FEEDING THE FAMILY

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The Welfare of the Family is Largely in the Hands of the One who Provides the "Three Meals a Day"

FEEDING THE FAMILY

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PREFACE

WHILE many things contribute to health, — sleep, fresh air, and exercise, for instance, — the foremost consideration is food. This is recognized to-day as never before, and those who regard their own welfare and desire to give their children the best possible equipment for the stress of modern life are asking how to choose food wisely. So many kinds of food are displayed in our markets, and so many placards offer warning or advice about what to eat, that a guidebook to good nutrition would seem quite essential for the twentieth century family. The purpose of the author has been to provide such a little book for the numerous housewives who prepare something like a thousand meals a year for their families and who wish to know how the science of nutrition can be made to function most successfully in their daily lives.

Much literature has been published in regard to food and diet, but it is not a simple matter to collect and organize it for one's own use in the midst of all the cares of a household. In the present volume separate chapters are devoted to the special food needs of the different members of a typical family group — babies, growing children, adult men and women, aged persons — after which some space is devoted to a consideration of the food problems related to the family group as a whole.

Among the latter are such points as the construction of daily menus on a rational basis, the wise expenditure of money for food, and reasonable control of the amount and kinds of food consumed. Since it is an unfortunate fact that the housewife is often called upon to feed the sick, a chapter upon this topic has been included. There has been no attempt to make this comprehensive or detailed, because the sick should be fed under a physician's guidance. The writer believes, however, that the home feeding of the sick will be more successful if intelligently done, and that a few printed suggestions will be helpful in carrying out the physician's orders.

Detailed calculations of the amount of food to be consumed each day are neither necessary nor practicable in the home, but some information in regard to the relative nutritive value of food materials is a great help in keeping the diet well balanced. For the sake of those who wish to study this phase of feeding, illustrative dietaries have been placed in each chapter, and in the Appendix tables given for quick estimation of the food values of a number of familiar kinds of food. These are expressed in terms of ordinary household measures (cups, tablespoons, teaspoons) and are as accurate as possible with such units of measurement applied to materials tending to vary considerably in their composition. The housewife does not need to do careful weighing so much as to train her eye to judge approximate food values, for which measures are usually sufficient, though weights are of course more accurate. The "dietary recipes" have been given because recipes vary so much that the name of a dish does not always give a clue to its exact composition. Often several recipes for the same type of dish have been given, to show how the food value will vary with changes in the ingredients.

The author wishes to acknowledge with thanks the valuable advice and criticism given by Professor Henry C. Sherman of Columbia University and the assistance of Miss Esther Swartz in the preparation of the manuscript.

TEACHERS COLLEGE, COLUMBIA UNIVERSITY,
February 16, 1916.

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THE SIGNIFICANCE OF FOOD

Introduction

"WHAT shall we have for dinner?" This is the constant cry of the housewife, who often feels that housekeeping would be relieved of one of its greatest bugbears if some one else would undertake the planning of the meals. And yet this is a burden not so easily shifted from her shoulders. Menus may be written for her, but they seldom fulfill her requirements exactly as they stand. The foods designated are not in the market, or the family does not like them, or there are leftovers to be disposed of, and the problem remains unsolved. In fact, the one who is intrusted with the feeding of the family has a responsibility not lightly escaped. Of the three necessities of life which the home must provide, — food, clothing, and shelter, — food is the most important. Without it, life is impossible. With scanty provision of it, growth is stunted and energy fails. With abundance, one may stuff the furnace until the fires of life are dulled by sheer surplus of good fuel. By indiscreet choice, precious days of life may be lost on account of headache or other acute, though minor, ills, and by continued bad feeding the way paved for serious impairment of health. For food most people spend the largest part of their incomes. What a pity if they buy sickness instead of health!

While it is true indeed that "the life is more than meat," it is equally true that there is no life of the spirit without sustenance for the body. The welfare of the family, both physical and spiritual, is largely in the hands of the one who provides the "three meals a day" which often seem so appalling in their inevitability. The only way of relief is through mastery of the principles which underlie the daily choice of meals. "What shall we have for dinner?" does not imply choice between nothing and something, as under the precarious conditions of primitive life or the equally uncertain chances of extreme poverty. It indicates rather bewilderment amidst a wealth of materials for man's delectation such as the world has never seen before. If only half a dozen foods were available, the matter would be quickly settled. The question is apt to mean, What new foods can be found to delight the palate or charm the eye of those who are never really hungry? Eating is a social custom as well as a physiological necessity, and the hostess, even at a table of two, is disturbed, votes her dinner a failure and her efforts wasted if her partner does not partake freely. What she may really need is more skill in divining his physiological requirements, rather than in preparing dainty dishes to pamper his appetite.

Many traditions have grown up about foods, prejudices against this and that, rooted in ancient tribal or religious taboos, or the results of misinterpreted experiences; thus some men have called meat, the sign of the chase, the means of producing warlike qualities in human beings, attributing to meat eating "all evil passions and all vain belief — the germs of misery, death, disease, and crime," and others have devoted their best energies to convincing the world that "an exclusively farinaceous and fruit diet is best adapted to the development and improvement of all powers of body, mind, and soul." The occult powers of the moon are no greater than the reputed magic of all sorts of foods. Many a little girl has patiently eaten dry bread crusts to make her hair curl; many a man counted on meat to make strong muscles or fish to develop his brain power!

In the light of modern scientific research these traditions give way to exact knowledge of what food does for the body and how it does it. By patient steps, through Harvey's discovery of the circulation of the blood; Priestly and Scheele's discovery of oxygen; Lavoisier's brilliant insight into the relation between the intake of oxygen into the body in respiration, the output of carbon dioxide from the lungs, and the evolution of heat and work in the body; Liebig's study of the composition of foods and body materials; Pettenkofer and Voit's demonstration of the possibility of measuring the heat given off and work done by the body; and Rubner's accurate researches establishing definite relationship between food consumption and body activity, — through the work of these and other able investigators, we have come to the realization that nutrition is science rather than a bundle of old wives' rules; that foods, though so numerous and so varied in form, can be reduced to rather simple terms; that the amount required by a man for a day's work can be determined with amazing accuracy; and that even the factors which govern so obscure an impulse as the power to grow can be analyzed and a young animal made to grow or stunted at will by the control of its food.

Scientists in many laboratories are studying the laws which govern nutrition, and as they progress in knowledge the housewife is given new standards by which to choose the food for the family, and greatly increased ability to secure physical welfare for the group in her care. She is also relieved of old and foolish fears about the baleful influence of this or that particular food, and turns a deaf ear to alarmists and faddists, who by juggling with technical terms often put good foods into disrepute. Meals of many kinds are found to be good and simplicity may be cultivated without fear of malnutrition.

The Body a Working Machine

In considering the part which food plays in human life, the most important conception which modern science has given us is that of the body as a working machine, whose output we can measure as accurately as that of any steam, gasoline, or electric engine. Unlike other machines, this living one must work to exist. Man is to be compared to a clock, going all the time, rather than to an automobile engine, working only at intervals. When lying asleep or perfectly quiet, the heart is doing its work, which, counted for a whole day, will amount to as much as lifting an average man some 2500 feet into the air; the chest is moving in respiration; the muscles are under tension ready for any sudden call to further work; the digestive tract is busy, caring for the last meal, or if that is gone, possibly by vigorous movement calling like Oliver Twist for "more." Every movement, voluntary or involuntary, even to winking an eye, is work in the mechanical sense; and exercise which brings many muscles into play, whether in digging a ditch or playing football, sweeping a room or flitting over a tennis court, adds to the energy expended in proportion to its severity.

Fuel for the Human Machine

In order to have energy to spend as outlined above, we must first acquire it. But how? The earth's great bank of energy is the sun; its currency is light and heat. These man cannot "cash in" directly. They have to go through a great clearing house, the plant world, before they become available for the human economy. Plant cells transmute light and heat into chemical energy and bind this with elements from the air and soil to make three great classes of energy-bearing substances, which man can use for his activities, known as *protein*, *fat*, and *carbohydrate*. These are the "fuels" which supply energy for the human machine. This energy of food may be converted into useful work — inside the body in keeping up the life processes, outside in performing all sorts of muscular movement — and also into heat to maintain body temperature. In fact, heat is a by-product of all bodily activities, which is turned to good account in keeping warm. If not enough is obtainable in this way, the transformation of more energy into heat can be brought about by doing more work (shivering, clapping the hands, stamping about, running, etc.); or if this is not done, by the automatic response of internal processes to the stimulus of cold, increasing the rate at which body fuel is burned. Since the three fuel foodstuffs are so essential to man's well-being, it behooves us to inquire how they may be obtained.

Sources of Body Fuel

The three substances which serve as body fuel, *protein*, *fat*, and *carbohydrate*, are found variously distributed in all kinds of vegetable food. From the juice of the beet and sugar cane we refine a pure carbohydrate, *sugar*, which is also found in the juice of sweet fruits and vegetables, such as oranges, grapes, apples, corn, peas, etc. From wheat, oats, corn, and other grains, potato tubers, manioc roots (tapioca), we secure another form of pure carbohydrate, *starch*, which is also found in lesser amounts in many kinds of fruit and vegetables, as bananas, peas, beans, nuts (especially chestnuts).

From olives, cottonseed, peanuts, cocoa beans, and other seeds we can obtain pure fat, which we find plentiful in nuts, but only in small amounts in other kinds of vegetable food.

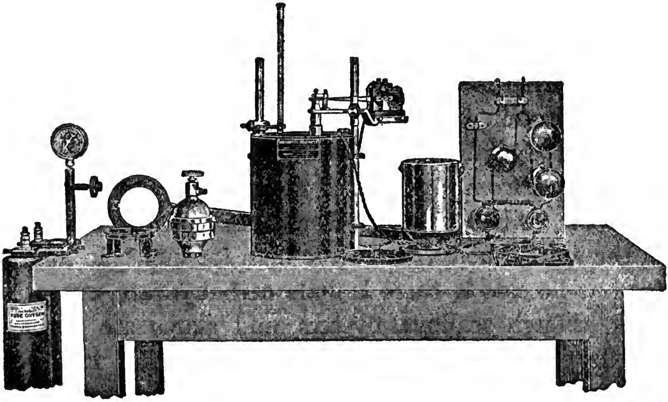
The vegetable foods which have the largest amounts of protein are the legumes, — peas, beans, lentils, and peanuts. Nuts such as almonds, filberts, walnuts, pecans, have also a considerable store. Next in importance come the cereals, with oats, wheat, and corn heading the list. Other vegetable foods contribute comparatively small amounts of this sort of fuel.

Plant foods may be called the original source of human energy. But animals, eating the plants, may work over the protein, fat, and carbohydrate of their plant food in their internal laboratories, the living cells, and produce animal protein from the vegetable protein, animal fat from the vegetable carbohydrate or fat, and animal carbohydrates from any one of these three, but especially from the carbohydrates. These new forms, elaborated in the animal body, also serve man for fuel. In animal food as he eats it there is little carbohydrate, except in milk, though scallops, oysters, and clams are perhaps worthy of mention. Fat is found more or less intimately associated with lean in all kinds of meat, about the leanest animal food being codfish. Milk is often prized most for its fat, in the form of cream or butter, and bacon also offers fat in a very acceptable form.

Strictly lean meat affords fuel in the form of protein, whatever the animal from which it is derived. From bones we get gelatin, also pure protein, though not in all respects equivalent to that of meat. Milk and eggs are particularly valuable for their protein content. Cheese consists chiefly of the protein from milk, with or without the fat according to variety. Egg white has all its fuel in the form of protein, while the yolk has it partly as protein and partly as fat.[1]

Measurement of the Fuel Value of Food

Food materials differ greatly in the amount of protein, fat, and carbohydrate which they may contain. Some, as has been noted, have only one kind of



Courtesy of Eimer and Amend.

A Bomb Calorimeter — a Device used for Measuring the Fuel Value of Foods

fuel, some two, and some all three, and these in varying proportions. It is, nevertheless, a comparatively simple matter to find out how much energy (or working power) a given kind of food is capable of yielding in the body.

[1] For further information on the kind and relative amounts of protein, fat, and carbohydrate in different food materials, the reader is referred to Tables I, II, and III, of the Appendix, to Sherman's *Food Products*, Rose's *Laboratory Handbook for Dietetics*, or to *Chemical Composition of American Food Materials*, Bulletin 28, Office of Experiment Stations, U. S. Dept. of Agriculture.

The chemical processes by which energy is liberated are of the same nature as burning outside the body. If we take some kind of food, then, as a lump of sugar, and burn it under such conditions as to make the process complete and to measure all the heat generated, we can express this heat in terms of a standard unit of measurement, called the Calorie.[1] A special piece of apparatus is used in food laboratories which fulfills all the requirements for measuring the fuel value of food; it is called a calorimeter. The food is burned in an atmosphere of pure oxygen in a gas-tight chamber or "bomb," and the heat is taken up in water surrounding the bomb, the change in temperature of the water showing the amount of heat liberated.

In reckoning the fuel value of food, we have to consider whether it will be burned as completely in the body as in the calorimeter and one of the tasks of the nutrition laboratories has been to discover the losses due to imperfect utilization of food materials. From hundreds of digestion experiments we have learned how to correct the calorimeter returns for the healthy person on a mixed diet and can say in general that an ounce of pure carbohydrate or pure protein will yield 113 Calories to the body; an ounce of fat, 255 Calories.

But, as we have seen,[2] most of our foods are mixtures of these substances in varying proportions, and almost always we find associated with the energy-yielding sub-

[1] The amount of heat required to raise 1 kilogram of water 1° Centigrade or 1 pound of water 4° Fahrenheit.

[2] Pp. 6 and 7.

stances water and salts, very valuable in the diet for other reasons, but not sources of energy; also plant fiber or cellulose, a form of carbohydrate which the body cannot use for fuel but which makes valuable ballast for the digestive tract. We may say, then, that the more water and cellulose a given food contains the lower its fuel value for a given weight will be. Thus the fuel value of pure sugar is 1814 Calories per pound; that of grape juice, which as regards fuel is practically a dilute solution of sugar, is only 454 Calories per pound; while that of tomatoes, which are largely water and cellulose, is but 103 Calories per pound. Pure proteins and carbohydrates have the same fuel value per pound in the body, but pure fat has two and one-fourth times as high an energy value; hence the more fat a food contains, the higher its energy value in proportion to its weight.

Some differences in fuel values of various foods, when compared by weight, are brought out in the following tables, in which the foods are grouped according to the foodstuff which predominates in them:

I. FOODS RICH IN PROTEIN

	CALORIES PER POUND OF EDIBLE UNCOOKED MATERIAL
Beef, dried, lean	817
Beef, fresh, lean	709
Beef, tongue, fresh	718
Cheese, cottage	498
Cod, fresh, steaks	329
Cod, salt	473
Egg whites	231

II. Foods Rich in Fat

	Calories per Pound of Edible Uncooked Material
Bacon	2836
Butter	3488
Cream, thick	1727
Lard	4082
Oleomargarine	3410
Olive oil or Cottonseed oil	4082
Salt pork	3555
Suet	3425
Walnuts, English	3199

III. Foods Rich in Carbohydrate

	Calories per Pound of Edible Uncooked Material
Apples	285
Bananas	447
Cornstarch	1632
Dates	1575
Honey	1480
Molasses	1301
Potatoes, white	378
Rice	1591
Sugar, granulated	1814
Tapicoa	1608

IV. Foods Rich in Both Protein and Fat

	Calories per Pound of Edible Uncooked Material
Almonds	2936
Beef, fat	1357
Cheese, American	1994
Eggs	672
Egg yolks	1643
Milk, whole	314
Peanut butter	2741
Peanuts	2487
Sardines	1221

V. Foods Rich in Protein and Carbohydrate

	Calories per Pound of Edible Uncooked Material
Beans, dried	1564
Bread	1174
Buttermilk	162
Farina	1641
Lentils	1581
Macaroni	1624
Milk, skim	166
Oatmeal	1810
Oysters	222
Peas, dried	1612

VI. Foods Rich in Cellulose and Water

	Calories per Pound of Edible Uncooked Material
Cabbage	143
Celery	84
Cucumbers	79
Lettuce	87
Spinach	108
Squash	103
Tomatoes	103
Watermelon	137

From such tables it is easy to see that we could scarcely depend upon celery or lettuce for our daily fuel supply, as it would be hard to eat even a single pound in one day and a man would require over 25 pounds. It is also evident that some foods are cheaper fuel than others, bread at $6\frac{2}{3}$ cents a pound being nearly 20 times as cheap fuel as oysters at 25 cents a pound. In everyday life, however, we do not eat foods by the pound, but by the *serving*. When we sit down to the table and the host serves the meat, we should like to be able to tell how much energy he is passing us. When the dessert comes in, we should need mental agility indeed to translate pounds of eggs, flour, sugar, and cream into ice cream and cake. A better unit for this purpose is the amount of food required to yield 100 Calories, which corresponds quite closely to the ordinary serving of a number of foods. The following table shows how convenient a unit this is for practical purposes.[1]

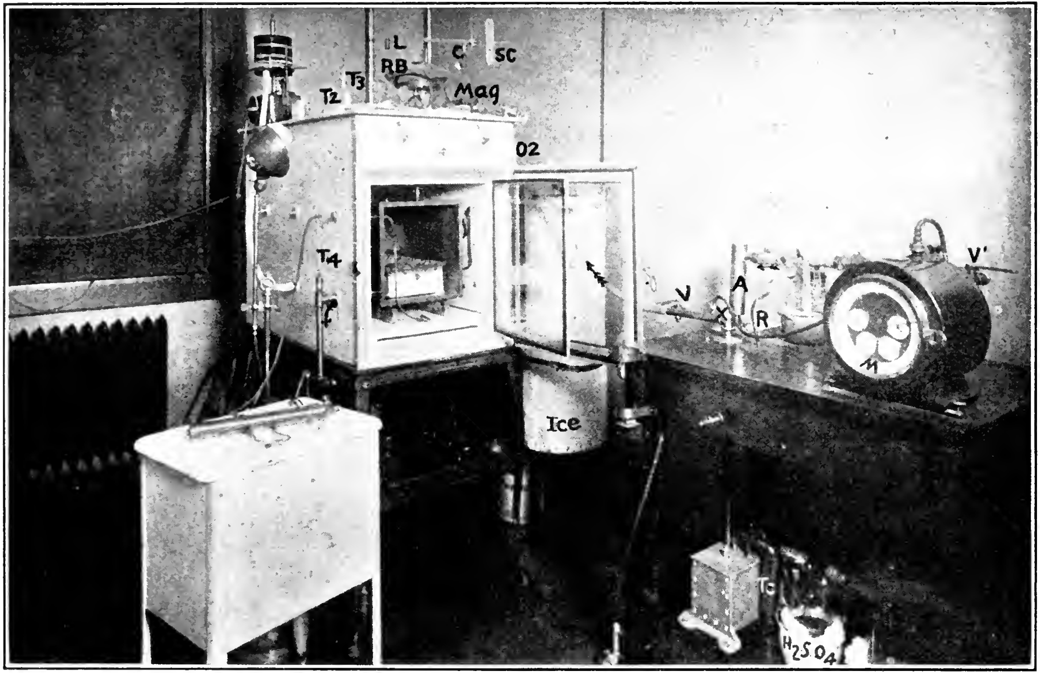
Approximate Amounts of Food to Yield 100 Calories

Cooked or flaked breakfast foods	¾–1¼ cups
Milk	⅝ cup, whole; 1⅛ cups, skim
Cream	¼ cup, thin; 1⅓ tablespoons, very thick
Butter, olive oil, or any other kind of fat	1 tablespoon
Bread	1 slice 3 in. × 3½ in. × 1 in.
Uneeda biscuit	4 crackers
Fresh fruit	1 large orange or apple; 1 medium banana or bunch of grapes; 2 medium peaches or pears
Dried fruit	4 or 5 prunes or dates; 2 dozen raisins; 1½ large fig
Eggs	1 exceptionally large; 1⅓ medium
Meat (beef, lamb, mutton, veal, chicken)	About 2 ounces of cooked lean meat
Bacon (cooked crisp)	About ½ ounce (4 small thin slices)
Potatoes	1 medium
Sugar	1 tablespoon granulated; 3½ "full size" lumps
Cocoa (made with milk)	⅗ cup
Cream of bean soup	½ cup
Macaroni and cheese	½ cup
Rice pudding	½ cup
Ice cream (made with thin cream)	¼ cup
Milk sherbet	¼ cup
Sponge cake	1 large individual cake
Nuts (shelled almonds, peanuts, pecans)	About ½ ounce
Sweet chocolate	About ¾ ounce

[1] For fuller details see Tables I and III of the Appendix.

Measurement of the Fuel Requirements of the Body

Food is fuel for the human machine, but how shall we know how much to supply? Ordinarily we trust to appetite, and an unperverted appetite is a very useful guide to rational eating. If an adult year in and year out maintains a uniform normal weight, we may assume that his food supply is adjusted to his needs. If a child makes healthy, steady gains in weight throughout the period of growth, a study of the food which he consumes will give us a good clue as to his actual needs. But all adults do not maintain normal weight; some are too thin and many are too fat; all children do not make normal gains in weight; appetite is too great or too little or too pampered; and we need accurate measurement by scientific methods of the real fuel needs of the body to serve as a check on appetite or as a guide when appetite fails. Before it was realized that the energy in food must be proportioned to the body's energy expenditure, it was the custom to feed invalids very largely on beef tea and other broths with little fuel value. No matter how quietly they lay in bed, the internal work of their bodies had to go on, which means that fuel was still being burned; only in this case little of it came from food, and most of it from stores of fat held in the body for just such emergencies, and some of it from the proteins of the body itself, such as the proteins of muscle. Now it is clearly understood that a man lying quietly in bed throughout the twenty-four hours of the day burns at least twelve Calories for every



Courtesy of Professor **John R. Murlin.**

A RESPIRATION CHAMBER FOR MEASURING THE ENERGY REQUIREMENT OF BABIES

(The baby's bed can be seen inside the chamber.)

pound of body weight, which means for an average man a daily total of from 1600 to 1800 Calories. So far as conditions permit, care is taken to see that the energy supply comes from food, rather than that the body be permitted to burn itself up. A general starving policy for the sick is as obsolete as blood-letting.

The most satisfactory way to study any person's fuel requirements is to measure directly the amount of energy given off from his body hour by hour in the forms of work and heat. To do this, a closed chamber with walls impervious to heat is required, and devices for supplying fresh air and food, so that the person may remain within for some time. Such a device is called a respiration calorimeter. In its present state of perfection (the result of many years of experimentation) it is very elaborate and expensive to build and operate; hence the whole number in the world is not large. The illustration opposite shows the double-walled chamber (containing in this case a baby's bed) and some of the pipes for the ventilating system, which includes measurement and analysis of the air as it enters and leaves the calorimeter. In such a chamber a person may remain under normal conditions while his energy output is measured during sleep, awake but lying quietly, sitting up at rest, reading, writing, riding a bicycle, or doing anything which the size of the chamber permits.

The energy expenditures of men, women, and children have been studied in this way, and no matter what preconceived notions a person may have had about his own food requirements, the calorimeter measures his actual energy expenditure, which there is no way to meet except by food. Hundreds of observations show that men under the same conditions of age, weight, and occupation expend practically the same amount of energy. This is further verified by studies of food consumption of men of the same class, doing the same kind of work, in different parts of the world, as the table below strikingly illustrates.[1]

Farmers in Connecticut	3410 Calories
Farmers in Vermont	3635 Calories
Farmers in New York	3785 Calories
Farmers in Mexico	3435 Calories
Farmers in Italy	3565 Calories
Farmers in Finland	3474 Calories
Average	3551 Calories

As far as energy requirement is concerned, nutrition is an exact science; a definite amount of work calls for a definite amount of energy in the form of food. The only reason why we are not forced to stop working as soon as food is withheld is that we are able to carry stores of fat (and a little carbohydrate) as reserve fuel, and also to draw if necessary on our own body protein. So men have fasted thirty and forty days; but the body becomes more and more impoverished, and when the reserves are exhausted there must come fuel in the form of food, or all work stops and death is the result. On the other hand, if more fuel is supplied than can be used, the fires do not burn the brighter, but the surplus is stored up for emergencies and we say the person is

[1] Lusk, *Fundamental Basis of Nutrition.*

getting fat. In later chapters the fuel requirements of the different members of the family will be discussed in detail.

The Body a Builder of its Own Tissues

The body is not only an active, working machine, spending energy in the form of work and heat, and demanding that the expenditure be made good by fresh supplies of fuel in the form of food; it is also a busy contractor, sending goods hither and yon along a network of traffic lines, to add to parts already built, or to replace or repair parts lost through ordinary wear and tear or through accident. The materials handled are of various kinds, made up from 16 or 17 different elements, among which may be mentioned carbon, hydrogen, oxygen, nitrogen, sulphur, phosphorus, iron, calcium, magnesium, potassium, sodium, chlorine, and iodine. By means of these substances a seven-pound baby grows until he becomes a man weighing perhaps 200 pounds; and the man, though daily losing small portions as the price of his very existence, may still maintain a uniform weight through many years of adult life, by taking in enough to replace what has been lost. The relative amounts of these different elements in the adult body is shown in the following table:

Average Elementary Composition of the Human Body[1]

Oxygen, about	65.0 per cent
Carbon, about	18.0 per cent
Hydrogen, about	10.0 per cent
Nitrogen	3.0 per cent

[1] Sherman, *Chemistry of Food and Nutrition*, p. 260.

Calcium, about	2.0 per cent
Phosphorus, about	1.0 per cent
Potassium, about	0.35 per cent
Sulphur, about	0.25 per cent
Sodium, about	0.15 per cent
Chlorine, about	0.15 per cent
Magnesium, about	0.05 per cent
Iron, about	0.004 per cent
Iodine	Very minute quantities
Fluorine	
Silicon	

How Food Supplies the Material for Body Building

The fuel foods all contain carbon, hydrogen, and oxygen, so that no special attention need be paid to these elements. Protein food has an absolute monopoly of the nitrogen supply for the body, and so occupies a distinguished place in the human economy, for nitrogen enters into the construction of body proteins, which are essential to the existence of every cell and constitute the most prominent part of muscle tissue. A child cannot grow and form strong muscles without it; a full-grown adult cannot keep in health without it, for throughout life the cells discard small amounts of nitrogen hour by hour, as a waste product of their internal life; furthermore, some old cells die, are disintegrated and their nitrogen thrown out, so that altogether there is a certain daily loss which must be made good by protein food. Hence in choosing the day's fuel we cannot confine ourselves to carbohydrate and fat, but must include some protein. The proportion of fuel best taken in this form will be discussed in connection with the food requirements of the different individuals in the family group.

Protein is a term standing for a large number of related substances, all made by the chemical union of simpler substances containing nitrogen, called *amino acids.* There are 17 of these entering into the structure of common proteins, and, as has been aptly suggested, these are used like the letters of the alphabet to build up different kinds of protein. It is estimated that these 17 units may be joined together to make 350 million times a million different combinations, using only a single representative of each. Hence we have milk, meat, fish, egg, cereal, and vegetable proteins, all built from the same "building stones," or the same "letters of the protein alphabet," containing therefore all the essentials for constructing different kinds of body protein, as circumstances may require. Such proteins are called "complete." There are certain proteins, such as gelatin and some kinds found in vegetable foods, in which important amino acids are lacking. If these "incomplete" proteins were used as the sole kind of protein in the diet of children they could not grow, because some of the constituents for building body protein would be lacking. It would be like taking the word *legume* apart and trying to make the word *muscle.* We should have a superfluous *g* and *e*, but no *s* nor *c*, and be forced to break up another word, such as *casein*, to get the extra letters. The effect of incomplete proteins has been most interestingly shown in the feeding of young rats. When given milk food or a mixed diet they grew up in the normal way, but on a diet in which the only protein food was a single kind of incomplete protein called gliadin, separated for the purpose from all the other proteins of the wheat kernel, they seemed perfectly well but could not grow; as long as they were kept on the gliadin diet they remained dwarfs, but as soon as fed with the milk food or mixed diet they began to grow again. In one experiment a rat fed the gliadin diet weighed, when 140 days old, just what it should have weighed when 36 days old!

Fortunately, most protein foods contain a goodly assortment of amino acids, and on an ordinary mixed diet, in which milk, eggs, meat, fish, and various vegetables rich in protein are used, an adult need have little concern as to the particular kind of protein which he is taking. If he confines himself to vegetable food, in which incomplete proteins are more frequent, there is more danger of lack of sufficient amounts of some amino acid, and the combination with such a diet of some milk, cheese, or other food known to be rich in "complete" proteins is wise. In the diet of growing children this is a matter of more importance, and emphasis must be laid on the *best* proteins for growth, as will be brought out in the chapters on feeding of children. Protein in the food is measured according to its weight, usually in grams,[1] according to its fuel value, in Calories, or according to the amount of nitrogen which it contains. The following table shows these protein and nitrogen values for a number of foods rich in protein:

[1] One gram equals about $\frac{1}{454}$ of a pound.

Amounts of Protein in 100-Calorie Portions of Some Common Food Materials

Food Material	Measure of Portion	Protein Calories	Protein Grams	Nitrogen Grams
Gelatin, dry	2¾ tablespoons	99.8	24.9	3.98
Cod, fresh steaks	5 ounces (uncooked)	93.7	23.4	3.90
Chicken, lean meat	2½ ounces (roasted)	79.6	19.9	3.19
Halibut, steaks	3 ounces (uncooked)	61.3	15.3	2.45
Beef, lean round	2¼ ounces (uncooked)	54.5	13.6	2.18
Salmon, canned	⅓ cup	53.6	13.4	2.14
Oysters, solids	⅔ cup	49.0	12.3	1.95
Milk, skim	1⅛ cups	37.0	9.3	1.49
Eggs	1⅓ eggs	36.4	9.1	1.47
Buttermilk	1⅛ cups	33.6	8.4	1.34
Sausage, Frankfort	1 sausage	31.3	7.8	1.25
Peas, dried	2 tablespoons (uncooked)	27.7	6.9	1.10
Beans, navy	⅛ cup (uncooked)	26.1	6.5	1.04
Cheese, American	1⅛ in. cube	26.0	6.5	1.04
Beans, baked (canned)	⅓ cup	21.5	5.4	0.86
Milk, whole	⅝ cup	19.0	4.8	0.77
Peanuts, shelled	2 dozen singles	18.8	4.7	0.75
Oatmeal	1 cup (cooked)	16.8	4.2	0.67
Macaroni	1 cup	14.8	3.7	0.59
Bread, white	2 small slices	14.4	3.6	0.58
Almonds, shelled	12–15 nuts	12.9	3.2	0.51
Wheat, flaked	⅔ cup (cooked)	12.7	3.2	0.51
Cornmeal	⅔ cup (cooked)	10.4	2.6	0.42
Walnuts, shelled	8–16 meats	10.4	2.6	0.42
Chocolate, bitter	½ square	8.4	2.1	0.33

Sulphur is supplied in the form of protein food, and if the nitrogen requirement is met the sulphur need give no concern.

Phosphorus is equally important with nitrogen, though required in smaller amounts. It forms a part of every active cell of the body and, along with calcium, helps to give rigidity to the bones. It is not limited like nitrogen and sulphur to the protein of food, but is found sometimes associated with protein, as in the protein of the yolks of eggs (called vitellin), or one of the proteins of milk (casein); sometimes associated with fat, as in the yolks of eggs (in the lecithin); and sometimes in simpler forms in grains, fruits, and vegetables.

AMOUNTS OF PHOSPHORUS IN 100-CALORIE PORTIONS OF SOME COMMON FOOD MATERIALS

Food Material	Measure of Portion	Phosphoric Acid Grams
Buttermilk	1⅛ cups	0.61
Codfish, fresh	5 ounces (uncooked)	0.60
Celery	4 cups of ¼ in. pieces	0.54
Spinach	2½ cups (cooked)	0.54
Haddock, fresh	5 ounces (uncooked)	0.50
Lettuce	2 large heads	0.47
Cauliflower	½ medium head	0.45
Beef, lean	2¼ ounces (uncooked)	0.42
Cheese, cottage	5½ tbsp.	0.40
Asparagus	20 stalks	0.39
Cheese, hard	1⅛ in. cube	0.329
Beans, dried	⅛ cup (uncooked)	0.326
Milk	⅝ cup	0.303
Rhubarb	4 cups of 1 in. pieces	0.30
Turnips	2 cups of ½ in. cubes	0.292
Beans, string	2¼ cups of 1 in. pieces	0.284
Cabbage	5 cups (shredded)	0.28
Egg yolk	2 yolks	0.27
Tomatoes	1¾ cups (cooked)	0.257
Peas, dried	2 tbsp. (uncooked)	0.25
Eggs	1⅓ eggs	0.24
Onions	3–4 medium	0.24
Peas, fresh	¾ cup	0.24
Oatmeal	1 cup (cooked)	0.216
Corn, green	½ cup	0.21
Bread, graham	2 slices	0.19
Raspberries	1⅛ cups	0.18
Potatoes	1 medium	0.166
Peanuts	2 doz. singles	0.16

Iron is another element essential to body structure. It enters into the composition of the red corpuscles of the blood (essential to the conveyance of oxygen to the cells and hence to the burning of the fuel foods) and also is an element in the structure of all active cells, so playing a part in secretion and growth. While not needed in very large amounts, it is so important that the newborn child is not left to the chances of getting it in his food, but comes into the world with a special supply to tide him over the first few months while he is getting adjusted to the outer world. It is found in a variety of foods, among the most valuable being egg yolks and green vegetables, especially spinach.

AMOUNTS OF IRON IN 100-CALORIE PORTIONS OF SOME COMMON FOOD MATERIALS

Food Material	Measure of Portion	Iron Grams
Spinach	$2\frac{1}{2}$ cups (cooked)	0.0133
Beans, string	$2\frac{1}{4}$ cups of 1 in. pieces	0.0038
Cabbage	5 cups (shredded)	0.0035
Beef, lean	$2\frac{1}{4}$ ounces (uncooked)	0.0032
Celery	4 cups of $\frac{1}{4}$ in. pieces	0.0027
Egg yolk	2 yolks	0.0023
Strawberries	$1\frac{1}{3}$ cups	0.0023
Beans, dried	$\frac{1}{8}$ cup (uncooked)	0.0020
Eggs	$1\frac{1}{3}$ eggs	0.0019
Tomatoes	$1\frac{3}{4}$ cups (cooked)	0.0017
Carrots	3–4 medium	0.0016
Peas, dried	2 tbsp. (uncooked)	0.0015
Potatoes	1 medium	0.0015
Beets	2–4 medium	0.0013
Turnips	2 cups of $\frac{1}{2}$ in. cubes	0.0013
Bread, graham	2 slices	0.0013
Grapes	1 large bunch	0.0013

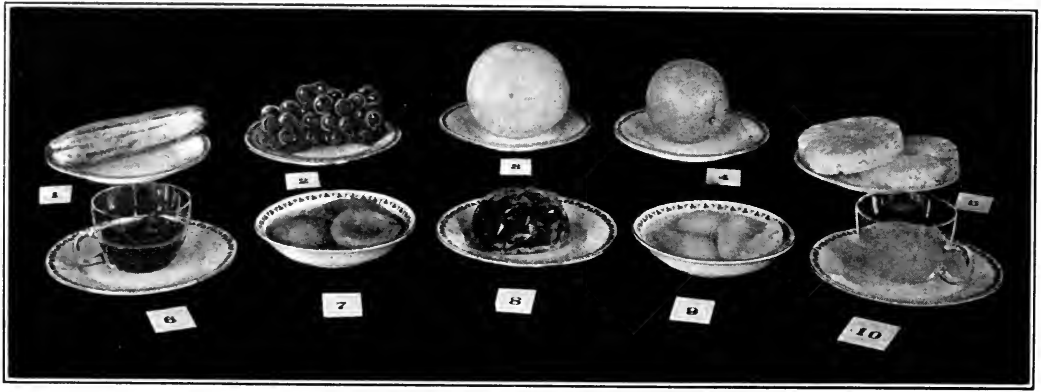
AMOUNTS OF IRON IN 100-CALORIE PORTIONS OF SOME COMMON FOOD MATERIALS — *Continued*

FOOD MATERIAL	MEASURE OF PORTION	IRON GRAMS
Onions	3–4 medium	0.0011
Raisins	¼ cup	0.0010
Figs	1½ large	0.0010
Oatmeal	1 cup (cooked)	0.0009
Prunes	4–5 prunes	0.0009
Milk	⅝ cup	0.00034
Bread, white	2 slices	0.0003

Without calcium strong bones and teeth are impossible, since it, in combination with phosphorus, is the chief mineral element of these tissues. By far the most valuable food for calcium is milk, 100 Calories of milk yielding as much as could be got from about 2400 Calories of white bread and meat. Considerable calcium can be obtained from the grains if the outer coats are included, but very little from cereal preparations made without them, as a comparison of whole wheat and white flour will show.

AMOUNTS OF CALCIUM IN 100-CALORIE PORTIONS OF SOME COMMON FOOD MATERIALS

FOOD MATERIAL	MEASURE OF PORTION	CALCIUM OXIDE GRAMS
Cauliflower	½ medium head	0.55
Celery	4 cups of ¼ in. pieces	0.54
Buttermilk	1⅛ cups	0.415
Spinach	2½ cups (cooked)	0.37
Cheese	1⅛ in. cube	0.25
Milk	⅝ cup	0.239
Cabbage	5 cups (shredded)	0.214
Beans, string	2 cups of 1 in. pieces	0.177



100-Calorie Portions of Fruit[1]

Food Material	Weight (oz.)	Measure
1. Banana	5.5	1 large
2. Grapes	4.9	1 large bunch
3. Grape fruit	7.6	1 medium
4. Orange	9.5	1 large
5. Pineapple	8.2	2 slices 1 in. thick
6. Stewed prunes	2.8	2 prunes and juice
7. Canned peaches	7.5	3 medium halves and juice
8. Baked apple	2.3	1 large
9. Canned pears	4.7	3 halves and juice
10. Apple sauce	3.5	$\frac{3}{8}$ cup

[1] Cf. Appendix, Tables I and III.

AMOUNT OF CALCIUM IN 100-CALORIE PORTIONS OF SOME COMMON FOOD MATERIALS — *Continued*

FOOD MATERIAL	MEASURE OF PORTION	CALCIUM OXIDE GRAMS
Carrots	3–4 medium	0.168
Blackberries	1½ cups	0.13
Strawberries	1⅓ cups	0.13
Onions	3–4 medium	0.12
Figs	1½ large	0.089
Tomatoes	1¾ cups (cooked)	0.087
Lemon juice	1 cup	0.083
Beans, dried	⅛ cup (uncooked)	0.063
Eggs	1⅓ eggs	0.06
Beets	2–4 medium	0.06
Peas, fresh	1 cup	0.032
Oatmeal	1 cup (cooked)	0.03
Prunes	4–5 prunes	0.02
Raisins	¼ cup	0.02
Potatoes	1 medium	0.019
Bread, whole wheat	2 slices	0.016
Bread, white	2 slices	0.011
Beef, lean	2¼ ounces (uncooked)	0.009
Crackers, soda	4 crackers	0.006
Cornmeal	1 cup (cooked)	0.004

The other elements which go to make up the body structure are not only required in comparatively small amounts, but are practically certain to be provided if the diet contains the range of foods which will include the four already mentioned. Hence for practical purposes they may be dismissed without further discussion.

Balance Wheels for the Human Machine

A man with locomotor ataxia is a pitiable sight. He can move about, but he has lost the power to control his movements at will. He makes us realize what fine coördination of nerves and muscles ordinary people enjoy. Now the body is composed of many units, each with activities of its own, but subservient to the welfare of the whole; there are glands, like the pancreas and the thyroid, which play a wonderful part in this coördination. If the pancreas becomes seriously deranged, the body loses the power to burn carbohydrate and this most valuable of fuel foods is lost to the economy; if the thyroid gets excessively active, the body may burn fuel faster than it can be supplied, and the victim grows emaciated.

So, too, the chemical elements which make up the body substance must be nicely balanced or trouble ensues. The blood maintains its neutrality, the heart its regular beat, nerves and muscles their ready response to every impulse, largely through the presence of phosphorus, calcium, magnesium, sodium, and potassium in suitable amounts in the tissues and fluids. Water helps to regulate the concentration of the mineral elements, to make possible the transportation of materials to the tissues by holding them in solution in the body fluids, and to facilitate the removal of waste through the kidney drainage system. The elements which enter into food in other forms than protein, fat, carbohydrate, and water are conveniently grouped together as *ash constituents*, because they constitute the part left behind as ash when food materials are burned. They are sometimes styled "salts" or "mineral matter."

Besides the fuel foodstuffs, water, and ash constituents, there are substances existing in minute quantities in some foods and not in others which exercise a profound influence upon nutrition. These have only recently been studied at all, and their exact nature is still a matter of investigation. They are spoken of as "vitamines" or "accessory food substances." Young white rats fed a diet of strictly pure protein, fat, carbohydrate, and ash constituents in suitable proportions, will not grow. If, however, certain natural food fats, such as butter, or beef fat, be substituted for the highly refined fat, an improvement is very quickly noted. So, too, persons living almost exclusively on polished rice develop a disease called beriberi, which can be cured by feeding the unpolished rice, or by substituting beans for a small part of the rice. The United States stamped beriberi out of the ranks of the Philippine scouts within three years by such simple changes in their army ration. Furthermore, individuals restricted to a diet of dried and cooked rations, especially if limited in variety, run the risk of developing scurvy, which is readily cured by the addition of such fresh foods as oranges, lemons, limes, potatoes, and cabbage. Babies fed exclusively on cooked milk or dried prepared foods run a similar risk, and should have some fresh food, such as milk or orange juice, included in the diet if it must consist largely of the cooked or dried material.

