FOOD OPERATIONS REFERENCE MANUAL

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This publication is issued for the information and guidance of all interested personnel. The "Food Operations Reference Manual" provides guidance in the operation of a general mess and is to be used for management, menu planning, food preparation and service, food storage, equipment maintenance, and controlling sanitation and safety. In addition, this publication has been designed for use in training subsistence personnel.

Section C, Parts I, II, and III comprise the second increment of the publication. The attached sheets will be inserted in numerical sequence and sheet I issued with the first increment will be removed and destroyed. The promulgating letter issued with this increment will be retained as the last sheet of the publication.

H. J. GOLDBERG
Chief, Bureau of Supplies and Accounts

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FOOD OPERATIONS REFERENCE MANUAL

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The material incorporated into the "Food Operations Reference Manual" also embraces suggestions from officers and men comprising the Field Food Service Teams who represent the Navy Subsistence Office and conduct on-the-job training programs throughout the Naval Establishment. Commissarymen/Stewards Class "B" Schools in San Diego, Calif., and Newport, R.I., likewise have contributed suggestions for revision of various commissary handbooks which have been revised and incorporated in the "Food Operations Reference Manual."

The Navy Subsistence Office also acknowledges the helpful counsel and technical assistance of Dr. Lendal H. Kotschevar, Professor in the School of Hotel, Restaurant, and Institutional Management, Michigan State University, East Lansing, Mich. Dr. Kotschevar's professional career also includes other academic experience at Teacher's College, Columbia University, New York City, and at Montana State University, Missoula, Mont. Dr. Kotschevar served on duty with the U.S. Navy and is retired with the rank of Commander, Supply Corps, U.S. Naval Reserve. Among his many active assignments was a tour of duty as Director of Commissary Schools for the U.S. Navy. Following World War II, Dr. Kotschevar became the Civilian Director of Commissary Research at the Naval Supply Research and Development Facility, Bayonne, N.J.

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PART I: PRINCIPLES OF NUTRITION

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101—INTRODUCTION

Menu planning is a vital responsibility. The meals must be enjoyable, the men well-nourished, the cost within justifiable limitations, and the menu written with a view to time- and labor-saving food preparation.

Section C, "Menu Planning," of the "FOOD OPERATIONS REFERENCE MANUAL" offers suggestions and other help which take into account this 4-point approach to menu planning. Information given on nutrition aims to bring the menu planner modern-day viewpoints on diet adequacy and to point up the need for planning a well-rounded variety of food. Foods brought together in a meal must be planned to work together in the human body's remarkable chemistry as a team, not as lone substances working independently of each other. Meals should contain a composite of good flavor, texture, color, and nutrition.

101-a—HISTORY OF MENUS—Old menus are interesting documents. They tell us a great deal about the past on which our social customs and habits are built. Menus record for posterity more than a list of food served at a king's sumptuous banquet, or at a poor man's table. These repasts show us in a very real sense how man's ingenuity has brought about changes in the technology of producing foods and preparing them for human consumption.

Menu history dates back to the 15th century, some 200 years previous to the passage of the first Navy Ration Law. The very first menu recorded resembled the Galley Work Sheet more than the General Mess Menu because it was not seen by the people who ate the meal, but by those who prepared the food. The original menu showed the precise order in which each dish was to be served along with details on its preparation and service.

The first printed menu that the diner saw dates back to 1541. A Frenchman, Duke Henry of Brunswick, printed one to inform his guests about the forthcoming dishes to be served at a dinner. This menu had very practical value since it informed the diner of the lengthy list of dishes to follow, and enabled him to reserve appetite for his favorites. In those days, marathon eating was fashionable and hearty appetites essential to equal the occasion of each banquet; and the menu helped the diner to establish his limitations.

Early American menus now found in museums reflect the influence of our European ancestors. Food tastes, as might be expected, were chiefly English. Eventually, the French made their contribution to American eating as the French have done elsewhere in the world, especially as restaurants became established. On the whole, our menus in the 18th and 19th century show how well Americans ate generally. The rich abundance of food naturally made it possible for us to have greater selectivity and supplied the motive for man's solving the problems of what to eat and how much and why. Hence, the study of nutrition which had its early roots in European science could be readily applied in American eating.

Nutrition as we know it was founded in the late 19th century, but many beliefs and knowledge of food as related to health existed prior to this time. Indeed, even before the birth of Christ, Hippocrates taught the value of diet.

One idea originated by him, that there was one ultimate principle (or value) in food, was not refuted until about 1834. Galen, a Greek physician, wrote books on diet and health in A.D. 164 which were accepted until the experimental method began to replace opinions and observations of learned men. The 18th century brought the rise of modern chemistry, and foods were analyzed to learn what they were made of; and the study of physiology supplied information on how the human body functions. Combined knowledge of these two basic sciences laid the cornerstone on which the knowledge of nutrition was laid.

The naval fleets of various countries of the world have been valuable proving grounds for nutritional studies. The British Navy contributed one bit of important knowledge to show that some foods are helpful in preventing disease. In 1747, some 150 years before the recorded discovery of vitamin C, Dr. James Lind attempted to determine why so many sailors on long voyages died of a disease known as scurvy, so named because it was the "scourge" of sea travel. He found through carefully controlled experimentation that by the simple addition of lemon juice to diet, a scurvy cure was effected.

In Japan, Baron Takaki found that he could prevent the deaths of Japanese sailors caused by beriberi by increasing the amounts of meat and fish in their diets.

Many other studies have established that adequate human diets can be readily obtained from natural foods. By 1926, the science of nutrition was well on its way and even greater progress has been made since. More knowledge is to come, but at least today menu planners have a wealth of recorded experience from nutritionists which has shown beyond doubt what an adequate diet should be for maintaining a vigorous, healthy people.

The development of the Navy's present day general mess menu is a story that all subsistence personnel can relate with great pride. The utmost in research and planning has preceded each item of a meal before it reaches the messing tables.

Shipboard messing years ago left a great deal to be desired. As described by Capt. J. H. Skillman, SC, USN, in the U.S. Naval Institute Proceedings, 1941, in an article entitled, "Eating Through the Years," the menu followed a pattern of Hardtack, Plumduff, and other nondescript foodstuffs for breakfast, dinner, and supper—7 days a week. A Sunday noon meal, for example, was served from a deck tarpaulin and consisted of a dish of rare delicacy called "crackerhash" which was made from bits of hardtack, chunks of salt beef and salt pork, potatoes, turnips, and any other available vegetables. The whole mixture was well seasoned with fat.

When the first Ration Law was enacted in 1794 for the purpose of guaranteeing a sailor a certain amount and kind of food each day, the menu became "fixed" 7 days a week. Sundays, Tuesdays, and Thursdays were beef days; Mondays, Wednesdays, and Saturdays were pork days; and cheese was the main dish for Fridays. Cheese was supplemented with butter, an item allowed only on one other day of the week. The meager ration had its compensations, however, in the form of ½-pint distilled spirits or one quart of beer daily. By 1861 there had been relatively few major changes in the whole ration. The following lament, written by Paymaster Casper Shunck about this time, reflects an end to an era in Navy feeding:

"Jack's happy days will soon be past
To return again, no, never!
For they've raised his pay five cents a day
AND STOPPED HIS GROG FOREVER!"

The USS **Portsmouth** recorded the following daily menu in 1894:

Breakfast	**Dinner**	**Supper**
Prunes.	Plumduff.	Crackerhash.
Hardtack.	Salt horse.	Tea.
Molasses.	Hardtack.	Hardtack.
Coffee.	Coffee.	Molasses.

After 1902, when the first Navy cookbook appeared, the menu picked up momentum because there were many dishes to choose from. The original collection of recipes numbered less than 100 recipes. At present, "Navy–Marine Corps Recipe Service" has over 700 recipes.

101-b—OBJECTIVES OF MENU PLANNING—A menu is a food plan for a meal, or for a day's meals or for longer periods of time. Menu plans are an orderly and systematic way to provide nutritious meals and to meet other necessary requirements of the Navy food service program.

An important goal of menu planning is to obtain maximum endurance for the ships of the fleet so as to insure adequate food supplies within limited stowage space. Saving time and energy of subsistence personnel in the preparation of meals is still another important goal of Navy food service. Last, but by no means least, menu planning for the Navy general mess aims to provide the most enjoyable meals possible.

The menu planner aims to write meal plans that are in line with the American standards of good nutrition, within prescribed monetary allowances, and which are practical to prepare with available facilities and personnel.

The skill of the individual menu planner shapes every meal served in the Navy. The Senior Commissaryman prepares the draft of menu. Preparing varied, balanced, and artistic menus for 7 days a week, 52 weeks a year is one of the most demanding tasks personnel face in their subsistence careers. The menu writer must be completely objective about items he places on menus for consciously or unconsciously, he may be in favor of a particular item or prejudiced against it.

Basic training in the scientific principles of nutrition and artistic aspects of menu planning pave the way for objectivity. In addition, the use of informal aids and records, as discussed under separate parts of this section, help the menu writer to control personal choices.

In order for the men to follow through on duties in the galley and on the serving line, the menu also must be systematic and efficient from a management standpoint. All facets of food service are influenced by the menu planner. Many of the internal operations as well as the readiness of the ship are affected by the menu.

The goals and standards of Navy food service may be reached and upheld by many approaches to menu planning. Flexibility and adaptability are essential in designing Navy meals. There is no one best way to plan. When food operations are similar, often identical menus cannot be used because of the variance in local conditions.

102—ESSENTIALS OF AN ADEQUATE DIET

It is possible to obtain the human body needs by eating various combinations of many different foods. Foods available in this country are sufficient in variety and quantity to furnish every individual with a good diet. Food does far more than keep you alive and going. The three major functions food provides are:

1. Materials for building and repairing body tissues throughout life.
2. Materials for regulating a combination of foods for use in the body.
3. Fuel for the body's energy and warmth.

In addition, food has immense emotional and psychological implications in our daily lives.

102-a—NUTRITION AND NUTRIENTS DEFINED—Nutrition is a science of the quantity, as well as the nature of the substances needed from food for good health. These substances, called nutrients, are chemical compounds with specific

functions for the nourishment of the body. There are about 50 different food nutrients, each known by a different name.

102–b—KEY NUTRIENTS AND THEIR FUNCTIONS—The list of food nutrients which function for the building and maintaining of a body runs from A to Z. These nutrients act to help one or more of foods functions to be carried out in the body (see par. 102). A person may choose a better diet and a menu planner may write a better menu if he has information about the different nutrients. If, for example, a commissaryman took a set of menus previously used for the general mess, it would be easy for him to count the total number of different foods combined into breakfast, dinner, and supper. Then suppose he separates out the different food classes into items of similar groups such as meats, vegetables, bread, and so on. The original list would total some 20 to 25 items, but when grouped into categories, the number could be reduced to a possible 7 or 8 groups.

Nutrients in food are reclassified from a total of 50 names to 6 chemical classes of substances similar in content and function. These are:

Proteins.
Fats.
Carbohydrates.
Minerals.
Vitamins.
Water.

These groups of nutrients function in the body in the three ways mentioned previously for foods in general. Some of them perform more than one function, as follows:

1. Materials for building body tissues and repair. The following classes of nutrients assist bone, teeth, and tissue building during growth and are used for body repair in later life:

Protein.
Minerals.
Water.

2. Materials to control and regulate food nutrients to be used in the body. The following nutrient classes assist in this way:

Vitamins.
Minerals.
Protein.
Water.

3. Fuel which supplies energy. The following classes of nutrients yield energy:

Protein.
Fats.
Carbohydrates.

NO NUTRIENT ACTS COMPLETELY INDEPENDENT OF THE OTHER. The body breaks down these nutrients into a simplified form for distribution to various parts of the body. The nutrients may be used immediately, or may be stored in the body for use at a later time, depending upon the body's need, the nature of the nutrient and its function. How much of a nutrient is absorbed, of course, also depends upon the kind of foods in the diet, the quantity consumed, and the individual chemical makeup of a person. The steps of breaking down the food within the body could be faulty, causing poor absorption of nutrients.

In addition, not all substances contained in foods are known to be essential to the proper nourishment of the body. Those which are known to be key nutrients are "carriers" of the other nutrients as well. When menus are planned to include the key nutrients, the day's meals will include other nutrients not considered as "key" essentials. Key nutrients are discussed in pars. 102–b(1) through 102–b(7).

