence allowance only when there is no general mess available for them.
3. Commuted rations are paid only when the CO so orders.
4. When an officer is given permission to eat the food of a general mess, he is to pay 70 cents per day for such food.
5. The *Daily Ration Memorandum*, prepared by the exec, notifies the CCS of the number of rations to be prepared.
6. A man must be on leave 72 hours before he is entitled to leave rations.
7. Steward's mates are subsisted on the food prepared for the officers' mess in which they work.
8. The CO must approve the issue of general mess rations to non-naval personnel.
9. When Army and Navy personnel take part in joint shore activities, the Army usually furnishes the chow.

## CHAPTER 9

### MORE OF THE PAPER WORK

1. The *Statement of Issues to General Mess and Cost of Ration Daily* is substantiated by *Stub Requisitions*, the *Daily Ration Memorandum*, and by a memorandum showing how many men were fed, made out by the CPO in charge of the mess deck.
2. The *General Mess Control Record*, NavSandA Form 338, is made out everyday by the SO from the NavSandA Form 333 turned in by the CCS each day.
3. The pound is the most common unit of measure used in the *Provision Ledger*.
4. *Stub Requisitions*, NavSandA Form 307, furnish the data for making entries in the issues column of the *Provision Ledger*.
5. NavSandA Form 36 is used instead of NavSandA Form 45 for final returns when the general mess is operated on the basis of the Navy Ration instead of on a money allowance.

## CHAPTER 10

### COOKING IN THE FIELD

1. Field Ration D should be used only as a last resort and then only for as short a time as is necessary.
2. The K ration is the best field ration for all around use.
3. The *ten-in-one ration* will subsist ten men for one day.
4. Three units of the M1937 range are needed for subsisting 175 men.
5. When you wish to do frying with the M1937 range, place the fire unit in the middle position.
6. Four men are needed to conveniently assemble the M1942 field bake oven.
7. The bottom section of the M1942 field bake oven contains 2 burner chambers and 3 proofing chambers.
8. The fire units are installed in the M1942 field bake oven as the last step in the assembling process.
9. A green flame can be maintained with the M1937 fire unit by adjusting the air shutter.
10. Three cans of boiling water should be provided for cleaning mess gear in the field. Two of these cans should contain clear water and one should have soapy water.
11. The best way of disposing of garbage in the field is by burning.

## CHAPTER 11

### GETTING THE MOST OUT OF YOUR PROVISIONS

1. Careless handling of canned goods may lead to the formation of holes in the cans.
2. The best way to thaw out canned foods that have become frozen is to let them stand at warm room temperatures.
3. It is dangerous to place unopened cans in the oven or on the back of the range. The steam pressure built up may cause the cans to explode.
4. Potatoes should remain in the potato peeler from 2 to 3 minutes only.
5. When foods are removed from the deep fat fryer, place them on brown paper, a clean cloth, or in a colander.
6. Add salad dressings to fresh fruit or green vegetable salads just before these salads are to be served.
7. Exposure to air, water, or heat tends to destroy the B vitamins.
8. Fat to be used for cooking must be rendered.
9. If cooking fat is to be stored for some time, keep it under refrigeration.

## CHAPTER 12

### SAFETY FIRST

1. When lifting heavy objects, let your leg muscles do most of the work.
2. Only safety matches are to be used aboard ship.
3. If a gallon of paint will cover 400 square feet of area, here's how to figure out how much paint is needed for a rectangular storeroom 18 feet long, 10 feet wide, and 8 feet high—

deck and overhead

$$18 \times 10 \times 2 = 360 \text{ square feet}$$

side bulkheads

$$18 \times 8 \times 2 = 288 \text{ square feet}$$

end bulkheads

$$10 \times 8 \times 2 = \underline{160} \text{ square feet}$$

total area            808 square feet

$$\begin{array}{r} 400 \overline{)808} \\ \underline{800} \\ 8 \end{array}$$

About 2 gallons of paint is needed.

4. A triangular bulkhead 15 feet wide and 10 feet high has an area of

$$\frac{15 \times 10}{2} = 75 \text{ square feet}$$

Four such bulkheads have a total area of  $75 \times 4$  or 300 square feet. If one gallon of paint will cover 450 square feet, these 4 bulkheads will require  $\frac{300}{450}$  or  $\frac{2}{3}$  of a gallon of paint.