Under ordinary conditions there is comparatively little danger of scurvy or beriberi, since many foods contain vitamines and few people confine themselves strictly to cooked and dried foods. But it is well to know of the possible results of a too restricted ration and to include some fresh food in the diet, such as uncooked fruits and vegetables or unpasteurized milk, as well as to see that there is some variety in the kinds of food from time to time, so that all the elements contributing to good nutrition may be represented.

CHAPTER II

THE CARE OF THE DIGESTIVE MECHANISM

The first requirement for good nutrition is an adequate supply of fuel for all body activities. This must be accompanied by or include those substances which serve to build up the organism and maintain it in repair, constituting a so-called "balanced diet." Many selections of food will theoretically accomplish these results, but not all of them are equally successful in practice. It is possible to make a balanced ration from two or three foods, if carefully selected, and eat these to the exclusion of all others. One may take the whole day's supply of protein in the form of cottage cheese, or of beans; may divide the total day's food in two meals or six; serve molasses on meat, as truly a combination of protein and carbohydrate as bread and meat. But we must ask whether these practices represent the highest art in caring for the human machine. It makes a great deal of difference in an engine whether the coal for the day is put in all at once or at intervals, whether in large lumps or fine dust. We may lose valuable fuel through imperfect combustion if the fires are choked. Coal may fall through the grate and be lost with the ashes if not of suitable size. The walls of the fire chamber may be burned out by bad packing preventing circulation of air. So in the case of the human furnace a great deal depends upon the way in which the fuel is introduced.

We gather food materials from the four quarters of the globe, prepare them in factory and kitchen for the table, and yet when the products come to the table they are mostly crude material so far as the body is concerned. Food must be subjected to many processes in that long and tortuous tract which we call the alimentary canal before it can enter upon its real functions in the living cells where energy is liberated and new material built. And the way it behaves in that canal is of great import for good nutrition. If it irritates the sensitive walls of stomach or intestines, the whole body is depressed, and the cells may be unable to make use of good material when finally brought to them. If it is crowded along too fast, with no time allowed between meals for rest of the digestive organs, a strike may be inaugurated against such bad working conditions and the poor body left to starve in the midst of plenty.

Before discussing in detail, therefore, the food needs of individual members of the family, it will be worth while to give some attention to those principles in the choice and manner of taking food which in general tend to conserve or promote good digestion and are more or less applicable to all. The final purposes in digestion are (1) to bring all foods into fluid form, (2) to separate all proteins into their amino acid fragments, (3) to divide all fats into two components (fatty acids and glycerol), soluble in the digestive fluids, and (4) to divide all carbohydrates into their component parts (simple sugars). In such simple forms foods pass into the blood stream and thence to the tissues.

The processes by which these objects are attained are partly mechanical and partly chemical. They begin when food is taken into the mouth and continue in orderly fashion until the products indicated above pass through the intestinal walls into the blood and lymph, and the waste material is eliminated in the feces.

The Part of the Mouth in Good Digestion

On guard at the beginning of the alimentary tract stands the mouth, whose first duty is to grind up coarse foods and soften or possibly dissolve them. Fluid foods relieve the mouth of this duty and are therefore selected when the teeth are missing or when for some other reason chewing is not likely to be well done. Fine mincing will to a large extent accomplish the same purpose; so beef is sometimes scraped free of all tough fibers, vegetables and hard-cooked eggs put through a fine sieve when great ease of digestion is desired. On the other hand, when chewing is possible, similar fineness and softness may be attained by giving foods which *must* be chewed in order to swallow them, such as crisp toast, zwiebach, and hard crackers, which tend to break up in fine pieces and are not only softened but actually dissolved by the saliva, which has the power of acting chemically upon carbohydrate material. The agents in the alimentary tract which split up proteins, fats, and carbohydrates into the fragments which can pass through the intestinal walls (amino acids, fatty acids and glycerol, and simple sugars) are technically called enzymes. They have been likened to keys, each fitting a single kind of lock, and setting free a simpler substance, as if one had a nest of boxes and a key to each by which the next smaller could be released. Thus in the saliva of the mouth we find an enzyme called ptyalin. It will unlock a starch unit, producing what we may call a "double sugar" [1] (maltose); this in turn must be unlocked by another enzyme which will set free from it a simple sugar, — the kind which the blood can take to the muscles to burn for fuel. By means of nicely adjusted series of enzymes the body is kept from being overwhelmed with the kind of material which it is trying to use. If we take at one time a large quantity of glucose, especially when the stomach contains no food which might help to dilute it, we are liable to irritation of the stomach and possibly of the small intestines, although glucose is a simple sugar and requires only to pass into the blood to be available to the body. This trouble is simply due to the fact that the body has too much of it to take care of at once. If it is greatly diluted with water before taking, it will cause no trouble; or if taken in small enough quantities to be diluted by the saliva, or mixed with other foods so that it is thoroughly diluted by them. When starch is taken, it is gradually changed to sugar, and this is one great reason why it is better to have most of our carbohydrate food in the form of starch rather than of sugar. But starch needs to be

[1] Technically known as a disaccharid.

cooked so that the enzymes can readily attack it and large masses of starchy food broken up so that the digestive juices can reach every particle. Foods which become pasty in the mouth, such as hot breads of many kinds, soggy potatoes, or unripe, raw bananas, tend to slip down the throat in lumpy masses little affected by the saliva and hard for the other juices to penetrate. This is another reason why baked potatoes, baked bananas, and hard, dry bread-stuffs are better for steady diet than the pasty foods just mentioned. Pure starches, like cornstarch and tapioca, may be cooked rather quickly, but cereal foods, especially such forms as breakfast preparations of oats, corn, barley, and wheat, have their starch grains sealed within pockets of cellulose, which the body enzymes cannot soften and which are not usually well broken by chewing. Hence without long, slow cooking to loosen up these cellulose walls, much of the starch will fail to digest.

Besides helping to grind and soften all hard, coarse food and to digest carbohydrate, chewing is one of the signals to the stomach to prepare for its duty. The alimentary canal is operated like a complex railway system. Signals are sent ahead and the way prepared for the oncoming load. Hence, while we cannot add to or take away from the energy which a food may contain by the care with which we chew it, we can make it easier for the rest of the digestive work to be carried on smoothly. We may thus save ourselves from some of the dangers of "indigestion," which often seems to be the chief topic when people discuss their food.

The Part of the Stomach in Good Digestion

The stomach is the great reservoir into which food from the mouth quietly settles. The receiving end holds it in such a way that the gastric juice penetrates it slowly; and the digestion of starchy food, begun in the mouth if the food has been thoroughly chewed and mixed with saliva, may continue here for some time, till contact with the acid gastric juice stops the action of the salivary enzyme and ends one chapter in the story of digestion.

A good flow of healthy gastric juice depends upon many factors. Regularity in time of meals is one. Habit is a powerful force in digestion as elsewhere, and the habit of responding to food at regular times and those only will do much to keep the stomach healthy. Most people are exceedingly careless in this respect, and good food is often blamed for bad results, when the broken schedule was really what upset the system.

Efficient mastication has already been mentioned as a factor in putting the stomach in good humor to receive food, and in sending the food down in such shape that it can be taken care of with ease. The pleasurable sensations from the sight, smell, and taste of food not only "make the mouth water," but the stomach also. Some foods stimulate a flow of gastric juice aside from any pleasant sensations they may produce, and are of great value when appetite fails or when for some other reason the stomach's responses to food in general are weak. Water is such a substance and can be taken a few minutes before or at the beginning of a meal with positive stimulating effect. The most efficient gastric stimulants are those substances which give flavor to meats; hence the advantage of meat early in the meal when it is served, and the value of beginning a meal with soups containing the extracts of meat, such as bouillon, consommé, and other kinds with meat stock as the foundation, when the stomach responses are feeble. Herein lies the chief value of beef broth for invalids; but, since beef broth itself has little if any fuel value, it should be accompanied by some "real food," which it will help to digest.

The general nervous state of the person is very quickly reflected in the stomach. "Laugh and grow fat" is a wise saw. Attention to the appearance of food on the table and other devices which tend to put the prospective eater in a happy frame of mind are worth while from this point of view. Excitement, worry, anger, chill, fatigue, all tend to retard the digestive processes and the greatest skill in the choice of easily digested food may be of no avail while these unfavorable states persist. If food must be taken under such conditions, it is best taken in some warm, rather dilute fluid form, such as soup, cocoa, malted milk, gruel, or a raw egg beaten up in milk. Next best is some very dry food which has to be moistened and softened in the mouth and reaches the stomach nearly fluid, such as toast crisp throughout, which may be accompanied by some finely minced, lightly cooked lean meat.

Concentrated foods of various kinds are apt to prove irritating, especially to a sensitive stomach. Among such foods are cheese, candy, nuts, strongly acid fruits. These should be used in small amounts at a time, and in combination with bland foods which will dilute them, — crackers, bread or macaroni with cheese, candy only at the end of a meal (never on an empty stomach, as concentrated sugar is particularly irritating), nuts in small quantities along with other food less rich in fat and less concentrated, acid fruits very much diluted, as in lemonade or cherry tapioca.

The rate, and hence often the comfort, of digestion is further influenced by the proportions of protein, fat, and carbohydrate eaten. Water passes through the stomach very quickly. Carbohydrates tend to pass out faster than proteins and proteins faster than fats. Mixtures of protein and carbohydrate go faster than proteins alone, but more slowly than carbohydrates. Mixtures of fat and protein, on the other hand, go more slowly than either alone. This retarding effect of fat is an advantage or disadvantage according to circumstances. The healthy empty stomach tends to contract rhythmically, with more or less insistence, producing the "pangs of hunger." Its possessor, therefore, may find himself very uncomfortable between meals, complaining that his food does not "stay by him." He does not need a diet that relieves the stomach, but rather one which tends to require some time for digestion, and this can be accomplished by the use of more fat. Such a person can eat pork and beans, sausage, suet pudding, mince pie, and the like without discomfort, especially if leading an out-of-door life. A less vigorous person would find such foods delaying digestion unduly; hence they are usually, and very properly, considered hard to digest. The same is true of other foods where a considerable amount of fat is intimately mixed with proteins or even with carbohydrates, such as fat meats, rich sauces, pastries, cakes. A good cook is not always the safest provider of the family food because of her tendency to load up all kinds of dishes with cream and butter. The taking of fat is less likely to be overdone if it is served by itself as butter for bread, or as thin cream for beverages and cereals, than when it is used liberally in the kitchen.

Most people can eat large amounts of carbohydrate food with ease. Thus bread, in which eight-tenths of the Calories are in the form of carbohydrate, is the "staff of life." But there are persons in whose stomachs carbohydrates tend to ferment very easily, usually because of bad mastication, little gastric acid, or poor muscular activity of the stomach. These need to eat less carbohydrate food than others and to rely more upon protein and simple forms of fat for fuel. As already pointed out, sugars ferment more readily and are liable to be more irritating than starchy foods, so that good results are often obtained merely by ruling out sugars and very sweet foods. At other times foods containing much cellulose, such as green vegetables, must be excluded because the cellulose tends to retard carbohydrate digestion, unless it is removed through a strainer. Usually it is wise to enforce good mastication by the use of hard, dry breadstuffs.

Good stomach digestion depends, in general, upon keeping the whole body in good condition by breathing fresh pure air, taking suitable exercise, cultivating cheerful mental habits; observing regular mealtimes, and refraining from food at all other times; avoiding food when greatly overwrought or exhausted, or limiting it to simple, warm, fluid foods; masticating thoroughly so that food never goes down in large lumps; paying some regard to the retarding effect of fat on digestion; and avoiding large amounts of very concentrated or irritating foods.

Good Digestion in the Small Intestine

Into the small intestine by spurts from the stomach comes material in various stages of digestion, mostly fluid, with small particles of insoluble or still undissolved substances floating in it. Here are enzymes greater in number and more powerful in action than anywhere else in the alimentary canal. The acid gastric juice sends a call to the pancreas through a special "chemical messenger" and out pours a fluid with enzymes for starch, protein, and fat. From the walls of the intestine itself numbers of tiny glands supply a secretion containing enzymes for breaking up the last combinations, setting free amino acids from the larger protein fragments left by the other enzymes, and also dividing all the remaining double sugars into simple sugars. The bile flows into the intestine and makes conditions more favorable for these changes, especially helping in the digestion of fat.

In the small intestine we find two systems of movements. By one the food is very thoroughly mixed with the digestive juices containing the enzymes, and brought into contact with the tiny fingerlike projections on the intestinal walls which absorb the digested materials and start them on their journey to the tissues that need them. By the other, the material is moved along from part to part, meeting fresh surfaces for absorption, and leaving less and less to be pushed into the large intestine.

Good health in the small intestine is very quickly affected by conditions in the stomach. Hence it is fortunate that the stomach is very sensitive to bad feeding and gives us warning of what we may be doing to the more important intestinal tube. Any nervous disturbance affecting the stomach is likely to be shared sympathetically by its neighbor. Anger, fear, and other painful emotions tend to stop digestion in all parts. Bacteria of various kinds thrive in the small intestine, and when food is not digested at the normal rate, are likely to seize it and devote it to their own nourishment. Thus carbohydrates tend to ferment, producing troublesome gases and irritating acids; and proteins to undergo putrefaction, with the formation of products which are more harmful than those formed by carbohydrates, producing, when absorbed into the system, the condition called "auto-intoxication." Fermentation can be lessened by limiting carbohydrate food, and putrefaction reduced by limiting protein food; the dangers of both can be avoided in part by care in mastication and choice of the form in which the food is taken, and in part by stimulating normal peristalsis in the intestine — the movement which carries the food downward into the large intestine. This will be discussed in detail after a few words in regard to the large intestine.

Good Digestion in the Large Intestine

The large intestine serves in great measure as a receptacle in which the last portions of digested material may be sorted out from the waste which is to be eliminated as of no further use to the body. No digestive enzymes are furnished in its fluids; no such vigorous mixing of food and digestive juices occurs as in the small intestine, though a slow backward movement in the part adjacent to the small intestine forces the material in this part back and forth to insure absorption of all that is useful. At intervals a vigorous downward push forces the waste onward and finally out of the body altogether.

It is very important that these movements of large and small intestine, conveying material along the tract, be normal. If they are too rapid, digestion is left incomplete and the body loses valuable food material, as in diarrhea. If they are too slow, waste accumulates, mechanically irritating to the intestinal walls and to adjacent parts; bacteria prey upon the retained material, and ample opportunity is afforded for the absorption of any poisons which they may produce, thus laying the foundations for bad complexions, headaches, sensations of fatigue, irritation of the appendix, and other unpleasant conditions.

The peristaltic movement of the large intestine tends to be hindered by many of the habits of civilized life.

In the first place, the abdominal muscles are likely to have less exercise and hence to be less vigorous, partly because of less general physical activity and partly because of more confining dress, particularly for women. In the second place, food is likely to be too highly refined. Some bulk is necessary for intestinal muscles to exercise against, and this is obtainable only by taking some indigestible material as part of the diet. Animals get ballast in the form of sand, or bones, or the woody parts of plants, and many of the natural foods of man contain considerable woody fiber, seeds, and other forms of cellulose. But by our modern milling processes we remove the bran from grains; in our market gardens we force vegetables so that their fiber is very delicate; we discard seeds and rind of fruits, and thus make possible a diet almost free from ballast.

Furthermore, modern transportation makes possible a very free choice of food. We are not dependent on a problematic catch of game or fish for meat; we can have it every day and three times a day so long as we have money to buy it. Therefore we may unconsciously eliminate from the dietary or relegate to an insignificant place foods which have chemically a stimulating influence upon the movements of the intestines, such as most fruits and acid vegetables.

Finally, habit plays a large part in normal intestinal movement, as in other digestive processes. If the normal warning is disregarded, it soon becomes ineffective and recalling it becomes increasingly difficult. The greatest stimulus to intestinal movement comes immediately after taking food into the stomach and particularly after breakfast. Thus the omission of breakfast, common with some persons, may mean the loss of a much needed impulse.

From these various causes, constipation is one of the recognized ills of modern life. One has only to notice advertisements of drugs in street cars and on billboards to realize this. But the taking of drugs is a poor substitute for the normal control of the alimentary tract by diet, and is to be countenanced only when more hygienic measures fail.

Diet for Constipation

In endeavors to remedy or avoid constipation through diet, we may choose then:

(1) Foods rich in cellulose, such as celery, cabbage, string beans, dried beans and lentils with their hulls, asparagus, lettuce, spinach, onions, raisins, figs, prunes, and other fruits eaten with their skins, cereals from which the bran has not been removed, such as rolled or cut oats and wheat. When still more ballast is required, bran itself can be used in various ways, the pleasantest being as bran bread, muffins, or crackers. Another plant product which serves the same purpose is agar-agar or "vegetable gelatin." This is eaten simply cut into small pieces, along with or instead of some breakfast food, or it can be obtained in the form of wafers. It may also be made into biscuits; boiled in water, flavored and cooled, it makes an edible jelly.[1] Successful results

[1] One-fourth ounce of agar-agar will solidify one quart of liquid.

from the use of such foods depend largely upon taking a sufficient quantity and constantly including them in the diet.

(2) Foods yielding vegetable acids, such as lemons, oranges, tomatoes, rhubarb, apples, cider, and other fruits and fruit juices (except blackberries, which are constipating). The acids are mild stimulants to intestinal movement and most people find fruit pleasant to take. The desired results are often gained by taking fruit or fruit juice the first thing in the morning. For persons of sensitive stomach, very mild fruit should be selected, or fruit juice diluted with water. Hot lemonade, prunes, or figs may be tried at bed time, if they do not cause discomfort. Liberal serving of fruit at meals has much to recommend it as a means of counteracting constipation.

(3) Foods producing slight gas formation, such as honey, molasses, spinach, onions, cauliflower, and some others. These tend to ferment slightly; the gas generated breaks up hard masses in the intestine and also acts as a slight stimulant to movement. Carbonated waters may bring about the same result through the gas with which they are charged. Honey and molasses are best taken with coarse breads. They must not be used too freely or they will disturb digestion. The vegetables may be effectively served as salads with an olive oil dressing, or simply cooked and seasoned with salt and butter.

(4) A lubricant. For people whose digestion of fat is rather imperfect, fat in liberal quantities is often laxative and such may be benefited by a tablespoonful or

two of olive oil before breakfast and the last thing at night. For most people, however, the lubricating effect is lost through digestion of the fat and can only be secured by taking an indigestible mineral oil. Such substances do not actually stimulate intestinal movement, and only aid in the elimination of waste by making it softer and allowing it to pass along the tract more readily. If movement is very sluggish, the oil may slip through without carrying feces with it, in which case foods of the two types indicated above must also be used, or recourse had to drugs which specifically stimulate peristalsis, under the guidance of a physician.

A large volume of water, two glasses or more, if taken on an empty stomach, will sometimes start intestinal peristalsis, but since water tends to be absorbed before it reaches the large intestine its action is rather uncertain, differing greatly with individuals. However, the drinking of water freely is desirable, as it helps to flush out the system and carry waste products off through the kidneys.

Some Anti-Constipation Menus [1]

I

Breakfast: An orange
Cut oats, cream
Bran muffins and honey
Bacon

Luncheon: Lentil stew
Triscuit
Baked apple (skin eaten)

[1] Two glasses of water or a glass of diluted lemon, orange, or other fruit juice should be taken each day, on arising.

DINNER:	Vegetable soup Roast beef Spinach (large serving) Baked potatoes (skins eaten) Cabbage salad Graham bread Steamed fig pudding, lemon sauce

II

BREAKFAST:	Stewed prunes Shredded wheat, cream Tomato omelet Graham toast
LUNCHEON:	Pork and baked beans Boston brown bread Sliced pineapple Oatmeal macaroons
DINNER:	Boiled mutton, caper sauce Stewed onions Lettuce salad, French dressing Bran wafers Lemon jelly, whipped cream

CHAPTER III

FOOD FOR THE ADULT MAN

A HUMAN being requires about twenty-five years to complete his growth. During this time he adds to his stature, gains in weight, and changes in physiological and mental habits. Then he enters upon a period, lasting perhaps from a quarter to a third of a century, during which his body may maintain a fairly constant weight, and no marked changes occur in the nature of any of his body processes. He is now the fully built "working machine" and his first food requirement is adequate fuel for his varied activities.

Some of the general principles governing choice of fuel have already been discussed in Chapter II. We are now concerned with the amount of fuel which will maintain the best working conditions. Underfeeding will weaken the body by causing it to draw upon its own substance for fuel; overfeeding will result in the storage of an overload of fat, interfering with normal muscle action and making unnecessary weight to carry, or else it will tax the digestive and excretory systems to the point of injury. Ideal conditions exist when a man carries a normal weight for his height, and his daily intake of food corresponds closely to his daily expenditure of energy.

Energy Requirements of the Adult Man

THE SEDENTARY MAN

Studies of healthy adult men lying at rest in a respiration calorimeter,[1] after fifteen hours without food, show that in the work of maintaining their internal body processes (circulation, respiration, muscle tension, etc.) they expend about 0.45 Calories per pound per hour; that is, a man weighing 154 pounds and lying quietly in bed without food for twenty-four hours would draw upon the tissues of his body for fuel to the extent of about 1665 Calories. From this fundamental or "basal" requirement there is no escape while normal life processes go on. If food be taken to make good this loss, the influence of food itself (often called the "work of digestion") must be taken into account in making up the balance. This will add about 10 per cent to the total heat production, so that his expenditure will be about one-half Calorie per pound per hour, or 1850 Calories for the whole day. Every movement of hand or foot, all the muscular work involved in raising and keeping the body in a sitting or standing position, or in performing the varied activities of daily life, will make definite increases in the energy output, all of which have been carefully measured in scientific laboratories.

Sitting quietly in a chair, with only the movements usually incident to sedentary living, such as changes of posture, movements in reading, writing, or talking, will

[1] See page 15.

make the total fuel cost per hour about three-fifths of a Calorie per pound. Hence a man of average weight, spending eight hours in bed and sixteen hours in a chair, will need a daily total food supply of approximately 2100 Calories.

Standing involves more energy than sitting, raising the energy expenditure to about three-fourths of a Calorie per pound per hour, while walking on a level road at a rate of some three miles an hour, or other light exercise incident to ordinary life, calls for about one Calorie per pound per hour. The day's energy requirement of a man of sedentary habits may then be estimated as follows:

Calculated Energy Expenditure for Twenty-four Hours for a Sedentary Man Weighing 154 Pounds

Activity	Pounds	Hours	Calories per Pound per Hour	Total Calories
Sleeping	154	8	$\frac{1}{2}$	616
Sitting	154	8	$\frac{3}{5}$	739
Standing	154	4	$\frac{3}{4}$	462
Walking and other light exercise	154	4	1	616
Total		24		2433

Studies of food requirements of sedentary men of various occupations, as, for instance, writers, draughtsmen, teachers, bookkeepers, shoemakers, tailors, physicians, and others who sit at their desks or watch machinery show that they tend to require from 2200 to 2800 Calories per day, as they vary somewhat in weight and activity. It is possible to supply this amount of fuel in the form of cereals, beans, pork, bread and butterine, with hot coffee and milk, for from 10 to 15 cents a day, or from two-fifths to one-half a cent per 100 Calories.[1] Reference to Table IV, showing costs per 100 Calories of some common foods, will make it clear, however, that the range of foods which can be used in a dietary costing less than three-quarters of a cent per 100 Calories is quite limited. Men prefer a more varied diet and it is easier to secure all the elements for good nutrition, including good digestion, if it is possible to spend somewhat more for food. The following food plan is suggested as a working basis for the selection of the diet of a sedentary man, when the money allowance is liberal. The cost estimate is based on New York City prices, and in many regions, where meats, milk, fresh fruits, and vegetables are cheaper, the food could be obtained for less. Such a plan will give a diet adequate in all respects and sufficiently easy of digestion for the ordinary sedentary person.

The dietaries worked out from this food plan (pp. 52, 53) show in detail how the following of such a scheme will insure a well-balanced ration.[2]

[1] The average for such men is often taken as 2500 Calories per day, and a very interesting publication by Gephart and Lusk on the "Analysis and Cost of Ready to Serve Foods," as found in Childs' Restaurants in New York City, gives the cost of 2500 Calories in foods arranged in order of their increasing price. This includes the cost of preparation, service, and business profits, while the estimates in this book are merely for raw food materials, prepared and eaten with the minimum of waste.

[2] Many of the recipes used in the menu in this and following dietaries are given in the Appendix, Table III.

A Day's Food Plan for a Sedentary Man

Fuel Requirement: 2200–2800 Calories   Cost: $1\frac{1}{2}$–2¢ per 100 Calories

Breakfast:	Fruit	100 Calories
	Cereal	50–100 Calories
	Eggs or Liver and bacon or Creamed dried beef on toast	100–200 Calories
	Toast or Rolls or Muffins or Waffles (occasionally)	100–200 Calories
	Butter	100 Calories
	Coffee with cream	100–150 Calories
	Top milk for cereal	100 Calories
	Sugar for cereal and coffee	50–100 Calories
		700–900 Calories
Luncheon:	Thick soup or Broiled fish or Cheese dish	100–200 Calories
	Rolls	100–200 Calories
	Butter	50–100 Calories
	Pudding (pie occasionally)	200–400 Calories
	Coffee with cream and sugar	100–150 Calories
		600–800 Calories
Dinner:	Clear soup and crackers	50–75 Calories
	Roast beef (rump) or Stuffed steak or Meat loaf or Baked fish	100–300 Calories

Potatoes or Rice or Macaroni	100–150 Calories
Bread	50–100 Calories
Green vegetable (cooked)	100–150 Calories
Lettuce, celery, or other crisp vegetable	50–150 Calories
Ice cream or Ice or Pudding or Fruit	200–300 Calories
	900–1200 Calories

THE MUSCULARLY ACTIVE MAN

Muscular activity greatly increases an individual's total energy requirement. The sedentary occupations demand little more food than would be needed if the person were sitting at rest, though it would be better for sedentary persons to take some vigorous exercise each day for the sake of their general health and increase their food intake accordingly. This is particularly true of brain workers and all whose work involves nervous rather than muscular tension.

Muscular work is usually graded as "light," "moderate," "active," or "severe," light exercise being such as that incident to sedentary occupations and not much more vigorous than walking at a moderate pace along a level road, and requiring about one Calorie per pound of body weight per hour. "Moderate" exercise is typical of occupations which involve active use of some parts of

A Dietary for a Sedentary Man, Based on the Preceding Plan.

I

Fuel Value: 2400 Calories — Cost: 1½–2¢ per 100 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
Grapefruit	½ medium	7.6	7	100
Shredded wheat biscuit	1 biscuit	0.9	13	100
Scrambled egg	⅓ cup	2.5	24	110
Bacon	2 small pieces	0.3	7	50
Graham toast	3 small pieces	1.2	14	100
Butter	2 tsp.	0.3	—	67
Top milk (10 oz.)	¼ cup	2.1	9	100
Whole milk	⅝ cup	5.1	19	100
Sugar	1 tbsp. (scant)	0.5	—	50
Coffee	1 cup	—	—	—
				777
Luncheon:				
Cream of baked bean soup	¾ cup	3.9	22	150
French rolls	1 roll	1.3	12	100
Butter	½ tbsp.	0.2	—	50
Apple pie	1 piece (3 in.)	4.8	9	300
Cream, thin	2 tbsp.	0.9	2	50
Sugar	2 tsp.	0.3	—	40
Coffee	1 cup	—	—	—
				690
Dinner:				
Clear tomato soup	½ cup	3.7	4	50
Saltines	2 crackers	0.3	3	33
Roast veal (shoulder)	small serving	2.1	66	100
with stuffing	⅙ cup	0.8	9	100
Gravy (brown sauce)	3 tbsp.	1.7	7	50
Boiled potatoes	1 medium	3.6	11	100
Green peas, buttered	¾ cup	3.0	21	100
Lettuce, French dressing	1 serving	0.6	—	50
Snow pudding	1 cup	3.3	15	150
Boiled custard	⅓ cup	2.2	13	100
Macaroons	2 macaroons	0.8	6	100
				933
Total for day			293	2400

A Dietary for a Sedentary Man, Based on the Preceding Plan.

II

Fuel Value: 2400 Calories Cost: 1–1¼ ¢ per 100 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
Apple	1 medium	5.6	2	75
Cornmeal and cream of wheat (half and half)	¾ cup	6.8	12	100
Milk	1 cup	8.5	34	170
Sugar	1½ tbsp.	0.7	—	75
French toast	2 slices	2.8	20	200
Coffee		—	—	—
				620
Luncheon:				
Scalloped potatoes with cheese (⅕ oz.)	1 cup	6.3	23	200
Graham bread	3 slices	1.4	14	100
Butter	1 tbsp.	0.5	1	100
Stewed apricots	⅜ cup	4.0	6	150
Cocoa I[1]	1 cup	9.0	22	160
				710
Dinner:				
Swiss steak with gravy[2]	slice 4 in. × 2 in. × ⅝ in.	2.2 (meat only)	73	325
Baked potatoes	2 medium	6.0	22	200
Mashed turnips	½ cup	4.5	6	75
Graham bread	3 slices	1.4	14	100
Butter	1 tbsp.	0.5	1	100
Cranberry jelly	1 tbsp.	0.7	—	50
Bread custard pudding	½ cup	4.3	34	220
				1070
Total for day			284	2400

[1] See Table III, Appendix, p. 358.

[2] 2 tbsp. drippings and 1 tbsp. flour added for gravy.

the body while sitting, standing, or walking, as in the case of carpenters, mail carriers, house workers, and others. Such exercise means an expenditure of from one and one-fourth to one and one-half Calories per pound per hour during working hours, and a daily total for men of average size in such occupations of from 2700 to 3000 Calories.

"Active" exercise is sufficiently great to develop muscular strength, as in farmers, masons, and blacksmiths, and requires during active working hours an expenditure of from one and three-fourths to two Calories per pound per hour, or approximately 3500 Calories per day. "Severe" exercise indicates very heavy muscular work, such as that done by lumbermen, excavators, and stevedores, and calls for fuel equal to as much as three Calories per pound per hour during work, so that the total day's food requirement for such men often reaches 4000 and may reach 6000 Calories.

The changes in energy requirement due to differences in activity may be summarized as follows:

I

Kind of Activity	Calories per Pound per Hour
Sleeping	$\frac{1}{2}$
Sitting quietly	$\frac{3}{5}$
Standing	$\frac{3}{4}$
Light exercise	1
Moderate exercise	$1\frac{1}{4}$–$1\frac{1}{2}$
Active exercise	$1\frac{3}{4}$–2
Severe exercise	3 or more

II

Occupation	Calories per Man per Day
In bed twenty-four hours	1600–1800
At rest, but sitting most of day	2000–2300
Work chiefly done sitting	2200–2800
Work chiefly done standing or walking	2700–3000
Work developing muscular strength	3000–3500
Work requiring very severe effort	4000–6000

A day's food plan for a man doing severe work is given below. Such work usually insures good appetite and digestion, if the work be done under generally hygienic conditions. Hence more foods rich in fat, such as fried cereal foods, sausage, pork and beans, suet pudding, and pie, may be taken without detriment. These have the advantage, too, of raising the total fuel value of the diet without greatly increasing the volume of food to be consumed.

A Day's Food Plan for a Working Man

Fuel Requirement: 3500–4000 Calories   Cost: $\frac{3}{4}$–1 ¢ per 100 Calories

Breakfast: Cereal (oatmeal, cornmeal, etc.) (fried occasionally) . . 150–300 Calories

Sausage or Salt fish or Liver and bacon . . . . 200–300 Calories

Toast or Muffins or Corn bread . . . . 300–400 Calories

BREAKFAST: — *continued*		
	Oleomargarine	150–300 Calories
	Milk for cereal and coffee	100 Calories
	Sugar for cereal and coffee	100 Calories
		1000–1200 Calories
LUNCHEON:	Beans, peas, or lentils (baked, or in soup or stew) or Macaroni and cheese or Cheese	200–400 Calories
	Bread (rye, graham, white, etc.)	200–400 Calories
	Fruit, fresh or as sauce (bananas, apples, apricots, prunes)	100–150 Calories
	Cake or pie	200–400 Calories
	Milk and sugar for coffee	200 Calories
		1000–1400 Calories
DINNER:	Meat pie or Stuffed meat and potatoes or Meat stew with dumplings	300–400 Calories
	Savory vegetable (onions, tomatoes, or cabbage)	100–200 Calories
	Bread	200–400 Calories
	Suet pudding or Bread pudding or Creamy rice pudding	250–400 Calories
	Milk and sugar for coffee	200 Calories
		1400–1800 Calories

Following is an example of a dietary based on this plan.

100-Calorie Portions of Cooked Vegetables[1]

Food Material	Weight (oz.)	Measure
1. Corn à la Southern	3.4	$\frac{1}{3}$ cup
2. Creamed asparagus on toast	4.6	Small serving
3. Potato chips	0.6	10 pieces
4. Baked potato	3.0	1 medium
5. Stuffed pepper (with ham)	2.5	$\frac{2}{5}$ pepper
6. Buttered Lima beans	1.7	$\frac{1}{4}$ cup
7. Stuffed tomato	4.0	1 medium
8. Spinach with egg	7.6	$\frac{4}{5}$ cup
9. Scalloped onions	2.5	$\frac{3}{8}$ cup

[1] Cf. Appendix, Tables I and III.

A DIETARY FOR A WORKING MAN, BASED ON THE PRECEDING PLAN

Fuel Value: 3945 Calories Cost: ¾–1¢ per 100 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
Oatmeal mush	1½ cups	12.0	25	150
Creamed dried beef	⅚ cup	6.0	40	250
Old New England corn bread	large slice	4.0	32	400
Oleomargarine	2 tbsp.	0.9	—	200
Milk for cereal and coffee	⅝ cup	5.1	19	100
Sugar for cereal and coffee	2 tbsp. (scant)	0.9	—	100
Coffee	1 cup	—	—	—
				1200
Luncheon:				
Kidney bean stew	1¾ cups	18.0	100	355
Rye bread	¼ loaf	2.8	28	200
Oleomargarine	2 tbsp.	0.9	—	200
Banana	1 large	5.5	5	100
Molasses cookies I[1]	2 large	1.5	12	200
Milk for coffee	3 tbsp.	2.0	8	40
Sugar for coffee	1 tbsp. (scant)	0.5	—	50
Coffee	1 cup	—	—	—
				1145
Dinner:				
Stuffed beef heart	1 serving	4.0	84	400
Potatoes, boiled	2 small	5.4	16	150
Carrots	2 small	5.0	5	50
White bread	⅜ loaf	3.9	42	300
Oleomargarine	2 tbsp.	0.9	—	200
Date pudding II[1]	1 serving	3.5	22	310
Brown sugar for clear sauce	2 tbsp. (scant)	0.8	—	100
Milk for coffee	3 tbsp.	2.0	8	40
Sugar for coffee	1 tbsp. (scant)	0.5	—	50
Coffee	1 cup	—	—	—
				1600
Total for day			446	3945

[1] See Table III, Appendix, pp. 371 and 381.

Thin and Fat Men

THIN MEN

In case men are extremely thin or fat, some variation from the general rule of feeding according to age and weight is necessary. Thin men usually have more muscle in proportion to weight than fat men, and they also have more surface exposed, both of which facts increase their need for fuel somewhat. A store of body fat is desirable as reserve fuel for emergencies, as evidence of a well-nourished body which is more resistant to disease, and as protection against jars and bruises. This reserve can only be gained by taking food in excess of daily fuel needs. Tables showing what normal men of different ages and height should weigh may be consulted with profit and are for convenience included in the Appendix. Since food is the only source of body substance, persistent overfeeding is the only way to gain in weight. Change of climate, outdoor living, and other devices which increase appetite are aids in taking sufficient food, but much can be accomplished under ordinary living conditions by conscious effort to take more fuel. Simple foods which do not upset digestion are best. Liberal use of butter, cream and bacon, and the taking of from one to two tablespoons of olive oil after each meal, are practical ways of increasing the fuel value of the diet. Vegetables can be served with cream sauces, or as salads with mayonnaise, French, or cream dressings; milk enriched with cream, cocoa and chocolate made with milk, or tea and coffee with cream and sugar liberally used are comparatively easy to take. Custards and creams of various kinds are valuable means of adding to the fuel value of the meal. Meat is best used in moderation.

A FATTENING DIETARY SUGGESTED FOR A SEDENTARY MAN

Fuel Value: 3450 Calories   Ordinary Requirement: 2400 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
Grape juice	1 cup	7.0	—	200
Farina with 4 dates	$\frac{3}{4}$ cup	7.0	14	200
Scrambled egg	$\frac{1}{2}$ cup	4.2	40	200
Toast	1 slice	0.5	7	50
Butter	$\frac{1}{2}$ tbsp.	0.2	—	50
Cream, thin	$\frac{7}{8}$ cup	6.3	18	350
Sugar	2 tbsp.(scant)	0.9	—	100
Coffee	1 cup	—	—	—
				1150
Luncheon:				
Creamed chicken	$\frac{1}{2}$ cup	3.2	32	200
on				
Toast	1 slice	0.5	7	50
Lettuce salad	1 serving	1.2	1	100
Saltines	3 saltines	0.4	5	50
Vanilla ice cream II[2]	$\frac{1}{2}$ cup	4.0	12	200
Chocolate II[2]	$\frac{5}{6}$ cup	7.8	33	250
				850
Dinner:				
Cream of corn soup	1 cup	8.0	24	200
Roast beef	$2\frac{1}{2}$ slices	4.0	115	250
Baked potato	1 medium	3.0	11	100
Buttered Lima beans	$\frac{3}{8}$ cup	2.5	24	150
Whole wheat bread	2 slices	1.4	16	100
Butter	2 tbsp.	0.9	—	200
Baked apple	1 large	4.6	2	200
Cream, thin	$\frac{1}{2}$ cup	3.6	10	200
Sugar	1 tbsp.(scant)	0.5	—	50
				1450
Total for day			371	3450

[1] See Table III, Appendix, pp. 358 and 385.

FAT MEN

A fat man requires less fuel in proportion to his weight than an ordinary man. Fat represents "dead weight." The actual amount of muscle may be no more (even less) than in another man who tips the scales at a lower figure. As men grow older they tend to less and less muscular exertion and yet their appetites often continue keen, so that they keep up eating habits formed in more active years, with the result that they steadily take in more fuel than they use up, and gradually increase in weight. Too much fat is a disadvantage, as it is apt to interfere with the healthy play of the muscles, causing them to deteriorate, and laying the foundation for troubles with the heart. Excessively fat people also seem predisposed toward gout and obesity. It is usually much easier to keep the weight from becoming excessive than to reduce fat after it has been stored. Hence it should be borne in mind that persistent gain in weight in a healthy person means that he has been overeating and he should make consistent efforts to lower his food intake. Increasing exercise will help to burn off fat, but is likely to stimulate the appetite, so that accurate measurement and systematic limitation of the fuel value of the diet is necessary.

Foods very high in fuel value, *i.e.*, fats and dishes containing much fat, should be avoided and bulky foods of low fuel value used to satisfy the eager appetite. Even then considerable self-denial is usually necessary to achieve success. Clear soups should take the place of

A REDUCING DIETARY SUGGESTED FOR AN OVERFAT MAN

Fuel Value: 1400 Calories Ordinary Requirement: 2400 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
BREAKFAST:				
Orange	1 large	9.5	7	100
Eggs	2 eggs	4.8	54	150
Graham bread	2 thin slices	0.7	7	50
Coffee (clear)	1 cup	—	—	—
				300
LUNCHEON:				
Bouillon	1 cup	8.5	21	25
Soda cracker	1 cracker	0.2	3	25
Halibut steak, broiled, with lemon	large serving	6.0	122	200
Asparagus, plain	10 stalks	8.0	16	50
Potato, boiled	1 medium	3.6	11	100
Butter (for potato and asparagus)	½ tbsp.	0.3	—	50
Apple, raw	1 medium	4.9	2	65
				515
DINNER:				
Raw oysters	12 oysters	7.2	49	100
Roast beef, strictly lean	large serving	5.8	162	250
String beans, plain boiled	½ cup	2.0	5	25
Potato, boiled	1 medium	3.6	11	100
Tomatoes, sliced, with vinegar, salt and pepper	1 medium	7.7	8	50
Cheese, pineapple[1]		0.4	12	50
Water cracker	1 cracker	0.1	1	10
Coffee (clear)	1 cup	—	—	—
				585
Total for day			491	1400

cream soups, butter and cream be almost eliminated, sugar used very sparingly, and confectionery avoided.

[1] Roquefort, Swiss, Brie, or American may be substituted.

Green vegetables of all kinds, raw or plainly cooked, such as cabbage, celery, lettuce, spinach, asparagus, cauliflower, can be freely eaten. Bread, cereals, potatoes, and other starchy foods should be taken in small quantities and can often be omitted. Fresh fruits should be substituted for puddings, cakes, and pies. Lean meats, simply cooked, may be used liberally if plenty of green vegetables be also included in the diet.