102–b(1)—Protein—This is one of the most abundant food nutrients. It is found in a wide variety of cereals, vegetables, fruits, meats, poultry, fish, eggs, and dairy products.

Long ago this nutrient was recognized as essential to life itself, for it is one of the major

substances of body tissues, muscles, tendons, blood, skin, bone, eyes, and nails.

An individual must have a daily supply of protein to replace that which has been used to perform the following functions:

1. To build and maintain all body tissues.
2. To form glandular secretions from vital body organs such as hormones, digestive juices, and antibodies in blood to fight disease.
3. To provide some energy.

Proteins differ widely in their composition according to their food source. That protein which comes from an animal is superior to plant proteins. The quality or value is determined by the quantity of amino acids contained in protein materials. Protein is made up of 22 amino acid materials. About half of these must come ready made from food, but the other half can be manufactured in the body if a supply is needed.

Meals which rate high nutritionally must have a large proportion of the proteins from animal sources. Next best in value are dry beans, nuts, and peas. Fruits, vegetables, and cereal proteins are lower in their protein value, but when combined with animal foods provide good nutrition by helping each other out. A varied combination of foods is needed for the body's best use of protein.

The actual amount of protein used by the body depends upon growth rate or the size of an adult individual. During rapid growth, more protein is needed. The larger the man, the more the tissue for which repair is needed. Recommended Daily Dietary Allowances for different nutrients are shown in table A, p. C1-6.

102-b(2)—Calcium—Mineral elements are present in large quantities in the body. About 2 percent of an adult's body weight is calcium. Most of this calcium is found in bones and teeth. A very small, but important, percent is present in body fluids, such as blood. Calcium serves several functions in vital life processes but never as a single nutrient.

Examples of how calcium combines with other nutrients to regulate and coordinate important body processes are as follows:

1. Bone and teeth building. Calcium requires vitamins A, C, and D plus protein and phosphorus.

2. Heart action. Calcium works together with sodium and potassium in regulating the normal action of the heart.

3. Blood clotting. Calcium and other constituents help control this important body fluid. Phosphorus maintains neutrality of the blood.

4. Nerve Stimulation. Calcium and phosphorus are essential for normal response of nerves. Without calcium, muscles do not contract nor relax.

Calcium, phosphorus, sodium, and potassium must be adequate in the daily diet to carry out these important building and regulatory functions. Some reserve of these nutrients can be accumulated in the body. Calcium foods should be eaten in liberal quantities to allow for immediate needs and additional body stresses where there is special need.

Some food sources of calcium give "up" their calcium faster than others. Milk is a primary food source of calcium. Unless liberal quantities of milk or other dairy foods are included in the diet, it is difficult to meet the recommended amount. About 75 percent of the calcium in our diets comes from milk and milk products. The next best calcium source is leafy green vegetables. Other foods such as fruits, meat, and eggs also contribute calcium, but in lesser amounts.

TABLE A
A YARDSTICK OF GOOD NUTRITION
(Recommended Daily Dietary Allowances [1])

	Age [2] Years From To	Weight lbs. (kg.)	Height in. (cm.)	Calories	Protein gm.	Calcium gm.	Iron mg.	Thiamine mg.	Riboflavin mg.	Niacin [3] equiv. mg.	Ascorbic acid mg.	Vitamin A Value I.U.	Vitamin D I.U.
Men.....	18–35	154 (70)	69 (175)	2900	70	0.8	10	1.2	1.7	19	70	[4]5000	....
	35–55	154 (70)	69 (175)	2600	70	0.8	10	1.0	1.6	17	70	5000	....
	55–75	154 (70)	69 (175)	2200	70	0.8	10	0.9	1.3	15	70	5000	....
Women..	18–35	128 (58)	64 (163)	2100	58	0.8	15	0.8	1.3	14	70	5000	....
	35–55	128 (58)	64 (163)	1900	58	0.8	15	0.8	1.2	13	70	5000	....
	55–75	128 (58)	64 (163)	1600	58	0.8	10	0.8	1.2	13	70	5000	....
Boys....	15–18	134 (61)	68 (172)	3400	85	1.4	15	1.4	2.0	22	80	5000	400
Girls....	15–18	117 (53)	64 (163)	2300	58	1.3	15	0.9	1.3	15	70	5000	400

[1] Allowance levels are intended to cover individual variations among most normal persons as they live in the United States under usual environmental stresses. The recommended allowances can be attained with a variety of common foods, providing other nutrients for which human requirements have been less well defined.

[2] Entries on lines for age range 18–35 years represent the 25-year age. All other entries represent allowances for the midpoint of the specified age periods.

[3] Niacin equivalents include dietary sources of the performed vitamin and the precursor, tryptophan. 60 mg. tryptophan represents 1 mg. niacin.

[4] 1000 I.U. from preformed Vitamin A and 4000 I.U. from beta-carotene.

NOTE: The above is adapted from a table published by the Food and Nutrition Board, National Academy of Sciences, National Research Council. The table was revised in 1963. Previous editions were published in 1943, 1945, 1948, 1953, and 1958.

The minerals and vitamins needed to help calcium with its work are usually present in adequate amounts in foods rich in calcium. The quantity of calcium needed varies according to age, sex, and special needs of an individual. Recommended Daily Dietary Allowances for different nutrients are shown in table A.

102-b(3)—Iron—Another mineral of great importance is iron, needed for red blood cells and other body cells such as in bone marrow. Iron, like other nutrients, does not work independently to carry out its important functions. The mineral, copper, which occurs in some of the same foods as iron, is essential to the proper intestinal absorption of iron and in the making of hemoglobin, a protein found in the red blood cells. Hemoglobin gives blood its red coloring.

Certain vitamins and protein play an important role in hemoglobin formation as well. The best way to prevent human iron deficiencies and low hemoglobin is to eat a generally excellent diet including all recommended nutrients.

Some iron is used immediately as it is absorbed from food; a little is stored in the liver, and certain quantity is excreted. The body

needs a generous supply of iron every day. The quantity required depends upon the individual's sex and age. Requirements for women and children are higher than that for men unless there is a special need such as an unusual loss of blood. Recommended Daily Dietary Allowances for different nutrients are shown in table A, p. C1-6.

Under stress conditions, an unusual amount of hemoglobin is needed. If one lacks iron, a deficiency disease called "anemia" is likely to occur. A good supply of hemoglobin is required to keep up a person's efficiency. These red blood cells take in oxygen in the lungs and help return carbon dioxide from the lungs. In an anemic state, an individual has less red blood cells, lowered oxygen intake, and more carbon dioxide, so that he becomes sluggish and dispirited. Anemia may be caused by other factors than a lack of iron in the diet and only a physician can determine such causes.

Foods richest in iron are liver, lean muscle meats of all kinds, fish, poultry, dry beans, molasses, dark green vegetables, and egg yolk. Bread and cereal foods which have been enriched are also valuable sources.

102-b(4)—Iodine—A small amount of iodine is required by the body to help the thyroid gland function properly. Iodine is contained in the drinking water along the seacoast and in fruits and vegetables grown in other parts of the United States. The so-called "goiter-belt" in this country is centered around the Great Lakes and in the northwestern States.

Salt-water fish and other fish from the sea are rich sources of iodine and should be eaten periodically. Regular use of iodized salt is highly recommended as well.

102-b(5)—Vitamins—There are some 20 vitamins known or believed to be important to human nutrition. Vitamins serve in many ways in the development and functioning of the body. Minute amounts assist the body in growth and reproduction; in the formation of certain disease-resisting substances in the blood stream; in coagulation of blood; in resistance to infection; in the building processes of bones, tissue, and teeth; and in regulating blood. Vitamins as such do not supply energy. The chief function of vitamins is their capability for coordinating other nutrients.

Vitamins are classified on the basis of their solubility as follows:

Water Soluble:

Vitamin C (ascorbic acid).

B Complex Vitamins (thiamine or vitamin B_1; riboflavin or vitamin B_2; niacin or nicotinic acid; folic acid; and vitamin B_{12}).

Fat Soluble:

Vitamins A, D, E, and K.

Solubility of vitamins is important as related to the retention of these vitamins. Fat-soluble vitamins withstand more "abuse" than water-soluble vitamins; that is, vitamin A, for example, is more stable in foods subjected to handling and cooking than foods containing vitamin C. Vitamin A is not soluble in water and can withstand boiling temperatures. Another major difference in these two classes of vitamins is their ability to be stored in the body. For the most part, vitamin C and the "B" vitamins are not stored and quantities eaten in excess of body's needs are excreted.

Vitamin A—Many vitamins protect the body against infection, and vitamin A is particularly helpful in its ability to protect the mucous membranes (lining of various body passages such as the mouth) against bacterial invasion and infection. Vitamin A is important to the young for growth, and for normal vision and eye health at all ages.

Vitamin A is known by two names. Vitamin A as such is called "preformed vitamin A" and exists only in animal foods. Another form of

vitamin A, carotene, is called "provitamin A" and is found in both animal and plant foods. This form is converted into vitamin A in the body after it is eaten.

Animal sources of vitamin A are liver, egg yolks, butter, whole milk and cream, and cheese. Vegetable foods containing the pigment, carotene, are yellow-orange and deep green. The deeper these colors in vegetable foods, the richer the carotene value, although this is not necessarily true of the carotene content of egg yolks and butter.

Vitamin A can be stored in the body but a good daily supply is highly recommended so that reserves are not drawn out of the body.

Vitamin D—The primary function of vitamin D is to help the body in the efficient utilization of calcium and phosphorus in nourishing the bones and teeth and maintaining a proper balance of these nutrients in the blood.

The need for vitamin D is most critical in childhood but continues into adult life under certain conditions. Recommendations have been made for the quantity needed by children, but not that for adults. Vitamin D is converted from a substance in the body, by sunshine and from certain foods. It is not naturally present in foods, and some foods are fortified with vitamin D.

Vitamin B Family—There are three vitamins in the "B" group which are the most familiar of the 11-member family. There are seven vitamins known to be essential to human nutrition but only three for which Recommended Daily Dietary Allowances have been suggested. These are thiamine (B_1), riboflavin (B_2 or G), and niacin (nicotinic acid). These vitamins are essential to steady nerves, good appetite and digestion, healthy skin, and promote a feeling of well being or "morale." A person whose diet lacks these vitamins is in a borderline deficiency state and may develop symptoms of illness.

Thiamine, or vitamin B_1, is referred to as the appetite vitamin because of its association with a desire to "eat." Thiamine helps make use of digested carbohydrate foods for energy. Foods supplying this vitamin are enriched flour and bread, cereals, meat, poultry, and fish; and dairy products.

Riboflavin works similarly to thiamine in converting fuel materials into energy. This vitamin promotes good skin health. Three food groups which contribute the major share of riboflavin are milk, meats, and grains (cereal and flour). Liver is outstanding for its riboflaven content. Egg yolks and green leafy vegetables also contribute.

A factor of importance to the use of riboflavin is its lack of stability. Heavy losses of this important vitamin occur in lengthy exposure of foods to light. Losses also occur in vegetables which have long soaking in water prior to cooking.

Niacin, another of the three best known "B" vitamins, also functions in energy metabolism, helping to convert fuel foods into a form which can be expended as energy. While this is its most important function, niacin also promotes skin and nerve health.

Like vitamin A, niacin as it exists in foods has two forms. Tryptophan, an amino acid present in protein-rich foods, supplies niacin by converting part of its value to this important B-vitamin in the process of digestion. Milk and eggs are the best sources of tryptophan. Next-best sources are meats, dry beans, and nuts. Niacin as such is available also from meats. Poultry, fish, and fortified flour, and cereal products contain niacin. It is possible, for example, for the human body to make 1 mg. of niacin from 50 to 60 mg. of tryptopan. The question naturally arising in relation to this conversion is: Does the body utilize tryptophan to make niacin at the expense of tryptophan's major function as an essential amino acid—that is, to build and repair tissues? The answer to this question has not been answered by scientists, but there is

reason to believe that the quantity recommended as a daily allowance of tryptophan is sufficiently liberal to do both the job of an amino acid and of niacin.