5. Use a foamite extinguisher or sand for grease fires. Use a CO<sub>2</sub> extinguisher for an electric switch fire.
6. Use a water stone or a carborundum oil stone for sharpening knives.
7. If anything goes wrong with an electrical appliance, turn off the current immediately.

## CHAPTER 13

### THE WAR AGAINST INSECTS

1. A typical insect goes through these 4 life stages—egg, larva, pupa, and adult.
2. The most practical way of getting rid of cockroaches is by spraying or scattering sodium fluoride or derris dust containing 1% or more rotenone into all cracks and crevices.
3. The presence of fruit flies usually indicates overripe, decaying fruit.
4. Get rid of the confused flour beetle by pouring boiling hot water into the cracks and crevices of your flour bins.
5. Here's how you can tell whether or not your flour contains mites—Make a small pile of flour under a strong light. The mites will try to get away from the light. In so doing they'll make your pile of flour spread out.

## CHAPTER 14

### FOOD POISONING

1. Bacteria are responsible for most food poisoning.
2. Botulism is the most deadly kind of food poisoning.
3. Home canned cold-packed products are more likely to cause food poisoning than commercially canned products.
4. Antimony poisoning is sometimes caused by foods cooked in cheap, gray-enameled cooking utensils.
5. Tin poisoning is practically unknown.
6. If you always cook pork thoroughly, you'll have no trouble with trichinosis.
7. Rhubarb leaves are poisonous to some people.

## QUALIFICATIONS

### SHIP'S COOK, FIRST CLASS

#### (A) PRACTICAL FACTORS.

- (a) SUPERVISION.—Demonstrate ability as ship's cook in charge of the galley.
- (b) FIELD KITCHEN.—Demonstrate ability to set up and operate a field kitchen, field bake oven and camp ice box, if any or all of this equipment is available in own ship or station.
- (c) D-5210.01 (2) (A). (Practical factors for Ship's Cook 2c.)

#### (B) EXAMINATION SUBJECTS.

- (a) LANDING FORCE DUTIES.—Know the duties of a ship's cook detail with a landing force. Know the variety and quantity of provisions and cooking utensils to be provided for a landing force under various conditions. Know how the field kitchen equipment for a landing force is arranged, including camp ice box, the kitchen pits, the kitchen fires, camp ovens, incinerators.
- (b) COMBAT DUTIES.—Know the duties of commissary personnel in combat.
- (c) FOOD THEORY.—Have a full and complete knowledge of the constituents of meat and foodstuffs.
- (d) REGULATIONS.—Know in detail the current regulations and instructions governing general mess.
- (e) D-5210.01 (2) (B). (Examination subjects for Ship's Cook 2c.)

# QUALIFICATIONS

## CHIEF COMMISSARY STEWARD

### (A) PRACTICAL FACTORS.

- (a) **FIELD KITCHEN.**—Demonstrate ability to set up a field kitchen and a field bake oven if this equipment is carried on own ship or station.
- (b) **CATERING.**—Demonstrate ability to cater for enlisted men.
- (c) **SUPERVISION.**—Demonstrate ability to take complete charge of the delivery, handling, stowage, and issue of foodstuffs on ship or station to which attached. Demonstrate ability to direct the proper stowage of provisions and to estimate capacities of storerooms, including cold-storage spaces. Be able to direct the preparation and cooking of food in the galley and bake shop.
- (d) **RECORDS AND REPORTS.**—Demonstrate ability to keep accurate records and reports of all transactions connected with the general mess.
- (e) **D-5210.01 (3) (A).** (Practical factors Ship's Cook 1c.) **OR D-5210.02 (3) (A).** (Practical factors Bakers 1c.)

### (B) EXAMINATION SUBJECTS.

- (a) **REGULATIONS.**—Know the Navy regulations regarding subsistence allowance, commuted rations, and the regulations and current instruments pertaining to the general mess.
- (b) **MENUS AND ORDERING.**—Be able to plan menus and estimate the quantity of food required for a given number of men.
- (c) **LANDING FORCE OPERATIONS.**—Understand the operation of the Commissary Department in a landing force.
- (d) **PRICES.**—Know the current prices and the normal seasonal fluctuations in price of the various ingredients of the Navy ration and other foodstuffs that may be purchased for special occasions.