Building Material for the Adult Man

When a steam engine transforms the energy of coal into useful work, about nine-tenths of the total amount of energy present in the fuel will be unavoidably converted into heat and dissipated into the surrounding atmosphere, and only one-tenth actually transformed into useful work. In the finest motors the skill of the designer has succeeded in reducing this inevitable loss of potential working power to about seven-tenths. Man is a much more efficient machine than the ordinary engine, being able to convert up to a third of his energy into muscular activity when well trained to his work (very commonly as much as one-fifth) and also utilizing the heat which is a by-product of his activities to keep up his body temperature. Man can also do his work with comparatively little wear and tear on the body itself, provided he treats it with the same care that would be given to any other high grade machine — supplies fuel in suitable forms and amounts, keeps within the limits of its work capacity, and sees that it is well oiled (furnished with regulating materials) and clear of waste.

Nevertheless, as we have seen in Chapter I, it is a law of life that some old material shall constantly be replaced by new, and we must take into account a daily loss from the body of substances entering into its intimate structure or serving to modify and control its processes, such as nitrogen, phosphorus, iron, and calcium. We must find out how the diet is to compensate for such depletions.

THE PROTEIN OR NITROGEN REQUIREMENT

During much of the nineteenth century biological chemistry was dominated by the ideas of the great organic chemist, Liebig. He thought muscular work to be performed at the expense of the muscle itself, and taught that the only way to maintain muscular strength was to eat protein food, and especially that as much like the body protein as possible, namely, meat. But near the middle of the century this idea was subjected to scientific investigation, and convincing, though crude, proof adduced to show that a man doing a day's work without protein food would by no means burn enough of his body protein to account for the work done; in fact, would burn scarcely more than if he had not been working at all. It became apparent, therefore, that fats and carbohydrates were the main source of muscular energy, a fact fully demonstrated before the opening of the twentieth century.

If a diet be ample in fuel, chiefly as carbohydrate and fat, the loss of protein for each individual in health proceeds quite uniformly, whether his life be active or quiet. Muscles do not "break down" in exercise; rather they tend to "build up," or increase in size and strength, and thus to store protein in their own structure rather than to use up what they have. Accordingly, the actual requirement for protein in the diet is comparatively independent of the amount of physical exertion, and remains fairly constant whether the individual be leading the sedentary life of an office or the strenuous life of outdoor work on the farm or in the lumber camp. The requirement for fuel, on the other hand, will vary tremendously with the kind and amount of work, as previously shown.

The fact that protein food is both a fuel and a building material makes its place in the diet confusing. When burned for fuel, the nitrogen in its constitution is gotten rid of as speedily as possible, beginning to appear in the urine within an hour or two after a meal, and the non-nitrogenous fragments then burn like carbohydrate or fat. When protein is used for building material, the nitrogen is retained in the body to help form new body protein. There is, however, no provision for storing a surplus against a rainy day. What is not needed is excreted and that for future use must come from future food. It is possible to take the whole day's fuel in the form of protein food, lean beef, for instance. A man requiring 3000 Calories would have to eat nearly five pounds and would get eight or nine times as much protein as actually needed to keep up his body protein. Since protein food is expensive, this would be uneconomical, if not harmful. By substituting carbohydrate or fat and carbohydrate, as potatoes, bread, butter, and the like, for part of the protein, a much more satisfactory diet can be arranged.

In scientific laboratories detailed experiments have been made to try to establish the ideal proportion of protein in the diet, and with plenty of fuel it is found that the protein will be used very economically. At the same time, protein is good fuel itself, and there is no reason for restricting one's intake to the minimum, under ordinary circumstances. For a man of average weight, from two to two and one-half protein Calories per pound of body weight will adequately protect the body against protein starvation and leave some surplus to be burned as fuel.

Where strict economy must be practiced, it is well to remember that adequate fuel is the first requisite for good nutrition, and the use of protein simply for fuel is extravagant. On the other hand, many protein foods are easy to digest, and when economic conditions do not forbid may be used more freely. There are limits, however, beyond which it does not seem wise to go. When a very large proportion of the day's fuel is protein material there is produced in the body a kind of stimulation which results in an increased production of body heat. This is of no advantage so far as we know, except when a person is exposed to cold, and can utilize this heat to maintain his body temperature instead of generating more by shivering or more active muscular activity. In extremely cold climates or in severe winter weather in temperate regions, a liberal supply of protein in the diet may promote physical comfort. On the other hand, in hot weather, especially with much humidity, dissipation of heat which the body is inevitably generating becomes difficult, and an extra supply of heat arising from a large amount of protein in the diet simply increases the difficulty of keeping comfortable, and may be a real menace to health. Furthermore, individuals differ in the ease with which they get rid of the surplus nitrogen. Sometimes large amounts of protein food, especially meats, tend to increase intestinal putrefaction and bring on a whole train of unfavorable symptoms; sometimes the kidneys' powers are overtaxed, and certain forms of nitrogen tend to accumulate in the body to its disadvantage. For such reasons, a moderate supply of protein, covering fully the needs for nitrogen, but not serving as the chief source of fuel, will produce the best results.

It is often convenient to express this in terms of the total day's fuel. An allowance of two Calories per pound for a man of average weight means about 300 Calories per day. If his total energy requirement is 3000 Calories, this means approximately 10 per cent of his fuel in the form of protein; if the total is 2500 Calories, 12 per cent in the form of protein. Two and one-half Calories per pound for a man consuming 3000 Calories would mean about 15 per cent of his fuel as protein. A higher proportion results in more loss of heat from the stimulating power of protein, so that in general the body needs seem best met by supplying from 10 to 15 per cent of the total fuel in the form of protein, except when a man is in bed, in which case care should be taken that he has at least two protein Calories per pound. By reference to the dietaries already given[1] it will be seen that the protein supply falls within the limits suggested here.

Liebig's notion that meat is a peculiar source of body strength having caught the popular fancy, and agreeing well with the food preferences of many, it has been slow in giving way to newer conceptions of the place of protein in nutrition, and many spend money in maintaining a traditionally high amount of meat in the diet who might be using their money to better advantage and perhaps securing better health. The regard in which meat is held is probably largely due to its peculiar texture and to certain substances found in its juices which give it a pronounced and agreeable flavor and exert a stimulating effect upon appetite and digestion. Meat agrees with the lazy eater who bolts his food, because it does not require mixing with saliva, being dissolved by the gastric juice of the stomach even if swallowed in comparatively large pieces.

As regards satisfying real body needs, meat proteins are by no means superior to all others. In fact, the proteins provided by nature for building body protein, as in the growth of the young, are found in milk and eggs. The value of milk as a source of protein for growth has already been pointed out. Meat has certain disadvantages as the sole or chief protein food of the diet. Associated more or less intimately with the protein of

[1] See pages 52, 53, 57, 59, and 61.

meat we find certain substances called "purins," to which, in part, the flavor is due. These purins are not nutritious, but are gradually transformed in the body to uric acid, to be carried off as waste in the urine. Persons inclined to gout have difficulty in getting rid of uric acid, and the more meat they eat the more uric acid tends to accumulate in the system, circulating in the blood and depositing in the joints. If protein is taken in moderation and chiefly from eggs, milk, cheese, bread, and nuts, which contain no purins, dangers of this difficulty may be avoided. Meat proteins are also particularly liable to intestinal putrefaction, while milk not only is less liable to this kind of decomposition, but actually helps to decrease the number of putrefactive bacteria in the intestines. For persons of indoor sedentary life a very liberal use of meat is certainly undesirable. Even athletes, for whom meat was once thought especially necessary, have demonstrated the possibility of reducing their daily consumption to one-sixth the amount which the training table previously provided, with an actual increase in their capacity for endurance. Aside from questions of health the economic advantages of some other protein foods over meat are easily demonstrated.

By reference to the table on page 21 [1] it will be seen that 100 Calories of lean round of beef will yield 54.5 protein Calories. Six portions will, therefore, supply 327 protein Calories, enough protein for an average-sized man for a day. But these 600 Calories will cost 24 cents (with beef at 28 cents a pound in the market) and

[1] Protein in 100-Calorie portions.

if his fuel requirement is 3000 Calories, 2400 must still be bought to make up the day's total. If milk be selected, it will take 17 portions, costing 22.6 cents (with milk at 9 cents per quart), but leaving only 1300 Calories to be obtained from other sources. If eggs are chosen, 9 portions will be required, costing 22.5 cents (with eggs at 25 cents a dozen), but requiring only 2100 Calories to supplement those from protein. Milk and eggs are not only adequate substitutes for meat, but they carry in addition valuable ash constituents which would have to be added to the meat ration to make it equally valuable with either of the other two. The housewife who provides a somewhat varied diet, ample in fuel value, including milk and eggs, need not feel that she is depriving her family of any essential if she furnishes a very small amount of meat or none at all. One-fourth of a pound a day as an average for each adult man will provide approximately one-third of his protein requirement; bread, cereals, fruit and green vegetables will furnish another third; and the remainder can be obtained with little difficulty from a glass of milk, an egg, some cheese, beans, or nuts.

THE ASH REQUIREMENT

Attention has already been called in Chapter I[1] to the importance of the ash constituents of food — how they enter into the structure of the skeleton and the soft tissues, and take a prominent part in the maintenance of life and health through the regulation of body processes.

[1] See pages 21–25.

The results of ash starvation would not be manifested so quickly as those of deprivation of water, fuel, or protein (nitrogen) because the amounts lost daily are small and in an adult the reserves in the body are comparatively great. Nevertheless, the ash supply is worthy of consideration in any food. Studies of what men actually do eat reveal that the elements most likely to be taken in too small amounts for a good daily balance are phosphorus, calcium, and iron. A comparison of a reasonable supply of these elements for an adult with the amounts furnished by several combinations of food otherwise very excellent will show how ash-bearing foods might be neglected (1 and 2 below), and how introducing a single change will improve such food combinations (3 and 4 below). The quantities per day believed to be adequate for an average healthy man are as follows:

Phosphoric acid	2.75 grams
Calcium oxide	0.70 gram
Iron	0.015 gram

(1) A ration of lean meat, white bread, and butter would be ample in protein and total fuel, but conspicuously deficient in calcium.

	Weight Oz.	Protein Calories	Total Calories	Calcium Oxide Grams	Phosphoric Acid Grams	Iron Grams
Bread, white ($1\frac{3}{4}$ loaves) . .	20.7	216	1500	0.165	1.125	0.0045
Beef, lean . .	9.0	216	400	0.036	1.680	0.0128
Butter . . .	2.8	4	600	0.018	0.024	——
Total . .		436	2500	0.219	2.829	0.0173

(2) A diet of white bread and milk would be adequate in protein and total Calories, high in calcium and phosphorus, but poorly supplied with iron.

	Weight Oz.	Protein Calories	Total Calories	Calcium Oxide Grams	Phosphoric Acid Grams	Iron Grams
Milk ($7\frac{1}{2}$ cups)	61.2	228	1200	2.868	3.636	0.0041
Bread, white ($1\frac{1}{2}$ loaves) . .	17.9	187	1300	0.143	0.975	0.0039
Total . .		415	2500	3.011	4.611	0.0080

(3) It is evident that the substitution of some milk in the bread-beef-butter diet will remedy its defect.

	Weight Oz.	Protein Calories	Total Calories	Calcium Oxide Grams	Phosphoric Acid Grams	Iron Grams
Bread, white ($1\frac{1}{2}$ loaves) . .	17.9	187	1300	0.143	0.975	0.0039
Beef	6.8	163	300	0.027	1.260	0.0096
Butter	2.3	3	500	0.015	0.020	——
Milk ($2\frac{1}{2}$ cups)	20.4	76	400	0.956	1.212	0.0014
Total . .		429	2500	1.141	3.467	0.0149

(4) The second diet could be liberally supplied with iron by the simple expedient of substituting graham bread for white.

	Weight Oz.	Protein Calories	Total Calories	Calcium Oxide Grams	Phosphoric Acid Grams	Iron Grams
Milk ($7\frac{1}{2}$ cups)	61.2	228	1200	2.868	3.636	0.0041
Bread, graham ($1\frac{1}{2}$ loaves) .	17.6	177	1300	0.247	2.470	0.0169
Total . .		405	2500	3.115	6.106	0.0210

In the probability of satisfying the ash requirement lies one advantage of a mixed diet. If some foods known to be rich in iron, calcium, and phosphorus are included each day, one may rest assured that the ash constituents will be adequately provided for, without detailed calculations like those on pages 70 and 71. Milk is the most valuable source of calcium; a single 100 Calories will supply one-third of the day's requirement. Other valuable sources are indicated in the table on page 24.[1] One portion of milk will also supply one-ninth of the day's phosphorus requirement. Eggs (especially the yolk), cereals from whole grains, lean meat, dried peas and beans, are desirable for their phosphorus content. (See table, page 22).[2] With the exception of milk, the foods just named and fruits and green vegetables are rich sources of iron. (See table, page 23).[3] A large serving of spinach will of itself supply one-third of the day's iron requirement.

With a little knowledge, it is not necessary to have elaborate cookery or many kinds of food to keep a man well nourished. As indicated above, so simple a ration as milk and graham bread will furnish all the essentials of a well-balanced diet, provided some or all of the milk is uncooked, to secure those "accessory food substances,"[4] which in milk are affected unfavorably by high temperature. The amount of waste to make

[1] Calcium in 100-Calorie portions.
[2] Phosphorus in 100-Calorie portions.
[3] Iron in 100-Calorie portions.
[4] See page 27.

ballast for the intestines is not very large; it could be increased by the addition of fresh fruit, such as apples or oranges, or of some green vegetable like radishes or onions. The bread-butter-beef-milk diet is not quite so ideal from the point of view of counteracting constipation, and needs even more the addition of some coarse material. Changes in the kind of bread (or use of equivalent fuel in the form of cereals and potatoes) and in the kind of meat and fruit will give that variety which maintains good appetite. Warm food usually adds to the ease with which a meal is digested, and often to its relish. Any one trying to live on a rather monotonous diet finds that soup, tea or coffee, "help one to eat bread." Whether tea and coffee add to the food value of the diet or not depends chiefly upon how much milk (or cream) and sugar are taken in them.

CHAPTER IV

FOOD FOR THE ADULT WOMAN

Energy Requirement

HOWEVER much civilization may tend to emphasize certain physiological and psychological differences between men and women, when we come to study their essential food needs we find that the laws of energy exchange are practically the same for both sexes. Respiration, circulation, digestion, and muscular tension, — all forms of internal body work, — demand their daily quota of fuel; the larger the body, the more fuel required to run it; the more external work done by the human machine, the more fuel demanded for this purpose.

In actual comparisons between living men and women, we recognize that men as a class are larger and heavier than women; they also tend to have a higher muscular development and to carry on more severe muscular work; wherefore the common notion that men as a rule eat more than women is true. But when we compare men and women of the same height and weight, lying at rest so that differences in external activity are excluded, we find them requiring about the same number of Calories, the differences being no greater than between athletically developed and ordinary men, or between tall and muscular men as compared with short and fat men. Women as a class tend to have more body fat in proportion to their weight, which reduces the amount of active working muscle. If a man and a woman do the same kind and amount of work, the expenditure of energy to accomplish the task will be as great for the woman as for the man. We shall not fall into any serious error then in applying to women the same table already used for calculating the fuel requirements of men.

Kind of Activity	Calories per Pound per Hour
Sleeping	$\frac{1}{2}$
Sitting (reading, hand or power machine sewing, knitting, writing)	$\frac{3}{5}$
Standing	$\frac{3}{4}$
Light exercise (dishwashing, cooking for 2–4 persons, bed making, sewing with foot power)	1
Moderate exercise (cooking for 6–12 persons, sweeping, ironing, scrubbing by hand)	$1\frac{1}{4}$–$1\frac{1}{2}$
Active exercise (cooking for large groups, ironing, scrubbing with heavy implements, etc.)	$1\frac{3}{4}$–2

Taking the weight of the average woman as 123 pounds, we may estimate the energy requirement of a housekeeper doing all but the washing and heavy cleaning for a family of five as follows:

CALCULATED ENERGY REQUIREMENT FOR TWENTY-FOUR HOURS FOR A MODERATELY ACTIVE WOMAN WEIGHING 123 POUNDS

ACTIVITY	HOURS	CALORIES
Sleeping	8	492
Sitting	5	369
Standing	2	185
Light exercise	6	738
Moderate exercise	3	461
Total	24	2245

The daily requirement for the average woman in some of her common occupations will be approximately as follows:

1. At rest . . . . 1600–1800 Calories per day
2. Sedentary occupations . . . . . 2000–2200 Calories per day
   - Milliners
   - Bookkeepers
   - Stenographers
   - Teachers
   - Seamstresses
   - Machine operatives
3. Occupations involving standing, walking, or manual labor . . 2200–2500 Calories per day
   - Cooks in family groups
   - General housekeepers
   - Chamber maids
   - Waitresses
4. Occupations developing muscular strength . . . . 2500–3000 Calories per day
   - Laundresses
   - Cooks for large groups

Women's appetites tend to be more fickle than men's, perhaps partly due to the fact that in the past they have not had very high ideals of health and have not made themselves lead such lives as to produce good steady appetites. They have stayed too much indoors, taken too little systematic exercise, and been confined too closely to one environment, to get that nervous and muscular poise which brings good tone to the alimentary tract and hence a healthy appetite. With the general improvement in the health of women, which is already remarked by careful observers, we are getting far from the "ladylike" notion of Janice Meredith and her kind that it would be a disgrace to let a man see one really relish food, and are recognizing the inevitable connection between the machine and its source of energy. Eating is primarily a duty; nature has graciously made it also a physiological and social pleasure for most people; but whether she has or not, the duty remains, and science steps in to guide when the palate fails as a monitor of health. For women perhaps more than for men is appetite apt to be perverted and a knowledge of food values of constant practical use.

The following food plans and dietaries are suggestive of ways of supplying suitable fuel for active and sedentary women.

A Day's Food Plan for an Active Woman

Fuel Requirement: 2600–3000 Calories   Cost: $1\frac{1}{4}$–$1\frac{1}{2}$¢ per 100 Calories

Breakfast:	Fresh or stewed fruit	50–100 Calories
	Cereal	50–150 Calories
	Milk	100–300 Calories
	Cream	100–200 Calories
	Creamed fish or Fish balls or Eggs	100–200 Calories

BREAKFAST: — *Continued*		
	Toast or muffins	50–150 Calories
	Sugar	50–100 Calories
	Coffee	
		600–800 Calories
LUNCHEON:	Thick soup with crackers or Cheese or nut salad or Scalloped eggs and tomatoes or Cold meat and potatoes	250–400 Calories
	Bread	100–200 Calories
	Butter	100–200 Calories
	Canned, dried, or fresh fruit with cake	200–400 Calories
		700–1200 Calories
DINNER:	Soup with rice, noodles, or vegetables	25–100 Calories
	Roast rump of beef or Mutton or Pork chop	200–350 Calories
	Potatoes or macaroni	150–250 Calories
	Boiled onions or other seasonable vegetable	150–200 Calories
	Simple vegetable salad or Celery or Olives	50–150 Calories
	Bread	50–200 Calories
	Butter	50–200 Calories
	Fruit gelatin or tapioca or Brown Betty or Fruit pie	200–400 Calories
		900–1400 Calories

A DIETARY FOR AN ACTIVE WOMAN, BASED ON THE PRECEDING PLAN

Fuel Value: 2865 Calories — Cost: $1\frac{1}{4}$–$1\frac{1}{2}$ ¢ per 100 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
Canned pineapple	1 slice	1.2	—	50
Cornflakes	$\frac{5}{8}$ cup	0.5	3	50
Milk	1 cup	8.5	34	170
Fish balls	2 small	2.6	21	150
Toast	2 slices	1.1	14	100
Sugar	1 tbsp. (scant)	0.5	—	50
Butter	1 tsp.	0.1	—	30
Cream, thin	$\frac{1}{4}$ cup	1.8	5	100
Coffee	1 cup	—	—	—
				700
Luncheon:				
Cheese soufflé	$\frac{3}{4}$ cup	2.5	27	150
Turkish pilaf	1 cup	7.5	9	100
Corn muffins	2 small	2.4	26	200
Butter	1 tbsp.	0.5	1	100
Canned apricots	$\frac{1}{2}$ cup	4.8	5	100
Chocolate loaf cake	piece $2\frac{1}{2}$ in. × $2\frac{1}{2}$ in. × $1\frac{1}{2}$ in.	1.8	10	200
Milk	1 cup	8.5	34	170
				1020
Dinner:				
Vegetable soup	$\frac{3}{4}$ cup	6.0	18	25
Pork chops	1 large	2.4 (Raw weight)	92	250
Glazed sweet potatoes	2 halves	5.2	10	250
Mashed turnips	$\frac{3}{4}$ cup	4.5	7	50
Cold slaw	$\frac{1}{2}$ cup	1.4	3	50
Rolls	2 small	1.5	15	120
Butter	1 tbsp.	0.5	1	100
Apple tapioca	$\frac{3}{8}$ cup	5.4	2	150
Cream sauce	$\frac{1}{4}$ cup	1.7	5	150
				1145
Total for day			342	2865

A Day's Food Plan for a Sedentary Woman

Fuel Requirement: 1800–2300 Calories Cost: $1\frac{1}{2}$–2 ¢ per 100 Calories

BREAKFAST:	Fruit	100 Calories
	Cereal or omelet or bacon	50–100 Calories
	Toast or muffins	50–200 Calories
	Butter	33–100 Calories
	Cereal coffee with cream and sugar or milk or café au lait or cocoa	100–200 Calories
		400–600 Calories
LUNCHEON:	Cream soup or creamed meat on toast or macaroni croquettes, cheese sauce or egg, fish, or cheese salad	150–250 Calories
	Rolls	100–150 Calories
	Butter	50–100 Calories
	Fruit	100–150 Calories
	Cocoa or milk	150–175 Calories
		600–800 Calories
DINNER:	Soup	25–100 Calories
	Croutons or crackers	25–50 Calories
	Roast beef or Nut loaf or Meat pie	150–300 Calories
	Potatoes or Rice or Baked banana	100–150 Calories
	Spinach or other green vegetable	10–50 Calories
	Crackers or bread and butter	15–50 Calories
	Lettuce, tomato or other simple salad	75–150 Calories
	Sherbet or Custard or Fruit jelly or whip	200–300 Calories
		800–1100 Calories

A Dietary for a Sedentary Woman, Based on the Preceding Plan. I

Fuel Value: 2000 Calories Cost: 1½–2 ¢ per 100 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
Orange	1 orange	9.5	7	100
Omelet	1 egg	2.0	28	100
Toast	1 slice	0.5	7	50
Butter	1 tsp.	0.1	—	30
Cocoa I[1]	¾ cup	6.7	16	120
				400
Luncheon:				
Corn à la Southern	½ cup (scant)	4.2	20	125
Fruit salad (mayonnaise)	½ cup	3.0	6	200
French rolls	1 roll	1.3	12	100
Butter	2 tsp.	0.3	—	66
Milk	¾ cup	6.3	24	124
Sugar cookies	2 large	1.0	7	100
				715
Dinner:				
Cream of pea soup	⅗ cup	5.2	16	100
Croutons	½ doz.	0.4	3	50
Lean roast beef	slice 5 in. × 6 in. × ⅛ in.	1.5	42	150
Baked potato	1 medium	3.0	11	100
Spinach à la crême	⅓ cup (scant)	1.8	4	45
Tomato salad (French dressing)	1 serving	4.5	3	170
Saltines	1 saltine	0.1	1	15
Tapioca cream	1 cup	7.0	30	255
				885
Total for day			237	2000

[1] See Table III. Appendix, p. 358.

A DIETARY FOR A SEDENTARY WOMAN, BASED ON THE PRECEDING PLAN. II

Fuel Value: 2035 Calories Cost: 1–1¼¢ per 100 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
Orange	½ orange	4.7	3	50
Cream of wheat	⅜ cup	3.0	6	50
Cornmeal muffins	2 small	2.4	26	200
Butter	2 tsp.	0.3	—	60
Top milk for cereal and coffee (10 oz.)	⅜ cup	3.1	14	150
Sugar	1 tbsp.	0.6	—	60
Coffee	1 cup	—	—	—
				570
Luncheon:				
Creamed salmon on toast	¾ cup and 2 slices	7.0	77	350
Cold slaw	½ cup	1.4	3	50
Bread	1 slice	0.7	7	50
Butter	½ tbsp.	0.2	—	50
Apple sauce	⅜ cup	3.5	1	100
Sponge cake	piece 1½ in. ×1½ in. ×2in.	0.9	11	100
Russian tea	1 cup	—	—	—
Sugar for tea	½ tbsp.	0.3	—	30
				730
Dinner:				
Lentil-meat loaf	slice 1¾ in. × 2½×1½ in.	2.2	56	200
Tomato sauce	⅓ cup	2.5	5	100
Browned potatoes	1 medium potato	3.5	11	125
Boiled onions	2 onions	5.0	10	100
Bread	1 slice	0.7	7	50
Butter	½ tbsp.	0.2	—	50
Coffee jelly	½ cup	4.0	4	40
Whipped cream (sweetened)	1½ tbsp.	0.7	1	70
				735
Total for day			242	2035

Thin and Fat Women

FAT WOMEN

To eat out of proportion to one's need, either on the side of meagerness or superfluity, is culpable. Tables of normal weight for age and height should be consulted and effort made to maintain an approximately normal weight.[1] If ordinary eating habits result in this, as they should, we may rest assured that the diet is satisfactory as to quantity of fuel; if not, some attention should be given to the matter. The tendency to take on extra fat is apparently greater in women than men, and should be especially watched if hereditary. The only sure and healthful way to prevent it is to be abstemious in food. A pound of body fat means the storage of some 4000 Calories. The time to adjust the diet is when the tendency to store fat begins to appear. Once a great excess has accumulated, the problem of its removal without harm becomes more complicated; and extensive "reducing" should be carried on only under the supervision of a physician who can regulate the rate of fat loss according to the general health. But in the early stages of growing fat, careful weighing of food or "counting the Calories" will prove effectual and safe, but must be persisted in, perhaps throughout life. Suggestions in regard to the choice of food have already been given in Chapter III, but a dietary whose total fuel value is more likely to meet a woman's requirements is given below.

[1] See Table VI, Appendix, p. 430.

A Reducing Diet Suggested for an Overfat Woman

Fuel Value: 1052 Calories   Ordinary Requirement: 2200 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
Apple	1 medium	4.9	2	65
Egg	1 egg	2.4	27	75
Toast	1 slice	0.5	7	50
Coffee [1]	1 cup	—	—	—
Skim milk	1½ tbsp.	1.0	3	10
10.30 A.M:				
Bouillon	½ cup	4.0	10	12
Water cracker	1 cracker	0.1	1	10
Luncheon:				
Lean cold roast beef	medium serving	3.5	97	150
Rye bread	2 thin slices	0.7	7	50
Lettuce and cottage cheese salad				
Lettuce	ad libitum			
Cheese	2½ tbsp.	—	40	85
French dressing	½ tbsp.			
4.30 P.M:				
Tea with lemon [1]	1 cup	—	—	—
Water cracker	1 cracker	0.1	1	10
Dinner:				
Boiled cod with lemon	large serving	8.2	209	225
Boiled potato	½ medium	1.8	6	50
Cauliflower (plain)	large serving	3.0	6	25
Butter	1 tsp. (scant)	0.1	—	30
Watercress and egg salad				
Watercress	ad libitum			
Egg	1 egg	—	27	110
French dressing	½ tbsp.			
Orange	½ large	4.7	3	50
Black coffee	demi tasse	—	—	—
10.30 P.M:				
Hot skim milk	½ cup	4.3	16	45
Total for day			462	1052

[1] Saccharine may be used for sweetening if desired.

THIN WOMEN

Women of nervous temperament are apt to be too thin. They expend much energy in heightened muscular tension, and nervous disturbances quickly react on the alimentary tract, making it difficult to take or digest sufficient food. Only an intelligent persistence in taking regularly a supply of food in excess of immediate needs will result in a gain of weight. The removal, as far as possible, of nervous excitement or irritation and avoidance of great muscular exertion, limiting exercise to the lighter forms, are great helps in adjusting the balance between intake and outgo of energy. Food must be taken regardless of appetite, and often also regardless of minor digestive disturbances, for these do not necessarily signify that food is not going to be utilized finally. At the same time it is wise to choose food which can be taken without repugnance and which will digest with the greatest ease. Fluid foods are most easily taken when appetite fails, and make practical additions to the usual diet. Milk, which is so valuable a food, can be taken in many forms: hot, cold, with added cream or milk sugar, or both; in cocoa and chocolate; in sherbets and ice creams; as buttermilk, zoolak or kumiss; so that it is one of the easiest foods to add to the diet. Fruit juices from sweet fruits, or with their fuel value artificially increased by the addition of milk sugar, make agreeable and nutritious beverages.[1] Raw eggs are easily swallowed and give a good return for the effort

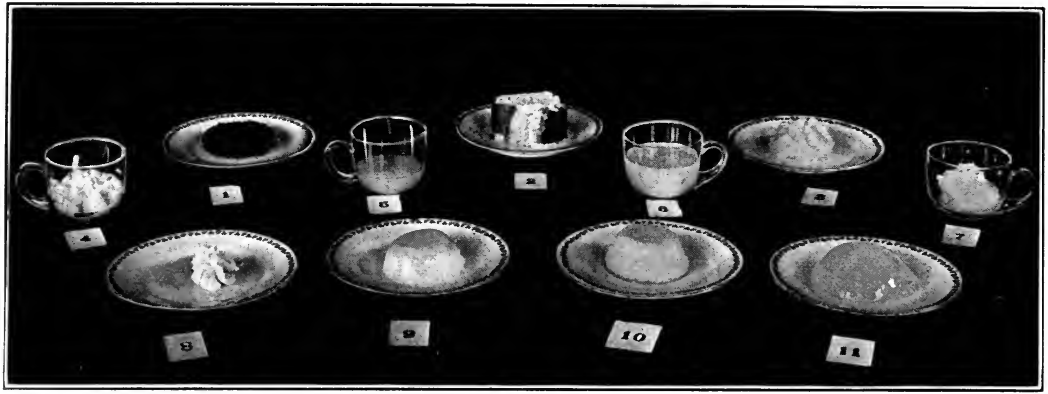
[1] See Lactose Lemonade, Table III, Appendix, p. 360.

made, whether taken plain or modified by being beaten up with milk, cream, or fruit juice. A little study of food values should make it possible to find acceptable ways of increasing the fuel intake. Three glasses of milk, added to the regular diet, will mean an increase of 500 or more Calories; an extra pat of butter taken at each meal will add 300 Calories. From one to three tablespoons of olive oil may be taken after each meal, increasing the fuel intake from 300 to 900 Calories. Very often the easiest way to increase the food intake is by one or two additional meals, *e.g.*, mid-morning and mid-afternoon lunches, or a morning lunch and a glass of milk or other nourishing beverage just before going to bed. This is especially true for women whose work is exhausting, so that they come to their regular meals "too tired to eat." It is hard to fatten an overworked person, but even a slight surplus over immediate needs, if persistently taken, will in time have its favorable effect on the general health and especially on the nervous system. To get the best results, considerable increases in the food intake should be maintained, with just enough exercise to promote a good appetite. One example of a fattening diet has already been given;[1] another, approximating a little more closely the average requirement of a woman, is presented on the next page.

The Protein and Ash Requirement

Just as the laws which control energy requirement operate in the same way for women as for men, so the

[1] See page 59.



100-Calorie Portions of Desserts [1]

	Food Material	Weight (oz.)	Measure
1.	Date pudding	1.1	Slice 3 in. diam., ½ in. thick
2.	Cottage pudding	1.1	Slice 2 in. × 2½ in. × 1¾ in.
3.	Rice pudding	3.1	½ cup
4.	Lemon milk sherbet	1.9	¼ cup
5.	Lemon sauce	1.5	⅛ cup
6.	Boiled custard	2.2	⅓ cup
7.	Vanilla ice cream	1.6	2½ tablespoons
8.	Hard sauce	0.6	1 tablespoon
9.	Cornstarch blanc mange	2.7	¼ cup
10.	Baked custard	3.3	⅓ cup
11.	Lemon jelly	3.8	⅓ cup

[1] Cf. Appendix, Tables I and III.

A FATTENING DIETARY SUGGESTED FOR A THIN WOMAN

Fuel Value: 3000 Calories Ordinary Requirement: 2200 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
Prunes	4 medium[1]	1.4 (dry)	3	100
Grapenuts	3 tbsp.	1.0	12	100
Egg	1 egg	2.4	25	70
Toast	2 slices	1.0	14	100
Butter	1 tbsp.	0.5	1	100
Cream, thin	¾ cup	5.4	15	300
Sugar	1 tbsp. (scant)	0.5	—	50
Coffee	1 cup	—	—	—
10:30 A.M.:				
Cocoa III[2]	⅘ cup	7.6	32	250
Luncheon:				
Corn chowder	⅗ cup	4.4	18	150
Fruit salad	1 serving	3.0	6	200
Roll	1 roll	1.3	12	100
Butter	1½ tbsp.	0.7	1	150
Chocolate blanc mange with	½ cup	5.4	18	200
whipped cream	2 tbsp.	0.9	2	100
4 P.M.:				
Egg in orange juice	1 egg, 3 tbsp. juice, 2 tsp. sugar	4.2	25	130
Dinner:				
Broiled steak	piece 3 in. × 1½ in. × ¾ in.	3.0	70	150
Scalloped potatoes	1 cup (scant)	5.2	13	150
Buttered beets	⅓ cup	2.0	3	50
Lettuce and tomato salad	1 serving	5.4	6	200
Salted almonds	12 nuts	0.5	13	100
Boiled custard	½ cup	3.3	20	150
Macaroons	2 macaroons	0.8	6	100
Total for day			315	3000

[1] Soaked 24 hours, then allowed to stand 24 hours to dry.

[2] Two tbsp. milk sugar instead of cane sugar. See Table III Appendix, p. 359.

requirements for protein and ash differ little for the two sexes under ordinary conditions. A woman requiring eight-tenths as much fuel as a man will probably need eight-tenths as much calcium and phosphorus and from two to two and one-half protein Calories per pound. She will probably need more iron because of the extra loss of this element in menstruation. Hence it is wise to see that the iron-bearing foods are supplied liberally. Fortunately salads of green vegetables and fruits are well liked by most women and constitute an easy way of introducing iron into the diet.[1]

Food for the Prospective Mother

Traditions in regard to food have a strong hold on the imagination in connection with those periods during which the unborn child or nursing infant derives its sustenance directly from its mother. Stuffing when food needs are not greatly increased, attributing mysterious influences to specific food materials, and supplying inadequate fuel when food needs are really very much increased are common errors due to lack of knowledge of the fate and function of foods.

It is reassuring for the prospective mother to remember that all food is broken down in the chemical processes of digestion and reorganized in the body according to its needs. Meat helps to build muscle, not because it is already in that form, but because when digested it yields amino acids (page 19) which the body can recom-

[1] See discussion of phosphorous, calcium, and iron contents of foods, pages 21–25.

bine into its own kinds of protein; the proteins of milk and eggs, and many of the proteins of vegetables will yield exactly the same kind of amino acids and hence serve equally well for constructing new muscle. Nature tries to promote normal development of the offspring even under adverse conditions; if materials for the growth of the baby are lacking in the food they will be drawn as far as possible from the mother's body. Thus if the diet be deficient in calcium and phosphorus for bone formation the mother's bones and teeth are likely to be the first to suffer loss, though, of course, a great scarcity is eventually likely to affect the baby.

For the most part, the same kinds of food which are well adapted to the mother under ordinary conditions will serve for the mother and child. Simple dishes, prepared from easily digested foods, should be adhered to for the sake of good digestion, without which any food will fail of its purpose. When the digestive tract is particularly irritable, considerable care must be exercised in this respect, bearing in mind that fatigue, anxiety, and constipation may be large factors in indigestion. The majority of mothers suffer in the early stages of gestation from nutritional disturbances familiarly spoken of as "morning sickness." The cause of the nausea and vomiting at this time is not in the stomach itself, but is due to the fact that the connection between the mother and the embryo through the placenta is not yet perfectly established, and a mild form of poisoning results from substances produced in the process of placenta formation getting into the general circulation. The disappearance of the morning sickness is an indication that the connection between mother and child which secures nourishment for the embryo from the mother's blood has been fully established, and from this time on the mother's appetite should steadily improve. Any special food requirements on the part of the developing child before the end of the fourth month of gestation have been shown to be practically negligible. Beginning with the fifth month, growth is increasingly rapid up to the time of birth, but the actual amount of building material needed day by day is not very large, nor even in the last weeks will the energy demands be increased more than 20 per cent, or one-fifth of the mother's usual daily supply. A woman of sedentary habits will then need from 2400 to 2800 Calories per day, while a woman who is usually active will probably be somewhat less so, and is seldom likely to require over 3000 Calories. The increased requirements for building material will be best met by the liberal use of milk and eggs, supplemented by fruit and green vegetables. Frequent small meals are often utilized to better advantage than a few large meals in the last two or three months; in fact, most of the suggestions which have already been given in regard to a fattening diet will be helpful in adjusting the food intake at this time.

The day's diet should include:

1. A cereal made from the whole grain, as rolled or cracked oats or wheat, wheatena, barley, puffed wheat; these to be served as breakfast cereals thoroughly cooked, or in simple puddings.

2. Milk, from a pint to a quart or more per day. This may be used as a beverage with meals, or between meals, or employed in making cocoa, custards, and other dishes. Sweet milk may be replaced by buttermilk, zoolak, malted milk, kumiss, etc., according to preference.

3. Fruit, as oranges, apples, prunes, raisins, figs, dates, or other easily digested kinds, fresh or dried, cooked or raw. Fruit juices may be substituted for the whole fruit, especially where digestion is disturbed.

4. A green vegetable, as spinach, peas, beans, lettuce, celery, cabbage, onions, etc. These may be served as salads, buttered, creamed, or in soups. When cooked, the cooking water should be used if possible, because it contains a large part of the ash constituents. Pea and spinach soups made with milk are often useful when digestion is poor.

5. Meat, fish, or some substitute such as eggs or cheese, once a day.

6. Butter, olive oil, bacon, peanut butter, or oleomargarine in moderate quantities to add to the fuel value of the diet. For the sake of ease of digestion, these are best used in their simplest form, on bread, with potatoes, rice and the like, rather than in the making of rich sauces and gravies. The food plan already given for a sedentary woman can easily be modified to yield 2700 to 2800 Calories by adding a pint of milk, a couple of eggs, two small tablespoons of butter, and a piece of sweet chocolate. The food plan and dietary for an active woman will be suitable when digestion is good, and the fuel value can be easily increased by the use of

milk or eggs, which, as already indicated, also give desirable increases in building material.

Where cost must be carefully considered such menus as the following may prove useful:

I

BREAKFAST: Oatmeal, milk and sugar
Whole wheat bread and butter or butterine
Cereal coffee or coffee, with an equal amount of hot milk added, or cocoa made with milk
Stewed prunes

LUNCHEON: Lentil and tomato soup
Cold corned beef
Whole wheat bread, butter or butterine
Tea or coffee (one-half milk), or cocoa

DINNER: Lamb stew with vegetables (carrots, potatoes, onions)
Whole wheat bread, butter or butterine
Custard pie
Tea or coffee (one-half milk), or cocoa

II

BREAKFAST: Wheatena, milk, sugar
Dates, graham bread and butterine
Coffee (one-half milk), or cocoa

LUNCHEON: Macaroni and cheese
Stewed tomatoes
Graham or rye bread and butterine
Coffee (one-half milk), or cocoa

DINNER: Bean or lentil loaf
Boston brown bread
Stewed onions
Apple betty, milk and sugar
Coffee (one-half milk), or cocoa

III

BREAKFAST:	Cracked wheat, milk and sugar
	Rye bread and butter
	Coffee (one-half milk)
	Apple
LUNCHEON:	Vegetable soup with crackers
	Whole wheat bread and peanut butter
	Figs (may be stewed)
	Cocoa or coffee
DINNER:	Corned beef hash
	Stewed cabbage
	Whole wheat bread and butterine
	Rice or tapioca pudding (made with milk, molasses, and raisins)
	Coffee (one-half milk), or cocoa

These menus may be supplemented by a cup of gruel or milk, with graham or whole wheat crackers, if an extra meal is desired.

Food for the Nursing Mother

It has been shown by calorimetric experiments that the total energy requirement of mother and child just after birth is almost exactly the same as the total requirement just before birth. But the normal healthy baby grows rapidly and makes increasing demands upon his food supply. A baby a month old will take, on the average, two and one-third ounces of mother's milk per day for each pound of body weight, a twelve-pound child thus receiving about 28 ounces of milk in twenty-four hours. Since an ounce of mother's milk yields on the average 20 Calories, the total day's fuel supply for such a child will be 560 Calories. But making milk is hard work; it is believed that about two Calories of extra food are necessary to produce one of milk, so that the above daily milk supply will demand an addition of some 1120 Calories to the mother's ordinary energy intake, or in general we may make the following estimates of the increased requirement:

Additional fuel requirements for nursing a baby

First 3 months . .	90 Calories per pound of infant's weight
Second 3 months .	85 Calories per pound of infant's weight
Third 3 months . .	80 Calories per pound of infant's weight
Fourth 3 months .	70 Calories per pound of infant's weight

This means that a woman of average weight and sedentary occupation will require while nursing a baby as much food as a laboring man doing moderately heavy muscular work, *i.e.*, 3000 to 3500 Calories per day; while a woman at the same time employed in moderately active physical labor will need as much as a man doing severe muscular work, or from 3500 to 4000 Calories per day.