Other "B" Vitamins—Folic acid and vitamin B_{12}—are especially important to normal healthy blood and are used medically in concentrated form to treat blood diseases. There are no recommended requirements for these, or for other less well-known "B" vitamins. Green leafy vegetables, liver, legumes, muscle meats, and whole grains are good sources of folic acid. Vitamin B_{12} is found in liver, milk, cheese, eggs, and muscle meats.

Vitamin C (Ascorbic Acid)—This rightly may be called "the sailor's vitamin." Scurvy is a disease which was common on long voyages when the diet was low in citrus fruits and other foods rich in vitamin C. When a deficiency of vitamin C manifests itself in the body, gums are tender and bleed easily, joints swell and hurt, and muscles weaken. Vitamin C is needed to keep tissues in good condition and to help resist diseases.

A good supply of vitamin C is needed daily because the body does not store it. In addition to citrus fruits, other good sources are tomatoes, fresh strawberries, cantaloupe, raw cabbage, green pepper, and spinach. Vitamin C is the least stable of all nutrients. When exposed to air, vitamin C will oxidize rapidly unless the food is citrus fruit or another acid food. High temperatures, too, are destructive, especially if foods are held for lengthy periods on steam tables or elsewhere.

The amount of ascorbic acid needed daily is higher for men in the 17- to 18-year age bracket than at any other time throughout life. Therefore, it is imperative that liberal use of foods high in ascorbic acid be included daily in the general mess menus.

102-b(6)—Fats—Without fat, many meals would be less palatable and satisfying. Fat is our most concentrated source of fuel energy. Some fats are excellent sources of vitamins A and D. Fat is necessary in the effective utilization of the fat-soluble vitamins in the human body and for suppling fatty acids.

Fats and oils from plant and animal sources furnish essential fatty acids which have specific body functions. A fatty acid is the end product of fat after it is digested. A fatty acid is considered essential if it cannot be manufactured by the body. Fatty acid deficiencies are linked with skin disorders.

The roles of fats and fatty acids in nutrition are complicated. Fatty acids common in foods are classified by and useful nutritionally according to their degree of "saturation." Saturation results from the chemical makeup of fat. Fats which are fully saturated are fats which remain solid at room temperature. Beef fat is an example of this type. Three broad groups of fatty acids include saturated, monounsaturated, and polyunsaturated types.

Fatty acids called monounsaturated do not remain completely solid at room temperatures. Some products are given special treatment to alter this characteristic. Included in this group are the hydrogenated shortenings. Those fatty acids which are called polyunsaturated are a mixed group, some of which are liquid at room temperature.

While a certain amount of fat is needed daily, the amount eaten should be moderate. Fat is invisible in many foods and it is easy to accumulate a large amount from a total day's food. A good amount of fat is found in lean meat, for example, and whole milk and egg yolks contain hidden fat. "Visible" amounts of fats such as butter, salad oil, or outside fat on meats can be eaten or omitted from a meal, as desired.

Cholesterol is a substance that is associated with fats in many natural foods. It is a complex, fatlike material which can be described chemically as a waxy alcohol. The subject of

cholesterol and its relationship to heart disease has spurred much interest in recent years. While no absolutely conclusive evidence exists, much information has been gained on the nature of cholesterol and its impact on diet and health.

Cholesterol is a normal and essential constituent of blood, nerve tissue, and other parts of animals used for food. A corresponding constituent in plants also has been identified as cholesterol. Since cholesterol is present in both animal and plant foods, it is readily available in human diets. Cholesterol also may be "manufactured" within the body from fats, carbohydrates, and proteins, as well as eaten in the diet.

Kinds and amounts of fat in the diet affect the amount of cholesterol in the blood. If a heavy concentration exists, there may be deposits on the inner walls of arteries in certain individuals with abnormal health. Some medical authorities believe that these arterial deposits and high concentrations of blood cholesterol are associated with a common form of heart disease.

Foods other than fat play a role in blood cholesterol levels, however, and exactly what these factors are still remains to be resolved. While it has been shown that blood cholesterol levels can be lowered by diet, it must yet be proved that lower blood cholesterol levels reduce the occurrence of heart disease.

102–b(7)—Other Fuel Foods—Another food group called carbohydrates are important in supplying fuel for energy in the body. Sugars and starches are the two main carbohydrate materials. Sugars and starches are easily digested and are absorbed quickly. They can be used efficiently for body energy.

102–c—FOOD VALUE MEASUREMENTS—To review the functions of essential nutrients and the principal food sources supplying them, refer to table B, pp. C1–11 and C1–12.

The menu planner may wish to learn more specifically which foods are responsible for carrying nutrients and which foods are deficit in certain of the dietary essentials. Most foods contain more than one class of nutrients, although a single food may be cited as "a protein food" and as "a fat." A food is identified nutritionally in this way because it contributes a larger share of one nutrient than another, or because it is outstanding as a source of that nutrient.

102–c(1)—Units of Measuring Energy—When estimating the energy value of food, a unit called a calorie is used. The term, calorie, has become a part of our everyday vocabulary because counting calories has become a common practice for many. Basic to calorie counting is understanding how the human body obtains and uses its energy.

Energy is supplied by food which in the normal process of digestion is broken down into simple components. These components are absorbed through the intestinal wall and transported by body fluids to the tissues where they are oxidized or "burned" and energy is released. This energy is used in these ways:

1. As heat utilized to maintain body temperature.
2. As work expended in muscular and other body activities.
3. As reserve if not utilized immediately. When fuel energy is not available, these reserve stores, deposited as body fat, are used instead.

To define a calorie: It is the unit generally used in expressing the heat-producing or energy-producing value of food. When released in the body from digestion, heat is transformed into energy to keep body processes operating, and to help nutrients function properly.

The total energy derived from proteins, fats, and carbohydrates in a given quantity of food is expressed as calories. For example, approximately 4 slices of ordinary white bread would furnish a total of 264 calories, and also provide an average of 9.1 grams of protein, 53.3 grams of carbohydrate, and 1.6 grams of fat. This does not mean that proteins and fats furnish fuel at the expense of performing their other vital body functions. Their usefulness in these functions continues, and they can be converted into heat energy at the same time.

The need for food as fuel depends mainly on body size and activity. An average-size, 25-year-old man who is a desk worker and is only moderately active outside the office, needs about 2,900 calories daily. A fast-growing, lively youth below 20 years old needs more calories.

If body weight is properly adjusted to height and build, it is a sign that fuel intake matches one's needs. When the body gets more food energy than it can use, it stores up the excess as fat. Tissue fat is a readily available reserve supply of fuel and is used continually in metabolism (digestion, absorption, and assimilation of food). If insufficient fuel foods are eaten, the body draws on these reserves for energy.

Balanced meals at regular intervals are recommended in weight reduction or in attempting to maintain a weight. The quantity of a food eaten is the key to maintaining desirable weight. Small servings mean fewer calories. High calorie foods, of course, should be omitted if weight reduction is an objective. Fat meat, salad oil, fried foods, rich gravies and sauces, nuts, pastry, cakes, cookies, other rich desserts, candy, jelly, jam, and alcoholic and sugar-sweetened beverages are examples of high-caloric foods. When attempting to reduce weight, one should continue to include foods from each of the four groups in the Daily Food Guide. Calories can be adjusted as follows:

Milk and Cheese—Choose fluid or dried skim milk and cottage cheese rather than whole milk and cheddar cheese.

Lean Meat, Poultry, and Fish; and Eggs—Prepared without added fat or rich gravies and sauces. Take the fat off the meat; keep the portions small.

Vegetables and Fruits—Eat a variety of these including potatoes but do not add large quantities of butter or other fats or cream sauces. Eat fresh fruits, but omit sirup when eating canned fruits; or when using vegetables as salads, omit the high-calorie dressings.

Breads and Cereals—Watch the quantity carefully but include some every day.

102–c(2)—Units of Measure of Nutrients—Nutrients are measured in different units as follows:

Grams	Carbohydrate, protein, fat, fatty acids, and calcium.
Milligrams	Iron, thiamine, riboflavin, niacin, ascorbic acid.
International Units.	Vitamins A and D.

These units reflect the particular nutrient values in food and serve as a basis for comparing kinds and amounts each food has, or for com-

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TABLE B

WHAT ESSENTIAL NUTRIENTS DO

Nutrient	Function	Principle Food Sources
Carbohydrates	Provides fuel for body warmth and energy (calories).	Starches and sugars.
Fats	Provides fuel for body warmth and energy (calories); carriers of fat-soluble vitamins A, D, and K.	Vegetable oils, meat, whole milk and its products, butter, cheese, ice cream, egg yolk.
Protein	Builds and repairs body tissues; provides fuel for body warmth and energy (calories).	Meat, fish, poultry, milk and its products, eggs, dry beans and peas, nuts, cereals, and vegetables.
Minerals:		
Calcium	Builds bones and teeth, aids blood clotting, regulates action of nerves and muscles.	Milk and its products, leafy green vegetables.
Phosphorus	Helps calcium to be used properly	Same as for calcium.
Iron	Builds red blood cells	Liver, meats, peas and beans, egg yolks, dried fruits, molasses, bread, and cereals.
Iodine	Helps thyroid gland work properly	Drinking water, vegetables, fruit, fish and seafood, iodized salt.
Vitamins	About 20 vitamins are known to be important to human well being. Each performs one or more special functions. A few of the most important are listed.	
Vitamin A	Assists growth, protects body against infection; maintains normal eye functions, keeps skin and linings of nose, mouth, and inner organs in good condition.	Liver, egg yolks, whole milk and its products, dark green vegetables, deep yellow vegetables.
B Vitamins	Regulates one or more processes so that the body can use proteins, fats, carbohydrates, and minerals.	Few foods contain large amounts of B vitamins. A varied diet contributes enough for daily needs.
Thiamine (B_1)	Helps maintain steady nerves, good appetite and digestion, and skin.	Enriched flour, bread, and cereals.
Riboflavin (B_2 or G).	Same as above	Milk, meats, and grains.
Niacin (nicotinic acid)	Same as above	Meats, poultry, fish, flour, and grains; milk.
Folic acid	Important to healthy blood	Green leafy vegetables, liver, legumes, muscle meats, whole grains.

TABLE B—Continued

WHAT ESSENTIAL NUTRIENTS DO—Continued

Nutrient	Function	Principle Food Sources
Vitamins—Con.		
Vitamin B—Con.		
Vitamin B_{12}	Same as above	Liver, milk, cheese, eggs, meat.
Ascorbic acid	Maintains healthy gums, bones, joints, and muscles.	Citrus fruits, tomatoes, strawberries, cantaloupe, raw cabbage, spinach and kale, green pepper, potatoes and sweet potatoes, broccoli, brussels sprouts.
Vitamin D	Works along with minerals to help form straight, strong bones and teeth in persons up through 18 years of age.	Egg yolk, butter, salmon, tuna, sardines, milk (fortified with vitamin D).

paring different nutrients in the same food. These units of measure are used to evaluate diets.

Grams are units of weight commonly used for expressing quantities of many materials, including food. Grams are used to specify the exact amounts of protein, carbohydrate, fat, fatty acids, and calcium suggested by the National Research Council in the Recommended Dietary Allowances. The reason why grams are used for this purpose is that a pound or even an ounce is far too large a weight to use for expressing scientific measurements.

The gram system is commonly used in most countries to simplify arithmetic where decimals or fractional parts of a pound must be used. It is less difficult to visualize quantities expressed in grams, if the following comparisons are noted:

1 oz.	=	28.4 grams
1 lb.	=	454.4 grams
1 kg. (kilogram)	=	2.2 lbs.

Kilograms are used to express body weight in scientific work. The protein requirement, for example, is based on body weight given in kilograms. The average adult requires 1 gram of protein per kilogram of body weight daily. Smaller units, such as milligrams and micrograms, are used to express requirements per kilogram of body weight for other nutrients.

Milligrams are the units used to express daily suggested quantities of iron, B vitamins, and ascorbic acid.

1 milligram	=	0.1543 grams
1 oz.	=	30,000 milligrams
1 gm.	=	1,000,000 micrograms

In other words, a milligram is about one one-thousandth of a gram if rounded down.