(e) D-5210.01 (3) (B). (Examination subjects Ship's Cook 1c.) OR D-5210.02 (3) (B). (Examination subjects Baker 1c.)

(C) SCHOOL QUALIFICATIONS.

(a) Must be a graduate of Chief Commissary Steward School.

## INDEX

- Abandon ship rations ..... 93  
Accessories for M 1937  
  range .....120  
Accessory packet .....112  
Accidental freezing of  
  canned goods .....141, 142  
Aircraft emergency rations 94  
Allowance, money ..... 87  
  subsistence ..... 87  
Allowed value of ration  
  issues .....109  
Animal poisoning .....179  
Antimony poisoning .....177  
Appetite, vitamin B and ... 20  
Arithmetic of estimating ... 34  
  storage space ..... 48  
Army rations ..... 94  
Arsenic poisoning .....178  
Ascorbic acid ..... 20  
Assigning men to jobs ..... 11  
Average daily cost of sub-  
  sistence per man .....109  
  
**B** unit .....112  
Bacteria .....173  
  clostridium botulinum ....177  
  salmonella .....176  
  staphylococci .....174-176  
  streptococci .....174-176  
Bake oven, field, impro-  
  vised .....131-133  
  M 1942 .....126-128  
  field heating unit ....128  
Baker, senior, duties ..... 9  
Baking, adapting the M 1931  
  range for .....122  
Battle, commissary person-  
  nel during .....111  
  rations .....112  
Beetle, cadelle .....166  
  flour .....164  
  saw-toothed grain .....165  
Bill of fare, effect of provis-  
  ions available on .... 21  
  for the general mess,  
    form to use..... 31  
    reverse ..... 33  
  paper work of ..... 31  
  planning ..... 17  
    for breakfast ..... 25  
    color of foods in ..... 23  
Bill of fare—*continued*  
  cost ..... 23  
  effect of mechanical  
    equipment on ..... 22  
  flavor in ..... 23  
  for dinner .....28  
  guide for Navy Cook  
    Book ..... 25  
    ration as ..... 24  
  questions to ask your-  
    self when ..... 29  
  for supper ..... 29  
  route of ..... 34  
  variety in ..... 22  
Black weevil .....170  
Boiling with M 1937 range 120  
Botulism food poisoning ...177  
Bread, baking with M 1937  
  range .....122  
  in the bill of fare ..... 27  
Breakfast menu ..... 25  
Bug, lobster .....166  
Butcher, senior, duties ..... 8  
Butter in the bill of fare .. 26  
  estimating need for one  
  day ..... 37  
  stowage of ..... 69  
  
**C** rations .....112  
Cadelle beetle .....166  
Cadmium poisoning .....178  
Calcium, benefits of ..... 19  
Can goods frozen acciden-  
  tally .....141  
Candy, stowage of ..... 72  
Canned goods, freezing, ef-  
  fects of .....142  
  stowage of ..... 63  
Carbohydrates, benefits of .. 18  
  foods that provide ..... 18  
Cellar, root .....116  
Cereals in the bill of fares .. 27  
Cheese in the bill of fare ... 26  
  stowage of ..... 69  
Chemical food poisoning ...177  
Chief commissary steward,  
  duties ..... 7  
  qualifications ..... 3  
Chocolate candy, stowage of 72  
Citrus fruits, stowage of ... 66  
Cleaning the mess gear ....133