Not only is there this marked increase in the energy requirement, but the construction of milk demands extra quantities of such important materials as protein, calcium, phosphorus, and even iron. Studies with cows show that the efficiency of milk protein for the production of a new milk supply is about 60 per cent. Such data indicate that the mixed diet ought to supply at least two protein Calories for each one withdrawn in the mother's milk, and milk itself must be considered one of the most desirable foods for milk production. On this basis, from three to four protein Calories should be allowed for every ounce of milk produced.

For a woman supplying 28 ounces of milk per day, there should be an increase over the average consumption of 17 per cent in iron, 20 per cent in phosphoric acid, and 76 per cent in calcium oxide. In other words, the most marked increase as regards ash is in the calcium requirement. This again is most easily met by milk, and also most economically, considering that milk supplies at the same time efficiently used protein. Two hundred Calories of milk in addition to the ordinary mixed diet will cover the extra requirement for calcium and phosphorus for 28 ounces of human milk, while 50 Calories of lean beef, 10 of spinach, or one egg yolk will meet the additional need for iron. This shows that with a little care in the selection of foods there need be no danger of shortage of these important elements.

The general plan of diet suggested for the prospective mother[1] may be followed by the nursing mother and the dietaries for thin men and women[2] will be suggestive as to how to keep up the fuel value of the diet. Since foods are broken down in the digestive tract and made over in the body, it is absurd to think that particular foods have specific effects upon the character of the milk. Any wholesome diet, ample in fuel and building materials, is suitable for good milk production. At the same time it must be borne in mind that the mammary glands are very sensitive to

[1] See page 90.

[2] See pp. 59 and 87.

nervous influences, and disturbances of digestion react very unfavorably upon the milk-secreting mechanism. Therefore any food which is known to disagree with the mother, or whose effect is doubtful, should be refrained from. And since the increased demands for food make the work of the digestive tract extraordinarily great, there is more danger than usual of an upset, and the diet should be correspondingly simpler and easier of digestion. Excitement, worry, fatigue, chill, constipation, all react quickly and unfavorably upon the milk secretion, and must be carefully guarded against. Successful nursing demands a quiet, contented life, in which food is carefully chosen, and exercise, fresh air, and mental diversion are provided in due moderation. For the few months which are so critical in the life of the baby, less important interests must be set aside, even those of other members of the family who can better afford a little neglect.

A very simple, inexpensive dietary, adapted to the fuel requirements of the nursing mother also engaged in physical labor, from one of the menus on page 92, is given below.

In addition to regular meals, a glass or bowl of hot milk, malted milk, gruel or eggnog taken just before nursing the baby in mid-morning or mid-afternoon is often beneficial.

A Day's Dietary for a Nursing Mother Also Doing Moderate Muscular Work

Fuel Value: 3595 Calories — Cost: ¾–1¢ per 100 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
Oatmeal	1½ cups	12.0	25	150
Milk	⅝ cup	5.1	19	100
Sugar	1 tbsp. (scant)	0.5	—	50
Whole wheat bread	3 slices	2.1	24	150
Butterine	¾ tbsp.	0.4	—	75
Cocoa II [1]	⅘ cup	7.6	32	200
Stewed prunes	5 prunes and juice	6.0	4	200
Luncheon:				
Lentil and tomato soup	1⅓ cups	13.4	56	200
Cold corned beef (with fat)	small serving	2.0	42	200
Whole wheat bread	4 slices	2.8	32	200
Butterine	1½ tbsp.	0.7	1	150
Milk for tea	⅓ cup	2.6	10	50
Sugar for tea	2 tsp.	0.3	—	35
Doughnut	1 doughnut	1.6	12	200
Tea	1 cup	—	—	—
Dinner:				
Lamb stew with vegetables	2 cups	17.0	67	350
Whole wheat bread	4 slices	2.8	32	200
Butterine	1½ tbsp.	0.7	1	150
Custard pie	1 large piece	7.6	36	400
Milk for tea	⅓ cup	2.6	10	50
Sugar for tea	2 tsp.	0.3	—	35
Lunch at Night:				
Bread	3 slices	1.9	21	150
Butterine	1 tbsp.	0.5	1	100
Peanut butter	2½ tsp.	0.6	19	100
Milk	⅝ cup	5.1	19	100
Total for day			463	3595

[1] See Table III, Appendix, p. 358.

CHAPTER V

FOOD FOR THE BABY

HAPPY the baby who enjoys his inalienable right to Nature's food supply — his own mother's milk! His chances of a long and healthy life are immensely greater than those of the poor child who has to be artificially fed. In case of misfortune depriving him of his natural food supply, the best substitute is the milk of some other healthy woman with a baby of approximately the same age, but unfortunately this kind of substitute is not readily commanded by the average family, and the faithful cow has usually to be relied upon when the normal supply is cut off. That such a substitute is far from ideal, statistics make perfectly clear. A study of nearly 50,000 babies born alive in Berlin in 1890 showed that about one-fourth of these were dead at the end of the first year, of whom one in two was bottle-fed and only one in 13 breast-fed. That the baby not only has a better chance of surviving the perilous first year, but of growing to manhood as well, was made evident in a hygiene exhibition recently held in Dresden, in which it was shown that in 24 families with 109 children, all breast-fed, not one was dead at the end of five years; while in 33 families in which the babies were all bottle-

Courtesy of the New York Milk Committee.

TWELVE, THIRTEEN—*FOURTEEN* POUNDS

fed one or more had been lost in each family in the same period. In another group of 79 families, in which 85 of the children were breast-fed and 109 bottle-fed, all the breast-fed children were alive at the end of eleven years, while more than half (57 %) of the bottle-fed babies were dead. In a study recently made in New York City of the relative danger to babies of dirt, flies, and artificial feeding, it was quite evident that artificial feeding was, of the three, the worst enemy to baby life. Such evidence makes clear the importance of a mother's making every effort to start the baby right and give him a fair chance to live and thrive. Every month of breast feeding is to be regarded as so much gain for the baby. If the milk supply is insufficient, it may be necessary to give additional food, but this does not justify the discarding of the natural food so far as it is available. Only when it fails entirely, or there is some serious disturbance of the mother's health which makes nursing unwise, or when there is persistent failure on the part of the baby to digest the milk, should artificial feeding be adopted as the sole means of sustenance.

Good breast feeding cannot be done carelessly, however. The mother must take the best possible care of herself, eating wholesome food in sufficient amounts, as outlined in Chapter IV; leading a regular, hygienic, peaceful life as far as she is able, in order to maintain a full and uniform milk supply. She must keep in mind that upon her rests the responsibility for the healthy development of her baby; must avoid indigestible food, or food that spoils her appetite so as to prevent suffi-

... quantities of food being taken; must have regular hours for meals and rest; get fresh air and exercise, but avoid fatigue and overwork; keep her mind pleasurably occupied while avoiding excitement; and, finally, she must feed the baby according to a definite schedule.

A healthy baby grows fast. During the first six months he should double his birth weight, and by the end of the year triple it. He must not only digest food for this rapid body building, but he must have energy for the daily maintenance of his internal and external body activities besides, the result being that he has to take care of much more food in proportion to his weight than an adult does, and any upset in digestion is a very serious matter. Hence, anything in the mother's life which might disturb her steady production of wholesome milk must be avoided, and anything in the baby's life which might cause indigestion. He must have plenty of sleep and be allowed to lie quietly by himself when awake, have plenty of fresh air to breathe and clothing which will give him a chance to exercise his arms and legs freely, so that he need not get all of his exercise by crying. Above all, he must get his meals regularly. With definite hours for feeding, the quality of the milk is more uniform, and the baby's alimentary tract responds better to the food. The stomach needs an interval of rest between meals, and the secretions of the alimentary tract are strongly influenced by habit, pouring out more freely under the stimulus of regular feeding. The appetite is less fickle, too, when meals come at definite times. "Meals by the clock" is one of the first rules of successful feeding.

What the schedule shall be depends somewhat upon circumstances. Probably the best practice up to the time a child is three months old is to feed every three hours through the day and once at night — seven feedings in the twenty-four hours; *e.g.* at six and nine A.M., noon, three, six, and nine P.M., and midnight. After the child is three months old no night feeding need be given unless the baby wakens. From the fourth to the sixth month there may be six feedings, three and one-half hours apart; six and nine-thirty A.M., one, four-thirty, and eleven-thirty P.M., and after that five feedings; six and ten A.M., two, six, and ten P.M.

Suggested Schedule for Infant Feeding

	Number of Feedings Per Day	Hours for Feeding	
		A.M.	P.M.
First 3 months	7	6, 9, 12	3, 6, 9, 12
4th, 5th, and 6th months	6	6, 9:30	1, 4:30, 8, 11:30
7th, 8th, and 9th months	5	6, 10	2, 6, 10

If the baby is delicate, shorter intervals between feedings are sometimes prescribed, but never less than two hours; if very sturdy, four-hour intervals are sometimes adopted at the very start. Such schedules should be arranged under the advice of a competent physician. Strict observance of the schedule determined upon is more important than the exact interval between feedings or the number of feedings in the day, but in general long intervals promote good digestion better than do short ones.

If the baby frets between meals he should be given cool (not cold) boiled water from a bottle or spoon — nothing else. Pacifiers are to be strictly avoided. They spoil the shape of the mouth and are bad carriers of germs; the constant sucking is undesirable for many reasons and swallowing air causes gastric discomfort.

After meals the baby should be placed upright and patted very gently for a moment or two to bring up the "gas" (generally air) which he may have swallowed, then laid in his crib to rest quietly and soon go to sleep. His chief business in life is to grow. He is not to be considered a source of entertainment, nor should efforts be made to amuse him. The healthy baby when awake will play quietly by himself and not get over-excited nor exhausted.

The Energy Requirements of the Baby

The baby requires fuel for his life processes just as an adult does, but these processes are more rapid in the child than in the adult, so that even when lying quietly he needs more fuel in proportion to his weight than he will require later in life. From calorimetric studies it has been found that babies asleep in bed beside their mothers, who were awake, give off nearly two and one-half times as many Calories per pound as the mothers. An allowance of from 30 to 35 Calories per pound is necessary merely to keep a baby alive.

Babies cannot lie quietly all the time, however. If they are to grow and acquire strong muscles they must have exercise, which they get by crying, kicking, pounding with their fists, and other movements. This means work, requiring a further supply of energy. A five-months-old baby has been shown to double his energy expenditure by the effort of crying. Active children really work as hard as any adult manual laborer.

Furthermore, a baby is constantly storing food materials in his body in the process of growth. Every day as much as 12 to 15 per cent of the Calories represented in his food may be used in this way. All the energy demands of the baby — (1) for the maintenance of life processes, more rapid than in the adult, (2) for muscular activity, often great, and (3) for storage in growth — make the infant's total energy requirement during the first three months of his life about 50 Calories per pound per day. As he grows older, the requirement for internal activities becomes gradually less in proportion to body weight, the rate of growth falls, and therefore the total requirement for the second three months is about 45 Calories per pound per day; for the third three months about 40 Calories per pound per day, and for the last three months of the first year about 35 Calories per pound per day.

In the case of the breast-fed baby, we judge the feeding to be successful when he makes steady gains in weight, averaging about eight ounces a week in the early months, and falling gradually to about four ounces a week; and when by quiet sleep, absence of fretfulness, and other signs of health he shows that his diet agrees with him.

Artificial Feeding

Unfortunately there will always be some babies deprived more or less completely of their natural food. Mothers with the best of intentions sometimes fail to produce milk, or furnish an inadequate supply, and other causes may rob the baby of his birthright. For such children a substitute for the natural food must be provided. Nothing can take the place of milk for this purpose, even though it be milk from another species of animal, such as the cow. Milk contains everything needed for growth, and while the proportions of building materials vary with the natural rate of growth of the species, — milk for the puppy that doubles its weight in nine days having more protein and ash per quart than milk for the calf that doubles its weight in 47 days, and this in turn having more building materials per quart than milk for the human baby that doubles his weight in 180 days, — the main point is that these substances are present in forms which the human child can use better than any others, provided he can be made to digest the strange food.

The ordinary problem in artificial feeding is, therefore, one of adapting cow's milk to the digestive tract of the baby and at the same time providing, as far as possible, a normal supply of fuel and building material. There are many special devices by which these objects can be attained, and the wise physician adopts the one which seems best suited to the individual case. For home use, when there is no expert to direct the feeding, the simplest plan is to take rich, well-mixed, whole milk, containing from four to five per cent of fat, and prepare it according to the following scheme:[1]

Scheme for Whole Milk Feeding During the First Year

1st day	1 to 2 ounces of water every 4 hours.
2d to 4th days	3 ounces of milk, 7 ounces of water, 2 teaspoonfuls of milk sugar,[2] divided into 7 feedings.
5th to 7th days	4 ounces of milk, 8 ounces of water, 3 teaspoonfuls of milk sugar, divided into 7 feedings.
8th day to end of 3d month	Beginning with 5 ounces of milk, 10 ounces of water, and 1½ tablespoonfuls of milk sugar, increase the milk by ½ ounce every four days; the water by ½ ounce every eight days; the milk sugar by ½ tablespoonful every 2 weeks. Thus on the 16th day give 6 ounces of milk, 10½ ounces of water, 2 tablespoonfuls of milk sugar, divided into 7 feedings; on the 20th day increase the milk to 6½ ounces, using 10½ ounces of water and 2 tablespoonfuls of milk sugar as before.
Beginning of 4th month to end of 6th month	At the end of the third month the baby will be getting approximately 16 ounces of milk, 16 ounces of water, and 4½ tablespoonfuls of milk sugar, divided into 6 feedings. Now increase

[1] Adapted from Holt and Shaw's *Save the Babies*, published by the American Medical Association.

[2] Malt food (dextrimaltose, for example) may be substituted for part or all of the milk sugar.

the milk by $\frac{1}{2}$ ounce every 6 days, reduce the water by $\frac{1}{2}$ ounce every 2 weeks, using $4\frac{1}{2}$ tablespoonfuls of milk sugar per day.

If the food does not digest readily, barley water may be used instead of the plain water. It is made by cooking $\frac{1}{2}$ tablespoonful of barley flour in the water for 20 minutes and cooling before adding to the milk.

Beginning of 7th month to end of 9th month

At the end of the 6th month the baby will be receiving about 24 ounces of milk, 12 ounces of water, and $4\frac{1}{2}$ tablespoonfuls of milk sugar daily, divided into 5 feedings. Now increase the milk by $\frac{1}{2}$ ounce every week, reduce the water by $\frac{1}{2}$ ounce every 2 weeks, and reduce the milk sugar to 3 tablespoonfuls per day. Midway between two of the morning feedings give from 1 to 2 tablespoonfuls of strained orange juice. This helps to keep the bowels in good condition and serves as a safeguard against scurvy when pasteurized milk is fed exclusively. If barley flour has not been used earlier, it may be advantageously introduced during this period, cooking $1\frac{1}{2}$ tablespoonfuls of the flour with the water for the day, and gradually increasing to 3 tablespoonfuls.

Beginning of 10th month to end of 12th month

At the end of the 9th month the child will be receiving about 30 ounces of milk, 8 ounces of water cooked with 3 tablespoonfuls of barley flour, 3 tablespoonfuls of milk sugar, given in 5 feedings, and from 1 to 2 tablespoonfuls of orange juice between two morning meals. Now increase the milk 1 ounce per month, decrease the milk sugar 1 tablespoonful per month, and add barley gruel made with 3 tablespoonfuls of barley flour cooked in 8 ounces of water. Continue the use of the orange juice, which may be increased to 3 tablespoonfuls if the bowels are not loose.

After one feeding, the soft yolk of an egg may be fed warm, with a spoon, or a small piece of stale bread crust be given to chew. No other foods should be given during the first year.

If the baby is much above average weight he may require a little more food than that provided in the preceding plan. For the first eight months he should average one and one-half ounces of milk for every pound of body weight per day, and from then till the end of the first year from one and one-third to one and one-fourth ounces per pound per day. This insures adequate protein for body building.

Dilution with water is the simplest means of making milk easier of digestion, but this brings down the fuel value of the food as taken by the baby, whose capacity is limited by the size of his stomach and the necessity for time between meals to digest his food. Since cow's milk is richer in protein in proportion to fat and carbohydrate than human milk, some of the fuel value can be regained by the addition of milk sugar throughout the nursing period, and after the first two or three months by barley or other cereal gruel, without increasing the difficulty of digestion. In fact, the use of barley water in the first three months is primarily to make digestion easier. The suggested schedule, outlined above, will supply fuel per day as follows:

At the end of the first month	30 Calories per pound
At the end of the third month	41 Calories per pound
At the end of the sixth month	43 Calories per pound
At the end of the ninth month	40 Calories per pound

The addition of orange juice, barley flour, and egg yolk will raise the fuel value from the sixth month to the end of the nursing period to about 45 Calories per pound.

Comparing these figures with the baby's actual energy requirements,[1] it is noticeable at once that the food supply during the first month is far below what a normal baby gets when taking mother's milk, and is barely enough to supply his daily needs for energy, with little or no surplus for gain in weight. But it is absolutely essential that the baby digest his food if it is to do him any good, and it is unwise to overtax his stomach while he is getting used to the artificial food. Hence we must increase the strength of the feedings gradually and try to make up later for these early deficiencies. After the first two weeks if digestion is good, the fuel value might be raised by increasing the milk one-half ounce every three instead of every four days up to the end of the third month, after which the energy supply is adequate for normal growth. Very rapid increase in weight is to be regarded as a doubtful good, especially on artificial food; small, steady gains are less likely to be followed by nutritional disturbance later.

Another way of raising the fuel value of diluted whole milk is by increasing the proportion of fat. Healthy

[1] See page 103.

babies are very successfully fed by starting with milk which is richer than the whole cow's milk. A quart bottle of milk is allowed to stand five or more hours for the cream to rise, and then the richer milk from the top is removed ounce by ounce by means of a Chapin dipper, the required quantity thoroughly mixed, diluted as desired, and milk sugar or malt food added. This is known as the Top Milk Method. A series of progressive formulas, illustrating the use of this method, is given below.

Top Milk Formulas

I. From the 3d to the 10th day:

Top milk (upper 10 ounces)	3 ounces
Water	11 ounces
Milk sugar	1 tablespoonful

7 feedings of 2 ounces each

II. From the 10th to the 20th day:

Top milk (upper 10 ounces)	4 ounces
Water	10 ounces
Milk sugar	1 tablespoonful

7 feedings of 2 ounces each

III. From the 20th day to end of 1st month:

Top milk (upper 10 ounces)	6 ounces
Water	12 ounces
Milk sugar	2 tablespoonfuls

7 feedings of $2\frac{1}{2}$ ounces each

IV. Second month:

Top milk (upper 12 ounces)	8 ounces
Water	13 ounces
Milk sugar	3 tablespoonfuls

7 feedings of 3 ounces each

V. Third month:

Top milk (upper 16 ounces)	12 ounces
Water	14 ounces
Milk sugar	3 tablespoonfuls

7 feedings of $3\frac{3}{4}$ ounces each

VI. Fourth month:

Top milk (upper 16 ounces)	14 ounces
Water	16 ounces
Milk sugar	3 tablespoonfuls
Barley flour	1 tablespoonful

6 feedings of 5 ounces each

VII. Fifth month:

Top milk (upper 20 ounces)	18 ounces
Water	18 ounces
Milk sugar	3 tablespoonfuls
Barley flour	1 tablespoonful

6 feedings of 6 ounces each

VIII. Sixth and seventh months:

Top milk (upper 20 ounces)	20 ounces
Water	15 ounces
Milk sugar	3 tablespoonfuls
Barley flour	2 tablespoonfuls

5 feedings of 7 ounces each

From one to two tablespoonfuls of orange juice once a day, between two morning feedings [1]

IX. Eighth month:

Top milk (upper 24 ounces)	24 ounces
Water	$13\frac{1}{2}$ ounces
Milk sugar	$4\frac{1}{2}$ tablespoonfuls
Barley flour	3 tablespoonfuls

5 feedings of $7\frac{1}{2}$ ounces each

Orange juice once a day, between two morning feedings

[1] With artificially fed babies orange juice is often given a month or two earlier than this.

X. Ninth month:

Whole milk	30 ounces
Water	10 ounces
Milk sugar	3 tablespoonfuls
Barley flour	3 tablespoonfuls

5 feedings of 8 ounces each

Orange juice once a day, between two morning feedings

These formulas will give approximately the following amounts of fuel per day:

At the end of the 1st month	35 Calories per pound
At the end of the 3d month	43 Calories per pound
At the end of the 6th month	45 Calories per pound
At the end of the 9th month	43 Calories per pound

For the remainder of the first year the feedings will follow the directions already given on page 106.

No scheme of feeding can be followed slavishly. Babies show individuality in their capacity for food as in other respects; frail babies cannot be advanced to stronger food and larger quantities as fast as hardy ones. When in doubt, go slowly. Overfeeding is as harmful as underfeeding — so far as the digestive system is concerned, it is likely to be more so. When signs of indigestion appear, it is well to reduce the strength of the food temporarily. The two types of feeding schedule given illustrate the general principles of all successful artificial feeding:

Regular meal times;

Gradual increases in strength and amount of food;

Giving less than the full energy requirement at first, and making up the deficiency later;

Supplementing the iron in the milk by egg yolk (and orange juice) as the normal time of weaning approaches;
Giving orange juice to prevent constipation and possible scurvy;
Using barley flour made into gruel to promote ease of digestion, primarily in the early months; to add also to the food value of the diet in the later months.

Care of the Baby's Food

Only clean milk should be bought. Fresh milk is best when one can be sure that every precaution has been taken to keep it clean and cold and free from harmful or excessive bacteria. Nature provides fresh sterile milk for the young; if they are deprived of this, it is their right to have the best obtainable substitute. "Laboratory" and "certified" milk are guaranteed to be wholesome. In the country, one should know the conditions under which the milk is produced, and buy only that which is clean and kept cold from the time of milking. Pasteurized milk must be used when there is danger of contamination, but pasteurized milk has changed somewhat by heating and if used exclusively should be supplemented as early as possible by orange juice, as a precaution against scurvy. Sometimes it is necessary to use boiled milk, to avoid all possible danger of bacterial poisoning, but if its use is long continued, it is even more important that some uncooked food be added to the diet.

All milk must be protected from contamination at home; kept in a cold place and covered. Food for the baby should be made up for one day at a time, each meal put into a clean feeding bottle (washed with hot soda water and boiled in clear water for twenty minutes), stoppered and kept cold till used. Just before feeding it can be warmed in hot water. Any food left over should be thrown away. A thermos bottle should never be used to keep the milk warm. Germs are likely to grow in the milk under such conditions and it may make the baby sick. Nipples must be thoroughly scrubbed inside with soda water after use, and kept in a covered bowl of borax water, ready for use.

If there is the least doubt about the quality of the milk, it should be pasteurized at home. The feeding bottles can be set in a wire rack and this in a deep saucepan, full of cold water. When the water boils, the pan is to be removed from the stove, but the bottles left standing in the hot water twenty minutes, after which they should be cooled as rapidly as possible with cold water and placed on ice.

Use of Proprietary Infant Foods

In spite of all one may say about the value of clean, fresh cow's milk, properly prepared, for the baby, the mother's faith is often shaken by glowing advertisements of patent infant foods and she is tempted by their convenience to give credence to their flaunted virtues. In composition they differ widely, some of them consisting of dried milk mixed with a certain amount of sugar, or dextrin and maltose, to be used with water without cooking; others consisting of dried milk mixed with sugar and baked wheat flour, to be used with water but requiring cooking; and a large group made chiefly from wheat or barley flour, sometimes simply baked and sometimes more or less completely changed into dextrin and maltose; none of these last should be used as a steady diet without the addition of milk.

It becomes evident at once that such foods cannot be used intelligently without information as to their composition. It is impossible to make the necessary adaptation of food to the growth of the individual baby simply by following directions on the label of a box of food. Those not requiring the addition of milk are to be criticized because they deprive the baby of *fresh* food, and because they often contain but little fat and ash, while they have a very high percentage of carbohydrate. This means that the baby may have his fuel needs met without getting proper building material; the result is an increase in weight, often beyond the normal, as a result of the high carbohydrate feeding. The body stores water and fat instead of building muscle and bone, looks fat but succumbs quickly in case of illness, losing weight with great rapidity; and is liable to trouble from soft or brittle bones, which have to bear too much weight for their strength.

The foods designed to be used with milk serve the same useful purpose as plain barley or other cereal flour made into gruel, provided sufficient quantities of milk are used. Those which are dextrinized are convenient because they go into solution readily, but barley can be easily dextrinized at home with any reliable preparation of diastase, and usually at much less expense.

Food after Weaning

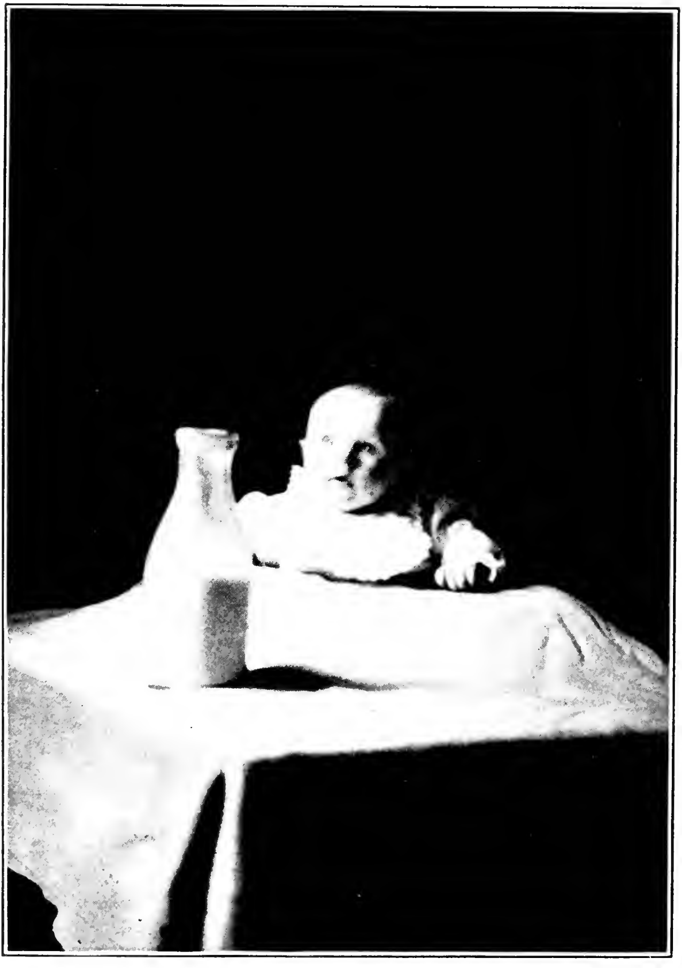
If the baby has had the good fortune to be nursed by his mother, the problems of preparing other food for him are delayed normally until about the ninth month, and if the mother is strong and well and the baby thriving, even to the twelfth month. Nursing after the end of the first year is seldom desirable unless to avoid weaning in hot weather. The quality of the milk is apt to deteriorate, and the baby begins to need iron in larger quantities than furnished in milk. He comes into the world with a special store of this precious material of growth — three times as much being found in his body in proportion to his weight as in the full-grown adult. But by the end of the first year, having tripled his original weight, and having received only a very small daily supply of iron in his milk, he needs to have this diet supplemented by such easily digested iron-bearing foods as yolk of egg and orange juice. The period from the ninth to the fifteenth month may be regarded as one of transition from mother's milk to other food. The best substitute with which to begin is cow's milk. This will not tax the baby's digestive tract as severely as it would have in the very early months of his life; still, it is a strange food, and care must be taken to make it easy of digestion. For this reason it should be diluted, preferably with barley gruel, and following the directions for artificial feeding of a baby one or two months younger (page 106). If possible, weaning should be done gradually, giving at first one feeding from a bottle in place of a nursing, and increasing the number of bottle feedings until the baby is entirely weaned at eleven or twelve months. This means less shock to his digestive system than if his food be suddenly changed entirely. When the baby digests the diluted milk well, the amount of gruel can be gradually decreased and a tablespoonful or two of strained cereal be given with a spoon twice a day. Most children can digest plain whole milk by the end of the first year if weaning has begun in the ninth or tenth month. If at all possible, weaning in the summer time should be avoided, as change of food is likely to cause some digestive disturbance which will be increased by the hot weather, and market milk in hot weather is seldom in quite so good condition as in cold. As soon after the eight or ninth month as the baby becomes accustomed to taking cow's milk, he should be given from one to three tablespoonfuls of strained fruit juice once a day unless he has trouble with loose bowels. By the time he is ten months old he may have a soft egg yolk to give him iron, and a small piece of stale bread crust or zwiebach to chew, immediately after his milk feeding.

At the end of the first year, whether a baby be breast or bottle fed, he should have reached the point where he drinks plain warm cow's milk from a bottle,[1] taking about one quart a day, one to three tablespoonfuls of strained, mild fruit juice once a day, the yolk of an egg

[1] The bottle is preferable to the cup, because the child will drink more slowly and the mother can tell more accurately just how much he has taken.

about once a day, two or three tablespoonfuls of thoroughly cooked, strained cereal daily (given at one or two meals), and a piece of stale bread, crisp toast or zwiebach to chew at least once a day. The milk provides the great bulk of his food. The fruit juice is partly to keep his bowels in order, partly to help in accustoming him to other foods besides milk, and partly to give him more iron than the milk affords. The cereal jelly serves as a good introduction to other foods which have to be eaten with a spoon, and also helps to keep a good proportion between the protein and the other fuel foods (fat and carbohydrate) in the diet. Cow's milk alone has too high a proportion of protein to be quite ideal for the slow-growing human child, although perfectly suited to the quick-growing calf. Toast or other forms of dry, hard bread give exercise to the jaws and help to develop good teeth later, while serving as a means of teaching the important habit of mastication. Nothing else is needed to keep the baby healthy and no risk of upsetting his digestive tract should be run by adding other foods. Because a baby is not made violently ill by meat, tea, coffee, sweet crackers, and what not, it does not follow that he has not been injured. Even the perversion of his appetite, so that he does not desire the foods which are best for him, is a serious matter, though the results are not immediately apparent.

The child's chief business in life in his early years is to grow strong and develop good habits. This applies not only to eating, but to sleeping also. Regular hours, regular supplies of carefully chosen food, and plenty of fresh air mean not only the development of sturdy legs and rosy cheeks, but of a strong digestive tract able to stand the inevitable strains of later life. Good growth of muscles and nerves in this part of the body cannot be seen directly, but they count tremendously when the whole life is in review. One year of good feeding at the beginning of life is more important than ten after forty, and a baby's needs are not to be judged by an adult's inclinations. Feeding must be a matter of principle and not of impulse, and the reward will be partly in the present — much more in the future.



A Quart of Milk a Day

CHAPTER VI

FOOD FOR THE TWO-YEAR-OLD CHILD

THE feeding of the baby during the first nine or ten months of its life is so important for its welfare that nature does not willingly entrust it to anyone but herself. The sensitive, rapidly-growing digestive tract is confined to a single food material, ideally adapted to its needs. By the end of the year the digestive apparatus is ready for new tasks; teeth demand material for chewing, the body store of iron is used up, the mother's milk deteriorates, and there is every indication of readiness for more kinds of food in the diet. But we must not assume that the year-old child is ready for the diet of an adult. Statistics from cities where the mothers generally nurse their babies show that the mortality rises at the end of the first year, when the diet changes. The still delicate digestive tract is given tasks far too great for it; as if a year-old child were asked to chop down a tree or run a race! The fundamental principle in child feeding is to *develop the digestive powers gradually.* The woes of the "second summer" and "teething" are very largely the result of an unwise choice of diet. To boast that a fifteen-months-old baby "eats everything" is not a tribute to its precocity, but to the ignorance or culpable negligence of its mother. With a carefully regulated diet, the second year is less perilous than the first.

Feeding during the Second Year

At the end of the first year the main part of the diet is cow's milk to the amount of nearly a quart a day. It should remain the chief staple throughout the second year, from three cups to a quart being given daily. Scientific study of milk has year by year emphasized its value as a food for growth; its proteins contain nitrogen in ideal forms for cell and muscle building; its fat carries some constituent essential to growth; its supplies of calcium and phosphorus are ample for bone construction; its iron compounds although present in small amount are of high value; its supply of other building and regulating ash constituents is liberal; and its ease of digestion insures utilization of these valuable elements. To cut down the supply of milk after the period of infancy is a great mistake; even chickens grow larger and healthier when milk is made a part of their diet. The same care to have it clean and fresh should be taken as in the first year.

During the first two or three months of the second year, cereals in the form of gruel may still be added to the milk, up to about one-third of its volume. But if whole milk can be digested readily, it is time to give the cereal food separately in the form of a "jelly." This is made by cooking rolled oats, wheat, or other cereal very thoroughly (four to six hours), as for ordinary breakfast food, and then putting it through a fine strainer. From one-half an ounce to an ounce of dry cereal cooked in this way can be given in a day, in one or two meals. After two or three months of strained cereals, the finer varieties, such as farina and wheatena, may be given unstrained; and, subsequently, any thoroughly cooked cereal may be fed without straining. Thus the principle of *gradually* training the digestive tract to take care of solid food and of food containing some indigestible material (cellulose) is carried out. Preference should be given to cereals made from the whole grain on account of their richer supply of ash. Oatmeal seems to be one of the most valuable cereals for growth, and, unless there is a tendency to looseness of the bowels, it can well be used three or four times a week at least. These cereal foods should be carefully seasoned with a very little salt, and served with milk or thin cream, but no sugar.

The use of the yolk of one egg daily, for the sake of its iron and phosphorus, should be continued. Once in a while the whole egg may be given for a change, but for children of this age who are getting a quart of milk a day the white is superfluous, as it tends to make the protein content of the diet very high.

Every day some fruit juice or strained pulp should be given. Orange juice remains the staple, but gradually other kinds mild in flavor may be tried, as prune juice or pulp, cooked apple juice or pulp (from stewed or baked apples), pineapple or fresh peach juice carefully strained. Not more than two or three tablespoonfuls should be given at one time. If a new kind is being tried, only half the usual quantity should be given, diluted with half as much water. The best time to give the fruit is between two morning meals. Fruit is important because it helps to counteract constipation and adds ash for growth.

Before the middle of the second year the habit of taking some stale dry bread, zwiebach, or thoroughly dry toast can usually be established. The exact time depends on the state of development of the teeth, as the main purpose of this addition to the diet is to foster the habit of mastication, so important to the easy digestion of solid foods, which are to constitute a large part of the diet later on. If this principle is kept in mind about the breadstuffs, most questions in regard to suitable kinds will be answered. Those that offer no resistance to the teeth and jaws will be excluded.

After the middle of the second year one green vegetable should be included in the diet every day. In the form of a dilute and thoroughly cooked soup, strained and mixed with milk, it is sometimes given by the end of the first year. But it is well to remember that the behavior of a new food in the alimentary tract is always problematical and it is unwise to experiment with more than one at a time. So in these early months of the second year, when new fruits and new cereals are being tried, one need not be in great haste to add vegetables. In any case, the amount given at first must be small (from one to three teaspoonfuls); it can be gradually increased as the child grows accustomed to it. The vegetable chosen must be mild in flavor and strained after cooking. Green vegetables are introduced for the sake of their ash constituents and care must be taken that these are not thrown away in cooking. Spinach is richer in iron than any other vegetable, and is the ideal one to add first. Green peas, asparagus tips, young beets and carrots (if thoroughly softened in cooking) are practical to strain and are usually well digested by children. The vegetable pulp (or pulp and juice) may simply be salted, or a little cream may be added. Often they are most acceptable when made into soup with milk, a little flour being used for thickening.

To recapitulate, the foods from which the two-year-old's dietary should be built up are the following:

Milk (the chief article in the diet);

Well-cooked cereals (at first strained, later unstrained);

Fruit juice or pulp (two or three kinds, small amounts);

Yolk of egg (not over one a day);

Vegetable pulp or juice (a few kinds, given especially in the second half of the year);

Stale bread or its equivalent (for training in mastication).

These foods, in suitable amounts and at proper times, will supply everything essential to good nutrition during the second year. Greater variety is not only unnecessary, but positively harmful; partly because it tempts the child to discard milk, and partly because of dangers of indigestion. Milk should remain the staple food for some years to come, if the child is to build firm, thick bones instead of spongy, thin-walled ones, and real muscle instead of a padding of fat and water to cover them; and a great variety of food, especially if highly flavored, is almost certain to result in a refusal of the milk.

Just as the alimentary tract is gradually trained to solid foods, so it must be gradually trained to variety in diet. One of the commonest mistakes in feeding in the second year is to give too many kinds of food. The older members of the family must rigidly refrain from offering "tastes" of their food, or in any way suggesting the thought of the child eating the food provided for adults. It is very important for him to learn early that adults' and children's food are not the same, any more than their clothing. What mother would put French-heeled slippers on an eighteen-months-old baby? Yet the same mother will offer her little child a twenty-five-year-old's food, quite content with the fact that he swallows it. If he is subsequently fretful and restless — that is "bad temper"!

While personal traits develop early, and manifest likes and dislikes have to be met as best one can, it is a foolish notion that any whim should be allowed to control the selection of food. What if a person disliked all foods containing protein? Should he be permitted to die of nitrogen starvation? Food needs of the body are governed by scientific laws, and the more the mind is trained to recognize and respect these laws, the simpler the feeding problem becomes. The adult who is responsible for the welfare of the child is the authority as to what he shall eat, and not the baby who is as yet but a little animal with no knowledge of his own needs. The early inculcation of good eating habits is one of the most fundamental things in his training. He may, like

Darwin, become world famous in spite of forty-three years of dyspepsia, but what might not Darwin have accomplished if he had been able to work a whole day at a time, instead of only half a day! People who offer to children, for whose feeding they are not responsible, anything to eat without express permission are vandals, guilty of a greater outrage than if they should tear or ruin their clothes. An attack of indigestion has far-reaching consequences in a little child; it may retard the healthy development of the digestive tract itself; it may help to stunt growth in general; or it may so lower the resistance of the body to bacteria that harmful organisms gain a foothold and acute illness results. It pays to take the best of care in the feeding of little children; to give them the few simple foods that are best for them in an atmosphere which promotes contentment with them, to prepare these with care, so that appetite and digestion may be fostered, and to serve them with unfailing regularity. When children run about and play actively, they need to be guarded against eating when exhausted or excited, and also against any interference with their hours for rest and sleep.

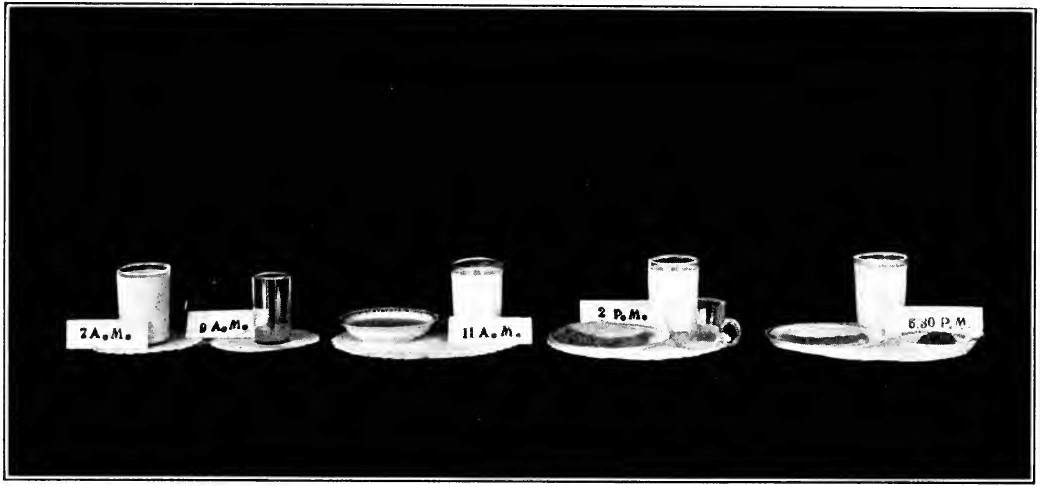
During the second year there should be four meals a day; the first not earlier than 6 A.M., nor later than 7:30; the second at 9, 10, or 10:30, depending on the hour for the first; the third at 1, 2, or 2:30 P.M.; and the fourth at 5, 5:30, or 6 P.M. Care should be taken to offer water between meals. Thirstiness is often mistaken for hunger. The food plan given below illustrates the arrangement of a schedule for meals, and the dietary worked out on this plan is suited to the food needs of the average child of eighteen months.

The average weight of a normal child one year old is from 20 to 21 pounds; of a child two years old, 29 to 30 pounds. Weighings should be made at frequent intervals, just as in the first year, as one test of the child's progress. An allowance of about 40 Calories per pound will cover the energy needs of the second year. Four protein Calories per pound will meet his need for nitrogen, and the selection of foods indicated will afford an abundance of ash constituents.