International Units are used to express the recommended daily amounts of vitamins A and D. An I.U. is a very small quantity defined in terms of an established standard of pure, crystalline vitamins. For example,

One I.U. vitamin A = 0.6 microgram of pure beta-carotene or 0.3 microgram of crystalline vitamin A

One I.U. vitamin D = 0.025 microgram of pure crystalline vitamin D

These International Units are used as a worldwide reference standard.

Meals may be planned by the Daily Food Guide system with reasonable assurance that menus are adequate without making an evaluation by calculated analysis.

102–c(3)—Tables of Food Composition—Scientists have compiled nutritive values into tables which give concise, analytical data nutritive values of foods in tabular form for ready reference. A list of such "Food Value and Dietary Tables" is given in C–II, pp. C2–39 and C2–40.

Recent up-to-date tables give food values for the following nutrients:

Food Energy (derived from protein, fat, and carbohydrate)
Protein
Fat
Total carbohydrate

Minerals:	Vitamins:
Calcium.	Vitamin A.
Phosphorus.	Thiamine.
Iron.	Riboflavin.
Sodium.	Niacin.
Potassium.	Ascorbic acid.

These tables of food composition show nutritive values for a definite quantity or quantities of food. For example, data for 100-gram portions of all foods are given in a table to facilitate the comparison of nutritive values.

Large quantity food service operations may wish to refer to tables showing values for 1 lb. quantities of food, as purchased (i.e., potatoes with skins). Still other tables show nutritive values both by weight and equivalent measure (i.e., 1 c. milk, or 8 fl. oz.).

Tables of food composition will assist the menu planner in assessing the nutritive value of menus when making specific calculations.

102–d—RECOMMENDED DAILY DIETARY ALLOWANCES—The amount of each nutrient needed individually varies by different age groups, sex, height, weight, and condition, as discussed on the key nutrients and their functions (see par. 102–b).

The Food and Nutrition Board of the National Research Council recommends the daily quantities of different nutrients. Referred to as RECOMMENDED DAILY DIETARY ALLOWANCES, this is not an absolute standard in the sense that the quantities of nutrients recommended are hard and fast rules, never changing. The Recommended Daily Dietary Allowances have been revised about every 5 years since 1941, the first year of their publication. The allowances are intended to serve as a guide in planning for food supplies and in determining the adequacy of diets.

See table A, p. C1–6, for a list of these allowances. They are designed by the Food and Nutrition Board for healthy persons in the United States who are normally active and live in a temperate climate (mean temperature 68° F.). The recommendations cover ages ranging from infancy through adult life for both sexes. Daily allowances are recommended for calories, protein, two minerals, and six vitamins.

The amounts of calories and nutrients recommended are believed to be adequate because the quantities are higher than the minimum amounts required for health, i.e., a margin of safety or sufficiency above the minimum has been included. The amounts recommended do not cover the additional amounts which would be required for stress conditions such as illnesses. Only a physician should prescribe for such conditions.

The Recommended Daily Dietary Allowances are a basis for checking the adequacy of food

consumed and should be used as a yardstick in connection with tables showing nutrient values in foods.

103—HOW TO DETERMINE NUTRITIONAL ADEQUACY

Commissary personnel must judge the adequacy of the general mess menu or a special ration issued to the men. This judgment is less difficult if a system of nutritional evaluation is used. The system must be simple, reliable, and rapid, and the method must suit the purpose of the menu. A precise analysis is not required to insure a proper nutritional evaluation. Menus for normal, healthy groups of Navy men need not be balanced by a computation method. There is a reliable short-cut method of balancing menus according to the Daily Food Guide described in par. 103-a. This is a practical application of the science of nutrition which makes possible simple, sound, and wise selection of food choices for menus.

103-a—DAILY FOOD GUIDE SYSTEM—A menu which meets the needs of the average man can be written according to the Daily Food Guide which has a "built-in" menu balance. The Daily Food Guide is a pattern, or an easy, practical, and common sense guide for selecting foods for each day's menus. Plan menus so that each person has food daily from four basic groups, as follows:

Milk (and cheese)	— 2 or more servings
Meat (and fish, eggs)	— 2 or more servings
Vegetables—Fruit	— 4 or more servings
Bread—Cereal	— 4 or more servings

PLUS OTHER FOODS, such as butter, margarine, other fats, oils, and sugar

If all the four basic food groups are included in menus, in the number of servings recommended for each group, the menu may be considered balanced.

The Daily Food Guide four-food group plan is a revision of a plan called "Basic 7," a foundation dietary pattern previously used. Foods were chosen for each group because of their significant contributions of essential nutrients. Each of the broad groups in the Daily Food Guide has a special job to do. These four groups furnish all, or a major share of the following nutrients in the Recommended Daily Dietary Allowances:

Calories.	Riboflavin.
Protein.	Niacin.
Calcium.	Vitamin A.
Iron.	Vitamin C.
Thiamine.	Vitamin D.

If the additional or "other" foods suggested in the Daily Food Guide are eaten in sufficient quantities, the calorie level will be adequate.

Suggested food choices and recommended number of servings in the four-group plan are shown in illustration 1, p. C1-16. A discussion of the number, quantity and kinds of foods in each food group in the basic scheme follows.

MILK GROUP

Milk, cheese, and ice cream are the food choices in this group. Milk is a leading source of calcium, riboflavin, high-quality protein, and also provides many other vitamins and minerals. Cheese and ice cream supply these same nutrients, but in smaller quantities.

Quantities of milk recommended daily include:

1 pt. for persons over 20 years
1 qt. (or more) for persons under 20 years

Any form of milk counts toward this total, as for example:

FOOD FOR FITNESS

A Daily Food Guide

MILK GROUP

Some milk for everyone

Children under 9. 2 to 3 cups
Children 9 to 12 . 3 or more cups
Teenagers . . . . . 4 or more cups
Adults . . . . . 2 or more cups

MEAT GROUP

2 or more servings

Beef, veal, pork, lamb, poultry, fish, eggs

As alternates– dry beans, dry peas, nuts

VEGETABLE FRUIT GROUP

4 or more servings

Include–
A citrus fruit or other fruit or vegetable important for vitamin C
A dark-green or deep-yellow vegetable for vitamin A–at least every other day
Other vegetables and fruits, including potatoes

BREAD CEREAL GROUP

4 or more servings

Whole grain, enriched, or restored

Plus other foods as needed to complete meals and to provide additional food energy and other food values

Illustration 1
A Daily Food Guide

Whole milk (any processed form)
Nonfat dry milk, reconstituted
Buttermilk
Evaporated milk (reconstituted)

Cheese and ice cream can be substituted for milk, based on this calcium equivalent:

1 c. whole milk = 1⅓" cube cheddar or American cheese
1 c. whole milk = ¾ lb. cottage cheese (creamed) or 1 pt. ice cream

The limited amounts of fresh, fluid milk available for afloat messes necessitates the liberal use of milk equivalents in Navy meals.

The importance of milk in the ration cannot be overemphasized because it is counted on to furnish the major portion of the daily needs for calcium and other nutrients. When milk or its equivalent is lacking in the ration, calcium, and sometimes riboflavin, is likely to fall below the amounts recommended for good health. If a recommended daily minimum of 1 pt. is used, it will supply the following amounts of nutrients in the Recommended Daily Dietary Allowances for adults:

About ⅔ of the calcium requirement.
About ¼ of the protein requirement.
About ½ of the riboflavin requirement.

See illustration 2, chart I, and note the contribution 2 c. (1 pt.) of milk to the day's needs for an average adult.

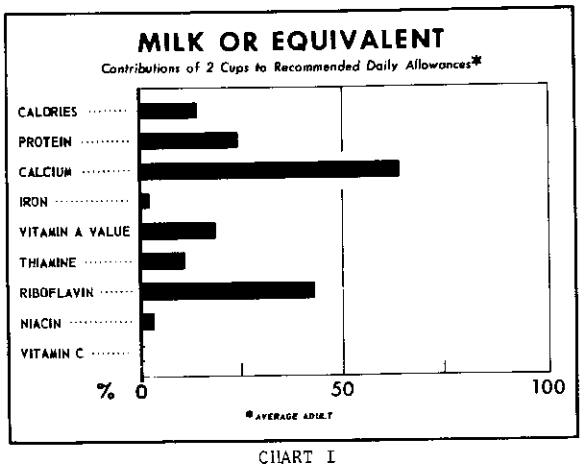

CHART I

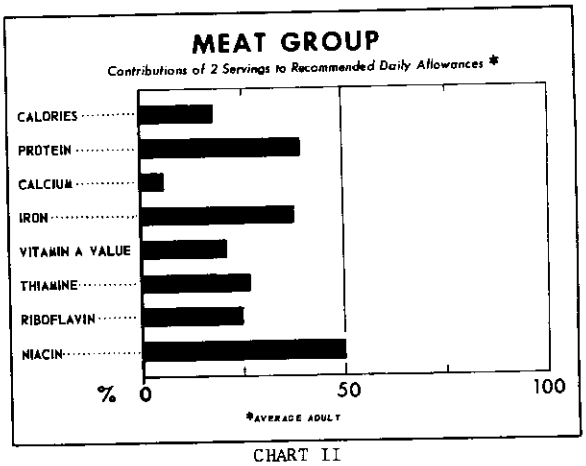

CHART II

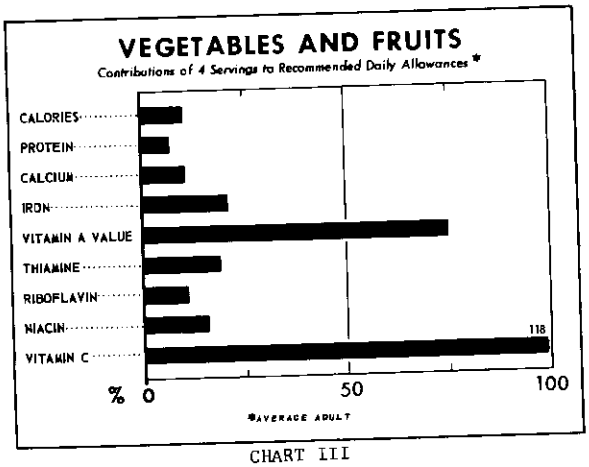

CHART III

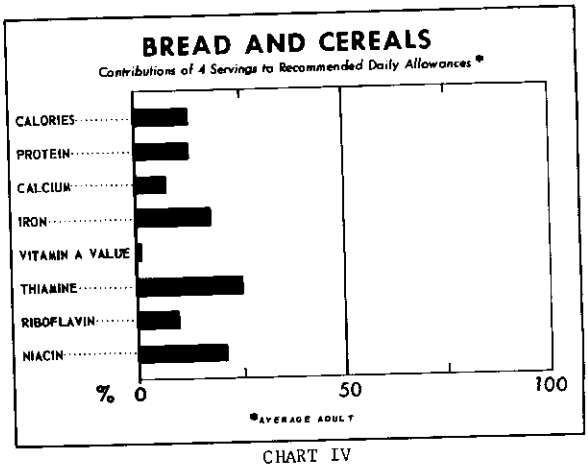

CHART IV

Illustration 2

Nutrients Supplied by Recommended Number of Servings of Foods in Four-Food Group Foundation Plan

MEAT GROUP

Plan a total of two or more servings daily of foods in the meat group. These foods are important for:

Protein.	Niacin.
Iron.	Fat.
Thiamine.	Other minerals and vitamins.
Riboflavin.	

Foods and recommended quantities in this group include:

2–3 oz. beef, boneless.
2–3 oz. veal, boneless.
2–3 oz. lamb, boneless.
2–3 oz. fish and shellfish, boneless.
2–3 oz. variety meats (liver, heart, kidney).
2–3 oz. poultry, boneless.
2 eggs.

ALTERNATES—1 c. dry beans, dry peas, lentils, nuts, peanuts, 4 tbsp. peanut butter.

About half of a day's protein requirement for an average adult will be furnished by two servings of foods from the meat group. Milk, cheese, bread, and cereals will supply the rest; dry beans, peas and nuts also furnish vegetable proteins. About half of the iron needed daily by an adult is contributed by two servings of foods in the meat group. These and other major nutrient contributions by the meat group to the Recommended Daily Dietary Allowances may be noted in illustration 2, chart II, p. C1–17.

VEGETABLE–FRUIT GROUP

The value of vegetables and fruits in the diet is far reaching. They are rich as sources of vitamins and minerals, and add interest to meals. They also provide roughage.