Cleaning the mess gear—  
*continued*  
 safety first in .....151-153  
 Climate, foods suitable for .. 22  
 Clostridium botulinum bac-  
 teria .....177  
 Coast Guard enlisted person-  
 nel, rations for ..... 90  
 Cockroach .....163  
 oriental .....163  
 Coffee King ..... 10  
 stowage of ..... 71  
 Color combinations in food  
 preparation ..... 23  
 Combined quarterly invoice,  
 return of provisions and  
 statement of over and  
 under issues .....107  
 Commissary, organization of 5  
 Commissary personnel dur-  
 ing battle operations ...111  
 steward, chief, duties .... 7  
 qualifications ..... 3  
 (supply) officer ..... 6  
 Common knives .....156  
 Commuted rations ..... 88  
 value of ..... 83  
 Conserving fats .....146-148  
 fuel .....146  
 provisions .....139-148  
 vitamins .....146  
 water .....145  
 when menu planning ....142  
 when preparing food ....143  
 when serving .....145  
 when stowing provisions ..140  
 Contract bulletin ..... 56  
 Conversion set number 2, M  
 1937 fire unit equipped  
 with .....124  
 Cooking equipment ....118-120  
 in the field .....111  
 utensils with M 1937  
 range .....121  
 with M 1937 range .....120  
 Copper King ..... 10  
 Cork-sealed containers, stow-  
 age ..... 64  
 Cost of general mess ..... 46  
 in planning bill of fare ... 23  
 of ration per day, esti-  
 mated ..... 40  
 of rations per day, deter-  
 mining ..... 98  
 of subsistence, average  
 daily .....109  
 D ration, field .....113

Daily cost of subsistence per  
 man, average .....109  
 ration memorandum ...78, 98  
 statement of issue, .. 97  
 Dairy products, stowage of 69  
 Dehydrated foods, staphylo-  
 cocci poisoning in ...175  
 stowage of ..... 71  
 Diet, well-balanced ..... 18  
 Dinner menu ..... 28  
 Discharged men, rations for 89  
 District service organization,  
 ordering provisions through 54  
 Drinks stowage of ..... 71  
 Drippings, use of .....147  
 Dry provisions, stowage of.. 70  
 Dysentery .....179  
 Eggs in the bill of fare .... 26  
 fresh shell, storage .... 48  
 stowage of ..... 69  
 Electric switch or plug fire .154  
 Electricity, safety first .....158  
 Energy foods ..... 18  
 Estimating, arithmetic of... 34  
 Evaporated milk, stowage of  
 cans ..... 64  
 Example, setting an ..... 15  
 Eyesight, vitamin A and, .. 19  
 Fats, conserving .....146-148  
 Federal specifications for  
 provisions ..... 62  
 Field bake oven, im-  
 proved .....131-133  
 M 1942 .....126  
 Field cooking .....111  
 equipment, improvised .129  
 Field ration D .....113  
 Field sanitation .....133  
 Fire, electric switch or plug 154  
 grease .....154  
 safety first .....153  
 trench, heating water with 135  
 unit, M 1937 .....124  
 Firebrats .....171  
 Fish in the bill of fare .... 26  
 Flavor, importance of .... 23  
 Flight rations ..... 93  
 Flour beetle .....164  
 mites .....170  
 stowage of ..... 70  
 Fluoride poisoning .....178  
 Fly, common .....164  
 fruit .....164  
 Food box, swinging cage ...117  
 underground construc-  
 tion of .....115  
 Food poisoning .....173-180

Food poisoning— <i>continued</i>	
conditions causing	173
from animals	179
from chemicals	177
from plants	179
stowage ashore	114
wastage, keeping to a minimum	139
energy-providing	18
Footwear, safe	149
Foreign enlisted personnel, rations for	90
Formal surveys	86
Freezing of can goods, accidental	141
Fresh fruits and vegetables, how long they last	66
stowage of	64
tips on	67
to be used immediately	66
Frozen canned goods	141
staphylococci poisoning in	175
storage space for	47
meat lockers, loading	52
stowage of	63
Fruit fly	164
Fruits in the bill of fare	27
fresh, how long they last	66
for immediate use	66
stowage of	64
quick-frozen, stowage of	68
season, table of	45
Frying with M 1937 range	121
Fuel, conserving	146
Fumigation	163
Galley ashore, locating	114
captain, duties	7
organization of	10
safety first in	154
Garbage disposal	86, 136
General mess, bill of fare, form to use	31
control record	99
galley, provisions	78
Marine Corps personnel	88
NavSandA form 307	80
officers in charge	88
rations in kind to estimate	90
statement of issue and cost of rations, daily	98
stub requisition for	80
who eats there	88
Grain beetle, saw-toothed	165
Granary weevil	169
Gravity feed burner	128
Grease fire	154
Griddle cooking with M 1937 range	121
Grinder, meat	157
Handling provisions	140
Haversack rations	93
Heating unit for M 1942 bake oven	128
Hospital rations	94
Immersion type water heater	134
Improvised field bake oven	131
cooking equipment	139
Incinerator, trench	136
Ice cream, stowage of	69
Indian-meal moth	168
Infection, resistance to, vitamin C	20
Insects	161, 172
detecting	161
eliminating	161, 163
life, stages of growth	161-163
pest control	137
in provisions, evidences of	62
Inspection of provisions	61
waste reduced by	140
Instructions, how to give	14
Inventory of provisions	73-75
form	106
spot	74
Invoices, quarterly	108
Iodine, benefits of	19
Iron, benefits of	19
Jack of the dust, duties	9
Jams and jellies, stowage of	72
K ration	113
Knives, common	156
Lasting characteristics of provisions	21
Leave rations	92
Ledger, provision	100
Legumes in the bill of fare	27
Lobster bug	166
Locating galley ashore	114
Lifting heavy objects the correct way	150
Lister bags	137
Loading frozen meat lockers	52
Lockers, frozen meat, loading	52
Long cruise, ordering for a	53
MCABM purchases	57
M unit	112