A Day's Food Plan for a Child One and One-Half to Two Years Old

Fuel Requirement: 900–1200 Calories   Cost: 1½–2 ¢ per 100 Calories

6 A.M.:	Warm milk, 1 cup		170 Calories
8 A.M.:	Orange juice or Prune pulp or Baked apple pulp	2–3 tbsp.	10–25 Calories
10 A.M.:	Strained cereal jelly, 2–3 tbsp.		25–50 Calories
	Top milk for cereal, 1–2 tbsp.		25–50 Calories
	Warm milk to drink, ¾–1 cup		125–170 Calories
	Stale bread or Dry toast or Plain zwiebach	1–2 slices	50–100 Calories
2 P.M.:	Yolk of egg		50 Calories
	Stale bread or Dry toast	1–2 slices	50–100 Calories
	Sifted spinach or Sifted green peas	2–3 tsp.	2–5 Calories
	Warm milk to drink, 1 cup		170 Calories



A Day's Dietary for a Child One and One Half Years Old

5:30 P.M.:	Cereal jelly, 2–3 tbsp.	25–50 Calories
	Top milk, 2–4 tbsp.	50–75 Calories
	Stale bread, 1–2 slices	50–100 Calories
	Warm milk to drink, 1 cup	170 Calories
10 P.M.:	Warm milk to drink, 1 cup. (To be given only if the child wakens very early in the morning.)	170 Calories

A DAY'S DIETARY FOR A CHILD ONE AND ONE-HALF YEARS OLD

Fuel Value: 1050 Calories — Cost: $1\frac{3}{4}$ ¢ per 100 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
6 A.M.:				
Warm milk	1 cup	8.5	34	170
				170
8 A.M.:				
Orange juice. . . .	2 tbsp.	1.0	—	12
				12
10 A.M.:				
Strained oatmeal jelly	3 tbsp.	1.5	5	30
Top milk (10 oz.)	2 tbsp.	1.0	5	50
Warm milk	1 cup	8.5	34	170
Stale bread	1 slice	0.7	7	50
				300
2 P.M.:				
Yolk of egg	1 yolk	0.6	11	56
Toast	1 slice	0.5	7	50
Sifted spinach . .	2 tsp.	0.5	—	2
Warm milk	1 cup	8.5	34	170
				278
5:30 P.M.:				
Strained oatmeal jelly	2 tbsp.	1.0	3	20
Top milk (10 oz.) .	2 tbsp.	1.0	5	50
Stale bread	1 slice	0.7	7	50
Warm milk	1 cup	8.5	34	170
				290
Total for day			186	1050

CHAPTER VII

FOOD FOR CHILDREN THREE AND FOUR YEARS OLD

ADHERING to the principle of gradual increase in the complexity of the diet, there will be no striking changes in the character of the food during this period. As children grow older they take an increasing interest in the appearance and flavor of food, and enjoy occasional changes in the form in which it is served, and even in the dishes used.

Milk is still the basis of the diet; one quart a day being a suitable amount for most children. Some of the cream from the top of the bottle may be removed and used for the cereal, and a portion of the remaining milk used in making a vegetable soup; another portion for some very simple dessert, as junket, plain baked or boiled custard, cornstarch or gelatin blancmange, bread, tapioca, rice, or other cereal pudding (without raisins). Such a dessert can now be served once a day. The rest of the milk will usually be drunk (slightly warmed); but, again, part of it may be used for supper in a dish of bread and milk; one of milk toast; or with rice or some other cereal taking up milk readily (such as crisp corn flakes). In this way adaptations can be made to the tastes of individual children without any real change in the character of the diet. Milk is milk whether

Courtesy of Professor Flora Rose.

SUITABLE FOOD IS THE MOST FUNDAMENTAL THING IN THE PHYSICAL PROGRESS OF THE CHILD drunk from a cup or eaten with a spoon as rice pudding or delicate pink junket.[1]

One whole egg per day can now be used, though the yolk is still the important part from the point of view of the child's body needs. It may be served as a dish by itself at the mid-day meal, in any way in which it is kept soft—"boiled," poached, coddled, or shirred; in an omelet or cooked with milk as creamy egg, egg timbale, etc.; but never hardened by high temperatures or coated with fat as in frying. Often it will be incorporated into the dessert; and sometimes instead of the cooked desserts children relish an "egg pudding," which is really an eggnog, the egg beaten up in milk and moderately sweetened.

A well-cooked cereal should appear in the menu at least once a day. Straining being no longer necessary, the choice is practically unlimited, though cereals from the whole grains (especially oatmeal) should have the preference. The most important point is thoroughness of cooking, so that the cellulose is softened in the highest degree, and the flavor of the grain is developed. The fireless cooker is a valuable aid in the preparation of cereals, but care must be observed to maintain a cooking temperature long enough to accomplish the purpose. Cut oats and cornmeal in particular need more than one night's cooking to develop their best texture and flavor. And since these bland dishes are a very important part

[1] Excellent suggestions in the way of menus and recipes for young children may be found in "Food for Young Children," Farmers' Bulletin No. 717, U. S. Department of Agriculture.

of the little child's diet, too much emphasis cannot be laid upon care in their preparation.

A cereal of different character from that usually served for breakfast can often be made the main dish for supper, rice, cornmeal, and occasionally cornflakes lending themselves well to this purpose. Milk or cream may be used freely with the cereal foods, but no sugar; this should be reserved for desserts and not put on plain foods like cereals and bread, because sugar blunts the appetite so that less is likely to be eaten and children are apt to tire of them sooner.

Some form of dry, rather hard bread can now be included in at least two meals a day, and for the sake of tooth and jaw development should never be neglected. Most crackers are too easily softened to serve the purpose well, and tend to cling to the teeth, though hard, whole wheat crackers may be given now and then for variety. As long as milk is the staple in the diet, and eggs and fruit and vegetables can be given daily, it is immaterial whether the bread be white or brown. When there is danger of lack of iron, whole wheat preparations should be used.

Fruit should be given at least once a day. If digestion is feeble, only the fruit juices previously allowed and in about the same quantity (one to three tablespoonfuls) should be given. If the child is sturdy, mild fruits of delicate texture, thoroughly cooked, such as baked apples (pulp only), apple sauce, stewed Bartlett pears, baked or steamed banana, may be gradually introduced into the diet. All of these should be cooked with little or no sugar and only two to four tablespoonfuls given at one time, according to the age and the strength of the child.

A green vegetable of mild flavor and delicate texture should be made a regular part of the diet, given once a day; it may be mashed or finely chopped instead of sifted, as earlier. String beans, squash, and stewed celery are good additions to the former list. Raw vegetables should not be used, nor cooked ones of strong flavor or coarse texture. Where great economy is necessary, dried peas and beans may be used in soups. As with cereals, care in cooking is necessary to make green vegetables wholesome and attractive, and since in later life these become more and more a source of the indispensable ash constituents, pains should be taken to teach children to like them. At this period, however, they only supplement milk, eggs, and fruit, and it is often better to be content if the child tastes a vegetable than to have a pitched battle over eating a larger amount. New foods are often unpopular simply because of their strangeness; with familiarity, the impression always being given that they are desirable, one can in time overcome many seeming aversions.

Extra fuel can be provided by the addition of baked potato, which in general should be introduced as soon as the types of food already mentioned in suitable amounts do not give the full quota of energy for the day. Butter may also be used in moderate amounts on the bread.

No other foods are needed to keep a normal child in healthy condition up to the beginning of the fifth year. The great temptation is to enlarge the range of foods too fast, and to feed the little children at the family table too soon. If they must be served there, they should be taught to pay no regard whatever to the food eaten by the other members of the family. The best meal schedules generally insure their being fed by themselves, however, which is more satisfactory in all respects; they are not tempted to cry for things they should not have; adults are not tempted to give them "tastes"; and exclusive attention can be given to their manner of eating, which is also important if they are to become civilized members of society.

The average weight of healthy children for the third and fourth years is in round numbers 35 and 37½ pounds respectively. An allowance of from 37 to 40 Calories per pound will cover the energy needs of these years, and three or four protein Calories per pound will meet the nitrogen requirement. The food intake of individual children will vary considerably from any standard because the rate of growth differs much and so does the muscular activity. Quite early, little boys exhibit a higher degree of muscular tension than little girls, so that even if they seem to play in much the same way the boy may give evidence of a larger amount of energy expended by a more pronounced demand for food. Throughout the growing period, the best way to meet this situation is to supply food equal to the standards developed by the study of many children, to watch weight and appetite, and to guard against possible underfeeding by supplying as extra fuel as much plain bread, milk, and cereals as the child desires. If he is really in need of food, he will eat plain bread; if not, such food will not tempt him to overeat merely to please the palate. In no case should food be offered except at mealtime, but water should be given now and then between meals.

The food plan and dietary given below illustrate the practical working out of the principles discussed above.

A DAY'S FOOD PLAN FOR A CHILD THREE TO FOUR YEARS OLD

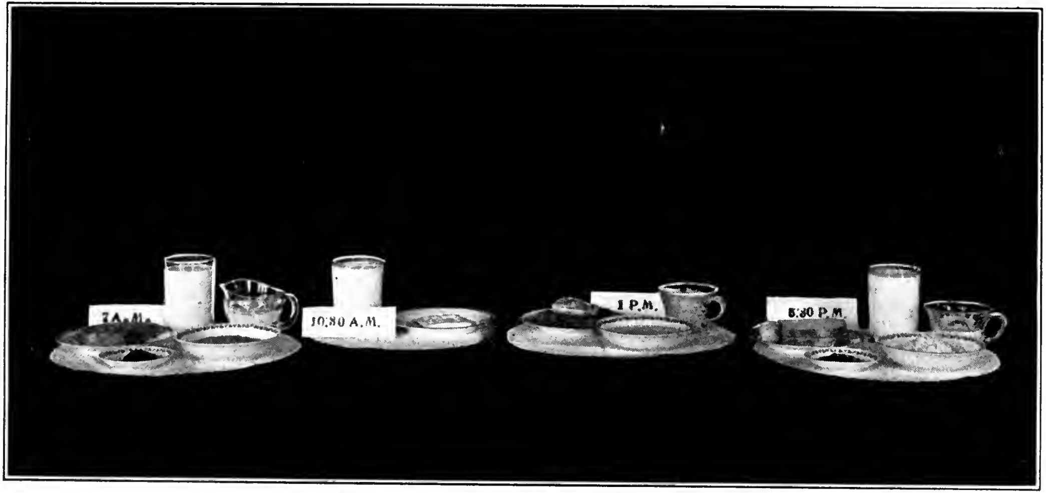
Fuel Requirement: 1100–1400 Calories   Cost: $1\frac{1}{2}$–2 ¢ per 100 Calories

7 A.M.:	Orange juice or prune pulp or apple sauce	3–4 tbsp.	25–50 Calories
	Well-cooked cereal		50–75 Calories
	Top milk, 2–4 tbsp.		50–100 Calories
	Milk to drink, 1 cup		170 Calories
	Toast or Dry bread	1–3 slices	50–150 Calories
10:30 A.M.:	Milk, 1 cup		170 Calories
	Bread and butter, 1 slice		50–75 Calories
2 P.M.:	Milk or Milk soup with vegetable juice or pulp		150–200 Calories
	Egg, soft cooked		60–80 Calories
	Sifted green vegetable, as spinach, asparagus tips, peas, 1–2 tbsp.		5–15 Calories
	Buttered stale bread, 1–2 slices or Zwiebach		75–150 Calories
	Plain custard or junket or cereal pudding	$\frac{1}{4}$–$\frac{2}{3}$ cup	100–200 Calories
5:30 P.M.:	Bread and milk or Milk toast or Cereal and milk		200–300 Calories
	Mild cooked fruit, as baked apple, stewed pears, steamed (and warm) mashed banana		25–150 Calories

A Day's Dietary for a Child Three to Four Years Old

Fuel Value: 1300 Calories — Cost: 1½ ¢ per 100 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
7 A.M.				
Prune pulp	1 tbsp.	0.7	1	50
Wheatena	⅜ cup	3.0	6	50
Top milk (10 oz.)	2 tbsp.	1.0	5	50
Toast	1 slice	0.5	7	50
Milk to drink	¾ cup	6.4	24	125
				325
Lunch:				
10:30 A.M.				
Milk	¾ cup	6.4	24	125
Soda cracker	1 cracker	0.2	2	25
				150
Dinner:				
2 P.M.				
Cream of pea soup	⅔ cup	5.2	16	100
Poached egg	1 egg	1.8	25	70
Toast	1 slice	0.5	7	50
Bread	1 slice	0.7	7	50
Butter	1 tsp.	0.1	—	32
Tapioca cream	⅖ cup	2.8	12	100
				402
Supper:				
5:30 P.M.				
Steamed rice	½ cup	2.6	6	66
Top milk (10 oz.)	¼ cup	2.1	9	100
Milk to drink	¾ cup	6.4	24	125
Bread	1 slice	0.7	7	50
Butter	1 tsp.	0.1	—	32
Date marmalade	1 tbsp.	0.5	1	50
				423
Total for day			183	1300



A DAY'S DIETARY FOR A CHILD THREE OR FOUR YEARS OLD

CHAPTER VIII

FOOD FOR CHILDREN FIVE TO SEVEN YEARS OLD

ONE day the writer sat in a restaurant for luncheon beside a little girl apparently about six years old. She was just finishing a plate of hot griddle cakes and a double portion of syrup, and her mother was pouring half of her cup of coffee into a cup for the child. As the meal was finished and they rose to depart, the mother remarked to a friend accompanying them that she was taking the little girl to see a doctor — "she had seemed languid lately." Poor child! With such a luncheon even a robust adult might feel "languid." Unfortunately the retribution for dietetic sins comes slowly and insidiously, as a rule, instead of swiftly and strikingly, and the connection between an abused stomach and "bad nerves" or "temper," or other manifestations of a physical constitution below par is not impressed, if it is even suspected. One of the interesting developments of the babies' health contests which have been held with such success in the past few years is the chagrin of parents who dreamed they were bringing normal if not prize babies to the examining experts and were startled into new vigilance by discovering that they did not even know what a normal child really is. And one of the most encouraging features of such contests is that, with knowledge of how a baby ought to be cared for put into practice, the babies low of grade one year have been able to capture prizes a second year. All through childhood weighing should be done at frequent intervals and tables of weight and height of normal children consulted. (See Appendix, pp. 431–433.) Due regard should also be given to such other evidences of good health as sound sleep, reasonable appetite, absence of peevishness, firm flesh, and rosy skin. And while fresh air, wholesome exercise, and plenty of rest must always be counted as factors in good nutrition, suitable food remains the most fundamental thing in the physical progress of the child.

Feeding during the fifth, sixth, and seventh years differs little from that for the fourth year, except in the increasing quantity required to meet the needs of the larger child. All the kinds of nutritive material essential to growth have already been introduced into the dietary — milk, eggs, cereals, fruit, green vegetables, stale bread; supplemented by butter, cream, potatoes, and, in certain dishes, a little sugar for extra fuel. All food should still be served as simply as possible. Much of the quart of milk which ought to be the foundation of the diet can be drunk; the rest used in simple soups, desserts, or plain cream sauces for vegetables. For variety, especially on cold days, the appearance of milk as a beverage may be changed by heating with a little malted milk; by cooking with just enough cocoa to

A Mid-morning Lunch

give color and flavor; or by coloring with a cereal coffee. The addition of a spoonful of whipped cream to one of these modified forms may glorify it into a very special treat for some birthday or holiday. No tea, coffee, or strong cocoa should ever be given to children. A welcome addition to the simple desserts during this period will be various homemade frozen dishes, such as milk sherbets and plain ice cream. These should not be served oftener than once a week, being too sweet for staple desserts; and in very moderate quantities on account of their coldness. Unless one is absolutely certain of the quality, ice cream purchased outside the home should not be given to young children. Very often it is made under unsanitary conditions, or kept unduly long, and is badly contaminated by bacteria. Ice creams made from thick cream are too rich for little children. The frozen dish should be regarded chiefly as another means of making milk acceptable in the dietary by a simple change in its form. Lemon or orange milk sherbet, cocoa or junket ice cream, or a plain frozen custard of milk and eggs are the most suitable to choose.

Cereals should still be served without sugar, but with plenty of milk. The warm cooked cereal should always be the staple breakfast dish, oatmeal being given the preference. The ready-to-eat cereals should be reserved for supper or for especially hot days in summer; eaten dry and crisp instead of bread, they make a suitable lunch if the child is hungry in the middle of the afternoon; he is not likely to fail to chew such fare or to overeat of it.

Raw fruits, except in the form of juice, should be introduced into the diet cautiously. Perfectly ripe pears, peaches, and grapes, free from skins and seeds, are the best to experiment with, but for the most part the fruit should be cooked, and especially any given for supper. Dried fruits, such as apples, peaches, and prunes, are very valuable, especially when the cost must be limited. They all need long, slow cooking and little or no added sugar. Dates may be stewed in a little water and put through a sieve to remove the coarse outer skin, then flavored with a little sugar and lemon juice. Bananas should always be cooked for young children, baked in their skins or steamed in a covered vessel in a very little water. They do not require sugar. Preserves of all kinds and very sweet canned fruits must be avoided.

Green vegetables should still be cooked, and mashed or sifted because they are likely to be poorly masticated. The addition of a plain cream sauce now and then will give variety to the menu and add to the fuel value of the vegetable dish. Potatoes should always be mealy. Baking is the most desirable method of cooking, but after the fifth year, plain boiled and mashed potatoes are not objectionable. Fried ones must never be offered.

The temptation to add hot breads, biscuits, rolls, griddle cakes, and the like must be steadily resisted. Only bread stale enough or hard enough to offer exercise in mastication should be given. Breadsticks, crisp to the center, or sippets, made by toasting narrow strips of bread in the oven, will be welcome for variety.

Butter, cream, and bacon fat in moderation are valuable in the child's diet. But the butter should be spread on bread rather than used in cooking; cream should be thin and used preferably over cereals, toast, and simple desserts. Bacon fat may be added to baked potatoes or spread on bread.

Occasionally a small serving of plain cookies, stale sponge cake, graham, whole wheat, or other crackers may be given at the end of the meal.

With milk freely supplied and an average of one egg a day, there is no call for the introduction of meat into the diet until after a child is seven years old, and, on the other hand, there are several good reasons for withholding it during these early years. In the first place, as has been already shown in Chapter II, meat is of all protein foods most liable to putrefaction in the intestine; and experiments indicate that the younger the child the more speedily these products of putrefaction develop when meat is fed. A somewhat analogous case among animals is often cited. Adult cats thrive on a rich meat diet, while kittens fed largely on meat are liable to convulsions. So children of three show more signs of putrefaction when meat is made a part of their diet than do children of six; and these in turn are more liable to it than children of eight. Since milk feeding will cause the signs of putrefaction to disappear and meat protein is no better for growth than milk protein, the advantage is decidedly with the milk rather than the meat.

Another reason for withholding meat is that it naturally tends to displace milk on account of its higher flavor, and meat is much poorer in ash constituents than milk, being totally deficient in calcium, of which milk is the most important source. A third reason is that the stimulating extractives in meat, which may be quite useful to a jaded adult, should not be used to whip up the sensitive growing organism, which when healthy is far better off without stimulants of any kind. The two chief advantages of meat are that it requires mastication and exercises the chewing apparatus and that it is a useful source of iron. But, as already shown, dry bread makes excellent chewing material, with none of the disadvantages of meat; and eggs and green vegetables will supply iron in forms believed to be more useful to the child, aside from the fact that the intestinal putrefaction of meat seriously interferes with the utilization of its iron. Excepting the point in regard to mastication, what is true of meat is true of beef juice. Its use is best restricted to babies who for some reason cannot have an adequate supply of milk, egg yolk, and fruit juice, or who are sick enough to need a stimulant. Meat broths are of course merely stimulating, and their only possible virtue in the ordinary child's dietary is to induce the eating of cereals or vegetables which may be cooked in them, and this can usually be accomplished in some other way. They almost inevitably limit the amount of milk taken, and therefore should be reserved till the child is older, his need of materials for growth less pronounced, and his total capacity for food greater.

The average weight of normal children for the fifth, sixth, and seventh years and the energy requirement per pound of body weight per day is, in round numbers:

ENERGY REQUIREMENTS FOR FIFTH, SIXTH, AND SEVENTH YEARS

Year	Weight in Pounds	Calories per Pound
Fifth	41	35–37
Sixth	45	34–35
Seventh	50	32–34

It seems advisable in these years of comparatively rapid growth to allow from three to four protein Calories per pound per day, though probably somewhat in excess of the actual requirement.

The same scrupulous care in regard to regularity of meals must be continued. Usually breakfast will now be given at 7 or 7:30; a very simple lunch at 10 or 10:30; a substantial dinner at 1 or 1:30; and a plain supper at 5:30 or 6. During this period many children begin going to school, and the meal schedules must be adjusted to the school schedule. Especial care needs to be taken that breakfast be provided in time to be eaten without haste or fear of being late to school. And no child should be permitted to go to school without breakfast. The pangs of an empty stomach will cause him to feel fagged out long before the noon meal, which is often the next one. He will then be likely either to be over-hungry and eat hurriedly to the upset of his digestion, or to have lost the feeling of hunger and refuse a rational meal. In any case, considering the amount of fuel a child must take to keep his machinery going and to have a surplus for growth, he cannot afford to miss breakfast with the hope of making good the loss later in the day. Numerous studies of school children show that no breakfast and malnutrition are commonly found together. The young child is fortunate if his school provides a mid-morning lunch, to take the place of the one which he has formerly enjoyed at home. This should be of the simplest character; a slice of bread and butter, a glass of milk and a cracker, or a bowl of cereal and milk being quite sufficient. Such good results have followed the introduction of these school lunches — gains in weight, improved general health, and better school behavior — that they are now a part of the regular school program in many places, and mothers may find that they can render useful public service in extending the practice where it is not in vogue.[1]

When there is no opportunity for a morning lunch, the dinner must be served earlier in the day — preferably at noon — and then a light lunch may be given in the afternoon, similar to that suggested for morning, at 3 or 3:30. During the first school years the child has many new conditions to meet, such as the excitement of going away from home and mingling with a large number of persons, and the change to a schedule involving hours of confinement, and no extra strain should be put upon him in the way of caring for difficult food. He needs more than ever to be safeguarded against unsuitable food, or food at unsuitable times, to which his school companions and surroundings may tempt him, and against eating when exhausted or greatly excited by his work or play. Regularity, simplicity, and serenity are good dietetic watchwords; good health

[1] For information on the school feeding movement, see *School Feeding: Its History and Practice at Home and Abroad*, by Louise Stevens Bryant.

has economic and social as well as personal value, and in these early years the foundations for it should be most carefully laid.

A Day's Food Plan for a Child Five to Seven Years Old

Fuel Requirement: 1400–1700 Calories Cost: $\frac{3}{4}$–$1\frac{1}{4}$¢ per 100 Calories

Breakfast: 7–7:30 A.M.	Orange or Baked apple or Prunes	50–100 Calories
	Well-cooked cereal	50–100 Calories
	Milk	150–200 Calories
	Dry toast or stale bread	50–100 Calories
	Butter or Cream or Bacon fat	25–50 Calories
10–10:30 A.M.	Milk	125–175 Calories
	Bread	50–75 Calories
	Butter	25–50 Calories
Dinner: 1–1:30 P.M.	Soft cooked egg	50–75 Calories
	Mashed or sifted vegetable, as spinach, peas, beans, carrots	5–15 Calories
	Baked potato or boiled rice	50–100 Calories
	Bread	50–100 Calories
	Butter	50–100 Calories
	Milk (may be combined with vegetable in soup)	100–150 Calories
	Stewed fruit or plain pudding	100–200 Calories
Supper: 5:30–6 P.M.	Cereal with milk or Cream soup or Milk toast or Bread and milk	150–300 Calories
	Stewed fruit, custard, or junket, with or without stale sponge cake or plain cookies	100–200 Calories

A Day's Dietary for a Child Five to Six Years Old

Fuel Value: 1608 Calories

Cost: ¾–1¢ per 100 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
7:30 A.M.				
Baked apple, without sugar	1 apple	4.0	1	100
Oatmeal	½ cup	4.0	8	50
Milk to drink	¾ cup	6.4	24	125
Milk for cereal	⅐ cup	1.2	5	25
Toast	2 slices	1.0	14	100
Butter [1]	½ tbsp.	0.2	—	50
				450
10:30 A.M.:				
Milk	⅝ cup	5.1	19	100
Soda crackers	2 crackers	0.4	5	50
				150
Dinner:				
12:30 P.M.				
Split pea soup	⅗ cup	6.0	26	100
Croutons (toasted)	27 croutons	1.4	14	100
Spinach	½ cup	4.2	4	33
Bread	2 slices	1.3	14	100
Butter [1]	½ tbsp.	0.2	—	50
Stewed prunes	6 small	2.8	2	100
				483
Supper:				
5:30 P.M.				
Baked potato	1 medium	3.0	11	100
Bread	2 slices	1.3	14	100
Milk	¾ cup	6.4	24	125
Creamy rice pudding	½ cup	4.4	24	200
				525
Total for day			209	1608

[1] If not over 24¢ per pound; otherwise oleomargarine.

A Day's Dietary for a Child Five or Six Years Old

CHAPTER IX

FOOD FOR CHILDREN EIGHT TO TWELVE YEARS OLD

By the time most children are eight years old they are established in the school-going habit. Some of the problems of nutrition which arise when they first change from a life of comparative freedom and of much time out of doors to one of restraint and too often, alas, of little fresh air, have been mentioned in the preceding chapter. The years when the rate of growth is most rapid and the digestive tract most sensitive now are past, and errors in diet are followed by less swift retribution, so that there is a temptation to relax the vigilant care of the child's food and leave him to his own devices. But this is a great mistake. The period of physical development in a human being covers nearly a quarter of a century, and the seven-year-old child has climbed less than a third of the hill of growth, as the diagram below plainly shows. We attend to his clothing and shelter — how much more important to see that he has proper food!

During the school years no such reserve of fuel is carried in the tissues as we find in the case of adults. A grown man can go three or four days without food and no important tissue or organ will suffer harm, but a growing child needs his proper amount of food at proper intervals every day, or he runs the risk of malnutrition

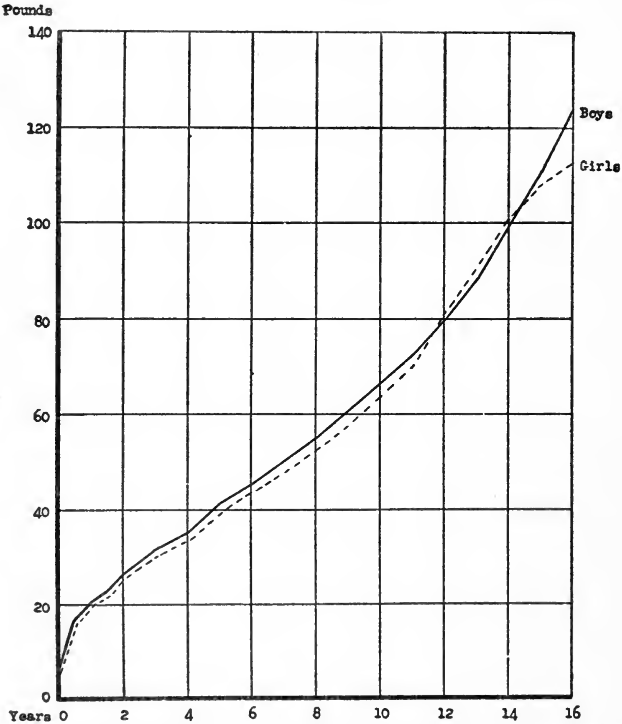


Chart Showing Normal Growth of Boys and Girls from Birth to the Sixteenth Year

and a stunted body in consequence. Too much emphasis cannot be put upon the importance of establishing a regular meal schedule and of forbidding food at all other times. Irregularity is one of the commonest errors in child feeding.

According to the principle already laid down, the comparatively simple diet of the seventh year is to be gradually extended. Only a few well-chosen dishes need be offered at any one meal, but a tendency to choose a single dish for a meal and refuse everything else should be discouraged. In adult life a well-balanced diet demands more kinds of food than in childhood, when such a variety of elements is supplied by milk alone, and it is a great advantage to have been so trained as to be able to take these in all sorts of forms. Most adults eat in groups and pronounced individual likes and dislikes have great economic and social, if not always physiological, disadvantages. Half the problems of the food provider arise, not from the difficulty of securing wholesome food to make a well-balanced ration, but from the necessity of remembering that Mr. Jones will not touch fish, Mrs. Smith never eats cabbage, and Mr. Brown must always have apple pie for supper! Youth is the time to cultivate respect for all natural foods as a means to physical and mental efficiency, and not merely as ticklers of the palate. Disparaging remarks about wholesome food should never be permitted, for it must always be borne in mind that eating has psychological as well as physiological aspects, and children are quick to catch the notions of those with whom they associate. If mother plainly turns up her nose at milk and cereals and bread and butter, how can she expect the children to relish them? Most food aversions are acquired in early life when the sensibilities are keenest. An accident at the table with humiliating consequences, an unpleasant association of a food with illness, a comparison with something disagreeable, may cause repugnance lasting for years. Such aversions, once acquired, call for patience and tact and may never be completely overcome. It is a part of the feeding problem of childhood to prevent such misfortunes. Table conversation should deal with topics other than food, and when disturbances arise at the table eating should be stopped until tranquillity is restored. Food taken in grief or anger has a poor chance of fulfilling its proper mission. If a child refuses a food really essential to his welfare, hunger will often do more to reëstablish his taste for it than commands or threats. New dishes or appeals to the imagination are often helpful in holding children to their proper diet. A glass measuring cup for milk has often inspired interest in the quantity drunk. One mother set her two little children to running "Calorie races" when they were below normal weight, with decided improvement in the quantity of food taken. It is worth while to take thought as to how to keep children's attitude toward their food rational.

Feeding from the Eighth to the Twelfth Year

A quart of milk, continued as the basis of the diet, will give relief from much concern as to whether it is well-balanced or not. Cooked cereals for breakfast should be given the preference, the ready-to-eat varieties being reserved for occasional use because the warm, full-flavored porridge is less likely to be tired of. By the eighth year, raw fruits can be used more freely, only the strongly acid ones being forbidden. For the evening meal preference should be given to cooked fruits, moderately sweetened. Jellies may be spread lightly on bread now and then, but preserves should be withheld entirely. Dates, figs, and raisins are valuable additions to the diet now. Dates and figs should be thoroughly washed and drained, after which they may be heated in an oven to dry and sterilize them, then cooled and packed in jars for future use. Figs are best stewed in a little water and require no sugar. With cream, they make an acceptable dessert. Raisins should always be cooked. They may be simply stewed and served as a sauce, or used to vary the flavor of other fruits, especially of dried peaches and apricots, added to bread, rice, and other cereal puddings, or baked in raisin bread. Their high fuel value, rich ash content,[1] and sweet flavor make them very valuable in children's dietaries. Dates are often used to vary the appearance of the breakfast cereal, being cut up and stirred in a few minutes before serving. They can also be used in puddings and bread like raisins, and make a popular sandwich filling.

The child may now be expected to eat any mild, thoroughly cooked, green vegetable, and one should be provided, if possible, every day. Raw vegetables should not be made a regular part of the diet before the tenth or the twelfth year. Pains should be taken to cook

[1] The significance of the ash constituents of food was discussed in Chapter I.

vegetables so as to develop their best flavor, much of their unpopularity being due to bad cooking. Children's sense of taste is keen in the early school years.

By the time a child is eight or nine years old, meat may be introduced into the diet. It should not be allowed to displace milk, but used to supplement it. Lean beef, mutton, lamb, chicken, lean fish, such as halibut and cod, or oysters are most suitable for this period. Fat meats or meats cooked in fat or served with rich gravies or sauces should be avoided, as too difficult of digestion. Only a small portion (not over an ounce) should be allowed and that not oftener than once a day.

Children are generally fond of sweets, but these should never be given between meals. Not only candy, but the delectables of the soda fountain and ice cream parlor, are entirely out of place except at the end of a regular meal. Sugar is a valuable fuel food, but with its high flavor and rapid diffusibility it is likely to satisfy the appetite before body needs are really met, if given at the beginning of a meal; and it is not only likely to disturb the normal appetite, but seriously to upset digestion if taken between meals; while in large quantities at any time it irritates the stomach and displaces foods which serve for building material as well as fuel. Candy is too concentrated to be an ideal food, but if greatly desired a very small amount may be given at the end of a meal, when it will be diluted by the other food and do no particular harm. Only plain candies made from pure ingredients should ever be allowed. Rich confec-

Always Hungry

tions from chocolate and nuts are too difficult of digestion. Plain sweet chocolate is a good substitute for candy and so are the sweet fresh and dried fruits. Gingerbread and plain cookies also satisfy the taste for sweets, and ice creams and ices can be used more and more for the same purpose.

Nuts are not easy to masticate, and on account of their high fat content are rather slow of digestion. Hence they do not enter into the dietary of little children, and cannot be freely permitted even during this period. When ground to a paste, however, the first objection is removed and peanut and other nut butters are an acceptable addition at this time. No fried food, pastries, tea or coffee, rich sauces, or meat salads with mayonnaise dressing should ever be permitted.

Three regular meals a day will now suffice for many children, but if breakfast is light or the child is very hungry between meals, a simple mid-morning or mid-afternoon luncheon may still be provided. It should not be given if it interferes with zest for the regular meals, and it should never be sweet, so as to tempt the child to eat when not really hungry. Dry bread, crackers, or milk are best. Mild fresh fruits are allowable if the child is well and strong. Dinner should be served at noon rather than at night, to insure early and peaceful slumber. Many children have to take the noon meal at school, however; in the country because they live too far away to go home at noon; in the city among the poor because the mother goes away to work and there is no one to prepare a noon meal, or among the well-to-do because the single school session often extends beyond what should be the dinner hour. The luncheon of the school child, therefore, deserves special consideration. Where the school authorities give it no attention, the children usually take their food from home. In this case they lose the advantage of warm food in promoting easy and rapid digestion, and their minds are not so clear for the afternoon work. They are also more likely to bolt their food when not eating at a table with other people. If then a lunch box must be carried from home, special thought should be given to the selection of food, so that it may be suitable in kind and amount, and appetizing when the box is opened. Three or four kinds of food are quite enough to provide at a time, for at best the busy housewife usually finds her wits taxed to furnish wholesome lunches with much variety.

PLAN FOR THE SCHOOL LUNCH BOX

1. *Sandwiches* are the great staple, easily portable and generally liked. The bread should never be less than twenty-four hours old, lightly buttered and filled with finely chopped boiled eggs carefully but mildly seasoned; a nut paste, such as peanut butter, preferably softened by working in a little milk or cream; a dried fruit paste, made of chopped dates, figs or raisins, or a mixture of these. For the older children, chopped meat, cheese of various kinds, and jellies are also desirable. Sandwiches of raisin or date bread without other filling than butter will help to give variety.

2. *Fruit* is appetizing and carries well. Its succulent qualities make it especially acceptable with the rather dry sandwich. Not only fresh ripe fruit, but also apple sauce, stewed raisins, figs, pears, peaches, etc., can often be carried by a little forethought in securing small jars with tight-fitting covers. Paper cups designed for jelly with close-fitting tops are practicable for this purpose. Tomatoes are juicy enough to take the place of fruit for the older children.

3. *A sweet* of some kind should be included, such as plain cookies of various sorts, gingerbread or sponge cake, baked custard, a piece of sweet chocolate or a few dates rolled in sugar.

4. *Some fluid* to drink with the meal aids digestion and should always be taken. Water will serve, of course, but milk will add to the food value and so will fruit juices, if they can be carried.

Plenty of waxed paper to wrap the different kinds of food and keep them from flavoring each other should be kept on hand; this is one of the big secrets of a tasty lunch box.

At its best, however, the lunch box must be regarded as a makeshift. A regular school luncheon, shared by teachers and pupils, has tremendous advantages. If only one hot dish — perhaps soup or cocoa — can be provided at school to supplement what the children bring from home, it draws the pupils together socially, so that the meal is taken in a more orderly fashion, and experience in dozens of rural schools shows that it results in improved physical condition of the pupils. When they leave home early in the morning, travel a considerable distance in the cold, and return only in time for supper, the cold food carried in their boxes would often be really insufficient for their body needs, even if it were in the best form. Recent studies of rural conditions have shown that country children tend more than city children to be below par physically; and this is certainly not because country life does not offer opportunity for good development, but because country dwellers often fail to realize that they must take advantage of the fresh air and wholesome food which are theirs to command. The realization of what good feeding means for physical and mental development results not only in careful provision of food for the meals at home, but coöperation with school authorities in securing protection from bad feeding at the noon hour.

In many of our large cities and industrial centers the elementary school luncheon has long since passed the experimental stage and is regarded as a valuable part of the school training as well as a safeguard for the health of the child. Very often the pioneer work has been done by women's clubs or philanthropic organizations which have assumed the task of demonstrating to school authorities the practicability and value of such feeding. The expensive machinery of education is wasted when it operates on a mind listless from hunger or befogged by indigestible food. Whether the cause be poverty, ignorance, or carelessness, the child is the sufferer, and the painstaking work of the school lunch supervisors to secure wholesome and adequate noon meals for the school children at a minimum cost not only brings immediate benefit to the children, but exerts a widespread influence upon homes and parents, as the children carry to them reports of these concrete lessons in the science of proper selection, preparation, and hygiene of food.

The school luncheon must be simple, easily served, and economical. It may consist of a hot dish, with some form of bread, and a choice of about two sweet dishes; milk or cocoa should always be obtainable. A week's menu as actually served by the School Lunch Committee of the Home and School League in Philadelphia is given below:

Weekly Menu in School with Penny Lunches and Five-cent Noon Dinner

Monday:	(1)	Baked beans and roll, 5 ¢
	(2)	Cocoa or milk, 2 ¢; crackers or ice cream, 1 ¢
Tuesday:	(1)	Vegetable soup and roll, 5 ¢
	(2)	Same choice as Monday
Wednesday:	(1)	Creamed beef on toast and roll, 5 ¢
	(2)	See Monday. Dates 1 ¢
Thursday:	(1)	Macaroni with tomato sauce and roll, 5 ¢
	(2)	See Monday. Jam sandwich, 1 ¢
Friday:	(1)	Creamed salmon and roll, 5 ¢
	(2)	See Monday

The following interesting description shows the mechanism of the service in the New York City schools:[1]

[1] The School Lunch Service, Dept. of Education, The City of New York: Division of Reference and Research. Bull. No. 3. 1914. p. 10.

At 11 : 45 in each of the seventeen schools squads of picked pupils set up the portable tables in preparation for serving the lunch. The children come from their classrooms, form lines, usually in the interior play yards, and as they pass a given point take up a tray, spoon, and whatever other utensils are necessary. The line goes by the large containers of soup, which is dispensed in half-pint portions to the children. The rule has been to have each child purchase first a half-pint bowl of soup, after which he may purchase any of the other items prepared for that day. After buying the soup the child passes along the table on which the other foods are displayed, choosing those which appeal to him.

Behind these tables the picked pupils, in white gloves and aprons, and, in the case of the girls, caps, hand to the children the desired articles. At the end of the line the associate manager stands to receive as many pennies as there are items of food on each child's tray. The child carries his lunch to one of the tables which have been set for that purpose, where the food is eaten.

After finishing the meal, the child takes the tray and soiled dishes to a designated place, where any remaining food is scraped into a pail and the bowls, trays, and utensils are neatly placed in piles ready to be washed. This affords an opportunity for a lesson in practical domestic science.

Analyses of the foods served establish the actual food values which the children receive for their money:[1]

	Calories per Penny Portion		Calories per Penny Portion
Soups — Half-pint			
Green pea	128	Corn	91
Cream of barley	120	American vegetable	85
Cream of macaroni	114	Scotch broth	85
Lentil	113	Clam chowder	82
White bean	111		
Macaroni and tomato	105	Foods Other than Soups	
Split pea	101		
Tapioca and tomato	91	Rice pudding	109

[1] Op. cit., page 12.

	Calories per Penny Portion		Calories per Penny Portion
Baked macaroni . . .	90	Jam sandwich . . .	228
Potato salad	117	Cheese sandwich . .	250
Vegetable salad . . .	77	Pot cheese sandwich .	212
Lentil salad	189	Prune sandwich . . .	243
Beet salad	58	Apple jelly sandwich .	240
Apple sauce	109	Jelly tarts	84
Egg sandwich . . .	236	Spice cakes	109
Butter sandwich . . .	247	Vanilla cakes . . .	29
Bread pudding . . .	131	Prunes	180
Chocolate pudding .	102	Dates	200
Baked beans . . .	168	Average	155

Some of the typical trays of food purchased, none of which aggregates a cost of more than three cents, are shown here:

Green pea soup . . .	128	Vegetable soup . . .	85
Bread, 2 slices . . .	200	Egg sandwich . . .	236
Apple sauce	109	Rice pudding . . .	109
	437		430
Cream of barley . .	120	Clam chowder . . .	82
Cheese sandwich . .	250	Butter sandwich . .	247
Chocolate pudding .	102	Jelly tarts	84
	472		413
Macaroni and tomato .	105	Bean soup	111
Apple jelly sandwich .	240	Bread, 2 slices . . .	200
Cocoa	100	Prunes	180
	445		491

If the noon meal is served at home, it may be somewhat more elaborate, provided the child has time to eat it in a leisurely fashion. When he has to hurry back to school this fact must be taken into account, and no extra tax put on his digestive powers. The food plan given below will show the general type of food to be chosen.[1]

[1] For further suggestions regarding school luncheons see "School Lunches," Farmers' Bulletin No. 712, U. S. Department of Agriculture.

If a warm, substantial dinner is served at noon, the evening meal may be comparatively simple, especially through the tenth year, as also indicated in the food plan below. Children of eleven and twelve will relish a dinner about as substantial as the noon meal, though they will be perfectly nourished with the simpler supper. If the noon meal has been a cold or light lunch, then the dinner as outlined should be given at night. In any case, the evening meal should be served by six o'clock, so as not to interfere with an early bedtime. For the normal body weight of children during this period, the reader is advised to consult the tables giving weight in relation to height in the Appendix. A healthy child of eight years may be anywhere from 45 to 51 inches in height and weigh from 45 to 59 pounds, and in later years even more individual variation is possible. The energy requirement will vary, not only with the body weight, but with the degree of physical activity, and boys with their higher muscular tension and tendency to vigorous sport will usually demand somewhat more food than girls of corresponding size; hence an absolute standard cannot be set. The following figures, however, deduced from the observations of many persons on the food needs of school children, will serve as a general guide as to suitable amounts of food to provide.