Four or more servings of foods in the Vegetable-Fruit group should be included in daily meals, including the following:

One daily serving of a "good" source or two servings of a "fair" source of vitamin C.

GOOD SOURCES INCLUDE:
Grapefruit or grapefruit juice.
Orange or orange juice.
Cantaloupe.
Raw strawberries.
Broccoli.
Brussels sprouts.
Green pepper, or
Sweet red pepper.

(NOTE: If activities are authorized to use, and have available supplies of guavas, mangoes, and papayas, these tropical fruits are also good sources of vitamin C.)

FAIR SOURCES INCLUDE:
Honeydew melon.
Lemon.
Tangerine or tangerine juice.
Watermelon.
Asparagus tips.
Raw cabbage.
Collards.
Kale.
Kohlrabi.
Mustard greens.
Potatoes (cooked in skin).
Sweet potatoes (cooked in skin).
Spinach.
Tomatoes or tomato juice.
Turnip greens.

One serving (every other day) of a good source of vitamin A, such as:

Dark-green vegetables (broccoli, chard, kale, spinach).
Deep-yellow vegetables (carrots, sweet potatoes, winter squash).
Apricots.
Cantaloupes.

(NOTE: If foods are chosen which are good sources of both vitamins A and C, omit vitamin A serving.)

One to three or more servings may be any vegetable or fruit valuable for vitamins A and C.

Serving sizes of raw fruits-vegetables are those ordinarily eaten—1 medium banana, half grapefruit, and so on. Count cooked vegetable or fruit serving sizes as ½ cup.

Fruits and vegetables suggested in the Daily Food Guide Plan will furnish all of the vitamin C needed and over half of the vitamin A required by an average adult. The remainder of the day's need for these nutrients is met by contributions from milk and dairy products, eggs, and occasional use of liver. As referred to in par. 102–b, vitamin A as such is not found in fruits and vegetables. These foods contain carotene which the body converts to vitamin A. Other nutrients are contributed also, as shown in illustration 2, chart III, p. C1–17.

The nutritive value of fresh, canned, frozen, or dehydrated fruits and vegetables are comparable and may be used interchangeably to count toward total servings in the Daily Food Guide Plan.

BREAD-CEREALS GROUP

Foods in this group include any of the following which are made of whole grains, or which have been enriched or restored to compare with their original nutritive value in iron, thiamine, riboflavin, and niacin:

Choose four or more servings:

Bread.
Crackers.
Flour (any baked product such as biscuits, cake, cookies).
Pasta-macaroni, noodles, spaghetti.
Cooked cereals such as rolled oats.
Ready-to-eat cereals.
Grits.
Rice.
Cornmeal.

The Daily Food Guide Plan allows for flexible choices of foods from this group. Figure as follows:

3 slices of bread, plus
1 serving of cereal (1 oz. ready-to-eat or ½ to ¾ cup cooked cereal)
or
5 slices bread, no cereal.

Foods in the Bread-Cereals Group furnish worthwhile quantities of protein, especially when eaten in the same meal with other high-quality proteins from milk, meat, fish, poultry, or eggs. Iron, several members of the B-vitamin family, and food energy are supplied as shown in illustration 2, chart IV, p. C1–17.

OTHER FOODS

The four foundation food groups—milk, meats, fruits-vegetables, and bread-cereal—do not include the "extras" which go along with meals. The butter on bread, the dressings on salads, the sugar in coffee. Such additional foods are part and parcel of all normal diets and make a contribution to the total value of the meal, although would not possibly correct actual nutrient deficiencies. The major contribution of additional or other foods is calories.

More calories are easily provided by incorporating more servings of one or several foods than recommended as the minimum number in the Daily Food Guide Plan. Many other foods may be selected to round out the day's calories, such as:

Butter or other fats.
Oils.
Unenriched refined cereal products.
Sugars and sweets.

These foods forming an additional group called "other" help to make meals more satisfying and enjoyable.

The final touch for completing a basic menu foundation is making sure that there is bulk and water in the foods chosen from the four-food groups. Both bulk and fluids are necessary for eliminating body wastes. Fruits, vegetables, and whole grain products will give the needed amount of bulk if these foods are included in the amounts suggested.

Each man each day needs about seven to eight cups of fluids. Some of this quantity can be in the form of milk, fruit juices, coffee, tea, or any other beverage featured on the menu. The amount of water consumed by each man counts toward the total recommended amount. Also, most foods contain water and contribute to the total amount of liquids needed by the body. In hot dry climates a man may require more than a quart of liquid, particularly if he is doing heavy physical work. The Daily Food Guide Foundation Plan is summarized in table C.

TABLE C

DAILY FOOD GUIDE FOUNDATION PLAN

(Minimum servings and portion sizes)

Milk Group

Persons over 20 years—1 pint.

Persons under 20 years—1 quart or more.

Any form of milk counts toward total—skim milk, buttermilk, reconstituted dried or evaporated milk. Cheese and ice cream can be substituted for part of milk, based on the calcium equivalent for 1 cup whole milk.

Vegetable—Fruit Group

Plan a total of 4 or more servings.

Any fresh, frozen, canned, or dehydrated fruit or vegetable can count toward the 4 servings, but the selection should include:

1 GOOD source of vitamin C, or

2 FAIR sources of vitamin C, and

1 GOOD source of vitamin A (every other day).

Count as a serving:

½ cup vegetable or fruit (3½ oz.), or the portion ordinarily served.

These foods will supply the recommended 2-cup and 4-cup levels recommended using calcium equivalents and 1 cup whole milk.

2-Cup Milk Level

1 cup fluid whole milk.
1 inch cube cheddar cheese.
½ cup ice cream.
2 tbs. dried milk (in cooked dishes).

4-Cup Milk Level

1 cup fluid whole milk.
2 inch cube of cheddar cheese.
1 cup of ice cream.
4 tbs. dried milk (in cooked dishes).

Meat Group

2 or more servings. Count as a serving:

2 to 3 ounces lean meat, poultry, fish, or meat alternates: 2 eggs; 1 cup cooked dry beans, peas.

Bread—Cereal Group

4 or more servings.

Count as a serving any of these foods:

1 slice of bread.

1 oz. ready-to-eat cereal, or ½ to ¾ c. cooked cereal, cornmeal, grits, macaroni, noodles, rice, or spaghetti.

Plus:

Other foods such as butter, other fats, sugars, enough to round out meals.

TABLE D

FOODS PROVIDING DAILY FOOD NEEDS FOR A MODERATELY ACTIVE YOUNG MAN

(Values Shown are Averages)

Kind of Food	Size of Serving (Ready-to-Eat)	Protein	Calcium	Iron	Vitamin A Value	B Vitamins			Vitamin C (Ascorbic-Acid)	Food Energy (in calories)
						Thiamine	Riboflavin	Niacin		
MILK GROUP:										
Milk	1 c	*	****		*	*	**			165
Cheese	2 oz	**	*****		**		**			210
Ice cream	1 c	*	**		****		*			295
MEAT GROUP:										
Meat, poultry, fish.	4 oz	****		****	**	**	**	****		395
Eggs	1 large egg	*		*	*		*			80
Dry beans and peas, nuts.	¾ c cooked beans.	**	*	***		*	*	*		170
BREAD-CEREAL GROUP:										
Grain products	6 sli bread	**	***	***		***	***	***		360
Cereal, ready-to-eat.	1 oz			*		*	*	*		110
FRUIT-VEGETABLE GROUP:										
Citrus fruits	½ c								*****	50
Other fruits	½ c			*	*				*	60
Tomatoes, tomato juice.	½ c			*	***			*	***	25
Dark-green and deep-yellow vegetables (except sweet potatoes).	½ c		*	*	*****	*	*	*	****	40
Sweet potatoes	1 medium		*	*	*****	*	*	*	***	170
Light-green vegetables.	½ c		*	*	*				**	35
Potatoes	1 medium			*		*		*	***	90
Other vegetables.	½ c			*					*	40

TABLE D—Continued

FOODS PROVIDING DAILY FOOD NEEDS FOR A MODERATELY ACTIVE YOUNG MAN—Continued

Kind of Food	Size of Serving (Ready-to-Eat)	Protein	Calcium	Iron	Vitamin A Value	B Vitamins			Vitamin C (Ascorbic-Acid)	Food Energy (in calories)
						Thiamine	Riboflavin	Niacin		
OTHER FOODS:										
Butter, margarine.	2 tbsp.				**					200
Other fats	2 tbsp.									220
Sugar, all kinds.	6 tsp.									105
Molasses, sirup .	2 tbsp.			**						110
Total										2,920

KEY: Percent of recommended daily dietary allowances:
*****More than 50 percent. ***About 30 percent. *About 10 percent.
****About 40 percent. **About 20 percent.

103–a(1)—Adapting the Food Guide for Navy Personnel—See table D, p. C1–21, as an example of how to adapt the choice of foods in the Daily Food Guide to the total day's nutrients required for an active young man. Instead of naming specific foods and exact figures to show nutrient values for each food, a system of asterisks is used to denote approximate values for all of the nutrients. Figures for calories are given for food energy.

Table D, indicates how simple it is to step up the number and quantity of foods in the four basic food groups of the Daily Food Guide to attain a balanced, adequate diet which meets the suggested standard in the Recommended Daily Dietary Allowances for a moderately active young man.

Unless a specific standard of nutrition is required, as for example for an airplane pilot requiring quick-energy foods, it is obviously impractical to calculate the exact nutrient content of a whole menu when use of the foundation of the four-group food plan has a built-in system which assures nutritional adequacy. The food needs of average, healthy, active men can be met with the foundation plan and adjusted to include adidtional servings and portion sizes above the minimum recommended. In other words, table D, shows how to elaborate on the basic plan given in table C, p. C1–20, to meet the quantities of nutrients and food energy in the Recommended Daily Dietary Allowances for a 25-year-old man weighing 154 lb.

The determination of quantities of nutrients and calories in the food list in table D is made as follows:

1. The total amount of food is measured (for example, 1 c. milk, ½ c. carrots, and so on).

2. The food values in each measured quantity of food is determined using standard reference tables of food composition. (See "Recommended Reading List for the Menu Planner" in this Section, Part II, pp. C2–39 and C2–40, for a list of these reference tables.)

3. The food values determined in item 2 are totaled and averaged to determine if the food

values in the diet equal, or exceed, that suggested for an individual of a specified sex, age, height, and weight. Stars representing percentages of the contribution of a food to the days' requirement are figured.

Listing the foods as shown in table D, p. C1–21, helps the meal planner to check on the number and kinds of foods he must include in a menu and points up the best choices of additional items to use to supplement the foundation group in planning nutritionally adequate meals.

103–a(2)—The Navy Meal Pattern—Next, let us explore the possibility of turning the Daily Food Guide into daily menus for a group of men as a whole. A list of foods normally eaten every day is an aid to shaping food plans for Navy men. The following list of food items grouped into three daily meals represents a pattern usually followed in Navy general messes:

Breakfast Pattern:
Fruit or fruit juice.
Cereal.
Milk.
Main dish.
Breakfast pastry.
Bread.
Butter.
Beverage.

Dinner or Supper Pattern:
Soup (once a day).
Main dish.
Gravy or sauce.
Potatoes.
Vegetable.
Salad or relish.
Dessert.
Bread.
Butter.
Beverage.

Other types of meals served in the Navy general mess such as brunch, quick lunch (speed lines), special meals used for flight rations and boat parties follow a less definite meal pattern than that for the general mess. Information on such meal patterns may be found in parts C–III and D–IX.

The general mess meal patterns may be altered to omit items that are not in supply nor suited to the local situation. For example: The main dish for breakfast may be either eggs, meat, French toast, fritters, or other dishes. The main dish could be a combination of eggs and meat; French toast and meat; or eggs, meat, and potatoes. Similarly, dishes in the dinner or supper meals may be omitted or replaced.

In other words, use the Navy meal pattern as a skeleton plan on which meals may be built in accordance with the Daily Food Guide system of balancing menus.

PART II: FOUNDATIONS OF MENU PLANNING

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201—PLANNING TOOLS FOR PROJECTING MENU PLANS

The kinds and quantities of foods to be used on menus must be accurately estimated by the menu planner. Guesswork and last minute planning can only result in overissue and poor menus. A number of "tools" are available to help the menu planner with writing an objective menu.