M 1937 fire unit.....	124
equipped with conver-	
sion set number 2	124
maintaining .....	125
range .....	118
accessories, .....	120
adapted for baking	
bread .....	122
cooking utensils .....	121
cooking with .....	120
pastry .....	123
M 1942 bake oven heating	
unit .....	128
precautions with .....	129
field bake oven.....	126
“Manner common among	
business men” .....	57
Marine corps personnel in	
general mess .....	88
Meal moth .....	168
worms .....	167
planning. <i>See</i> Bill of fare,	
planning.	
Meat in the bill of fare ...	26
frozen. <i>See</i> Frozen meat.	
grinder .....	157
Mechanical equipment, effect	
on bill of fare .....	22
Medical department, inspec-	
tion of provisions by ....	61
Menu. <i>See</i> Bill of fare.	
Messes, sales to .....	81
special .....	81
Mess gear, cleaning .....	133
general, who eats in .....	88
Metamorphosis of insects ...	161
of saw-toothed grain	
beetle .....	162
Midshipmen, rations for ...	89
Milk in the bill of fare ....	26
complete food .....	19
or trematol poisoning ...	179
stowage of .....	69
Minerals, benefits of .....	18
Militia, naval, rations for ..	89
Money allowances .....	87
ration .....	46
Monthly ration memo-	
randum .....	89, 105
Moths .....	168
indian meal .....	168
meal .....	168
Mushroom poisoning .....	179
NavSandA form 27 .....	106
27A .....	78
27A statement of issue .	98
36 .....	108
42 .....	82, 105

NavSandA form— <i>continued</i>	
43 .....	55
45 .....	103
48 .....	58
84 .....	74, 106
127 .....	56, 86, 106
147 .....	104
154 .....	85, 105
154, losses reported in ..	110
307 .....	79
307 for general mess ..	80
307 for special mess ...	80
333 .....	31, 97
333 example .....	32
335 .....	101
338 .....	99
Navy Cook Book as guide for	
planning bill of fare ....	25
Navy ration. <i>See</i> Ration, Navy.	
Niacin .....	20
Night watches, rations for .	92
Non-naval personnel, rations	
for .....	88
Number of rations to be is-	
sued in kind .....	90
Officers in general mess,	
charge for .....	88
Oil drum oven .....	131
Order and Inspection Report	58
Ordering. <i>See Also</i> Requisition-	
ing.	
for a long cruise .....	53
provisions .....	41-59
conserving .....	139
from a ship's service	
section .....	54
through a district serv-	
ice organization .....	54
Organization of commissary	5
of galley .....	10
Oriental cockroaches .....	163
Oysters, stowage of .....	72
Packet, accessory .....	112
Paint, calculating amount	
needed .....	151
Paper work for bill of fare	31
Pastry baking with M 1937	
range .....	123
Pellagra, niacin to prevent .	20
Pepper, estimating amounts	
of .....	38
Phosphorus, benefits of ....	19
Pilots, rations for .....	89
Plant poisoning .....	179
Poisoning. <i>See</i> Food poisoning.	
Potatoes, federal specifica-	
tions for .....	62