Age in Years	Protein Calories per Pound	Total Calories per Pound
8–9	3–4	30–35
10–12		28–32

A Day's Food Plan for a Child Eight to Ten Years Old

Fuel Requirement: 1700–2000 Calories Cost $\frac{3}{4}$–$1\frac{1}{2}$¢ per 100 Calories

BREAKFAST: 7–7:30 A.M.	Mild fruit, fresh, stewed, or baked	50–100 Calories
	Well-cooked cereal	75–100 Calories
	Dry toast or stale bread	50–100 Calories
	Butter	50–75 Calories
	Milk, plain or flavored with cocoa	100–150 Calories
DINNER: 12–12:30 P.M.	Soft cooked egg or very small portion of baked or broiled fish, lamb, chicken, or bacon	50–75 Calories
	Potatoes or Rice or Baked banana	75–100 Calories
	Spinach, carrots, onions, or other mild vegetable, simply cooked	10–25 Calories
	Milk (may be combined with vegetable in soup)	100–150 Calories
	Bread	75–100 Calories
	Butter or jelly	50–100 Calories
	Bread, rice, or other nutritious pudding or Stewed fruit, with plain cake	150–200 Calories
SUPPER: 5:30–6 P.M.	Cream soup or Milk toast or Rice and milk or Baked potato and milk to drink	200–300 Calories
	Bread	50–100 Calories
	Nutritious pudding or stewed fruit, as figs, raisins, dates, apples	100–200 Calories

A Day's Dietary for a Child Eight Years Old

Fuel Value: 1783 Calories   Cost: $1\frac{1}{4}$–$1\frac{1}{2}$ ¢ per 100 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
7–7:30 A.M.				
Orange (large)	½ orange	4.7	3	50
Oatmeal	¾ cup	6.0	12	75
Cream, thin	2 tbsp.	0.9	2	50
Milk	⅘ cup	6.8	25	133
Toast	1 slice	0.5	7	50
Butter	2 tsp.	0.3	—	66
				424
Dinner:				
12:30 P.M.				
Egg timbale	½ cup	5.6	32	125
Baked potato	1 medium	3.0	11	100
Asparagus tips	5 stalks	1.9	2	11
Bread	2 slices	1.3	14	100
Butter	2 tsp.	0.3	—	66
Peanut butter	1⅔ tsp.	0.4	12	66
Stewed pears	½ cup	4.0	1	100
Sugar cookies	2 cookies	0.9	6	100
Milk	⅘ cup	6.8	25	133
				801
Supper:				
5:30–6 P.M.				
Cream of bean soup	¾ cup	3.9	22	150
Bread sticks	12 sticks	0.4	10	75
Cornstarch blanc-mange	½ cup	5.4	18	200
Milk	⅘ cup	6.8	25	133
				558
Total for day			227	1783

A DAY'S DIETARY FOR A CHILD TEN YEARS OLD

A DAY'S DIETARY FOR A CHILD TEN YEARS OLD

Fuel Value: 1900 Calories Cost: $1\frac{1}{4}-1\frac{1}{2}$ ¢ per 100 Calories

	MEASURE	WEIGHT OZ.	PROTEIN CALORIES	TOTAL CALORIES
BREAKFAST:				
Orange	1 large	9.5	7	100
Flaked wheat	$\frac{2}{3}$ cup	6.0	13	100
Top milk (10 oz.)	$\frac{1}{4}$ cup	2.1	9	100
Milk	$\frac{3}{4}$ cup	6.4	24	125
Toast	2 slices	1.0	14	100
Butter	$\frac{1}{2}$ tbsp.	0.3	—	50
				575
DINNER:				
Hamburg steak	1 ball	1.3	41	75
Baked sweet potato	1 potato	4.5	9	150
Bread	2 slices	1.3	14	100
Butter	1 tbsp.	0.5	—	100
Creamed peas and carrots	$\frac{2}{3}$ cup	5.0	14	75
Bread pudding (with raisins)	$\frac{3}{4}$ cup	6.0	18	200
Milk	$\frac{3}{4}$ cup	6.4	24	125
				825
SUPPER:				
Potato soup	$\frac{3}{4}$ cup	6.3	22	150
Whole wheat bread	2 slices	1.4	16	100
Butter	$\frac{1}{2}$ tbsp.	0.3	—	50
Stewed apples	$\frac{2}{3}$ cup	5.0	1	100
Molasses cookies	6 very small	0.7	6	100
				500
Total for day			232	1900

CHAPTER X

FOOD IN ADOLESCENCE AND YOUTH

With the introduction of meat and raw vegetables into the diet in the preceding period, the range of food materials available for the child is practically the same as for the adult. In other words, any wholesome natural food may now be made a part of the dietary, in right amounts, at the right time, and in easily digestible form. Emphasis should still be placed on foods carrying substances for growth, such as milk, eggs, cereals, fruits, and vegetables. During adolescence development is again in some respects very rapid; boys grow suddenly tall and have the task of covering their long body frames with muscle; girls grow less fast, usually, but must meet demands for more blood, and take on the supply of muscle and fat which gives them the contours of womanhood. Inadequate and unsuitable food at this time hinders normal development just as truly as in infancy, and many a healthy child fails to make the strong man or women of which he gave promise because of malnutrition in these critical times. Careful training from birth will, of course, help a great deal in tiding over the adolescent years, but in the storm and stress of the period certain vagaries of appetite may develop, such as the desire on the part of girls to avoid all plain food and live on sweets or other highly flavored food; the insistent craving for food on the part of boys, that leads to the consumption of unduly large quantities at one time,—so that wise guidance in feeding is still essential. In addition to keeping out of the menu dishes which are decidedly difficult of digestion, or limiting them to occasional use under the most favorable circumstances for taking care of them, there should be such supervision of the food eaten that a very one-sided or insufficient diet is impossible.

The drinking of milk should be encouraged, and tea and coffee absolutely forbidden. Cocoa or cereal coffee in which milk and not water is the foundation fluid provide an acceptable warm drink for breakfast or supper. Cereals for breakfast are perhaps accepted more unquestioningly by boys with their keener appetites than by girls, but their use by both should be persistently encouraged. The addition of dates or of chopped nuts often increases their attractiveness. For girls of small appetite, toast made from whole wheat or graham bread, served with hot milk or cream, may take the place of the porridge. Fruit, fortunately, is usually well liked, and while this may be an expensive item in the diet, it is too important a source of body building and regulating material to be neglected. People who will buy porterhouse steak and lamb chops for themselves should not begrudge money for fresh fruit in the diet of their children. Those who must economize closely will have to depend more upon dried and less upon fresh fruit, except as the latter can be obtained cheaply in the height of the season. In the country, of course, fruit may be canned and so saved for use when out of season. The vegetables which serve the same purpose as fruit should be used as freely as possible, especially in the dietary of growing girls who need a rich supply of iron. Salads are usually popular if daintily prepared, and become a very useful part of the high school girl's menu. They should consist of crisp fresh or cooked vegetables, fresh fruit, or eggs, served with a simple cream or oil dressing without high seasoning. Strong condiments have no place in the dietary of youth, and rich salads of meat or fish with a heavy load of mayonnaise dressing are a severe tax even on the sturdy adult stomach.

Meat should be provided in moderate amounts, two to four ounces a day. This is a part of good education for adult life as well as a wise provision for this particular period. As an addition to the protein content of the diet, cheese may now be used in such dishes as cheese fondue, macaroni or hominy baked with cheese, combinations of rice, cheese, and tomatoes, or as a filling for sandwiches. These are good meat substitutes, and much less expensive than meat.

A variety of breadstuffs will increase the attractiveness of the menu and help to keep up the fuel value of the diet without great expense. The use of different kinds of flour; the incorporation into the loaf not only of the raisins and dates already mentioned, but now of nuts, especially walnuts or filberts; the sprinkling of cinnamon and sugar over the top of the loaf,—are some of the ways of varying this staple food. Warm breads of all kinds should be used sparingly, if at all. When provided, they should be so baked as to have plenty of crust and little soft center, and served for breakfast or luncheon rather than the evening meal. Rolls made from raised dough should be baked with a crisp crust and served cold or reheated on the second day. Small graham or cornmeal muffins, or cornbread or muffin batter baked in a thin sheet, are permissible occasionally, and so is Boston brown bread if served cold. Griddle-cakes, waffles, and baking powder biscuit should not appear in the dietary of the child under fourteen and very seldom after that. The habit of eating syrups on hot breads should not be fostered. The temptation to use them to excess is difficult to control, and the appetite for more wholesome food is vitiated. In no case should a hot bread constitute the main dish at a meal. On those rare occasions when waffles or griddlecakes are provided, they should follow a cereal or some other plain substantial dish. This insures a smaller consumption of the indigestible food and protects the body by that much.

Bread and cereal puddings, custards, and blancmanges are still the most desirable forms of dessert, since they combine high food value with ease of digestion. They are particularly useful in the dietary of boys whose demand for food is so great as to tax their stomach capacity severely. It is possible to overstrain the stomach muscles by too great distention and thus lay the foundation for gastric trouble when the nervous strains of middle life begin to be felt. For hearty boys a fairly concentrated diet is therefore desirable, and large volumes of fluid should not be permitted with meals. Desserts like baked Indian meal or poor man's pudding, where milk is concentrated with the cereal in baking, are ideal for growing boys. Pastry should be used very sparingly. Custard or prune pie, having but one crust and conveying valuable milk, eggs, and fruit, with the minimum of pie crust, are examples of the best kinds of pie. Cake should be served as a dessert and should never be rich. Cookies, sponge or plain cup cake are the best types. These can be varied by chocolate, nuts, or raisins very easily.

Regularity of meals becomes increasingly difficult to secure, but needs to be emphasized as much as ever. Three regular meals a day should be sufficient, but for the rapidly growing child of keen appetite it is often wise to provide access to some very plain food, such as bread or crackers, between meals. Girls, especially of high school age, frequently wish to omit breakfast, but they should not be permitted to go to school without any food. "Nerves" are often the direct result of undernutrition, and in this period the welfare of the woman's nervous system is largely determined. Many high school children do not go home for the noon meal. In fact, the custom of providing meals at school began in America with the high school, and most city schools have lunch rooms. Sometimes these are let by contract and there is no skilled supervision of the food supply.

But with the spread of the carefully supervised elementary school luncheon attention has been directed to the real needs of the high school youth and the opportunities for education in good eating habits. An interesting attempt to help the pupil to choose wisely is shown in the Menu Bulletin of the Julia Richman High School in New York City.[1]

JULIA RICHMAN HIGH SCHOOL

LUNCH SERVICE

Menu Bulletin No. 37

N.B. You require 800 balanced Calories for lunch. Purchase the items which give you this quantity.

	CALORIES	PRICE
Soup:		
Split pea, bread and butter	310	$0.05
Hot dish:		
Veal stew with vegetables, bread and butter	350	.10
Vegetables:		
Lima beans	125	.03
Sandwiches:		
Date nut on graham bread	245	.04
Chopped egg	200	.04
Desserts:		
Raisin layer cake	300	.05
Horton's ice cream	200	.05
Bread pudding, chocolate sauce	275	.04
Baked apple and cream	120	.03
Apple	50	.01
Crackers:		
Cecilias	100	3 for .01
Fireside peanut jumbles	110	2 for .01

[1] Op. cit., p. 17.

	Calories	Price
Candy:		
Sweet milk chocolate, large bars	500	.05
Almond bars	600	.05
Assorted penny candy	100	.01
Beverages:		
Milk	140	.03
Cocoa	110	.03
Breads:		
White or graham, with butter	185	.02

"The result of the educational work done here is clearly demonstrated in the change of demand for food. The first few days of the service, the candy and pastry tables were the chief points of purchase, more than half the receipts coming from that source. About 30 bowls of soup were sold and 15 to 20 other hot dishes. Within four weeks from the commencement of the service we were selling an average of 80 to 90 bowls of soup and 40 to 60 other hot dishes."

The high school luncheon will usually offer a greater variety of foods than the elementary school meal, but these should always be presented with the fact in mind that the young people are going back to brain work, and heavy dishes are out of place. The daily menu list may well include such dishes as the following:

1. Soup, as tomato, green pea, split pea, white and black bean.
2. Two or three hot dishes, as spaghetti with tomato sauce, mashed potatoes with green peas, baked beans, corn pudding, a stew with vegetables or a hot roast beef sandwich.
3. Salads, as potato, egg, fruit, or green vegetable.
4. Sandwiches, one or two varieties each day.
5. Fruit, as apples, bananas, stewed fruits of various kinds.
6. Milk and cocoa.
7. Plain cake or sweet wafers offered only in combination with milk or other plain food.
8. Ice cream, charlotte russe, simple baked pudding, sweet chocolate.

The evening meal needs to be more substantial than for the younger children. In the city this will be the time for the regular dinner; in the country it is more likely to be supper. Here we must guard against extremes — too heavy a meal on the one hand and too light on the other. Supper should include one substantial warm dish as a rule. This may be a thick soup, as suggested for the younger children, macaroni and cheese, a stew or chowder, or a loaf of beans or lentils with a cream or tomato sauce. This with plenty of bread and butter, some stewed fruit and cookies, or a wholesome pudding, and milk to drink, will make a sufficiently nourishing repast. Suggestions for dinner are given on the food plan below.

The energy requirements of this period are approximately:

Age in Years	Protein Calories per Pound	Total Calories per Pound
12–13	3	25–30
14–17		20–25

This means that the total daily requirement for girls from fourteen to seventeen will be from 2200 to 2600 Calories; for boys of the same age from 2500 to 3000 Calories. Very often by this time the full height will have been attained and the parents are surprised at the large consumption of food, thinking that growth has ceased. But growth is not merely a question of height. As already said, it involves laying on of muscle and fat, development of internal organs and a vigorous nervous system, and these demand food. Furthermore, muscular activity, especially out of doors, is a great aid in muscle and nerve development, and the extra fuel required to support this activity should never be begrudged young people. For five or ten years after full height is reached their food consumption will be considerably higher than that of adults of the same size. As long as they confine themselves to simple, nourishing foods they are not likely to overeat. Sometimes their expenditures in growth and activity exceed their assimilative powers. Especially is this true of those who grow very tall with great rapidity and indulge freely in active sports and dancing. To leave a balance in favor of the body it may be for a time necessary to curtail the activity somewhat—to insist on longer hours for rest and less violent exercise until substantial gains in weight and other signs of physical welfare show that the energy demands are not greater than the energy supply.

A Day's Food Plan — Age Fourteen to Sixteen Years

Fuel Requirement: 1800–3200 Calories Cost: 1–1½ ¢ per 100 Calories

Breakfast:

Fruit	50–100 Calories
Cereal	100–150 Calories
Milk	100–200 Calories
Bread	100–200 Calories
Butter	50–100 Calories
	500–800 Calories

Luncheon:

Macaroni and cheese or Hot roast beef sandwich or Bean soup and crackers	200–300 Calories
Cocoa or milk	100–150 Calories
Bread	100–300 Calories
Butter	100–200 Calories
Baked custard or Rice pudding or Baked apple	150–200 Calories
	600–1200 Calories

Dinner:

Meat or Bean or lentil loaf and potatoes or Scalloped eggs	200–300 Calories
Potatoes or Macaroni or Rice or Baked banana	50–100 Calories
Green vegetable, cooked	25–100 Calories
Fresh fruit or vegetable salad	100–150 Calories
Bread	100–300 Calories
Butter	100–300 Calories
Ice cream or Tapioca cream or Charlotte russe	150–200 Calories
Milk or cereal café au lait	100–200 Calories
	800–1400 Calories

A Day's Dietary for a Boy aged Sixteen Years

Fuel Value: 3000 Calories   Cost: 1–1¼ ¢ per 100 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
Banana	1 large	5.5	5	100
Oatmeal	2 cups	15.8	34	200
Milk	1½ cups	12.7	48	250
Cornmeal muffins	2 small muffins	3.2	36	275
Butter	2 tsp.	0.3	—	70
Sugar	1 tbsp. (scant)	0.5	—	50
				945
Luncheon:				
Macaroni and cheese	1 cup	4.2	34	200
Graham bread	3 slices	1.4	14	100
Butter	⅔ tbsp.	0.3	—	66
Cocoa II[1]	⅘ cup	7.6	32	200
Stewed rhubarb	¾ cup	2.5	1	150
Gingerbread I[1]	2 small pieces	2.2	14	200
				916
Dinner:				
Swiss steak	2 slices	2.2	70	200
Mashed potatoes	⅞ cup	6.2	14	200
Stewed tomatoes	¾ cup	6.7	9	120
Bread	4 slices	2.7	28	200
Butter	1 tbsp.	0.5	—	100
Brown Betty	⅖ cup	4.2	8	200
Milk	½ cup	4.2	17	85
Sugar	2 tsp.	0.3	—	34
				1139
Total for day			364	3000

[1] See Table III, Appendix, pp. 358 and 370.

A DAY'S DIETARY FOR A GIRL AGED SIXTEEN YEARS

Fuel Value: 2350 Calories Cost: $1\frac{1}{4}$–$1\frac{1}{2}$ ¢ per 100 Calories

	MEASURE	WEIGHT Oz.	PROTEIN CALORIES	TOTAL CALORIES
BREAKFAST:				
Orange	½ large	4.7	3	50
Oatmeal	1 cup	7.9	17	100
Top milk (12 oz.)	⅜ cup	3.0	10	100
Whole milk	⅝ cup	5.1	19	100
Toast	2 slices	1.0	14	100
Butter	1 tbsp.	0.5	1	100
Sugar	1 tbsp. (scant)	0.5	—	50
Cereal coffee	1 cup	—	—	—
				600
LUNCHEON:				
Corn chowder	⅘ cup	6.6	24	200
Date and cheese sandwich	3 triangles 3 in. × 3½ in. × 4 in.	3.0	27	290
Cocoa I[1] with whipped cream	¾ cup	7.0	16	155
Baked apple	1 small	3.2	1	140
				785
DINNER:				
Broiled Hamburg steak	1 large cake	2.6	82	150
Brown sauce	3 tbsp.	1.7	7	50
Baked potatoes	1 medium	3.0	11	100
Stuffed peppers[1]	1 small	2.6	9	50
Banana salad	1 serving	3.0	13	110
French rolls	2 small	1.9	18	150
Butter	1 tbsp.	0.5	—	100
Washington pie	piece 3 in. × 3 in. × 1 in.	2.1	21	200
Cereal coffee (¼ milk)	1 cup	8.0	5	25
Sugar	2 tsp.	0.3	—	30
				965
Total for day			298	2350

[1] See Table III, Appendix, pp. 358 and 424.

Food for Boys and Girls from the Seventeenth to the Twenty-fifth Year

"A little thought, a little self-control, and then forget that there is such a thing as digestion."

By the end of the sixteenth year good habits in eating ought to be well established and the digestive system should be strong enough to care for all reasonably wholesome food, if offered at suitable times. The food requirements of the next few years depend very largely upon the nature of the youth's occupation. Up to this time the majority have been held in school by choice or law, but now some engage in vigorous muscular labor, some go into sedentary trades, and some continue to go to school. Nearly all continue to increase in body weight, and many in height, for four or five years, if not longer. The processes initiated, sometimes with such vigor, in the period of adolescence are now more slowly completed. Muscle is added, internal organs perfect their structure, the nervous system grows stronger, and that fine working machine — the adult man or woman — comes upon the scene.

The influence of active and sedentary life upon the choice of food has already been discussed in the chapters dealing with the adult man and woman. The active youth engaged in outdoor labor can thrive on the simple rations of pork and beans, cabbage and potatoes, corn bread and apple pie, provided they are sufficient in amounts to cover his fuel needs. Outdoor life and fresh air are sauce to his appetite and tonic to his digestion. On the other hand, the young bank clerk, sitting in a hot, close room, with no more exercise than a short walk or two, would find his brain utterly befogged by such a diet because conditions are not favorable for digesting it. He must have the simple fare of the sedentary man, in quantities not exceeding his daily needs, and daintily prepared, since his living conditions do not foster keen appetite. Girls at sedentary occupations are more liable to suffer from the blunting effect on appetite than boys, and are tempted to eat foods of high flavor, like pickles and candy, with little regard to their after-effects. But the simple, nourishing food already suggested for sixteen-year-old girls and sedentary women indicates the type of diet which they should have.

Young people entering the commercial world are frequently confronted with the luncheon problem. If they take food from home, there must be careful selection, just as in the case of the school child, and a warm beverage should be added if possible. More and more are factories and other commerical concerns realizing the relationship between good feeding and efficiency in their employees, and establishing their own lunch rooms, with experts in charge to provide good food at a moderate price. Very often, however, the boy or girl must patronize some public restaurant, and here we have as yet little guarantee as to quality of food and no guidance as to what to choose. Those lunch rooms which provide plain, clean food under sanitary conditions, but without expensive frills in the way of table decoration and service, are doing a real service to the young man and woman of small means forced to lunch away from home.[1] But the individual must still decide for himself what shall constitute his meal. A serving of wheat cakes and maple syrup will give approximately the same fuel value as one of milk crackers and milk, but the latter is much less liable to cause digestive disturbances and is richer in building material for the still growing organism. Similarly, a serving of baked macaroni and cheese, with its accompanying bread and butter, as the main part of the luncheon would be preferable to one of mince pie, though the cost of fuel value may be the same.[2]

Most young people need from 750 to 1000 Calories for luncheon, the exact amount depending, of course, upon many factors — the kind of breakfast, the size and activity of the individual, and so forth. But even when growth has slowed down to these last stages, the welfare of the young person is usually promoted by three regular meals, each fairly substantial. Some examples of simple luncheons in which the cost of the food materials at retail is about one cent per 100 Calories are given below.

INEXPENSIVE LUNCHEONS

I.	Cream of tomato soup	1 cup	225 Calories
	Toast	2 slices	100 Calories
	Butter	1 tbsp.	100 Calories
	Rice pudding	$\frac{4}{5}$ cup	325 Calories
			750 Calories

[1] Attention has already been called to the valuable publication by Gephart and Lusk on the Food Value and Cost of the portions of food served in Childs' Restaurants in New York City. This is worthy of study by all patronizing these restaurants. (Analysis and Cost of Ready to Serve Foods; Gephart and Lusk. American Medical Association, Chicago, 10 cts.)

[2] Gephart and Lusk, *op. cit.*

II.	Potato soup	$\frac{3}{4}$ cup	200 Calories
	Croutons	15 cubes	50 Calories
	Cornmeal and raisin pudding	$\frac{2}{3}$ cup	300 Calories
	Sugar cookies	2 large	200 Calories
			750 Calories
III.	Bean soup	$1\frac{1}{2}$ cups	150 Calories
	Corn bread	2 in. $\times$ 4 in. $\times$ 4 in.	200 Calories
	Butter	1 tbsp.	100 Calories
	Chocolate blancmange	$\frac{1}{2}$ cup	200 Calories
	with cream (thin)	$\frac{1}{4}$ cup	100 Calories
			750 Calories
IV.	Cheese and nut sandwiches	2 large	415 Calories
	Dates	10	200 Calories
	Buttermilk	$1\frac{1}{2}$ cups	135 Calories
			750 Calories
V.	Milk	1 cup	175 Calories
	Date sandwiches	2 large	375 Calories
	Sliced orange (1) and banana (1) with		175 Calories
	Sugar	$\frac{1}{2}$ tbsp.	25 Calories
			750 Calories
VI.	Grape nuts	$7\frac{1}{2}$ tbsp.	250 Calories
	Sugar	2 tbsp.	100 Calories
	Milk	$1\frac{3}{4}$ cups	300 Calories
	Banana	1 large	100 Calories
	Salted peanuts	12 nuts	50 Calories
			800 Calories
VII.	Macaroni and cheese	1 cup	200 Calories
	Lettuce salad, French dressing	small serving	100 Calories
	Graham bread	2 slices	100 Calories

	Butter	1 tbsp.	100 Calories
	Gingerbread	2 in. × 2 in. × 2 in.	200 Calories
	Whipped cream	2 tbsp.	100 Calories
			800 Calories
VIII.	Nut loaf, tomato sauce	½ cup	200 Calories
	Graham muffins	2 small	200 Calories
	Butter	1 tbsp.	100 Calories
	Lemon milk sherbet	¾ cup	300 Calories
			800 Calories
IX.	Creamed dried beef	½ cup	175 Calories
	Baked potato	1 large	150 Calories
	Baking powder biscuit	3 small	125 Calories
	Butter	2 tbsp.	200 Calories
	Sliced banana (1) with sugar (1 tsp.) and thin cream (3 tbsp.)		175 Calories
			825 Calories
X.	Cheese fondue	⅔ cup	200 Calories
	Brown bread	3 slices	150 Calories
	Butter	1 tbsp.	100 Calories
	Cocoa	⅘ cup	200 Calories
	Rice pudding (creamy)	½ cup	200 Calories
	Whipped cream	1 tbsp.	50 Calories
			900 Calories

For the college youth the feeding problem is one of adaptation to a life partly active and partly sedentary, with some allowance of surplus for growth throughout most if not all of the four years. Within the period from the eighteenth to the twenty-third year most young people complete their college education, and this is the time when they should be laying the final stones in that foundation of physical health and strength which is to make their active working years most effective. It is not always realized that these are years for storing capital physically as well as mentally. Too often young people are released from the safe-guarding routine of home life and left to their own devices as regards food in the college community, when their eating ought to be carefully supervised. The existence of the training table shows some recognition of the fact that unwholesome living and physical fitness are incompatible, and what we need is to extend this idea in a modified form to every student in college — to make every college table a training table for high physical resistance in future years. Many institutions have their own dining halls, where the food can be properly prepared and served; small excuse for these if it is not adequate for the students' needs! And yet, all too often, the selection is left to some one with no real knowledge of the principles of good feeding, whose work is judged by the size of the bills and not at all by the well-being of the young people. With trained dietitians available, this is no longer excusable. On the other hand, college students do not need expensive and elaborate fare; and even the expert college dietitian is likely to suffer many and severe criticisms from the members of her group, because of the different standards of living which they bring with them, the bad eating habits which they may have acquired in their own homes, and the utter separation in their minds of the price which they pay for board from the kind of fare that a given sum of money will buy. At one time

Mrs. Richards made an investigation of a college dining hall in the University of Chicago where there were complaints of the food. The students were asked to make out some bills of fare which would please them, and it was found that to give them what they wished would cost about \$10 per week, whereas they were paying \$3.50! It is only by education and establishing confidence in the dietitian that such problems can be satisfactorily met.

Schools which do not provide dining halls of their own have a responsibility for the kind of eating houses patronized by their students, and should at least be able to warn against those which are unsanitary. Young people of limited means are in danger, if left to themselves, of economizing on food to the detriment of their health, and will naturally pick out those restaurants where they can seemingly get the most food for the least money. This is perfectly legitimate till we come to the type of eating house which buys adulterated, spoiled, or otherwise inferior food and skimps on dishwashing, refrigerator cleaning, and other necessary sanitary precautions, in order to sell at a low price. From such the college student needs to be strictly guarded. Fortunately the habit of "boarding oneself," which was fairly common half a century ago, is not so prevalent to-day, and students in general are probably better fed. This is as it should be, for it is a sad thing to see a young man or woman of promise break down at thirty-five or forty, unable to stand the strain of existence because of malnutrition in the critical years of development. With proper nutrition and rational division of work, rest, and play, the college student should emerge from his four-year course stronger physically as well as mentally. To achieve this is a part of his education.

Specifically, the college youth needs an ample diet of plain food, fairly rich in building materials and "ballast." During periods of more intense study the food should be specially easy of digestion, without being too concentrated. Such fare as already outlined for the boy and girl of sixteen should in the main be provided. In the institution, one of the great dangers is monotonous routine. A weekly program is made out and followed month after month. This is never advisable, as variety seems to be essential to the appetite of the human being, and the custom is most disastrous for the brain worker, whose less keen appetite makes him more sensitive to monotony. There should be variation from week to week, as well as from day to day, and still more marked variation with the seasons. Milk should be served freely as a beverage, and will often be found to cut down the amount of more expensive food. At any rate, it is food which the young people should be encouraged to take, and may be the means of providing individuals with high food requirements with a full quota of nourishment when the following of the conventional menu would scarcely satisfy them.

Fruits and vegetables are sometimes conspicuously lacking in the dietaries for students, partly on account of expense and partly on account of a failure to appreciate their value, both on the part of the students and the dining-room managers. Nothing interferes with clear thinking more than constipation, and the sedentary student on a diet chiefly composed of meat and potatoes, eggs, milk, and white bread, is particularly liable to this malady. Those who have young people to care for should insist on a food allowance liberal enough to include plenty of fruit and vegetables, and as a part of their education the young people should be encouraged to eat them. If they have been carefully trained in eating from their early years, this will be comparatively easy, but there will be some who need constant encouragement to teach them rational eating habits.

Advantage may be taken of holidays and other times when physical and outdoor activity is increased to vary the menu by the introduction of some foods which are too slow of digestion for the person at brain work. If afternoons are given over to athletics and little study is done early in the evening, baked beans and brown bread will make an acceptable supper. On a cold Saturday, after hours out of doors, mince pie or suet pudding will be a satisfying dessert. But no student should be set to his evening task on a meal of hot biscuits and honey or molasses. To satisfy his youthful needs for energy he will have to eat more of them than will be good for his digestion. A thick soup, and a cereal pudding with fruit, along with plenty of bread and butter, will fulfill his requirements much better.

The food of growing children and youth is relatively more expensive than that for adults, because of their higher expenditure of energy in proportion to size and the greater need for building materials, which are more costly than simple fuel. While we insist on economy in the use of food materials, it must be a wise economy which avoids waste, but recognizes the necessity of an adequate food supply, even through the college years. If rigid economy must be practiced, let it be as far as possible on the seasoned adult who can best bear it, and not upon developing young people whose right it is not only to be well born, but also well reared.

Twenty-five years serve to round out the period of growth. Then follows a span of a quarter of a century or more which constitutes the period of adult life, whose food needs have been discussed in chapters III and IV. After fifty one must consider the modifications for old age, which are treated in the next chapter.

CHAPTER XI

FOOD AFTER FIFTY

Old age is a physiological condition rather than an accumulation of years. Some men are older at fifty than others at eighty. After the first quarter of a century, roughly the period of growth, there follows a second quarter of a century, possibly a third, in which the body tends to maintain a fairly constant weight, sometimes not varying more than a few pounds in twenty-five or thirty years. With the fuel intake regulated to the muscular activities of the individual, and the load of work adapted to the capacity of the human machine, we have ideal conditions for constant productivity for years, provided the stoking of the furnace is sensibly attended to. "Overwork" in the active adult period is in most cases the mask behind which dwell sins against nutrition and other simple laws of hygiene. Poisons due to constipation and intestinal putrefaction insidiously undermine the body resistance and may be the real cause of the wreck which follows a severe strain. The normal healthy body is wonderfully elastic, and admirably repays reasonable care.

Though a man may not be "old" at fifty — may still be vigorous in mind and body — it is likely that his muscular activity has decreased from what it was at thirty. He is more content to watch a ball game than to participate in it; he takes his game of tennis more as a duty than as a means of working off surplus animal spirits; he walks where formerly he might have run and too often rides when he might walk. This tendency to lessened muscular activity is accompanied by a gradual slowing up of the internal processes demanding fuel for their maintenance and, so, with advancing years the need for food diminishes. Appetite, however, may be as keen as ever; the eating habits acquired in more active years are unconsciously followed; or the increase of wealth results in the setting of a more luxurious table, and the palate leads far from the path of necessity — often into danger. The tendency to increase in weight is a sure indication that the fuel intake is greater than the energy expenditure. Watching the scales and observing whether one is growing more than 10 to 15 per cent heavier than the normal weight for his height (see Tables V and VI, Appendix, pp. 429 and 430) is the best way for one to discover whether or not his food intake should be cut down. If the diet has been up to this time a well-balanced one, with meat in moderation, fruit and vegetables freely used, and few rich foods, condiments, or stimulants, reduction is a matter of quantity chiefly. Eating smaller portions of the foods served and chewing them thoroughly so as to appease the appetite without excess, at the same time drinking water freely so as to facilitate the elimination of waste, should keep the body in good condition. It must be remembered, too, that if alcoholic beverages are drunk, the alcohol, besides its stimulating and other peculiar effects, has a high fuel value[1] and must be counted in the day's food supply.

Up to the age of sixty reductions in food are necessitated chiefly by lessened external muscular activity, and excess of food is stored as body fat. These phenomena cannot be considered as particularly characteristic of "old age" as a physiological condition. In the truly aged, there is a decided retardation of the internal processes, and caring for excess food becomes more difficult. There is a tendency to lose rather than to gain body weight, as the following figures show:

AVERAGE WEIGHT OF OLD MEN AND WOMEN[2]

AGE IN YEARS	MEN POUNDS	WOMEN POUNDS
60	144	125
70	139	125
80	135	113
90	127	109

It is roughly estimated that the decrease in food requirement due to old age, from the total fuel which would be required by an adult of the same degree of activity, is about 10 per cent between the ages of sixty and seventy; about 20 per cent between seventy and eighty; and about 30 per cent after that. In other words a man who at

[1] Seven Calories per gram.

[2] From Bulletin No. 223, Office of Experiment Stations, U. S. Department of Agriculture (calculated to pounds).

thirty requires per day 2000 Calories simply sitting at rest, will require under the same circumstances only about 1800 at seventy and only 1600 at eighty. The ordinary activities of a man of thirty may raise his energy output to 3500 Calories per day, but few men of eighty could do sufficient muscular work to transform so much additional fuel. Their lives are likely to be decidedly sedentary; hence 1600 to 1800 Calories will probably closely approximate their total daily expenditure, though no absolute rule can be laid down. In general, there is safety in abstemiousness; dangers of excess are greater than dangers of undernutrition.

One of the difficulties in true old age is loss of the power of mastication. When the teeth become useless, it is necessary to provide food which does not require chewing, or digestion will be interfered with. Instead of the steaks and roasts which furnish much protein in middle life, we must substitute milk and soft-cooked eggs; finely scraped or minced meats, or easily flaked fish. If the gums cannot effect the mastication of breadstuffs, fermentation is likely to result. The substitution of thoroughly crisp toast or zwiebach, softened in milk, tea, coffee, soup, and the like, usually gives good results, the change in texture making the food break up readily into small pieces and the slight chemical change (principally conversion of starch to the more readily digested dextrin) being also advantageous. Very thoroughly cooked cereals and baked potatoes are other useful sources of carbohydrate food. If sugars can be taken without fermentation, they are valuable. Many old people are fond of sweets and can eat considerable amounts to advantage.

On account of the slowing of digestive processes, and the tendency for the digestive juices to flow less readily, fats should be used rather sparingly. Rich sauces, cakes and puddings, pastries, and fried foods should be discarded. Cream, bacon, butter, and olive oil, all forms which can be very simply used, with bread, cereals, and the like, are much to be preferred, and then in moderation. Stimulants to gastric secretion may very properly be used to aid digestion in the aged. Warm food is desirable for the same reason. Instead, then, of a glass of cold water before a meal to start the gastric juice, a warm beverage such as tea or coffee or a clear soup of some kind will be advisable. Unless there is difficulty in the elimination of uric acid, the potent influence of meat extracts as gastric stimulants may be exerted in the form of beef and other kinds of broth.

With the lowering of metabolism characteristic of senility, coupled with sedentary living, there is more difficulty in keeping the body comfortably warm, and more care must be taken to conserve the heat naturally generated. This is another reason for giving warm rather than cold food. Even between meals a hot drink of broth, tea, or coffee will often prove most acceptable instead of plain water, and will counteract the tendency to drink too little which interferes with free elimination of waste products.

With constructive processes at a standstill, or destructive actually in ascendance, the need for building materials is reduced to a minimum. As long as life persists there is necessarily some exchange of materials in the processes of cell activity, and none of the elements already seen to be essential to a well-balanced dietary can be entirely dispensed with. But the total amount required is less than ever before. In the case of protein, there is usually more danger of difficulty in getting rid of a surplus than in the more active years, so that a very moderate supply is best. An allowance in the day's diet of one and one-half protein Calories per pound should fully protect the body against nitrogen deficiency. Milk, gelatin, and cereal proteins — forms which do not readily undergo putrefaction — are more desirable than meat.

How freely fruits and green vegetables may be used depends much upon the individual. If mastication is possible and fermentation does not develop, they may make up a considerable part of the dietary. But with decreased powers of caring for them, they must be given in such ways as one would give them to little children, *i.e.*, fruits as juice or stewed pulp of mild varieties; vegetables well-cooked and mashed or put through a sieve and served as purée or soup.

Many old people sleep better with some form of nourishment late in the evening or when they waken in the night. Hot milk, plain or modified with a cereal gruel or warm water, hot malted milk, or hot bouillon with one or two crackers may be given at such a time. If the person wakes early in the morning, food is often desired before the regular breakfast. Sometimes a few plain crackers may be left by the bedside, some choice ripe fruit, fruit juice, or a glass of milk.

By such additions to the menu, it is likely to come about that the number of meals is increased in extreme old age to five or six instead of three a day. In many ways the diet gradually approximates that fed to children in the first five or six years — fruit juices, well-cooked cereals, milk, eggs, strained vegetables, and cereal puddings making a large part of the ration, with simple meals coming at frequent intervals. The emphasis on building materials is less, and hot and stimulating foods not permissible in early life are usually a part of the aged person's menu. Moderation and simplicity are the passwords to health.

A Day's Food Plan for an Elderly Person

Age: 70–80 Fuel Requirement: 1500–1800 Calories

7:30 A.M.	Soft, sweet fruit or mild, diluted fruit juice (grape, pineapple, or apple)	75–100 Calories
	Well-cooked cereal with thin cream and a little sugar	100–200 Calories
	Toast or zwiebach with butter	100–200 Calories
	Bacon or soft-cooked eggs	75–150 Calories
	Tea or coffee with cream and sugar	100–200 Calories
12:30 P.M.	Cream soup	100–150 Calories
	Fish or oysters, cheese soufflé or fondue	100–200 Calories
	Rice, or baked or riced potato	75–100 Calories
	Toast or zwiebach with butter	100–200 Calories
	Stewed fruit or fruit jelly with gelatin or tapioca	100–200 Calories
4 P.M.	Tea or coffee, or bouillon, or malted milk, toast or crackers	75–100 Calories
6 P.M.	Chicken, or lamb chop, or broiled beef balls	100–150 Calories
	Riced, or baked, or mashed potato	75–100 Calories
	One other cooked vegetable (soft enough to mash with a fork)	25–100 Calories

Toast or zwiebach, or Huntley and Palmer dinner biscuit	75–100 Calories
Custard, or cereal pudding, or gelatin dessert	100–200 Calories
Tea or coffee with cream and sugar .	100–200 Calories

A DAY'S FOOD PLAN FOR AN AGED PERSON

Age: 80 or over Fuel Requirement: 1200–1500 Calories

6 A.M.	Weak tea or coffee with hot milk or cream or hot milk or malted milk .	75–100 Calories
8 A.M.	Soft-cooked egg or omelet or well-cooked cereal with cream	75–150 Calories
	Zwiebach or toast	75–150 Calories
	Weak tea or coffee with hot milk or cream	75–100 Calories
12:30 P.M.	Cream soup or vegetable purée with croutons	100–200 Calories
	Broiled, baked or boiled fish, small serving or Cheese soufflé or egg timbale	100–200 Calories
	Baked, riced, or mashed potato . .	50–100 Calories
	Stewed or baked fruit [1]	100–150 Calories
	Weak tea or coffee with hot milk or cream	75–100 Calories
4 P.M.	Tea or coffee with hot milk or cream .	75–100 Calories
6 P.M.	Broth	10–15 Calories
	Minced chicken, lamb, mutton, or beef, small serving	100–150 Calories
	Zwiebach or toast lightly buttered and moistened with hot, salted water .	75–150 Calories
	A cooked vegetable, mashed or sifted (as peas, squash, asparagus tips) .	25–100 Calories
	Cereal pudding or custard	100–200 Calories
10 P.M.	Broth	10–15 Calories
	Toast	25–50 Calories

[1] If sugar causes gastric disturbance, saccharine may be used in place of part or all of it. If the fruit acid is irritating, a very little bicarbonate of soda may be used to neutralize it.