201–a—"NAVY–MARINE CORPS RECIPE SERVICE"—Learning to know the recipes in the "Navy–Marine Corps Recipe Service" is a first and most important step for the menu planner. There are over 700 recipes at the disposal of the menu planner (including variations) printed on 5 by 8 in. cards. These recipes are ready to be tapped for eye-appealing and tasty meals. The recipe service contains all the old and new favorite dishes of the crew which have been pretested in Navy galleys as well as aboard ship and reviewed by the Food Advisory Committee of the National Security Industrial Association. Revisions are consistent with current supplies and use. These established and standardized recipes will insure high quality food if good preparation techniques are used.

Use of the "Navy–Marine Corps Recipe Service" file in every stage of planning menus is necessary. Get acquainted with the different sections of the file. Be adventurous and try out different recipes from time to time. Keep a record or an index of those currently used and revise it periodically.

Information on recipe development and use may be found in part D–II. Particular attention is directed to par. 202 of this section, for information on recipe adjustment.

"The Navy–Marine Corps Recipe Service" is the basis for making several important menu planning decisions. These include (1) supplies to requisition, (2) cost records for individual recipes, and (3) food acceptance factors.

201–a(1)—Supplies to Requisition—Recipes supply information which can be used in advance menu planning from the standpoint of food supplies required to produce a meal, a day's meals, or 7 days' meals. Recipes are based on 100–portion quantities giving a workable figure for adjusting portions upward or downward as required to feed a given number of men. The adjusted figure is put to use in deciding quantities of food to requisition, to tell cooks to prepare, and so on. An example problem of how recipes are used is shown in table A, p. C2–2.

201–a(2)—Cost Records—The recipes provide a basis for keeping adequate menu cost records. Pricing out a menu cannot proceed without knowing how much individual recipes cost. This information, plus meal attendance records determine where food costs stand. Recipe cost data should be current to be useful to the menu planner. If pork prices soar, for example, recipes incorporating pork should be either carefully spaced on the menu, or not used until prices are reduced to a normal level.

Recipes are used to determine subsistence personnel workloads in galley food preparation. Use of recipes is essential to plotting time schedules for the cooks, bakers, spud coxswain, and others who man food production. Recipes are used also to obtain a workable plan for staggering the use of galley equipment.

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TABLE A

PLANNED USAGE FOR THREE-WEEK CYCLE MENU (BEEF ITEMS)

Beef Items	Recipe	Quantity per 100 Portions	Total Number Meals	Quantity Required
6-way, boneless:				
Grill steak category:				
Grilled steaks	J5	47.00	2	94.00
Pot roast category:				
Pot roast of beef	J9	38.00	3	114.00
Swiss steak category:				
Braised beef steak	J13	39.00	1	39.00
Chicken fried beefsteak	J14	39.00	[1] ½	(B) 19.50
Country style beefsteak	J13	39.00	1	39.00
				97.50
Diced category:				
Beef stew	J19	26.00	1	26.00
Baked beef hash	J23	20.00+	1	(B) 23.45
Sauerbraten beef cubes	J12	38.00	1	38.00
				87.45
Oven category:				
Pot roast of beef	J4	38.00	3	114.00
Ground category:				
Baked beef loaf	J42	29.00	[1] ½	14.50
Grilled hamburgers	J39	30.00	3	90.00
Italian meat sauce	O15	15.00	1	15.00
Barbecued ground beef	J36	25.00	[1] ⅔	16.75
Salisbury steak	J45	29.00	1	29.00
Chili con carne	J37	19.00	2	38.00
Beef balls	J33	32.00	[1] ½	16.00
Minced beef	J43	30.00	[1] ½	(B) 15.00
Grilled beef patties	J39	30.00	[1] ½	(B) 15.00
Total				756.20

Key:

(B) Indicates breakfast meal and change in breakout quantity specified on recipe.

[1] Fraction indicates that less than 100 portions are planned at breakfast or as an alternate entree.

201-b—INDEXES OF FOOD POPULARITY—Consideration of food acceptability enters into all menu planning whether the planner consciously or methodically takes it into account. Acceptability is a term which has multiple meanings. To a menu planner, food acceptability is defined in terms of food consumption and morale. In other words, an acceptable food is one that will be eaten, and eaten with pleasure and satisfaction. Food acceptability can be measured objectively as well as judged from common sense reasoning. A food accept-

ance factor is one which expresses the percentage of men who will eat a particular dish; for example, 67 percent chose Maryland Fried Chicken and ate it.

Food preference, while related to food acceptance, is another matter. Expressed preference for a food is an attitude—whether an individual or a group "likes" or "dislikes" a food. A man states his attitude toward a food with little effort whether the food is in front of him at the time or not. While it may be true that a person tends to eat what he likes and rejects what he dislikes, he may or may not consume the item he stated as a preference. This is the difference between acceptability and preference.

201-b(1)—Food Acceptance Factors—To obtain an acceptance factor for individual menu items, divide the number of portions of the item served by the number of men in attendance at the meal. For example, if 150 portions of buttered carrots are served to 225 men, the acceptance factor is calculated as follows:

$$\frac{150\ (\text{Portions Served})}{225\ (\text{Meal Attendance})} = 0.67\ (\text{Acceptance Factor})$$

When expressed as a percentage (67 percent), the number of portions of buttered carrots to be cooked would be estimated as follows:

Number persons predicted to attend meal	175
Buttered carrots acceptance factors	.67
	1225
	1050
Number portion of buttered carrots to prepare	117.

A record should be maintained of acceptance factors. The individual cards of the "Navy-Marine Corps Recipe Service" is the place to do this.

An acceptance factor also is a valuable index of the popularity of menu items, and should be used for this purpose after testing out an item at several meals. Acceptance factors for the same menu item may vary from meal to meal. Different combinations of foods on a menu, weather, or varying appetites may alter the acceptance of an item. A more accurate acceptance factor may result by averaging figures obtained at several intervals.

Excessive quantities of prepared food result from several malpractices but one of the major causes is miscalculating the likes and dislikes of the men.

Good food acceptance means less plate waste and leftovers to account for in planing the next round of meals. Even popular foods may become monotonous if served too often. Items like hamburgers or French fries, for example, need spacing on the menu.

201-b(2)—Food Preferences Ratings—Determining which foods are best liked or least liked is of immeasurable help to the menu planner. Food preference, or a stated attitude toward a food, may be determined by several approaches. What items men will take, or accept on a serving line, is not the same as what men will state as a food preference. One way to learn which are the popular foods is to keep a systematic check on the number of men who take items on their trays; or check trays returning to the scullery after each meal. Observe plate waste. Keep a record of the food most often left uneaten. This is a good indication but has its limitation as an accurate measure.

Another means of determining food preferences is to survey or canvass written opinions of particular items or classes of foods on which the menu planner has doubts about their relative popularity.

A questionnaire can be developed which will determine the food preference of an item that menu planner wishes to know. The manner of

describing the foods, how the person is instructed on answering the questionnaire, and where he fills it out are important to obtaining good reliable data.

The most commonly used food preference questionnaire is a rating scale given to each man in a messline or at some other appropriate time. This type of questionnaire is easily tabulated and is reliable because checking a block or circling is all that a man is required to do.

Rating scales describe a degree of preference from disliking an item very much to liking it very much. Five to nine degree-rating scales are used professionally by menu planners. Word descriptions for these two scales are as follows:

9-Point Scale	5-Point Scale
Like extremely.	Like very much.
Like very much.	Like moderately.
Like moderately.	Neither like nor dislike.
Like slightly.	Dislike moderately.
Neither like nor dislike.	Dislike very much.
Dislike slightly.	
Dislike moderately.	
Dislike very much.	
Dislike extremely.	

Individuals vary considerably in their abilities to detect the slight degrees of difference between preference for an item expressed as "like extremely" and "like very much." Therefore, the 9-point scale would be less practical for determining food preferences for a general mess menu than the 5-point scale.

Food preference questionnaires can determine which single food items are most or least popular, their desired frequency of use on a menu, and what menu combinations are most or least liked. An example of how to canvass opinions on single food items is given in table B, p. C2–5. These food preference questionnaires should be updated periodically because tastes change, new men come aboard, and new items are procured.

201–c—MEAL ATTENDANCE PREDICTIONS—After the menu planner has obtained a general idea of the most popular foods, he must then determine how many men will be on board at each meal. Meal attendance records are kept by headcount ashore. Afloat predictions are based on actual shipboard complement, an easy-to-obtain figure. There are variations in meal attendance from day-to-day and meal-to-meal. Headcount records should be kept to show how many men are on board on each weekday. Special days, such as payday where there is greater variation in meal attendance, must be noted and taken into account in projecting the number of portions of an item to be served. The number of portions of an item served should never be used as an indication of attendance at a meal.

201–d—FREQUENCY CHARTS—Simply defined, a frequency chart is a plan that outlines the basic structure of a menu and lists the number of times major foods will appear. Major foods include meats, potatoes, vegetables, and desserts in their most frequently used forms. Item accompaniments such a gravies, salad dressings, and sauces are not included. Improved menus and stabilized usage of particular food items can result from frequency charts.

The frequency chart will be of value only when its pattern of usage for basic menu items reflects a true picture of the food preferences of the men. Adjustments in the pattern should be made as food preferences change. In first attempts at frequency charting, plan a pattern of usage for only a few basic menu items at one time. (See table C, p. C2–6.) As the usage pattern for these few items is established (in several weeks or 1 or 2 months) new items may be added to the frequency chart to develop their usage pattern. Although a completely workable frequency chart may take several months to complete, its ultimate value will justify this initial period of experimentation and development.

TABLE B

SAMPLE GENERAL MESS FOOD PREFERENCE QUESTIONNAIRE [1]

(Single Items)

Circle one answer after each food.

	FOOD ITEM					
Not tried	Steamed frankfurters	Like very much	Like moderately	Neither like nor dislike	Dislike moderately	Dislike very much
Not tried	Pineapple and cottage cheese salad	Like very much	Like moderately	Neither like nor dislike	Dislike moderately	Dislike very much
Not tried	Spaghetti and meat balls	Like very much	Like moderately	Neither like nor dislike	Dislike moderately	Dislike very much
Not tried	Buttered green lima beans	Like very much	Like moderately	Neither like nor dislike	Dislike moderately	Dislike very much
Not tried	Succotash (lima beans and whole-kernel corn)	Like very much	Like moderately	Neither like nor dislike	Dislike moderately	Dislike very much

[1] Adapted from "Food Acceptance Testing Methodology", Advisory Board on Quartermaster Research and Development, Committee on Foods, National Academy of Sciences, National Research Council, October 1954, p. 67.

201–e—LOADING GUIDES—The Navy Subsistence Office publishes a series of loading guides. The purpose of these loading guides is to assist subsistence personnel for underway operations for different endurance periods and insure a balanced load of supplies. These loading guides include information on case weight and cube data for all subsistence items on approximately 60-to-90-day cruises proposed for use.

Activities must tailor loads to meet individual mess operations because requirements vary according to stowage space and different ship types. Similar ship types with complements of equal size may not require the same food supplies.

The following publications are available from the U.S. Naval Supply Center, Oakland, Calif., or U.S. Naval Supply Center, Norfolk, Va.:

1. "Subsistence Loading Guide for Large Surface Ships" (NAVSANDA Publication 417).
2. "Subsistence Loading Data for Surface Ships with an Allowed Complement of 99 Men or Less" (NAVSANDA Publication 346).
3. "Subsistence Loading Guide for Destroyers" (NAVSANDA Publication 401).
4. "Subsistence Loading Guide for Submarines" (NAVSANDA Publication 385).