Potatoes— <i>continued</i>	
variety in preparing . . . .	22
Poultry in the bill of fare . .	26
Power equipment, safety	
first . . . . .	157
Preparing food, conserving	
when . . . . .	143
proper methods of . . . .	143
Price, unit issue . . . . .	103
Prisoners of war, rations for	89
Proteins, benefits of . . . . .	18
Provisions, amount needed,	
calculating . . . . .	42
to order, figuring . . . . .	79
available, effect on meal	
planning . . . . .	21
at Navy supply activi-	
ties . . . . .	43
calculating meals from . . .	21
conservation of . . . . .	139-148
conserving when	
ordering . . . . .	139, 140
stowing . . . . .	140
contracted for, list of . . .	44
dry, stowage of . . . . .	70
federal specifications for .	62
in the field, stowing . . . .	117
general mess galley . . . . .	78
getting them to galley . . .	79
insects in, evidences of . . .	62
inspection of . . . . .	61
inventory of . . . . .	73
form . . . . .	106
lasting characteristics of .	21
ledger . . . . .	100
ordering . . . . .	41-59
through a district serv-	
ice organization . . . .	54
quality inspection of . . . .	61
quantity inspection of . . .	61
return of . . . . .	108
specifications for . . . . .	58
survey book . . . . .	110
surveying . . . . .	84
value . . . . .	82
Purchases, MCABM . . . . .	57
Quality inspection of pro-	
visions . . . . .	61
Quantity inspection of pro-	
visions . . . . .	61
Quarterly inventory of pro-	
visions . . . . .	73
invoice . . . . .	108
Quick-frozen fruits and vege-	
tables, stowage . . . . .	68
Range king . . . . .	10
M 1937 . . . . .	118

Range, M 1937— <i>continued</i>	
accessories . . . . .	120
utensils . . . . .	120
Ration D, field . . . . .	113
estimated cost per day . . .	40
factors . . . . .	108
guide for planning bill of	
fare . . . . .	24
K . . . . .	113
memorandum, daily . . . .	78, 98
statement of issue . . .	97
monthly . . . . .	89, 106
navy . . . . .	91
record . . . . .	103
table . . . . .	91
ten-in-one . . . . .	113
voucher and statement	
of sales to mess . . . .	83, 105
Rations . . . . .	87, 96
abandon ship . . . . .	93
aircraft emergency . . . . .	94
allowed value of issues . . .	109
army . . . . .	94
battle . . . . .	112
C . . . . .	112
commuted . . . . .	88
cost per day, determining .	109
flight . . . . .	93
for men standing night	
watches . . . . .	92
for non-naval personnel . .	88
haversack . . . . .	93
hospital . . . . .	94
in kind . . . . .	77
number for estimating	
general mess . . . . .	90
leave . . . . .	92
number allowed . . . . .	109
Receipt expenditure	
invoice . . . . .	56, 86, 106
Rectangular storage space,	
calculating . . . . .	48
Refugees, rations for . . . . .	89
Requisition and Invoice . . . .	55
stub . . . . .	79
statement of issue . . . . .	98
Requisition. <i>See Also</i> Ordering.	
period for fruits . . . . .	45
for vegetables . . . . .	45
from ship's service section	55
Return of provisions . . . . .	108
Rhubarb leave poisoning . . . .	179
Riboflavin . . . . .	20
Rice weevil . . . . .	170
Roasting with M 1937 range	121
Root cellar . . . . .	116
Rotation of men at jobs . . . .	12
Routine duties . . . . .	12
Rules and regulations . . . . .	13