A Day's Dietary for an Aged Person, Based on the Preceding Plan

Fuel Value: 1614 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
6. A.M.				
Buttermilk	¾ cup	7.4	25	75
				75
8 A.M.				
Grape juice	½ cup	3.5	—	100
Cream of wheat .	⅜ cup	3.0	6	50
Milk (top 10 oz.) .	¼ cup	2.1	9	100
Sugar	1 tsp. (scant)	0.1	—	16
Bread (toasted) . .	2 thin slices	0.5	7	50
Butter	½ tbsp.	0.3	—	50
Bacon	4–5 small pieces	0.5	13	100
Coffee with ¼ cup milk and 1 tsp. sugar	1 cup	—	9	60
				526
12.30 P.M.				
Bouillon	⅗ cup	5.0	13	15
Croutons (toasted)	1 doz.	0.7	7	50
Minced lamb with gravy (2 tsp. flour)	—	2.4 (roast meat)	43	120
Baked potato . .	1 small	2.3	9	75
Butter	½ tbsp.	0.3	—	50
Tapioca cream . .	⅖ cup	2.8	12	100
				410
4 P.M.				
Tea with 1 tsp. sugar	1 cup	—	—	16
Bread (toasted) . .	2 thin slices	0.5	7	50
				66

	Measure	Weight Oz.	Protein Calories	Total Calories
6 P.M.				
Omelet (1 egg, 1 tsp. butter)	—	—	25	100
Rice steamed with green peppers and tomato	½ cup	3.5	7	70
Baked squash (1 tsp. butter)	⅓ cup	3.0	5	50
Pulled bread . . .	1 slice	0.5	7	50
Coffee jelly . . .	½ cup	4.0	4	40
Whipped cream . .	2 tbsp.	0.9	2	100
Cereal coffee with ¼ cup hot milk and 1 tsp. sugar . .	1 cup	—	9	60
				470
10 P.M.				
Hot malted milk .	2 tbsp. in ⅔ cup water	0.6	9	67
				67
Total for day . .			228	1614

CHAPTER XII

FOOD FOR THE FAMILY GROUP: MENUS

DIVERSITY of age! Diversity of need! Diversity of taste! How shall the individual requirements set forth in the preceding chapters be harmonized so that one table may serve all? How shall one pair of hands, if need be, prepare the food required? And how may there be time and energy left for house and clothes and for that "higher life" of the family to which food, clothing, and shelter are after all only the means? Our grandmothers have brought up families without any knowledge of food requirements save tradition — why not do likewise; spend what we can, take what the market affords, and trust in Providence for the results? Alas, science has at least made us aware that "mysterious dispensations of Providence" which robbed families of health and strength could have been averted by a little knowledge and care; that bad feeding kills more babies than any other kind of negligence; "that man's efficiency in this world, if not his happiness in the next, is mainly due to the precautions he takes to use suitable food and to avoid dangerous combinations." To-day the profession of housewife demands knowledge of the needs of each member of her group and ability to supply them under all sorts of circumstances. "Happy is he who sits down to the dinner provided for him without thought of what he must leave out, with a mind free for social pleasure, secure in the skill and *knowledge* of his cook." Happier still the children brought up under a watchful eye that understands the laws of health and holds them in the highest regard. They will repay patient mastery of the A B C's of nutrition a hundred fold. And some of the rewards will be immediate. One grandmother remarked the other day: "The modern way of bringing up *does seem to make good babies*." Nutrition as a science is not very old, but it has begun to illumine the page of tradition; and mastery of its principles will enable us to proceed with confidence instead of uncertainty. We have to cope to-day with many new conditions upon which tradition throws no light. Package goods, ready-to-eat foods, hothouse products, strange wares from the ends of the earth — we must learn in these to recognize the old familiar food-stuffs (or to note their absence) and adapt ourselves to the new order. Then when we find that a new food product at $4 a pound contains the same nutritive substances as milk at four cents a pound, we shall be able to choose intelligently between them. Knowing that milk and egg yolk, which are no trouble to prepare, are better for little children than beef juice, shall we not save ourselves labor and often expense? Realizing that the energy value of a food is the same whether served simply or elaborately, shall we not be better able to decide how much elaboration is worth while?

"I shouldn't mind housekeeping if it were not for planning the meals" — how often have we heard this! There is a sort of inevitableness about meals which makes them seem truly awful at times. A hungry family and nothing on the table is terrible to contemplate. But routine (drudgery if you will) loses much of its depressing power when our work gains significance. To see the children rosy, the family accounts free from doctor's bills, and an atmosphere of serenity in the home are surely compensations for time and thought given to family meals.

The Construction of the Menu

There is a steady demand for menus, and they are always suggestive. But they seldom fit the case exactly. They depend on times and seasons, localities and pocketbooks, community customs and individual notions, as well as the states of health and size of families and ages of their members. Hence menus cannot be made wholesale and slavishly followed. The examples which have been given in this book in discussing the food of the different types which one may find in a family group are designed to illustrate principles and may be greatly modified without any sacrifice of nutritive value. A meal may be reduced to a single kind of food material or it may contain many kinds of food and many dishes. If there is only one kind of food used, the menu is no problem. So the baby, each of whose meals is alike, is not the one the mother has in mind when she worries about "planning meals." Nor are normal young children up to at least four or five years of age much cause of concern on this account; their food is limited in variety and their meals vary little from day to day. It is when the choice of food materials becomes practically unlimited, when selecting for the older children and adults, that the menu looms large in her mind, and from this point of view it will be first discussed.

Types of Meal Plans

One great help in the daily task is the standardization of the meals to be served at different times in the day. This will have to be determined for each family group according to its food needs. If the adults are all sedentary, and have ample noon meals, breakfast may be *very light:* fruit, some kind of breadstuff, as toast or rolls, and a beverage, as coffee, cocoa, or milk. Or it may be *light:* fruit, cereal, breadstuff, beverage. If, however, the workers take little food at midday, it may be wise to increase it to *medium:* fruit, cereal, eggs or meat, breadstuff, beverage. If the workers are engaged actively in muscular pursuits, and their total intake for the day must be high, the breakfast may be medium or *heavy:* fruit, cereal, eggs or meat, one other hot dish, breadstuff, beverage. For the mixed family group, where the adults are not very active muscularly, the "light" breakfast is the most convenient type, as it provides at the same time the essentials of the children's breakfast. For one person demanding more variety, an egg or serving of bacon can be added without much extra labor. On the other hand, the sedentary person eating in a group of active muscular workers can pass by the extra dishes and confine himself to the "light" or "medium" breakfast, the "heavy" type being quite unsuited to his needs.

Similarly, various plans present themselves for luncheon and dinner, or for dinner and supper, as the case may be.

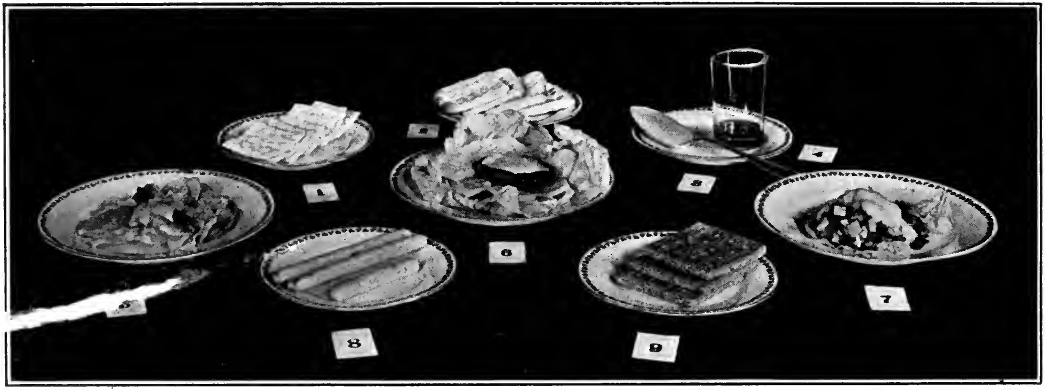
As a general rule, digestion is better served by having at least one hot dish at a meal. This may be a beverage, and luncheon consist of a beverage and sandwiches. Thus peanut butter sandwiches and cocoa are perfectly practical for a luncheon yielding 700 to 800 Calories per capita. Or the hot dish may be a soup, and again sandwiches used to supplement it. Or the hot dish may be a chowder, macaroni and cheese, some creamed dish on toast, and the like, served with bread and butter and a beverage. These simple types of luncheon are suited to the sedentary worker, but can be made more pleasing to the palate by the addition of a simple dessert — stewed or fresh fruit, charlotte russe, blancmange. Another type of luncheon, still suitable for the sedentary, consists of soup, some other hot dish, such as mentioned above, bread and butter and dessert, to which a beverage may or may not be added. This can be easily varied by substituting a salad for the hot dish — giving a type of luncheon especially attractive to sedentary women. For the active worker, especially if engaged out of doors, for whom food must be liberally provided, one or two hot dishes, a substantial dessert (as pie) and a hot beverage, with bread and butter, will give as satisfactory results as a greater variety, if the dishes are high in fuel value. More formal luncheons resemble dinners in type.

A very simple dinner will consist of two hot dishes (as meat and a vegetable), which may be combined and served as one at times, bread and butter, and a dessert, with or without any beverage but water. The addition of another vegetable will make this more pleasing and almost always better balanced. Where it does not involve too much labor, dinner is very happily begun with soup. As already said, this stimulates gastric secretion, the warmth is refreshing, and one is in better condition to enjoy the rest of the dinner with the edge taken off hunger without blunting the appetite. A soup, three hot dishes, a salad, dessert, and beverage, with bread and butter, make a meal elaborate enough for any family. In fact, one of the reasons for difficulty in menu making is the tendency to put too many dishes into one meal. We may apply to foods as well as to house furnishings William Morris's dictum, "Nothing is beautiful which is not also useful." An added dish should serve a real purpose in a meal, artistic or physiological. A green vegetable is a desirable part of any dinner menu, but *two* green vegetables offer no enhancement to each other and rarely add anything to the effect not already accomplished by one, while physiologically they serve the same purpose and one might just as well eat two servings of one as one serving of each of two kinds. Every duplication of this kind makes it so much the more difficult to provide the sauce of variety for the next time. Potatoes, macaroni and rice are essentially equivalents in the menu, carbohydrate foods of mild flavor and of the same color and general texture; hence they should be served one at a time and made to give variety to three days — never all, nor even two of them, at one meal. The same is true of any group of foods like sweet potatoes, cooked bananas, parsnips, and carrots — all sweet carbohydrate foods so similar that they are both nutritively and artistically food equivalents, and where one values esthetic effects to be used one at a time. In this matter of food equivalents, minor adjustment to individual preferences can often be made through the use of leftovers. If macaroni is the starchy dish to-day and John prefers rice, which was served yesterday, a leftover portion may be given to him; he will be as well fed as if he ate the macaroni, and the cook will be relieved of the odd portion.

Often the dessert furnishes the most energy of any single dish, amounting to as much as 300 or 400 Calories. When the first part of the meal is not very high in fuel value, this is all very well; but when "heavy" desserts are not needed to bring up the total fuel value of the meal, a salad or fruit will leave a pleasant impression upon the diners, at the same time relieving the cook of work and making the meal better balanced.

Food Combinations from the Scientific Standpoint

"What foods go well together?" Many housewives seem to think that there are laws on this point as unalterable as those of the Medes and Persians. As a



100-CALORIE PORTIONS OF SALADS AND SALAD ACCESSORIES[1]

	Food Material	*Weight (oz.)*	*Measure*
1.	Saltines	0.8	6 saltines
2.	Soda crackers	0.9	4 crackers
3.	Mayonnaise dressing	0.5	1 tablespoon
4.	French dressing	0.6	$1\frac{1}{2}$ tablespoon
5.	Fruit salad	1.5	Very small serving
6.	Tomato and cucumber salad	2.0	Very small serving
7.	Chicken salad	1.6	Very small serving
8.	Cheese straws	0.8	$2\frac{2}{3}$ straws
9.	Graham crackers	0.8	3 crackers

[1] Cf. Appendix, Tables I and III.

matter of fact, the answer depends very much upon whether one is an Englishman or an Esquimaux, a Bostonian or a Bengali. Reverend S. Hall Young, recounting his experiences with John Muir in Alaska, tells what difficulty they had, when they were entertained by the Indians, to keep their food from being drenched with a sauce of seal oil — a special delicacy to their hosts, which tasted very disagreeable to them. A Chinaman does not put sugar on his rice nor in his tea, but what American housewife would omit to offer sugar with both, unless she were serving rice as a "vegetable" — a habit too little in vogue?

The study of food combinations is like the old definition of arithmetic, "both a science and an art." As a science it relates chiefly to the promotion of digestibility and the representation of the different food elements in the diet. It has been pointed out in Chapter II that digestion is more likely to be satisfactory for the adult when the meal is not limited to a single food material. Thus bread and milk is to be preferred to milk alone. A meal composed mainly of carbohydrate material leaves the stomach too quickly to suit ordinary meal schedules, and so does one entirely fluid. A meal of fat alone would offer a staggering proposition to an ordinary appetite, and if eaten would digest slowly, giving no zest for another meal soon. A meal of protein alone might have some advantages in an Arctic climate, since it would stimulate heat production and help to give feelings of warmth, but this would be most disadvantageous in warmer regions. Altogether, man finds himself better off with proteins, fats, and carbohydrates represented in each meal, the carbohydrates where available (*i.e.*, in all but extremely cold climates) predominating. To see that these three foodstuffs are represented in good proportions in each meal is what is usually meant by serving a "balanced" meal. We should go a step further and see that some foods furnishing iron, phosphorus, and calcium and some giving "ballast" in the form of cellulose are also included, and that the fuel value of the meal is approximately the same each day; or, in other words, that we do not have a feast and upset our digestions by overeating to-day, and have a famine to-morrow, but stoke the furnace regularly, according to its needs. Herein lies the advantage of knowing the relative fuel value of different foods and different dishes. It will keep us from serving to-day a cream soup, a fat meat, sweet potatoes (perhaps glazed, with increase in fuel value), a vegetable with Hollandaise sauce, a salad with mayonnaise dressing, and ice cream with a chocolate sauce — all dishes very high in fuel; and to-morrow a bouillon, a lean fish, riced potatoes, sliced tomatoes without dressing, and fruit for dessert — a meal which may have only half the fuel value of the first one — unless we have good reason for making such a change.[1] Foods which are known to be difficult of digestion should not be massed in the same day, or more particularly, in the same meal. Even though the family enjoys griddle cakes, pork chops, fried potatoes, and plum

[1] By means of the tables in the Appendix, a rough check can easily be kept on the fuel value of a meal, without any detailed computation.

pudding, do not provide them all on the same day, but spread them over four days in combination with other foods easier to digest. Thus, we might have cantaloupe, grape nuts, and griddle cakes for breakfast one day; tomato soup, cold roast beef, fried potatoes, apple float and cookies for luncheon another day; and pork chops, mashed potatoes, string beans, orange salad, and caramel custard for dinner another day, thus giving the enjoyment of these more difficult foods under circumstances favorable to their digestion, and making it possible, where there are children, to provide for them without an entirely different menu; for of course these dishes, so hard to digest, would be withheld from children entirely. Dishes which contain large amounts of fat and protein are always slow of digestion and should be eaten with simple carbohydrate food. Thus, chicken salad with mayonnaise dressing, eaten with bread and butter (the butter in moderation), may make an acceptable luncheon, but if we add a cup of rich chocolate with whipped cream, the chances of a good appetite for dinner are decreased, and unless the person is active and out of doors, the effect is apt to be bad in the long run, if a headache does not immediately follow. Foods which are fried in small pieces, so as to be well loaded with fat, are to be used sparingly and in combination with those having little or no fat. Thus, fried potatoes "go with" lean meat like beef or mutton, and not with fat pork or bacon. Foods fried in large pieces are not necessarily loaded with fat, but their texture is often objectionable. This is the case with fritters, hot doughnuts, and the like. They form pasty masses like other hot breads, and should not be used in the same meal with such breads, pastry, or rich cake.

Concentrated foods should be served with something which will serve to dilute them. Thus cheese, a concentrated protein food, is served with crackers, or combined with a white sauce and served on toast; or mixed with macaroni, rice, hominy, bread, etc., in various dishes. Eaten in this way, it loses its reputation for being indigestible. Butter, a concentrated fat food, is eaten with bread or potatoes; foods mildly sweetened with sugar are more wholesome than rich preserves, cake, or candy. Small portions of many foods can be well borne where larger ones would do harm, because they are diluted by the rest of the meal.

Foods which stimulate digestive juices should precede those which are negative or tend to retard the flow. Thus, soup precedes other foods; meat is also served near the beginning of the meal.

Foods which promote appetite are placed early in the meal, as fresh fruit for breakfast. Sweets, which dull appetite, should be reserved till the last.

Some people are sensitive to certain combinations which others eat with ease. This can be explained only by some peculiarity of the individual. Impressions that certain combinations do not agree are often based on very little evidence; but if repeated and unprejudiced experiments give always the same result, the troublesome combination should, of course, be avoided by that person. Sometimes the trouble comes from putting together too concentrated foods. Acids taken with sweet milk tend to make the milk form hard curds in the stomach, which of course interferes with digestion.

Catsups, pickles, and highly spiced or very sweet foods of all sorts are irritating to the delicate walls of the alimentary tract and should be used sparingly by the robust, never by invalids, children, or any of delicate digestion.

Food Combinations from the Esthetic Standpoint

A balanced meal does not necessarily mean an artistic one. Graham bread and milk will sustain a man for months, but most people would find it uninteresting in a few days and actually palling on the appetite in a week or two. The human being exhibits two psychological tendencies in his diet — one, to stand by the old favorites; the other, to demand variety from day to day. A very radical change in diet is apt to upset digestion. Foreigners suffer from the strange food in a new country as much as from lack of other familiar associations. Some one has said that acclimatization is largely a matter of getting used to the food, and certainly this is an important part. So we find a diet made up of certain staples, like bread and butter and potatoes, welcomed daily, along with variables of all sorts, which help to keep up the appetite as well as to insure the presence of the different food elements required by the body. The menu maker needs to steer a medium course; to recognize this love of variety and yet not to cater to it to an unnecessary extent. A well-balanced diet, even if monotonous, will be more satisfying in the long run than an ill-balanced one. The first thing to see to, then, as already indicated, is that the different food elements are represented each day in some form. Then attention may be turned to that variety which comes from differences in form, color, flavor, and texture of foods, so prized by the expert in gastronomics. The aim of the artist is to arrange a meal not only wholesome, but a joy to all the senses. So long as beauty is a part of life, and the spirit more than meat, the housewife will take pride in assembling her family about a board which delights the eye and "makes the mouth water." Her great care must be, if this spirit is strong in her, to see that she does not sacrifice real body welfare to the eye and the palate.

Not all have a natural gift for making happy food combinations, and many have little opportunity to study the achievements of others. A visit to a good hotel, restaurant, or tea room, with careful study of the *table d'hôte* menus, will often furnish new ideas for the home table. So to exchange meals with a neighbor and to compare notes on menus is interesting and instructive. Most home magazines furnish menus, and these may well be kept as an aid when one's own ingenuity fails. But there are a few working principles which may at least keep one from committing great gastronomic blunders, and really help in securing a well-balanced diet from day to day.

In the first place, take the day as a unit in planning rather than the single meal; or, better still, plan for the week or the month; at least remember that there should be some variation from week to week and month to month. In the country, the natural procession of the seasons helps to secure this wider variety. In the city, where hothouse products or those from other districts press close on the heels of those from near-by territory, season is more apt to be lost sight of. But here one should learn to use the maximum amount for the year in the height of a given food's season. We may, for instance, serve cantaloupe in New York from April to November, but it is better for artistic as well as economic reasons to limit our freest use of the melon to August and September, when it is likely to be at its best.

Impressions carry over strongly from one meal to the next and from one day to the next. So, with the exception of certain staples (usually mild in character), such as bread, butter, milk, and the like, try to avoid serving any food in the same form twice in the same day, and, better still, avoid repeating it the same day in any form. When storage facilities are poor and perishable food has to be used up quickly, of course such a rule cannot be rigidly adhered to. And in the country, where a crop like strawberries must be enjoyed to the full in its short season, the effect of variety is gotten chiefly by varying the form in which the food is served. Thus, we may have plain, unhulled berries surrounding a mound of sugar for breakfast, a berry float, or sherbet for dinner, and get a very different impression from the dishes. So the country housewife welcomes the little book of *Apples in One Hundred Ways* and others of its kind, whereas the city housekeeper, who has perhaps ten or fifteen kinds of fruit at her command at one time, may get her variety simply by changing the species, and is less concerned with different ways of preparing each kind. In fact, she is foolish to spend time in making elaborate dishes when she can get her variety so largely by careful marketing.

Another good rule is to avoid serving a food which gives its pronounced character to a dish twice in the same meal, even in different forms. How often we see tomato soup, tomato catsup, and tomato salad on the same dinner table! Or find soup, meat, and salad flavored with onions, and perhaps onions served as a vegetable also. Care should be taken in cookery to develop the natural flavor of each kind of food, and to add extra flavors sparingly, so that they may be fully enjoyed when they are used.

Serving meals in courses helps to heighten artistic effect, and is often easier than getting everything on the table at once. Courses should contrast with one another; a bland one, then a more highly flavored one; a hot one and then a cold one; a fluid one and then a solid one. The last course should have a pleasant after-taste. This is especially emphasized in a formal meal like dinner. Some people prefer a sweet dessert, others cheese, still others coffee or fruit.

Individual courses may consist of one or more dishes. In general, the larger the number of courses, the simpler each one should be. A meal may consist of a single course and still be artistic in effect, exhibiting contrasts and harmonies within itself. Broiled steak, potato balls, watercress, bread and butter, coffee, and fruit not only make a satisfying meal, but show contrasts of form, as between the potato balls and the steak; of color, emphasized by the cress and the fruit; of texture, part being good to chew, part soft, part crisp, and part succulent. On the other hand, a meal composed of cheese fondue, sweet potatoes, creamed carrots, baked bananas, and bread and butter would be equally good from the nutritive point of view, but would weary the eye by sameness of color and the palate by sameness of texture and, to some extent, of flavor. Many popular combinations offer sharp contrasts in texture — crackers and cheese, tea and toast, ice cream and cake; in fact, this kind of contrast seems to play almost as important a part in creating a pleasing effect as good combinations of flavor. Of the latter, there are many familiar examples; cranberry or other acid fruit sauce with fowl and game, mint or peas with lamb, apples with pork, tomatoes with cheese or beef. But it is a mistake to adhere too closely to conventional combinations. Gooseberries are quite as pleasing with chicken as are cranberries; apples are good with beef, and many combinations may be devised which give pleasing effects and make the often used foods seem "different." One secret in the happy use of leftovers is to place them in entirely different surroundings from those in which they were first served; in another meal, perhaps, or at least with other kinds of food. Thus, macaroni served creamed with roast beef for dinner, if not all used, may be made into croquettes and served for luncheon with a cheese sauce. Allowing a considerable interval of time between repetitions of the same dish is another help in creating a sense of novelty. If possible, keep to-day's leftovers till day after to-morrow; repeat a favorite food once in ten days or two weeks, instead of regularly every week. Even changing the dish in which the food is served will often have an evident effect on the appetites of the family. Mrs. Richards, in one of her numerous "dietary surveys," found the girls of a certain school refusing *en masse* a dessert served in a large baking dish. It was put away till the next day, turned out in a fine mold, and the girls not only ate it, but demanded more! A consideration of the menu — the selection and service of foods in a meal — is worth while because it will help the housewife to make her family eat the foods which they ought to have. Skill in cookery and genius in food combination are only means to this end. The ideal meal is a simple one — whether of one or several courses — in which the different types of food are harmoniously represented, but not repeated, and in which food accessories, such as pickles, spices, preserves, and the like, are little needed because the foods themselves are well cooked and each contributes its own characteristic flavor, texture, form, and color to the making of a well-blended whole.

Summer and Winter Menus

Spells of hot weather have always been accounted disastrous to babies. The well-organized infant welfare work of some of our larger cities has taken account of the fact that more babies die in July and August than in other months of the year and makes preparation for a regular summer campaign for the purpose of remedying this sad condition. While its activities include all kinds of hygienic measures — cleanliness, protection from flies, suitable clothing, etc. — the matter which receives most attention, as most important, is that of food. With this properly supplied, illness and death both decrease strikingly.

In the case of older children and adults, hot weather does not work such havoc, but it does render every one more susceptible to nutritional disturbances and it is well to recognize this in planning the family meals. Sudden and extreme changes in the weather are especially trying and often go unsuspected as the cause of digestive difficulties. When the temperature suddenly drops after a few days of intense heat (especially with high humidity), one often notes in the newspapers that several prominent men have been stricken about the same time with acute indigestion, and remarks on the coincidence, especially if a number of one's own acquaintances are having the same experience. It is quite likely that the weather is at least in part to blame, and one should be particularly cautious about dietary indiscretions and chill when the thermometer is falling rapidly in the summer time.

Before the days of canning and cold storage it was often quite difficult to have much variety in the winter diet, especially towards spring, when the supply of home preserved fruits and vegetables began to give out. Salt meats and potatoes many times formed the bulk of the ration, and undoubtedly some of the ash constituents were not very well represented, the value of milk as a supplement to such a diet being quite unrealized. So it came about that a low nutritional state was expected with the warm days of spring, and dosing with "treacle and sulphur" was not limited to Mrs. Squeers of Dothe-boys' Hall. To-day, with our vastly improved facilities for a rational diet throughout the year, fruits and green vegetables, canned if not actually fresh, take the place of "blood medicines," and one may expect to be as healthy in the spring as at any other time of year.

But warm days do bring a muscular relaxation which reacts on the digestive tract as well as the rest of the body, and it needs to have its task lightened somewhat, if we do not wish to run the risk of an upset. While increases in atmospheric temperature do not affect the activities which go on internally, the amount of energy transformed in muscular work is apt to be more or less unconsciously reduced, and it is well to diminish the energy intake somewhat. Even if muscular work goes on as in cold weather, there is apt to be a lessened muscular tension in sleep, or when resting, and even if there were not, it would be wise to eat a little less for a few days till the body had adapted itself to the weather. With lessened amount of food there should go care to choose those things which are most likely to prove easy of digestion — simple dishes and not too many kinds in any one meal. Foods rich in fat, which, as we have seen, is of all the foodstuffs the most likely to retard digestion, should be withheld — pastries, cakes, sauces, and gravies. Hot breads, particularly with syrups or honey, are especially liable to fermentation at such a time. Protein foods, which, as already pointed out, most deserve the term "heating foods," should be used in moderation. The diet should consist of a very moderate allowance of lean meat, or its equivalent in eggs, cheese, milk, or other meat substitute; vegetables very simply cooked, as baked potatoes, boiled onions; or served as crisp salads dressed with French dressing, cream dressing (cream and vinegar), or merely a little vinegar and seasonings; fruits, cooked when there is any doubt as to perfect ripeness or in the person any tendency for them to disagree, and eaten in moderation. Cold desserts, of gelatin, cornstarch, tapioca, or frozen milk or fruit juices, are not only easy of digestion, but refreshing. If taken slowly at the end of a meal, frozen dishes will not chill the stomach unduly. This is much better than icing the stomach at the soda fountain between meals. If it is impossible to resist its temptations, it is much better to take a plain soda or phosphate, lemonade, iced tea, or grape juice, than to indulge in ice cream sodas or sundaes. In any case, care should be taken not to drink cold beverages rapidly when warm. The shock to the nerves of the stomach is never good, and may be very severe.

Since the body goes on generating heat at the same rate internally whether the weather be hot or warm, the problem of physical comfort in the summer time is one of getting rid of the heat generated. Any physical activity, of course, increases the amount to be dissipated into the surrounding atmosphere. We may facilitate this heat loss by lighter clothing, by fanning, by cooling baths, or by inducing perspiration if conditions are favorable for its speedy evaporation. This is the reason hot beverages prove cooling to some. On days when the humidity is high this method will not work. The warm beverage will only add to the total discomfort. Cold beverages will take body heat to warm them in the stomach and will carry away body heat when their water is eliminated, and therefore they are very valuable if not taken too cold or too fast.

Another factor in nutrition in warm weather is the fact that bacteria flourish at an amazing rate, and extra care must be taken to guard against spoiled food. Even in the refrigerator there is not always safety. Many ice boxes are so poorly constructed that their temperature rises with that of the surrounding air, and food is poorly protected. Especial care should be taken of protein foods, such as meat and milk.

In planning a menu for a hot day, it must be remembered that eating habits cannot be radically changed on short notice, without danger of a digestive upset. It is not well to give a person accustomed to hot food entirely cold meals. One hot dish can be provided without much difficulty — a beverage if nothing else. The following are suggested as illustrating good types of summer menus:

Summer Menus

I

Breakfast	Dinner	Supper
Raspberries	Veal cutlet, brown sauce	Creamed macaroni on toast
Cooked cereal with cream	Buttered beets	Sliced tomatoes
Toast	Mashed potatoes	Rolls
Coffee	Lettuce salad	Tapioca fruit jelly with whipped cream
	Wafers with cream cheese	Lady fingers
	Currant jelly	

II

Breakfast	Dinner	Supper
Fresh fruit	Stewed chicken.	Scalloped corn
Cornflakes with cream	String beans	Baked potatoes
Toasted muffins	Rice	Stewed fruit
Coffee	Red cabbage salad	Gingerbread
	Shortcake	

III

Breakfast	Luncheon	Dinner
Fresh fruit	Potato salad, mayonnaise dressing	Tomato soup
Cooked cereal with cream	Graham bread sandwiches	Saltines
Toast	Fresh sponge cake	Jellied tongue
Coffee	Chocolate	New potatoes with parsley
		Vegetable salad
		Junket ice cream, fruit sauce

IV

Breakfast	Luncheon	Dinner
Fresh fruit	Minced chicken on toast	Vegetable soup
		Bread sticks

Cooked cereal and cream	Bread and butter	Salmon loaf, cream sauce
Popovers	Jelly	Peas
Coffee	Cocoa	Boiled potatoes
	Marguerites	Sliced cucumbers
		Fruit sponge with creamy sauce

V

Breakfast	Luncheon	Dinner
Stewed rhubarb	Broiled sardines on toast	Julienne soup
Cooked cereal with cream	Tomato and chive salad	Cold roast lamb
Muffins	Brown bread and butter	Currant mint sauce
Coffee	Fresh fruit	Baked hominy and cheese
	Cocoa or tea	Cottage pudding with berry sauce

VI

Breakfast	Luncheon	Dinner
Fresh berries	Omelet with asparagus tips	Cream of spinach soup
Puffed rice	Creamed potatoes	Croutons
Frizzled ham	French rolls, twice baked	Nut loaf, cream sauce
Graham toast	Macedoine of fruit	Stuffed peppers
Coffee	Cocoa or tea	Caramel custard
		Vanilla wafers

In cold weather any excess of food beyond immediate needs is apt to be taken care of with greater ease than in summer, and energy requirements often are slightly higher, as cold stimulates to higher muscular tension and greater physical activity. This does not apply, of course, to one who lives in hot, close rooms at summer temperature during the winter months. Most people get enough stimulus from the cold to have a little better appetite and a little higher food requirement in winter than in summer. But the most marked difference is usually in digestive power. Dishes may safely appear in the winter menu which would be out of place in warm weather. Buckwheat cakes, sausage, doughnuts, baked beans, and mince pie are commonly recognized as winter foods, though it is well to remember that even then they have little place in the dietary of sedentary persons. The man who goes to work out of doors on an icy morning will find a breakfast of fried mush and sausage well suited to his needs. He can digest fat meats and other kinds of food rich in fat without any trouble. A liberal supply of protein will help to give him a feeling of warmth, and the conditions of outdoor life usually insure him against harm from an excess of nitrogenous waste products, though in special cases an excess of meat may cause trouble. Esquimaux thrive on a diet in which protein may contribute 40 per cent of the total energy value of the diet, and turn the heating properties of the protein to good account in the severe cold, whereas in a warmer climate such high protein would be at least a waste of good fuel, if not actually harmful. But the sedentary person needs at all times to be careful neither to overtax his digestive system nor to overeat, and children must be protected in winter as well as summer against rich and heavy food.

Some Winter Menus

I

Breakfast

Stewed figs
Oatmeal with cream
Scrambled eggs
Golden corncake
Coffee

Dinner

Baked ham, brown sauce
Southern sweet potatoes
Spinach
Apple pie
Coffee

Supper

Corn chowder
Toasted crackers
Orange and date salad
Bread and butter pudding

II

Breakfast

Stewed dried peaches and raisins
Hominy with cream
Bacon
Graham muffins
Coffee

Dinner

Cream of corn soup
Hamburg steak with onions
Mashed potatoes
Dried Lima beans, stewed
Steamed fig pudding, foamy sauce

Supper

Cheese soufflé
Baked rice and tomatoes
Hermits
Tea or cocoa

III

Breakfast

Cornmeal and cream of wheat, with cream
Baked sausages
Waffles
Coffee

Luncheon

Scalloped oysters
Parkerhouse rolls
Celery
Stewed apricots
Ginger cookies
Tea

Dinner

Noodle soup
Boiled mutton, jelly sauce
Baked potatoes
Creamed onions
Cold slaw
Chocolate bread pudding, creamy sauce

IV

Breakfast	Luncheon	Dinner
Stewed prunes	Minced lamb on toast	Tomato bisque
Wheatena and cream	Apple and nut salad	Boiled tongue, vinaigrette sauce
Boiled eggs	Cream cheese	Savory potatoes
Toast	Crackers	Buttered parsnips
Coffee	Cocoa or tea	Mince pie

V

Breakfast	Luncheon	Dinner
Cream of wheat with dates	Macaroni and cheese	Potato soup
Omelet with bacon	Apple sauce	Braised beef with vegetables
Toast	Baking powder biscuit	Scalloped tomatoes
Coffee	Cocoa or tea	Pineapple salad
		Pumpkin pie

VI

Breakfast	Luncheon	Dinner
Sliced bananas	Creamed oysters on toast	Chicken soup with rice
Shredded wheat biscuit	Pickles or olives	Beef loaf, brown sauce
Griddle cakes	Jellied fruit with whipped cream	Mashed potatoes
Coffee	Cup cakes	Creamed carrots and peas
	Tea	Apple sauce
		Baked Indian pudding, lemon sauce

CHAPTER XIII

FOOD FOR THE FAMILY GROUP: COST OF FOOD

It is comparatively easy to plan attractive menus if one does not have to count the cost of materials nor of the labor required in preparation and service, though, of course, it can never be done without some time and thought. With plenty of money, the great danger is in the line of over-elaboration, which is not only inartistic, but tempts to overeating and waste of food. It is better to gratify one's esthetic taste by excellence of quality in food and service than by a multiplicity of dishes. Especially to be shunned are dishes made over-rich with cream and butter, which are not only expensive but upset digestion.

For most people, cost is a large factor in the feeding problem; from one-half to one-fourth of the family income has to be devoted to buying food, and the smaller the income the larger the percentage which must be so spent. Fortunately there is no vital connection between nutritive value and cost. Nutritious and expensive are not synonymous; in fact, some of the most nutritious foods are the cheapest. Cost alone is, therefore, a poor guide for the housewife in determining what she will feed her family. She needs to know some of the factors which influence the cost of food in order to make wise selection, especially if she has to try continually to make one dollar do the work of two.

Factors in the Market Cost of Food

One of the factors in the cost of food is the amount of labor and price of material required to produce it. A potato is cheap, and one will produce several dozen with very little work on the part of the planter. Hence potatoes rank as cheap food. Fish, which forage for themselves and have only to be caught and brought to market, make cheap meat. Under pioneer conditions meat is, in general, cheap, since it comes from wild animals. But when grain has to be raised to feed cattle for beef, the cost of the animal's food and care makes meat dear. In this country we have just recently felt the effect of the passing of the great western grazing fields in the increased cost of beef, and our present hope of keeping this kind of food within reach of our pocketbooks lies in the utilization of the vast plains of South America, where food for the animals may still be had for nothing. Meat from Argentine cannot, however, be as cheap as that caught near one's own door, because of the cost of transportation.

Cost of transportation played a small part in domestic economy before the days of express or fast freight and refrigerator cars. But to-day we bring together in one market apples from Oregon, melons from California, olive oil from Spain — food products from almost every quarter of the globe — and the expense of this transportation must be added to the original cost of production. The cost of foods out of season is very largely due to their having been brought from a distance.

With the best of facilities for transportation, many foods deteriorate in transit, and any percentage of loss must also be added to their cost. So perishability becomes another factor to be reckoned with. If a carload of peaches goes to market, and half of them spoil before they reach the retail buyer, she will have to pay twice as much for what she gets as she would if they had all kept perfectly. Cereal products, dried foods of various kinds, potatoes, onions, and other foods which keep very well, are always cheap as compared with strawberries, raspberries, lettuce, and the like, which require careful handling and will not keep long under the most favorable conditions. With the development of cold storage, perishability is not so great a factor as formerly, but we still have to add the storage charge, and to take into account the fact that foods taken out of cold storage deteriorate with extra speed, so that the cost cannot be as low as for fresh goods delivered to a near-by market.

Canning reduces the loss due to perishability and makes transportation of food products simpler, but one must pay for the labor involved in the process as well as the materials, so that canned goods are to be ranked as intermediate in price between dried foods and fresh ones, at least under city conditions.

The way in which goods are put up for the market will affect the cost. Package goods are more expensive than the same material in bulk; small packages cost more in proportion than large ones; fancy wrappers often bring a fancy price. Elegant shops and immediate delivery add materially to the original cost. The extra charge for package goods is often worth paying, because greater cleanliness is assured, and sealing keeps the material in better condition, to say nothing of the greater ease of storage at home. A small package is a better investment than a large one, if part of the large one would spoil before it could be used up. But these things should be realized by the purchaser. Twenty-five cents invested in two jars of peanut butter, one costing 15 cents, the other 10, will yield 10 ounces of food, while a single 25 cent jar will contain 12 ounces, so that one saves over four cents (a gain of 20 per cent) on the larger purchase. Each housekeeper must decide for herself where the danger of loss and inconvenience of storage counterbalances the gain from large quantity buying, but the tendency in cities is to buy in unnecessarily small quantities, not only because storage space is precious, but because it is so easy to replenish one's larder quickly. In the country, where space is available, there may be the opposite danger of buying in such large quantities that the food either deteriorates before it is used up, or a great deal of extra care must be given to keep it in proper condition.

Many foods bring high prices because of the esthetic appeal which they make to the consumer. Size and shape, color, flavor, and texture all play their parts in this appeal. Tender beef is preferred to tough, and, since a comparatively small part of each creature is tender, the law of supply and demand sends up the price. Large red apples are more attractive than small green ones, though the latter may actually have a better flavor. Olive oil is preferred to cottonseed on account of the difference in flavor, though the nutritive value is the same. In some markets white eggs are preferred to brown. It is hard to separate this idea of esthetic appeal from nutritive value. We are all inclined to think the foods which we like are good for us, and appearance and flavor attract or repel very quickly; but so far as real nourishment goes, these things are secondary, and the household provider must be able to discriminate between real nutritive value and other factors, in order to spend her money to the best advantage. Just as the finest-looking food of a given kind may not give the best return in nutritive value for the money spent, the cheapest form of the same goods may be an equally bad investment. A peck of apples so small and gnarled that more than the average amount of waste is produced in paring and coring may be dearer than larger ones at a little higher price. A pound of prunes in which there is little flesh and much skin and stone may be bought for five or six cents, but will be satisfactory neither as regards nutritive value nor flavor; one will get a better return on one's money by spending for this fruit at least eight or 10, preferably 12, cents a pound. A piece of corned beef at 18 cents a pound may have so much bone and fat that the lean cooked meat will have cost fully 50 cents per pound, while a rump roast of beef at 25 cents a pound will yield lean cooked meat costing only 35 cents per pound. Unless the fat of the corned beef is eaten, it will not be as economical a purchase as the rump, though the first cost is less and the total number of Calories per pound is greater. Fat meat is never profitable unless the fat is used for food.

Market Cost and Fuel Value

One cannot say, then, that either the dearest or cheapest in food is the best to buy. The first cost gives no direct clue to the real part which a food will play in the domestic economy, and different conditions of living must determine what it is wise to buy.

If our food allowance is liberal and the fuel requirements of our family low, we may indulge more freely in food materials for the sake of their esthetic appeal. But if we are trying to make every cent go as far as it will toward supplying actual nourishment, we must think, not only in terms of market conditions, but of nutritive value. As Professor Graham Lusk has so often earnestly pointed out, it would be a great advantage to the purchaser if the manufacturers of all kinds of package goods would not only indicate the nature of the contents (as they are now required by law to do), but also say, "This package contains — Calories of which — are protein." The housewife, looking along the cereal shelf, would then see something like this:

Food Values and Cost of Cereals in Packages

	Total Calories	Protein Calories	Price of Package (Cents)
Rolled oats	2475	456	10
Flaked wheat	2495	368	13
Cracked wheat	2325	491	10
Rice	1590	145	9
Shredded wheat	1551	205	13
Cornflakes	1080	66	10
Puffed rice	702	64	10
Puffed wheat	690	102	12

The most casual inspection of the above shows that of all these cereal products rolled oats gives the best return for the money. Even taking into account that it requires long, slow cooking, it is cheaper than one of the cheapest ready-to-eat cereals — cornflakes. It may be perfectly legitimate to serve puffed wheat now and then, but it should be with full consciousness that one is paying about three-fourths for a special mode of preparation and one-fourth for actual fuel value.

In canned goods there is a great amount of difference in fuel value, even with the same kind of food, owing to differences in the amount of water used to fill up the can and in the amount of sugar in sweetened products. At present the only way for the housewife to protect herself is to make her own observations on the amount of "solids" which she gets for her money, the richness of the syrup, etc., and buy those brands which give the best values.[1]

[1] Cf. *Canned Foods; Fruits and Vegetables.* Florence R. Corbett. Teachers College Bulletin, No. 18. Also *Net Weight of Foods Sold in Packages.* J. P. Street. Conn. Agr. Exper. Sta.

The discrepancy between nutritive value and cost is nowhere better seen than in a comparison of milk with other high protein foods. A quart of milk yielding 675 Calories and costing, let us say, nine cents, is the equivalent in fuel value of about one pound of lean round steak, costing over 20 cents, or of nine eggs, which would be cheap at 18 cents. Even more striking is the case of oysters. A quart of solid oysters is equivalent in fuel to one quart of milk, but will cost from seven to eight times as much as milk at nine cents per quart.