TABLE C

SAMPLE FREQUENCY CHART

(Selected items from vegetable section of a four week frequency chart for major menu items)

Item	1st Week			2d Week			3d Week			4th Week			Total Times Served		
	B	D	S	B	D	S	B	D	S	B	D	S	B	D	S
Corn (8 meals):															
Fresh		1				1								1	1
Frozen								1				1		1	1
Canned—Whole grain			1								1			1	1
Cream style					1				1					1	1
Onions (4 meals)															
Fresh		1				1						1		1	2
Dehydrated								1						1	
Peas (8 meals):															
Canned		1			1	1			1		1			3	2
Frozen			1					1				1		1	2
Spinach, frozen (2 meals)					1							1		1	1
Squash, summer (1 meal)		1												1	
Tomatoes, canned (4 meals)		1				1		1				1		2	2

KEY:

1. "Item" column—List major menu items and not components of recipes (such as flour, baking powder, butter). This listing is meant to reflect the foods preferred and the varieties or forms in which these foods are available and authorized for the type of activity. As food preferences change or availability of certain items is altered, the foods listed on the frequency chart may be adjusted.

2. "Week" column—The "Weeks" column is usually charted for a 4-week period. This length of time is sufficient for planning a balanced distribution of the major menu items stocked. It is also a representative period on which to base future requirements for requisitioning. Each weekly column is divided into three columns representing breakfast (B), dinner (D), and supper (S). This breakdown will assist in distributing the same major menu item among these meals over the 4-week period. For example, if whole kernel corn is used two or three times a week, the corn might be charted on the frequency chart as follows: 1st and 3d weeks—once at dinner, once at supper; 2d week—twice at dinner, once at supper; 4th week—once at dinner, twice at supper.

3. "Total Times Served" column—This is subdivided into three meals to assist in estimating requirements. It indicates the number of times major menu items are served at specific meals over the 4-week period.

201-f—FOOD USAGE RECORDS—The Subsistence Ledger (SandA Form 335) if up-to-date, makes possible quick, on-the-spot inventories of food supplies. This record, or other similar informal records of supplies used, will assist the menu planner in predicting what foods will be used.

Ideally, the menu planner would use food usage records as a guide in choosing items, or plotting their frequency. Recommended procedure for planning is to first write the menu and then order supplies. Situations of all sorts arise in the Navy general mess which preclude this recommended menu planning sequence. Plans, if made well in advance, must be flexible to be workable, particularly afloat. Where space is a great limitation, menus are planned after supplies are requisitioned and stocked.

A first consideration in advance menu planning should be "balanced" requisitioning. Past usage records help attain this balance by showing what is "on-hand" and what items are needed. Planned calendars of stock rotation will prevent a rewrite of menus to incorporate surplus stocks of on-hand items. Items should be rotated on a regular basis, using oldest stocks first.

201-g—REQUIREMENTS TABLES — Another source of information, when planning procurements or projecting menu plans in advance of need, is the BUSANDA Manual. It includes the following tables for reference:

Normal Subsistence Requirements Table, Volume IV
"B" Ration Requirements Table, Volumes III and VIII

Each of these tables serves a valuable purpose.

The Normal Requirements Table lists the most commonly used subsistence items with average quantitative needs for 1,000 men for 30 days. The table includes planning requirements for ashore use only. It also may be used as a standard by which activities can measure stock levels to determine whether a given quantity meets the subsistence needs. Cube data is included.

In the "B" Ration Requirements Table only nonperishable subsistence items are listed. Quantities required for 1,000 men to subsist for 30 days are given. The "B" ration is designed for use by activities under operational conditions which preclude the use of perishable subsistence items. The "B" ration table should be used as a guide in stocking or loading.

202—MENU PLANNING GUIDELINES

A menu planner needs to be resourceful and imaginative. He must be well informed as well. A few good sources of information kept within easy reach will be valuable in guiding choices for menus.

Studying previous menu plans on file will be helpful for this gives a good indication of what is practicable for the preparation facilities and number of men subsisted at a particular location. Use these menus along with other sources of information discussed.

202-a—RECOMMENDED READING—A list of pamphlets, books, and periodicals recommended for the menu planner are included at the end of this section. See pp. C2-39 and C2-40.

202-b—INDEX OF RECIPES—One of the most valuable references a menu planner can have is "Index of Recipes" (NAVSANDA Publication 7/MCO P-10110.16A). This index is issued in conjunction with the "Navy-Marine Corps Recipe Service" and is to be used particularly by menu planners to make menu choices.

The recipes listed in "Index of Recipes" are organized according to the recommended sequence of listing major items on the menu.

The "Index" also lists miscellaneous information included in the "Navy-Marine Corps Recipe Service."

202-c—"NAVY FOOD SERVICE"—The menu planner should rely upon authoritative and reliable sources to guide food choices in planning Navy meals. Even veteran menu planners can profit by following the suggested menus planned by professionals at the Navy Subsistence Office.

The menu is featured quarterly in the "Navy Food Service." The menu is based on a 21-day cycle system of meal planning. (See par. 302 of this section.) The 21-day menu cycle offers the menu planner ideas for meal combinations, new foods, and suggests recipes that the menu planner possibly has not tried before. The importance of checking over these menus, however, is that they incorporate basic scientific and artistic menu planning principles and best demonstrate a completed, well-planned menu. In addition to the menus given, preparation hints are included, and subsistence news is given as well in the "Navy Food Service." Keep back copies of "Navy Food Service" filed for ready reference.

202-d—MENU BOARDS—There are two types of menu boards which can function effectively for the general mess. These are: (1) Menu planning boards which actually plan the menu within the subsistence division, and (2) a menu review board which functions in an advisory capacity.

Representatives to boards are designated by each department or division of the ship or activity. The type of board which acts on major decisions affecting food supplies to support a menu, on selection of food choices commensurate with galley equipment, workload, and other administrative decisions must be composed of personnel with experience in food service. The representatives on this board are the Commissarymen and Chief Petty Officers in the Subsistence Division.

Each command must make its own policy on menu board representation outside of the subsistence division.

202-d(1)—Menu Planning Boards (Subsistence Division)—Team effort functions well in menu planning. When the menu board consists only of subsistence personnel, combined effort works to make an efficient menu. The commissary officer at activities with large complements can select one Chief Petty Officer to preside over the board while 2d and 3d class Commissarymen contribute to the plans from the depth of their experience as well as obtain on-the-job training as menu planners. Individual experience in preparing different meals in the galley, preparing requisitions for supplies, and directing service on the messline add a depth of information in the writing of the menu. Personnel trained in subsistence matters are acquainted with the complexity of menu planning and as a group can be very effective management.

Goals of such a board should be aimed to obtain these results:

1. Effective training of personnel on the board by active participation with adequate understanding of planning;

2. Balanced stock usage (early use of highly perishable items on the menu; planned use of ration-dense items; maximum extent food production equipment can be used within limits of producing the planned menu); and

3. Determine major decisions affecting menu.

202-d(2)—Menu Review Boards—A diversified menu review board consisting of personnel representing the divisions onboard can bring new and fresh ideas on general mess menus. Board membership can vary from one representative from each division to a more limited membership, depending upon how the Command wishes the board to function. The pri-

mary aim of an intramural board is to have outsiders communicate with men who actually prepare the menu. Troubleshooting on crew grievances about the food in the general mess can proceed, or on the other hand, the menu planner may have verification by word of mouth that he is satisfying the men.

The troubleshooting done by the review board may proceed several ways. The board may be used to distribute and collect food preference questionnaires. These may be tabulated and brought to the Subsistence Division for discussion. Such procedure facilitates an objective measure of crew preferences by groups and permits good working relationships. Since the menu is the object of some emotionalism, a control technique should be employed to direct the activities of the board, and preclude the possibility of its functioning solely as a "sounding board" instead of a menu review board.

203—FACTORS AFFECTING FOOD CHOICES FOR MENUS

Menu planners are continually faced with numerous detailed problems which affect their choices of food for the menu. There are many restrictions which narrow down food choices. Expert knowledge of nutritional requirements and food values, estimates of probable acceptability, technical knowledge of food costs, and current information on availability of supplies must be integrated into a single document. One or all of these factors may affect items chosen.

203–a—NUTRITIONAL STANDARD—Nutrition is of first importance. The menus must be adequate to maintain the good health and efficiency of the men. The design for providing sufficient calories and essential nutrients is described in pars. 102, 103, and 104 of this section.

203–b—MONETARY ALLOWANCES—Economic factors invariably concern all menu planners. The cost of the ration fluctuates according to appropriated funds and overall trends in food prices. The allowance is sufficiently adequate to permit a good and plentiful ration, but luxury items are generally prohibited. It behooves a menu writer to stay within the costs permitted. Careful planning will eliminate unnecessary rewriting menus and making last minute substitutions. If an expensive item is placed on a menu, a less costly one must be used elsewhere to balance out costs.

203–c—ITEM USAGE RESTRICTIONS—Usage restrictions on subsistence items must be considered in planning menus. Certain items are procured for particular purposes and regulations governing these may be noted in applicable paragraphs in BUSANDA Manual, Volumes III, IV, and VIII, under "Ration Components and Allowances." Comply with the regulations applying to the size and type of mess for which the menu is being planned and use items as indicated in the allowance lists.

Federal Supply Catalog, DOD, FSC Group 89, Subsistence, "Stock List," tells the menu planner what foods are available to the military services. All of the items listed are not intended for use by naval activities, nor are all items designated "N" (Navy) or "AM" used by all activities. Check BUSANDA Manual for food items authorized for the size and type of mess for which the item has planned use.

FSC Group 89 Change Bulletins list supplementary item procurements. In addition, Navy subsistence items listed in the catalog change as requirements are altered. Check FSC Group 89 and BUSANDA Manual for changes in items procured and items authorized, respectively.

The FSC Group 89 catalog is a very effective management tool because it combines packing data along with item identification. Case lot data, conversion factors, and source of supply information are contained in one volume along with the alphabetical listing of items by classes.

"Case Lot Data" is arranged in numerical sequence by Federal Stock Number in "Part II"

of the Catalog. It should be consulted to locate or identify an item in Part I when only a stock number is known. The major purpose of "Case Lot Data" is to provide weight, cubage, and dimensional data for unit packaging for items listed in Part I.

The alphabetical listing of required subsistence items is essential to menu planning. Such descriptive information as the following is given to help plot advance plans and prepare requisitions:

1. Perishability of an item.
2. Unit of issue.
3. Conversion factor.
4. Source of supply for nonperishables.

Careful reading of the description accompanying each item will be informative to the menu planner. Type style, class, grade, form, flavor, and other descriptive information is given relative to the item including size of product and/or container.

203–d—AVAILABILITY OF FOODS—A menu should be planned with a view to seasonal variations affecting fresh food supplies. Since appetites of the men may fluctuate because of extreme heat or cold this also should be allowed for in planning winter and summer menus. Both seasonal and climatic conditions affect the quality of meals and their aesthetic appeal.

203–d(1)—Season—Produce procured in season usually has higher quality, is cheaper, and has better flavor. Use local supplies of fruits, vegetables, and fish in homeports or at ashore installations. Oversea ports may be good sources of local produce if sources are approved and produce used according to sanitation regulations.

The use of canned, frozen, and dehydrated foods can be used on the menu with assurance of having comparable nutritive value. Make menu selections to include whatever seasonal vegetables and fruits are available, price and stowage space permitting. Information on seasonal availability is given in table D, pp. C2–11 and C2–12.

Menus should be adjusted to accommodate seasonal changes in appetite as well as to capitalize on seasonal supplies of fresh produce in spring and summer months. Some men eat more in winter, less in summer. Preference for foods served hot or cold varies according to season.

In winter and fall, menus also should be adjusted. The availability of fruits and vegetables change considerably, cold weather makes for greater appetites, and the inclusion of a great number of hot foods on the menu is desirable.

203–d(2)—Climate—Consider the temperature at different locations for menu planning. In cold climates as in winter seasons, there may be need for extra "fuel" foods, particularly if wearing extra-heavy clothing and working hard. In such cases, nutritionists recommend 2 to 5 percent increase in calories over the normal amount. In the Arctic, in northern seas, and in winter at northern shore stations in the United States, menus should be planned that are rich in energy value (carbohydrates, fats, and proteins) for men spending the majority of their time outside in the open, on strenuous jobs. Use such foods as:

Cream pies.	Cream soups.
Iced cakes.	Salad oils.
Fried foods.	Gravy.
Breads.	Sirups.
Breakfast pastries.	Ice cream.
Butter.	Cheese.
Cereals.	Whipping cream.
Macaroni.	Nuts.
Rice.	Peanut butter.

Also include meats, dried beans, eggs, and other protein foods furnishing energy.