Safety first .....	149-159	Storage space, arithmetic of	48
around electricity .....	158	provisions affected by ..	47
and fire .....	153	temperature of, for	
in cleaning .....	153	canned goods .....	65
in general .....	149	for fresh fruits and	
in the galley .....	154	vegetables .....	65
in the storerooms ....	158	for meats .....	63
with power equipment ..	157	Storerooms, safety first in ..	158
with sharp instruments	155	Stowage ashore .....	114
Sales to mess, statement of,		of candy .....	72
form for .....	82	canned goods .....	63
to messes .....	81	coffee .....	71
Salmonelle bacteria .....	176	dairy products .....	69
poisoning .....	176	dehydrated products ...	71
source of .....	176	drinks .....	71
Salvage fat .....	146	dry provisions .....	70
Sanitation in the field .....	133	eggs .....	69
Saw-toothed grain beetle ..	165	fresh fruits and vege-	
Sea food, stowage of .....	72	tables .....	64
Seamen, destitute, rations		frozen meat .....	63
for .....	89	jams and jellies.....	72
Season, suitable foods for ..	22	miscellaneous provisions	73
Senior baker, duties .....	9	provisions ashore .....	114
butcher, duties .....	8	quick-frozen fruits and	
cook, duties .....	7	vegetables .....	68
Serving, conserving when ..	145	sea food .....	72
Sharp instruments, safe-		sweets .....	71
ty first with.....	155-157	tea .....	71
Shellfish poisoning .....	179	yeast .....	72
Ship's cook, first class, quali-		Stowing provisions, conserv-	
fications .....	2	ing when .....	140
second class, qualifica-		in the field .....	117
tions .....	2	Stoves, improvised .....	130
Ship's service section, order-		Streptococci bacteria .....	174
ing provisions from .....	54	Streptococuss food poison-	
Shore patrol, subsistence on	95	ing .....	176
Sick personnel, subsistence of	96	Stub requisition for general	
Silverfish .....	171	mess .....	80
Soakage pit .....	135	statement of issue .....	98
Special diets, subsistence of	96	Subsistence allowance .....	87
duties .....	13	average daily cost per	
mess, NavSandA form 307	80	man .....	109
percent of average cost		during travel .....	95
price .....	81	of sick personnel .....	96
stub requisition .....	80	on shore patrol .....	95
messes .....	81	on temporary duty .....	96
Specifications for provisions	58	Sunshine vitamin .....	20
federal .....	62	Supervising .....	13
Spot inventory .....	74	Supper menu .....	29
Spud coxswain, duties .....	8	Supply activities ashore, pro-	
Staphylococci bacteria .....	174	visions available at ...	43
poisoning .....	174	department, inspection of	
prevention .....	174	provisions by .....	61
symptoms .....	174	(commisary) officer ....	6
Statement of issue and cost		Survey book, provisions ...	110
of rations daily, gener-		record book .....	84
eral mess .....	98	request, report and expen-	
to general mess and		diture .....	85, 105
cost of rations daily	97	Surveying officer .....	84

Survey book— <i>continued</i>	
provisions .....	84
Surveys, formal .....	86
Sweet fat .....	147
Sweets, stowage of .....	71
Swinging cage food box ...	117
Tea, stowage of .....	71
Temperature of M 1937	
range for baking .....	122
of storage space for	
canned goods .....	63
for fresh fruits and	
vegetables .....	64
for meats .....	63
Temporary duty, subsistence	
on .....	96
Ten-in-one ration .....	113
Thiamin .....	20
Tin poisoning .....	178
Trapezoidal storage space,	
calculating .....	51
Travel, subsistence during .	95
Trematol or milk poisoning .	179
Trench incinerator .....	136
Triangular storage space,	
calculating .....	51
Trichinosis .....	179
Two can stove .....	130
Under ground food box, con-	
struction of .....	115
Unit B .....	112
issue price .....	103

Unit— <i>continued</i>	
M .....	112
Utensils, M 1937 range ...	120
Value of commuted rations .	83
of provisions .....	82
Variety in bill of fare .....	22
Vegetables in the bill of fare	27
fresh, how long they last	66
for immediate use .....	66
stowage of .....	64
quick-frozen, stowage of .	68
season for various, table of	45
Vision, vitamin A .....	19
Vitamins .....	19-21
conserving .....	146
Watch captains .....	8
Water, conserving .....	145
heater, immersion type ..	134
heating with fire trench ..	135
hemlock poisoning .....	179
Wash tub stove .....	130
Weevils .....	169
granary .....	169
Worksheet .....	39
“Working factor” in estimat-	
ing .....	35
Worms, meal .....	167
Yeast, stowage of .....	72
Zinc poisoning .....	178