TABLE D

GUIDE TO AVERAGE MONTHLY AVAILABILITY OF FRESH FRUITS AND VEGETABLES [1]

(Monthly Availability Expressed as Percentage of Total Annual Supply)

Commodity	January	February	March	April	May	June	July	August	September	October	November	December	Annual total million lbs.
Apples	11	10	10	8	6	3	2	3	10	15	11	11	3,875
Apricots	....	....	....	....	5	62	31	2	....	....	....	....	38
Asparagus	....	3	20	31	29	15	1	....	....	1	(*)	....	132
Avocados	11	11	11	11	9	7	6	6	5	6	8	9	113
Bananas	7	8	9	9	10	10	8	8	7	8	8	8	3,824
Beets	4	5	6	8	9	14	13	12	10	9	6	4	132
Blackberries	....	....	....	....	13	56	19	12	....	....	....	....	4
Blueberries	....	....	....	....	2	32	39	23	4	....	....	....	31
Broccoli	12	12	11	12	7	4	3	3	5	10	11	10	76
Brussels sprouts	15	7	3	(*)	....	....	....	4	11	22	22	16	19
Cabbage	9	8	10	9	10	9	8	7	8	8	7	7	1,928
Cantaloupes	(*)	1	1	3	8	24	24	22	12	4	1	....	1,607
Carrots	9	8	10	10	10	8	7	7	7	8	8	8	1,304
Casaba melons	....	....	....	....	....	1	5	16	29	29	18	2	4
Cauliflower	8	8	7	6	6	7	6	6	10	14	13	9	227
Celery	9	9	10	9	10	9	7	6	6	7	9	9	1,474
Cherries	(*)	....	....	....	14	39	42	4	....	....	....	1	76
Collards	13	11	12	9	6	5	5	5	7	7	8	12	133
Corn	1	1	1	4	15	17	20	19	13	5	3	1	1,550
Cranberries	1	1	....	....	....	....	....	....	6	21	49	22	38
Cucumbers	4	3	4	7	12	15	15	11	9	8	7	5	529
Eggplant	6	4	6	6	8	9	10	12	12	11	9	7	76
Endive-Escarole	9	9	9	9	8	8	8	8	8	9	8	7	150
Grapefruit, all	12	12	13	12	10	6	3	2	2	8	10	10	1,758
Grapes	3	3	3	3	2	6	10	18	19	15	11	7	699
Honeydews	2	5	7	6	3	7	14	22	21	12	1	(*)	132
Kale	18	14	12	8	5	3	3	3	5	6	8	15	38
Lemons	7	6	7	8	10	11	11	10	8	7	7	8	548
Lettuce-romaine	7	8	8	8	9	10	9	9	8	9	8	7	2,921
Limes	6	4	4	4	6	15	16	13	10	7	6	9	19
Mustard greens	21	17	7	5	5	6	3	3	5	7	7	14	34
Nectarines	2	5	....	....	....	16	35	34	8	....	....	....	95
Onions, dry	8	7	9	9	10	9	9	9	8	8	7	7	2,211
Onions, green	6	6	8	9	11	11	11	10	8	7	7	6	187
Oranges, all	12	11	11	10	9	7	5	5	5	6	8	11	3,478
Parsley	7	6	7	7	11	10	8	8	9	9	10	8	72
Parsnips	12	11	13	9	7	5	4	4	7	11	9	8	74
Peaches	(*)	(*)	(*)	....	2	26	31	27	13	1	....	....	1,796
Pears	6	6	7	6	4	1	6	15	16	15	10	8	529

See footnotes at end of table.

TABLE D—Continued

GUIDE TO AVERAGE MONTHLY AVAILABILITY OF FRESH FRUITS AND VEGETABLES[1]

(Monthly Availability Expressed as Percentage of Total Annual Supply)

Commodity	January	February	March	April	May	June	July	August	September	October	November	December	Annual total million lbs.
Peppers, sweet	6	6	7	6	7	10	11	11	10	10	9	7	454
Persian melons	....	....	....	....	(*)	5	15	29	31	19	1	(*)	24
Pineapples	8	9	12	14	15	17	7	4	2	3	4	5	93
Plums	1	1	1	....	2	18	25	25	24	3	....	....	265
Potatoes	9	7	9	9	9	9	8	8	8	8	8	8	15,970
Radishes	6	6	8	8	12	13	11	9	8	7	6	6	350
Rhubarb	6	12	16	17	25	16	4	1	(*)	1	1	1	56
Spinach	9	9	11	10	10	8	6	5	6	8	9	9	170
Squash	6	6	6	7	9	9	8	8	9	12	11	8	310
Strawberries	1	1	4	14	33	26	8	5	3	2	2	1	265
Sweet potatoes	9	9	9	7	5	3	2	5	9	12	17	13	1,210
Tangerines	24	8	3	1	....	....	....	....	....	....	20	44	246
Tomatoes	6	6	7	7	10	11	12	10	9	9	7	6	2,400
Turnips-rutabagas	11	10	11	9	6	5	4	3	7	10	13	11	233
Watermelons	....	(*)	1	2	11	27	33	21	5	(*)	....	....	.....

*Indicates that some supply has been available in month stated but less than 0.5 of 1 percent of annual total. The column on annual supply in pounds is approximate farm weight, wholesale weight or shipboard weight, the distinction not being important. Computations are based mostly on U.S. Department of Agriculture reports of unloads but where all of the commodity is imported, the import figures are used. More than a dozen minor commodities have been omitted because data is too fragmentary to justify estimates. Necessarily, this report can only be an approximate guide since crops and imports vary considerably from year to year. For month to month information, consult the Monthly Supply Letter issued by this Association.

[1] Adapted from United Fresh Fruit and Vegetable Association pamphlet entitled: "Guide to Average Monthly Availability of 88 Fresh Fruits and Vegetables," copyright 1964.

Men who must live and work at activities in hot climates also expend energy which will require extra energy foods. In the tropics, southern seas, and at southern shore stations in the United States, plan summer menus which are a combination of both heavy and light meals. Men who are exposed to the sun for long hours, choose lean beef, poultry, and veal for entrees and use a variety of beverages, including fruit juices. When seasonally available, use tropical or native fruits and vegetables approved for general mess use.

203-e—STORAGE FACILITIES, EQUIPMENT, AND PERSONNEL—Limited stowage space, especially on small craft deployed on long cruises, preclude the use of many perishable subsistence items. Menus for these activities must include wide use of ration-dense items to extend those stores of perishable supplies which are available.

Plan menus well in advance for such cruises to insure balanced meals as well as balanced

stocks. Assistance for menu planners is available through load lists described in par. 201-e.

The choice of preparation for foods to be served is also dependent upon the galley equipment and the number of personnel to be fed and the number who have galley duty. Menus may be elaborate if labor-saving equipment such as food shaping machines are available, or a sufficient number of men are on duty to allow preparation of last-minute items.

203-f—HOLIDAY AND SPECIAL MEAL CELEBRATIONS—Meals serve a three-dimensional value in Navy life—(1) to support physical health and vigor, (2) to build morale, and (3) to provide an occasion for socializing with shipmates. While every meal should be an occasion, good menu planners will plan wisely for special occasion meals which deserve the very best artistic effort. Without a doubt, food counts a great deal more to everyone than just for the eating. Meals are ceremonial, recreational, and rewarding.

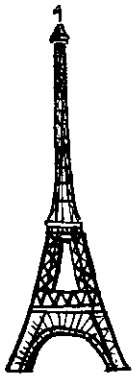
Beginning in January with New Year's Day and continuing throughout the year, there are a series of holidays and other special day occasions important in civilian and Navy life. Meals on these days can be highlighted with one or more special dishes to commemorate the occasion. A great deal of festivity can be built around a holiday meal theme with printed menus and decorations. (See illustration 1, pp. C2-14 and C2-15.)

Creative menus may be planned using foods traditionally associated with the holiday. Research through the "Navy-Marine Corps Recipe Service" file will supply new ideas. Here are a few recipes for special occasions for the month of February:

Occasion	Traditional Recipes	Remarks
Lincoln's Birthday (2/12).	Chocolate covered sponge cake roll.	A red, white, and blue color scheme can mark the occasion of this day. A chocolate covered cake roll resembling a log will satisfy the more traditional minded. Use chocolate cream icing for the filling, too.
Valentine's Day (2/14).	Plain cake/Lady Baltimore filling. Decorate w/ red ornamental frosting.	A red and white color scheme can be used for the meal, topped off with this elaborate dessert.
George Washington's Birthday (2/22).	Washington cream pie. Cherry pie. Cherry crumble pie.	The inclusion of a popular dessert item on this day offers a simple way to make a special meal occasion.

Recipe names can be changed to increase holiday festivity. As an example, the messhall menu board illustration for Lincoln's Birthday, February 12, could read "Lincoln Log Cake" rather than "Chocolate Covered Log Roll."

Special meals in either afloat or ashore messes provide opportunities for well-planned special meals which will add interest and enthusiasm among cooks and customers. For a handy reference, see table E, p. C2-16.



UNITED NATIONS DAY

October 24, 1964

Split Pea Soup P26
Erwtensoep - NETHERLANDS

Barbecued Beef J106
Carne Asado - SPAIN

Rice Pilaff Q62
Pilaf - TURKEY

Grilled Potato Patties Q49
Potato Cakes - IRELAND

Buttered Mixed Vegetables Q80
Colache - MEXICO

Chilled Pickled Beets Q11
Inlagd Rödbeta - SWEDEN

Garden Salad M29
Salata - GREECE

Fresh Fruit Salad M2
Fruktova Salata - BULGARIA

Cracked Wheat Bread C15
Chappati - PAKISTAN

Butter
Voi - FINLAND

Hard Rolls C18
Gressini - ITALY

Baked Stuffed Apples G19
Teffah Bil-Forn - AFGHANISTAN

Pound Cake D19
UNITED STATES OF AMERICA

Coffee
BRAZIL

Milk
Maelk - NORWAY

Tea
CEYLON

Illustration 1

Examples of How to Print Special Occasion Menus

CHRISTMAS DINNER 1961

Chilled Ambrosia Fruit Cup
Tomato Bouillon P30
Crisp Rye Croutons

Roast Tom Turkey
Sage Dressing L5 or Apple Stuffing L14
Giblet Gravy 033

Duchess Potatoes Q82 or Glazed Pecan Sweet Potatoes Q1
Buttered Peas with Diced Pimientoes Q67 or Buttered Succotash S17

Garden Salad M31 with Zesty French Dressing M2

or

Cottage Cheese Salad M47 on Lettuce
Crisp Celery Sticks Assorted Olives
Chilled Jellied Cranberry Sauce

Hot Twin Rolls C5 or Hot Oatmeal Muffins C21
Butter Patties

Cherry Pie K20 with Streusel Topping I11 or Fruit Cake Slices D2
Vanilla Ice Cream G9

Hard Candies Salted Nuts
Chilled Fresh Fruit Tray:
Ripe Winter Pears Grapes Bananas

Coffee Tea Milk

NEW YEAR'S DAY 1964
suggested menu

Beef Julienne Soup P2
Crisp Saltines

Oven Roast of Beef J4
Brown Beef Gravy O7

Franconia Potatoes Q46 Mashed Potatoes Q49
Simmered Black-eyed Peas Q42 Baby Limas a la Creole Q4

Tossed Vegetable Salad M33 with Garlic French Dressing M51 Golden Glow Salad on Lettuce M34 with Salad Dressing
Pickled Pepper Relish*
Assorted Olives

Hot Pan Rolls C20 Hot Southern Style Corn Bread C8
Butter Patties

Chocolate Ice Cream G35 Strawberry Ice Cream G35

Fruit Cake Slices D2 Fudge Nut Brownies D39

Coffee Tea Milk

***Pickled Pepper Relish**

Yield: Approximately 3 1/2 qts. or 100 portions
6 oz. dehydrated green peppers
8 oz. dehydrated sliced onions
1 qt. vinegar

Portion: 2 tablespoons
2 c. sugar
3 tb. salt
1 tb. celery seed

Rehydrate peppers and onions, drain, and chop. Add remaining ingredients. Simmer 10 minutes. Taste and add more sugar or salt, if desired. Place in covered container and chill before serving.

Illustration 1

Examples of How to Print Special Occasion Menus