In the restaurant, a menu card indicating the fuel value of the different dishes would help the patron to choose his meal with better regard to his food needs and the state of his pocketbook. In the interesting and valuable study of 350 portions of food as sold to guests in Childs' Restaurants in New York City already referred to (see page 176), the authors make the following summary of their investigations.[1] Dishes are classified in the ordinary fashion as pastry, meats, soups, etc., and the first column of figures in the table gives the mean nutritional value for five cents for each class of dish. The succeeding columns state the particular dishes within the class which represent the maximum and minimum of fuel value for that group.

[1] Adapted from Discussion of Results, pp. 60–61, *Analysis and Cost of Ready to Serve Foods.*

PURCHASING POWER OF FIVE CENTS IN CHILDS' RESTAURANTS

Orders Classed as	Average Number of Calories for Five Cents	Highest of Class in Fuel Value	Calories from Highest of Class	Lowest of Class in Fuel Value	Calories from Lowest of Class
Pastry	233.0	Napoleon	453.6	Strawberry shortcake	91.8
Beans	204.5	Boston baked	307.6	Boston "on the side"	133.7
Sandwiches	180.3	Roast beef sandwich	357.8	Sliced chicken sandwich	78.1
Dairy dishes	174.4	Milk crackers	317.1	Cream of wheat	63.0
Meats	174.1	Lamb croquettes and mashed potatoes	291.4	Deviled crab	83.0
Oysters	149.4	Oyster pie	220.4	Raw oysters	18.6
Eggs	140.7	Plain omelet	231.5	Poached eggs on toast	65.6
Salads	135.9	Potato salad	217.0	Crab meat salad	99.5
Soups	116.0	Beef stew	251.0	Tomato soup with rice	36.6
Fruits	88.8	Baked apple with cream	196.0	Cantaloupe	12.1

According to the above, 15 cents invested in a luncheon of beef stew, lamb croquettes and mashed potatoes, baked apple and cream, would give the following return:

Beef stew	251.0 Calories for five cents
Lamb croquettes and mashed potato	291.4 Calories for five cents
Baked apple and cream . . .	196.0 Calories for five cents
	738.4 Calories for 15 cents

On the other hand, selecting corresponding foods from those lowest of their class in fuel value, our 15 cents would only give about one-sixth as much fuel for the money spent:

Tomato soup with rice	36.6 Calories for five cents
Deviled crab	83.0 Calories for five cents
Cantaloupe	12.1 Calories for five cents
	131.7 Calories for 15 cents

The difference is nearly as striking when we compare these same foods on the basis of the portions actually served:

	Price of Portion Served (Cents)	Total Calories
Beef stew	15	641.4
Lamb croquettes and mashed potatoes .	15	918.4
Baked apple with cream	10	393.7
Total	40	1953.5

II

	Price of Portion Served (Cents)	Total Calories
Tomato soup with rice	10	77.5
Deviled crab	20	386.6
Cantaloupe	15	37.4
Total	45	501.5

In the first case, a man would get four-fifths of an ordinary day's ration for 40 cents, while in the second case he would get only about one-sixth.

These comparisons include, of course, cost of labor and service, and therefore differ from those which the housewife makes in purchasing raw materials, but they serve to show that cost offers no true criterion as to nutritive value.

For ordinary purposes of comparison, the 100-Calorie portion serves as a most convenient unit, and in the Appendix will be found tables (see pp. 332 and 355) classifying practically all the foods used in the dietaries in this book, or regarded as common household staples. These give only the cost of food materials; they do not include charges for fuel and labor. Good food cannot be bought for nothing. There are to-day very few kinds which cost less than one-third of a cent per 100 Calories. These are mostly cereal products, such as cornmeal, rolled oats, hominy, and flour; fats, such as cottonseed oil, suet, lard, and lard substitutes; sugar, molasses, and corn syrup; and dried peas. A somewhat longer list may be had for half a cent per 100 Calories, including pearl barley and flaked wheat, dried beans, bread, and salt pork, while for from two-thirds to three-quarters of a cent we may extend our list to cornstarch, cornflakes, plain crackers, butter at 24 cents per pound, or oleomargarine, lentils, macaroni, rice, tapioca, and dates. It will be observed that all of these foods belong to the non-perishable, easily transported class; meat, milk, eggs, fresh fruits, and vegetables are not included. For one cent per 100 Calories we may add bacon, olive oil, cabbage, carrots, potatoes, peanuts, dried apples and prunes, and milk at six cents per quart. In the country, where fruits and vegetables are comparatively cheap, it will be possible to have a greater variety of food materials than this without going beyond one cent per 100 Calories, but in the city fresh fruits and vegetables will range from two cents per 100 Calories for apples, onions, and cabbage, to 20 or 30 cents for asparagus, celery, and choice melons. Most meats exceed two cents per 100 Calories and choice cuts exceed four cents per 100 Calories. It is by study of these relative values and judicious combinations of the inexpensive with the more costly foods that the housewife controls her expenditure and yet provides "meals that shall be at once gratifying, satisfying, and fundamentally right."

Cost of Other Nutritive Factors

Feeding a family on a small income is no mean task. It demands intelligence and much thought, knowledge both of food values and human needs. One cannot become a finished mistress of the art in a week or a year, but the reward of patient study comes, not only in the saving which may be effected in the cost of living, but also in the increased happiness and efficiency of the well-nourished family and the personal satisfaction of ceasing to grope blindly (which is drudgery) and acquiring a conscious power over one's environment, which makes even the difficult task interesting and joyous.

So far the discussion of cost has dealt with food chiefly in relation to fuel value. But we cannot rest content with learning which foods give us the most Calories for our money. We must consider the price which we shall pay for building material — protein, iron, calcium, phosphorus,[1] etc.; and for base-forming and other regulating factors in the diet. Sugar and oatmeal have the

[1] See pages 21–25.

same fuel value per pound (1800 Calories) and can be bought for the same price. On the basis of Calories they are, therefore, equivalent. But a pound of sugar yields nothing but fuel, while a pound of oatmeal will furnish 300 of its Calories in the form of protein, and will also yield over half a gram of calcium oxide, or nearly the whole day's requirement for a man; nearly four grams of phosphoric acid, which gives a good margin of safety above his daily need; and 16 one-thousandths of a gram of iron, which is a very liberal day's supply. We shall realize what a very cheap food oatmeal is as compared with sugar (which seems at first equally cheap) if we stop to consider what we shall have to pay to get from other foods the protein and ash constituents which the sugar lacks. Suppose we buy 300 protein Calories in the form of lean round steak: they will cost us 23.4 cents, estimating the market cost of the meat as 28 cents per pound. In buying 300 protein Calories from oatmeal for five cents we got 1500 additional Calories; from the meat for our 23 cents we shall get only 250, which is small compensation for the difference in cost. From the beef we shall also get about one-tenth as much calcium as from the oatmeal, less than one-third as much phosphorus, and about five-sixths as much iron. Hence, we shall have to go on spending more money to make up these missing amounts, and will begin to inquire how we can get the rest of them most cheaply.

We shall find that the cheapest source of calcium is milk, and, as milk is also rich in protein and phosphorus, it will be interesting to see with what economy we can substitute milk for beef altogether. To secure 300 protein Calories we shall require about two and one-third quarts of milk, costing, at nine cents per quart, 20.7 cents. Since 300 protein Calories from beef cost 23.4 cents, we have saved 2.7 cents, or 11.5 per cent, on our investment for protein. At the same time we shall find that we have obtained over 1200 Calories in addition to our protein Calories (nearly as many as from the oatmeal) as against a surplus of 250 Calories from the meat; 68 times as much calcium oxide, and over three times as much phosphoric acid. The only lack will be iron, of which we get about half as much as from the meat, but here again the milk has the advantage that its iron is in a specially available form and more likely to be completely utilized than that of meat. Granting that we must buy some food to supply the rest of the iron, the milk will be cheaper than the meat, to supplement which we shall need to purchase calcium, phosphorus, and iron, and probably Calories too.[1]

Protein foods are, as a rule, a more expensive item in

[1] Data upon which these statements are based:

Food Material	Weight to Yield 300 Calories of Protein	This Amount Will Yield			
		Total Calories	Calcium Oxide (Grams)	Phosphoric Acid (Grams)	Iron (Grams)
Oatmeal . . .	1 lb.	1800	0.59	3.96	0.016
Beef, lean round (E. P.) . .	0.78 lb.	555	0.056	1.50	0.011
Milk, whole . .	5.37 lb.	1575	3.84	4.91	0.005

the dietary than carbohydrates and fats. This is partly because we like them in delicate, perishable, and highly flavored forms, such as meat, fish, and shell fish. From the nutritive point of view, eggs, cheese, and milk are interchangeable with them, and can usually be substituted with real economy. The grains and breadstuffs can also be depended upon to a considerable extent, having about the same proportion of protein to total fuel value that we aim to have in a well-balanced diet,

Table Showing the Cost of 100 Protein Calories from Different Sources

Food Material	Cost per Pound	Cost of Portion Yielding 100 Protein Calories
1. Beans, dried navy	$0.08	$0.019
2. Oatmeal	0.06	0.020
3. Cornmeal	0.05	0.030
4. Beans, dried Lima	0.10	0.030
5. Bread, white	0.066	0.038
6. Salt cod	0.22	0.044
7. Milk (6 cents per quart)	0.03	0.047
8. Cheese, American	0.28	0.053
9. Peanuts, shelled	0.25	0.053
10. Macaroni	0.13	0.053
11. Mutton, leg	0.16	0.053
12. Beef, lean rump	0.22	0.063
13. Milk (9 cents per quart)	0.045	0.070
14. Beef, lean round	0.28	0.073
15. Lamb, leg	0.22	0.076
16. Eggs (24 cents per dozen)	0.18	0.077
17. Halibut	0.22	0.080
18. Porterhouse steak	0.32	0.092
19. Eggs (36 cents per dozen)	0.27	0.116
20. Almonds, shelled	0.60	0.158

i.e., 10 to 15 per cent of their Calories in the form of protein. The dried legumes — beans, peas, lentils, peanuts — are always cheap sources of protein. We must bear in mind, of course, that proteins differ somewhat in their nutritive properties, and that milk and eggs have a fuller quota of the proteins which promote growth than the cereals and legumes, so that we should not depend exclusively upon the latter in feeding children, nor, if we can afford to do otherwise, even in feeding adults. The table on page 234 shows the cost of the amounts of different food materials which will yield 100 protein Calories, and serves as a rough measure of the relative economy of these foods as sources of protein.

It is worth while to compare in a similar fashion some of the foods which are the best sources of the different ash constituents, especially calcium, phosphorus, and iron. In the three tables following the foods are arranged in order of the amount of money required to purchase enough of any one to yield a quantity of the element under consideration sufficient to meet an adult man's daily requirement.

From an inspection of these tables it is easy to see that some foods are cheap from all points of view; thus, dried beans, costing half a cent per 100 Calories for fuel, are also the cheapest food for protein and for iron, next to the cheapest for phosphorus, and included in the cheapest 10 for calcium. Milk is a fairly economical source of fuel, protein, and phosphorus, exceptionally cheap for calcium, and dear only for iron, a condition compensated again in part by the fact that its iron is

I. Cost of Portions of Calcium-bearing Foods to Yield 0.7 Gram of Calcium Oxide

Food Material	Cost per Pound	Cost of Portion Yielding 0.7 Gram of Calcium Oxide
1. Milk (6 cents per quart)	$0.03	$0.026
2. Buttermilk (6 cents per quart)	0.03	0.029
3. Milk (9 cents per quart)	0.045	0.039
4. Cheese, American	0.28	0.040
5. Cheese, cottage	0.10	0.046
6. Cabbage	0.02	0.046
7. Beans, dried navy	0.08	0.057
8. Beans, string	0.07	0.060
9. Peas, dried	0.08	0.075
10. Oatmeal	0.06	0.076
11. Onions	0.03	0.087
12. Celery	0.08	0.126
13. Carrots	0.05	0.127
14. Beans, dried Lima	0.10	0.158
15. Bread, graham	0.066	0.215
16. Eggs (24 cents per dozen)	0.18	0.351
17. Bread, white	0.066	0.364
18. Peanuts, shelled	0.25	0.390
19. Eggs (36 cents per dozen)	0.27	0.526
20. Cornmeal	0.05	0.543
21. Almonds, shelled	0.60	0.570
22. Salt cod	0.22	1.419
23. Beef, lean round	0.26	3.341
24. Halibut	0.22	3.367

specially good as far as it goes. Taking all these things into consideration, we must regard milk as inexpensive. This is particularly noticeable when we compare it with lean beef (round), which at 28 cents a pound is just as economical a source of protein as milk at nine cents per quart. The beef is not to be considered as a source of

II. Cost of Portions of Phosphorus-bearing Foods to Yield 2.75 Grams of Phosphoric Acid

Food Material	Cost per Pound	Cost of Portion Yielding 2.75 Grams of Phosphoric Acid
1. Oatmeal	$0.06	$0.042
2. Beans, dried navy	0.08	0.043
3. Peas, dried	0.08	0.047
4. Buttermilk (6 cents per quart)	0.03	0.077
5. Beans, dried Lima	0.10	0.079
6. Milk (6 cents per quart)	0.03	0.080
7. Bread, graham	0.066	0.084
8. Cornmeal	0.05	0.103
9. Cheese, American	0.28	0.119
10. Milk (9 cents per quart)	0.045	0.120
11. Cheese, cottage	0.10	0.137
12. Beans, string	0.07	0.146
13. Peanuts, shelled	0.25	0.171
14. Onions	0.03	0.172
15. Cod, salt	0.22	0.195
16. Bread, white	0.066	0.209
17. Raisins	0.12	0.271
18. Beef, lean round	0.28	0.282
19. Prunes	0.12	0.341
20. Eggs (24 cents per dozen)	0.18	0.344
21. Almonds, shelled	0.60	0.426
22. Celery	0.08	0.433
23. Halibut	0.22	0.438
24. Carrots	0.05	0.450
25. Eggs (36 cents per dozen)	0.27	0.516

calcium; is more than twice as expensive as milk as a source of phosphorus, and, while much cheaper than milk as a source of iron, it is by no means the cheapest of iron-bearing foods.

The tables also show justification for the purchase of

III. Cost of Portions of Iron-bearing Foods to Yield 0.015 Gram of Iron

Food Material	Cost per Pound	Cost of Portion Yielding 0.015 Gram of Iron
1. Beans, dried navy	$0.08	$0.038
2. Peas, dried	0.08	0.043
3. Beans, dried Lima	0.10	0.049
4. Oatmeal	0.06	0.055
5. Beans, string	0.07	0.060
6. Bread, graham	0.066	0.067
7. Spinach	0.10	0.104
8. Lettuce	0.08	0.113
9. Raisins	0.12	0.123
10. Cornmeal	0.05	0.150
11. Prunes	0.12	0.171
12. Beef, lean round	0.28	0.202
13. Onions	0.03	0.205
14. Eggs (24 cents per dozen)	0.18	0.235
15. Bread, white	0.066	0.285
16. Carrots	0.05	0.291
17. Eggs (36 cents per dozen)	0.27	0.353
18. Peanuts, shelled	0.25	0.429
19. Celery	0.08	0.472
20. Milk (6 cents per quart)	0.03	0.556
21. Milk (9 cents per quart)	0.045	0.821
22. Almonds, shelled	0.60	1.025

some of the green vegetables, which in general are expensive sources of fuel and protein. String beans afford noticeably cheap calcium, iron, and phosphorus; and spinach and lettuce compare very favorably with other foods as sources of iron. Eggs are hardly to be regarded as cheap from any point of view, if we compare them with peas, beans, and cereals. But if we compare them with other perishable protein food, like meat, it is evident that when they do not exceed 25 cents per dozen they may be regarded as a substitute for the cheaper cuts of meat, and when they cost as much as 36 cents per dozen they are, by the balancing of counts, cheaper than porterhouse steak and other expensive kinds of meat. We have also to bear in mind here that the protein, iron, and phosphorus in eggs are considered unusually available to the body, so that their use may be justified, even if they have strong rivals in the economic field.

The market price of fresh fruits varies so greatly that no attempt has been made to include them in these tables. They are negligible as regards protein, but are useful sources of the ash constituents, though as a rule more expensive than the green vegetables which have been chosen for illustration. They are especially valuable in the diet for their pleasing flavors and for their tendency to counteract acidity in the blood or other body fluids. A food like oatmeal, cheap as a source of fuel, protein, calcium, phosphorus, and iron, cannot be used as the sole article of diet, because its tendency is to create an acid condition in the body, the alkalinity of its ash not being sufficient to neutralize the acids formed from its proteins. So with oatmeal we need a fruit or a vegetable to supply this needed alkali in the best way. The same is true of other cereals, of eggs, meat, and other high protein foods, with the exception of milk. It must also be borne in mind that fruits are exceedingly useful in counteracting constipation and intestinal putrefaction. In the well-balanced diet, therefore, fruits and vegetables have a real place, aside from their fuel and iron value, and at least as much money should be spent for them as for meat, eggs, and fish.

CHAPTER XIV

FOOD FOR THE FAMILY GROUP: FOOD PLANS AND DIETARIES

A SIMPLE, well-balanced menu provided from day to day for a family group of healthy persons with reasonable appetites ought to go a long ways toward insuring the continuance of health, and we have in experience abundant evidence that it will do so. The suggestions which have been made in the preceding chapters in regard to the special needs of persons of different ages and occupations can be in the main carried out without detailed calculations of quantities consumed or of food values obtained. But, since the fundamental basis of nutrition is in the last analysis a quantitative matter, the housewife has a surer grasp on the situation if she can now and then make a study of the amounts of nutritive material which her group is actually consuming. She will in this way find out whether there is a tendency toward over- or under-consumption, or toward a one-sided diet, and can modify her table accordingly. She can also discover, if she will, whether she is getting a good return for the money invested in her table supplies.

It is proposed, therefore, in this chapter, to describe a simple way of planning family dietaries and to give some illustrations of what can be done with different sums of money towards securing nourishing fare.

Planning a Family Dietary

Since energy is the fundamental requirement in nutrition, we must have at the outset some idea of the fuel needs of our family group. Let us take for illustration a family consisting of a professional man, a woman doing all but the heaviest household tasks, a baby one year old, a boy three years old, two girls, six and nine, a boy of twelve, and a grandmother of ninety. From the data in preceding chapters we may estimate the requirements of the group as follows (assuming average body weights):

FUEL REQUIREMENTS OF THE FAMILY

MEMBER OF FAMILY	AGE	WEIGHT POUNDS	PROTEIN CALORIES[1]	TOTAL CALORIES
Man	40	154	277–415	2770
Woman	37	125	225–338	2250
Baby	1	21	84–126	840
Boy	3	35	140–210	1400
Girl	6	41	139–208	1394
Girl	9	56	184–276	1848
Boy	12	75	225–338	2250
Woman	90	110	150	1500
Total			1424–2061	14,252

[1] Allowing 10 to 15 per cent of total fuel in the form of protein, which will be sufficient to cover all nitrogen requirements.

Thus we find the total fuel requirement of our group is about 14,000 Calories. In the typical family, consisting of father, mother, and three children under fifteen, where the man's occupation is sedentary, the energy requirement usually ranges from 8500 to 10,000 Calories per day, depending upon the ages of the children. In a family of the same size, where the father is doing manual labor and often the mother also, the requirement will range from 12,000 to 14,000 Calories as a rule. The exact fuel intake will fluctuate somewhat from day to day, of course, with minor changes in the degree of activity of different members of the family, so all the housewife need aim to do is to keep the fuel supply fairly constant, without trying to make exact calculations. A little care will prevent a feast of Calories one day and a famine the next.

Essentials in the Family Dietary

As a working basis in building up the family dietary, it is a good plan to make first a list of the food materials which need to be included in the day's rations, no matter what the particular menu. For the group which we are using by way of illustration there should be provided:

Milk for all the children — one quart apiece if possible
Fruit juice for the one-year-old
One kind of fruit for the others
Cereal for all the children — preferably for all the family
A mild green vegetable for the three- and six-year-olds
One kind of green vegetable for all the others except the baby
Eggs for at least the three younger children and some protein dish (meat or a meat substitute) for the rest

To this list may be added those staples which are likely to appear in every day's menu, such as bread and butter.

An estimate can quickly be made of the fuel that will be supplied by these essentials of the diet.

	Calories
Milk (5 quarts for children, 1 for adults) .	4050
Cereal for all	600
Eggs (3 eggs and 1 yolk)	260
Fruit and fruit juice	525
Green vegetable	225
Bread	1500
Butter	1500
Meat or meat substitute	800

Planning the Menu

Keeping in mind the fact that we are going to include the above in the day's menu, we may next decide on the dishes which are to be served for some particular day. Usually the dinner will be planned first, as the most formal and substantial meal, and the meat dish taken as the key note. Suppose, then, we are to have baked fish, as halibut. This gives us a characteristic protein food, but not in a highly flavored form. We may, therefore, have a soup and salad of pronounced flavor, and develop the following menu of simple, wholesome dishes of which most of the family may partake, thus saving the labor of preparing special dishes for the very young and the very old.

Dinner

Consommé
Baked halibut, egg sauce
Potatoes on the half shell
String beans, buttered
Bread and butter
Tomato salad, French dressing
Apple snow with boiled custard
Lady fingers

This will serve for the father, the mother, and the two older children as it stands, and for the grandmother with the omission of the egg sauce, salad, and lady fingers, and a serving of the custard part of the apple float for her dessert. Her bread should be toasted or zwiebach be used. If this dinner be served at night, the younger children will have a simple supper beforehand; the baby at 5.30 and the three- and six-year-olds at the same time or just afterwards. It is always an advantage to serve the young children at a separate table, at least for all but one meal. Usually their meal hours do not coincide with those of the older members of the family, and if they do come to the adult table they need the undivided attention of some one to supervise their eating. If that person is the mother, she does not have a chance to eat her own meal satisfactorily, and often goes undernourished. The children at their own table are less distracted by foods which they may not share, and more care can be given to their table manners, — a very important part of their education, for eating habits once formed are hard to break, and good ones are a valuable hygienic and social asset for every child.

The character of the luncheon will depend largely upon the breakfast and the occupations of the different members of the family. In the city, some are likely to be away from home at midday, and luncheon is a less formal meal than where all gather together at noontime.

Having planned the dinner, it is best to decide on the breakfast next. Assuming that a medium weight breakfast suits this family best, we might have

Breakfast

Oranges
Wheatena with cream
Puffy omelet with bacon
Toast
Coffee for adults
Milk for children

Before this is served, the baby will have had a cup of warm milk at six o'clock, and the three-year-old will have his breakfast just before the family breakfast (7 A.M.), or, if the hours for the two coincide, he may take his with the rest — orange juice, wheatena with top milk, toast, and milk to drink. After breakfast the baby will have one or two tablespoons of orange juice (8 A.M.) and at ten o'clock both these youngest children will have their lunch: strained oatmeal jelly with top milk and milk to drink, — or milk modified with cereal gruel, — for the baby, a glass of milk and a piece of stale bread or hard cracker for the three-year-old. It is to be hoped that the six-year-old will have a glass of milk and a cracker in the middle of the morning at school.

Assuming that luncheon will be served for all the family except the two youngest, a suitable menu to fit the day's scheme would be:

LUNCHEON

Creamed chicken on toast
Baked bananas
Boston brown bread and butter
Rice pudding
Tea for adults
Milk for children

This luncheon will need no modification for the six-year-old except that the cream sauce only from the creamed chicken will be served on her toast.

After the family luncheon the baby will have another meal (2 P.M.), consisting of milk, egg yolk, and possibly a little stale bread to chew; the three-year-old will at the same time have a soft-cooked egg, some toast, some strained vegetable or some of the baked banana served in the regular luncheon, rice pudding, and milk to drink.

In the evening, before the family dinner, the three youngest will have their suppers: the baby, milk and cereal jelly, or milk modified with a cereal gruel; the three-year-old, cereal and milk, bread and butter, a little of the custard which is served with the apple snow for the family dinner, and milk to drink; the six-year-old, cereal and milk, bread and butter, apple snow, lady fingers, and milk to drink. It would be an easy matter to arrange for baked potatoes for these two children's suppers, since potatoes on the half shell form part of the family dinner.

Late in the evening (10 P.M.), the baby may require a bottle of warm milk, and the grandmother will enjoy a hot, nutritious beverage (such as hot milk, plain or flavored) and a cracker; but these meals entail little work by way of preparation.

It is possible, therefore, by choosing simple, easily digested foods for the general menu (which are good for everybody), to provide for the special needs of the children without much extra cooking, even if meals must be served at a good many times during the day.

Calculation of the Family Dietary

Having now estimated the quantitative needs of our family for protein and fuel, and planned a menu designed to give everybody something suitable to eat, our next aim is to find out how nearly this will fulfill the theoretical requirements. We must make a list of the amounts to be served and then, by reference to the tables in the Appendix, especially those of 100-Calorie portions (Table I), and those giving food values in terms of common measures (Table II), we can very quickly estimate fuel values for the day. The dietary is given in detail below:

Family Dietary Number I

Fuel Value: about 14,400 Calories   Cost: $1\frac{3}{4}$–2¢ per 100 Calories

Food	Measure	Protein Calories	Total Calories
Breakfast:			
Milk for baby	1 cup	34	170
Milk for 3-year-old	1 cup	34	170
Wheatena for 3-year-old [1]	4 tbsp.	4	33
Orange juice for baby	1 tbsp.	—	11
Orange juice for 3-year-old	3 tbsp.	—	33
Oranges for 6	3 large	20	300
Wheatena for 6 [1]	$3\frac{7}{8}$ cups	63	525
Omelet for 6			
eggs	4 eggs	100	280
milk	$\frac{1}{2}$ cup	17	85
bacon	12 small pieces	39	300
Toast for 6	10 slices bread	70	500
Butter for 6	5 tbsp.	5	500
Milk for older children	3 cups	102	510
Milk for coffee [2] and cereal	3 cups	102	510
Sugar for coffee	2 tbsp. (scant)	—	100
Coffee for adults	—	—	—
			4027
Lunches:			
10 A.M.			
For baby:			
Oatmeal jelly	2 tbsp.	3	16
Milk for jelly	$\frac{1}{4}$ cup }	34	170
Milk to drink	$\frac{3}{4}$ cup }		
For 3-year-old:			
Milk	$\frac{3}{4}$ cup	26	127
Bread	1 slice	7	50
For 6-year-old:			
Milk	$\frac{3}{4}$ cup	26	127
Crackers	2 crackers	5	50
			540

[1] Cf. farina.

[2] The milk is estimated as whole milk throughout, assuming that it will be skimmed, the top used for coffee, cereal, and pudding, and the rest for cooking and drinking.

Food	Measure	Protein Calories	Total Calories
Family Luncheon (for 6):			
Creamed chicken on toast	1½ cups, 6 slices	144	900
Baked bananas	6 bananas	30	600
Boston brown bread	10 slices	50	500
Butter	5 tbsp.	5	500
Rice pudding II [1]	1½ cups	72	600
Milk for children	3 cups	102	510
Sugar for tea	2 tbsp.	—	100
Tea for adults	—	—	—
			3710
Afternoon Meals:			
2 P.M.			
For baby:			
Egg yolk	1 yolk	11	56
Bread	½ slice	3	25
Milk	1 cup	34	170
For 3-year-old:			
Egg	1 egg	25	70
Toast	1 slice	7	50
Butter	1 tsp.	—	33
Sifted pea pulp	1 tbsp.	3	10
Rice pudding II [1]	¼ cup	12	100
Milk	¾ cup	26	127
			641
5.30 P.M.			
For baby:			
Oatmeal jelly	2 tbsp.	3	16
Milk for cereal, Milk to drink	¼ cup, ¾ cup	34	170
For 3-year-old:			
Steamed rice	¼ cup	3	33
Milk for rice	⅓ cup	11	56
Bread	1 slice	7	50
Butter	1 tsp.	—	33
Boiled custard	⅓ cup	13	100
Milk to drink	¾ cup	26	127

[1] See Table III, Appendix, p. 383.

Food	Measure	Protein Calories	Total Calories
For 6-year-old:			
Steamed rice	½ cup	6	66
Milk for rice	½ cup	17	85
Bread	2 slices	14	100
Apple snow	⅓ cup	2	33
Boiled custard	⅓ cup	13	100
Lady fingers	2 fingers	10	100
Milk to drink	¾ cup	26	127
			1196
Family Dinner:			
Bouillon for 5	3 cups	63	75
Baked halibut for 5	21 oz. (raw wt.)	366	600
Egg sauce for 4			
white sauce	1 cup	57	470
egg	1 egg		
Potatoes on half shell for 4			
potatoes	2 very large	56	556
butter	2 tbsp.		
milk	¼ cup		
Buttered string beans for 5			
beans	2¼ cups	23	200
butter	1 tbsp.		
Bread for 5	6 slices	42	300
Butter for 5	3 tbsp.	3	300
Tomato salad for 4			
tomatoes	4 medium	20	416
lettuce	8 leaves		
French dressing	4½ tbsp.[1]		
Apple snow for 5	2 cups	12	200
with			
boiled custard	1⅔ cups	65	500
Lady fingers for 4	8 fingers	40	400
			4017
Night Lunches:			
10 P.M.			
Milk for baby	¾ cup	26	127
Hot milk } for grandmother	¾ cup	26	127
Cracker } for grandmother	1 cracker	3	25
			279
Total for day		2202	14,410

[1] 7½ tbsp. served; 3 tbsp. lost on plates.

Comparing our totals with the estimated day's requirements, we find that we have almost our full quota of fuel, and a very liberal supply of protein, much of which is from milk, so that we know it will satisfy the protein needs of the growing children in the best possible way. The adults will get their protein largely from the halibut, chicken, and eggs, supplemented by milk, cereals, and bread. Checking off the list of essentials for the diet (see page 243) we find that we have used a little over six quarts of milk, nearly 600 Calories of cereal in the form of oatmeal and wheatena; have supplied five eggs and one yolk in addition to those used in the egg sauce, apple snow, custard, and lady fingers; over 900 Calories in the form of fruit; 226 in green vegetables (string beans, tomatoes, lettuce, pea pulp); fully 1500 each in butter and bread; and a little more than 1000 in the halibut, eggs, and chicken. Hence, we have a good representation of the different kinds of food stuffs, so that without calculation we can safely say that the ash constituents are properly supplied, and the dietary shows that protein and total fuel are fully adequate.

Thus, by following a simple general plan, and using our knowledge of food values to help in arranging an attractive menu, we can get a good family dietary without great difficulty, if we do not have to count cost too closely.

Cost of the Family Dietary

The dietary just planned will probably cost from \$2.50 to \$2.85 per day, or from one and three-fourths to two cents per 100 Calories, depending upon the locality, provided milk costs nine cents per quart and eggs about three cents apiece. With milk at six or seven cents per quart and eggs not over two and one-half cents apiece, fruit and vegetables correspondingly cheap, it would be possible to purchase such food for one and one-half cents per 100 Calories, but hardly for less. It must be remembered that in these estimates nothing is allowed for kitchen or table waste, beyond the unavoidable losses in paring vegetables, discarding meat bones, etc. If the cook spoils food in the kitchen, or leaves it in the cooking utensils through careless heating or bad scraping; if she is not careful to save every bit of edible food which comes back from the dining room, the food bills will go up, even though the family has no more to eat. Scientifically speaking, bread crumbs have the same food value as freshly cut slices of bread, bits of meat on bones are as nutritious as handsome roasts, sour milk as valuable as sweet. Every Calorie thrown away either deprives the family of nutriment which it needs or adds to the total cost of its food supply. At the table there is often much carelessness about leaving food on individual plates, breaking bread or rolls and eating only a small portion, and otherwise performing a kind of "dog in the manger" act, refusing to eat and spoiling the food for others. Careful supervision of the serving will help to prevent this, and children should be early trained to a sense of responsibility about the waste of food. In public places, where strangers are fed, it is not possible to gauge accurately their probable consumption and serve accordingly; consequently the table waste is often great, but at the home table, where individual requirements can easily be studied, there is little excuse for table waste.

A food budget of $2.50 per day means $900 a year for this item of family expenditure alone. To justify such an outlay, an income of at least three times this amount would be required, if the family is to have clothing and shelter at all commensurate in quality with the food, and opportunity to satisfy its "higher" or intellectual and spiritual needs, such as education for the children, books, travel, music, entertainments, gifts to church and charity, and other good things which require money.[1]

Reducing the Cost of the Dietary

The majority of families do not have incomes of $3000 or more a year; most housewives must spend less than one and three-fourths to two cents per 100 Calories on their food in order to have money for decent clothing and shelter and any "higher life" at all. Yet these families have need of being well nourished and wish to enjoy some of the esthetic pleasure of a well-set table. Suppose, for instance, that we wish to reduce the cost of the foregoing dietary to between one and one-fourth and one and one-half cents per 100 Calories, making a total cost of from $1.75 to $2.10 per day. In our first

[1] It is usually estimated that, with an income of $2000 to $4000, 25 per cent will be spent for food, but the family under consideration here is larger than that taken as "typical," the latter including only five persons — two adults and three children under fourteen years of age. A more liberal proportion for food would be justifiable in the present case.

dietary we have used a liberal supply of fresh fruit and vegetables, and as these are expensive items when considered as sources of fuel, we may cut down the amount somewhat, using only one kind of fresh fruit and one fresh vegetable in a single day, or we may substitute canned or dried fruit for the fresh. While the milk seems to occupy a large place, its value and economy has already been demonstrated, and as long as the average cost of the dietary is over one cent per 100 Calories it can be used freely to advantage. Eggs are usually expensive, and can be omitted for breakfast, in the sauce for the fish, and the dessert, and cookies substituted for the lady fingers. Chicken is an expensive form of meat and, while not much is used, the cost could be lowered by substituting dried beef, without changing the form of the menu. The fish used in the dinner is usually not very dear and may be retained. The consommé adds little food value and, unless made of material not valuable for other purposes, can be omitted. Keeping in mind the essentials first laid out for this dietary (see page 243) and these possible changes, we may plan a second menu at lower cost,[1] an illustration of which is given below.

[1] The table in the Appendix showing groups of foods at different price will be helpful in this connection. See pp. 426–429.

Menu I

Breakfast:

Oranges (very large)
Wheatena with cream (top milk)
Puffy omelet with bacon
Toast
Coffee for adults
Milk for children

Luncheon:

Creamed chicken on toast
Baked bananas
Boston brown bread
Rice pudding
Tea for adults
Milk for children

Dinner:

Consommé
Baked halibut, egg sauce
Potatoes on the half shell
String beans, buttered
Bread and butter
Tomato salad, French dressing
Apple snow with boiled custard
Lady fingers

Menu II

Breakfast:

Oranges (smaller)
Wheatena with cream (top milk)
Toast
Coffee for adults
Milk for children

Luncheon:

Creamed dried beef on toast
Baked bananas
Boston brown bread
Rice pudding
Tea for adults
Milk for children

Dinner:

Baked halibut, white sauce
Potatoes on the half shell
String beans, buttered
Bread and butter
Cold slaw
Chocolate blancmange with thin cream and sugar
Plain cookies

That the second menu will answer the food requirements of the family quite as well as the first is shown by the following calculations.

Family Dietary Number II

Fuel Value: about 14,400 Calories Cost: $1\frac{1}{4}$–$1\frac{1}{2}$¢ per 100 Calories

Food	Measure	Protein Calories	Total Calories
Breakfast:			
Milk for baby	1 cup	34	170
Milk for 3-year-old	1 cup	34	170
Wheatena for 3-year-old	4 tbsp.	4	33
Orange juice for baby	1 tbsp.	—	11
Orange juice for 3-year-old	3 tbsp.	—	33
Oranges for 6	3 medium	14	200
Wheatena for 6	$3\frac{7}{8}$ cups	63	525
Toast for 6	10 slices	70	500
Butter	5 tbsp.	5	500
Milk for older children	3 cups	102	510
Milk for coffee and cereal	3 cups	102	510
Sugar for coffee	2 tbsp. (scant)	—	100
Coffee for adults	—	—	—
			3262
Lunches:			
10 A.M.			
For baby:			
Oatmeal jelly	2 tbsp.	3	16
Milk for jelly	$\frac{1}{4}$ cup	34	170
Milk to drink	$\frac{3}{4}$ cup		
For 3-year-old:			
Milk	1 cup	34	170
Bread	1 slice	7	50
For 6-year-old:			
Milk	$\frac{3}{4}$ cup	26	127
Crackers	2 crackers	5	50
			583
Family Luncheon (for 6):			
Creamed dried beef II[1]	3 cups	212	1040
on toast	6 thin slices	36	240
Baked bananas	6 bananas	30	600
Boston brown bread	10 slices	50	500
Butter	5 tbsp.	5	500
Rice pudding II[1]	$1\frac{1}{2}$ cups	72	600

[1] See Table III, Appendix, pp. 383 and 394.

Food	Measure	Protein Calories	Total Calories
Family Luncheon: *Continued*			
Milk for children	3 cups	102	510
Sugar for tea	2 tbsp.	—	100
Tea for adults	—	—	—
			4090
Afternoon Meals:			
2 P.M.			
For baby:			
Egg yolk	1 yolk	11	56
Bread	½ slice	3	25
Milk	1 cup	34	170
For 3-year-old:			
Egg	1 egg	25	70
Toast	1 slice	7	50
Butter	1 tsp.	—	33
Sifted pea pulp	1 tbsp.	3	10
Rice pudding II [1]	¼ cup	12	100
Milk	¾ cup	26	127
			641
5:30 P.M.			
For baby:			
Oatmeal jelly	2 tbsp.	3	16
Milk for jelly	¼ cup	34	170
Milk to drink	¾ cup		
For 3-year-old:			
Steamed rice	¼ cup	3	33
Milk for rice	⅓ cup	11	56
Bread	1 slice	7	50
Butter	1 tsp.	—	33
Boiled custard	⅓ cup	13	100
Milk to drink	¾ cup	26	127
For 6-year-old:			
Steamed rice	½ cup	6	66
Milk for rice	½ cup	17	85
Bread	2 slices	14	100
Chocolate blancmange	¼ cup	8	100
Plain cookies	2 cookies	6	100
Milk to drink	¾ cup	26	127
			1163

[1] See Table III, Appendix, p. 383.

Food	Measure	Protein Calories	Total Calories
Family Dinner:			
Baked halibut for 5 . . .	21 oz. (raw wt.)	366	600
White sauce for 4	1 cup	32	400
Potatoes on the half shell .	4 halves	56	556
String beans, buttered, for 5	2¼ cups	23	200
Bread for 5	6 slices	42	300
Butter for 5	3 tbsp.	3	300
Cold slaw for 4	2 cups	12	200
Chocolate blancmange for 5	2½ cups	80	1000
Top milk for blancmange .	2 cups	68	340
Plain cookies for 4 . . .	10 cookies	30	500
			4396
Night Lunches:			
10 P.M.			
Milk for baby	¾ cup	26	127
Hot milk } for grandmother	¾ cup	26	127
Cracker } for grandmother	1 cracker	3	25
			279
Total for day		2106	14,414

The above dietary calculation makes it evident that the changes in the menu have not materially affected the fuel value of the diet; all the items listed as essential to the family welfare (see page 243) have been included, so that a sufficient supply of ash constituents is assured, and the calculations also show that there has been no decrease in the amount of protein, though it is high enough that some reduction would not have been objectionable. The reason it remains high in spite of the fact that seven eggs used in the first dietary have been left out of the second — thus decreasing the cost considerably — is that a quart more milk has been used and the creamed dried beef yields more protein than the creamed chicken, so that the final result is quite as satisfactory as if the seven eggs had been used. The changes suggested in the fruit and vegetables may not always mean much saving; all depends upon season and locality and general market conditions. But cabbage is usually one of the cheapest vegetables, while fresh tomatoes are often rather dear; fine, large oranges are always more expensive than medium-sized ones, and the reduction in the number of fruits used in the dietary, by the omission of the apples, is also in the nature of an economy, since fruits are always a relatively expensive source of energy. The chocolate blancmange served with top milk gives nearly twice the fuel value of the apple snow and boiled custard, but costs less than one cent per 100 Calories, while the other dessert will cost about one and one-half cents per 100 Calories. If these modifications of the first menu do not mean the most effective cost reduction under all circumstances, they will at least show how one may go about the reduction of the cost of food, once a general working plan has been thought out.

Dietaries costing one and one-half to two cents per 100 Calories are comparatively easy to plan; milk may be used freely, and a variety of fruits and vegetables can be obtained, fresh or canned, with dried ones occasionally for variety. Meats of choice cuts can be provided in moderation, the more expensive kinds being offset by the introduction of a meat substitute or some specially cheap cut now and then. Dietaries costing from one to one and one-half cents per 100 Calories must be given more thought in order to keep them well balanced. Milk becomes a more important item, taking the place, to some extent, of other protein and ash-bearing foods, especially expensive meats and fresh fruits and vegetables. Eggs must be used very little, except for the young children, and butter confined chiefly to table use and those dishes in which its flavor really counts. In others, cheaper forms of fat may be substituted.

Dietaries Costing One Cent per 100 Calories or Less

If now we wish to reduce the cost of food to one cent or less per 100 Calories, distinct emphasis will have to be placed on the non-perishable, staple foods, such as cereals and dried fruits and vegetables, which in the main cost from one-third of a cent to one cent per 100 Calories, and very sparing use will have to be made of meats and fresh or canned fruits and vegetables. In the family group under consideration, the children require over half the total fuel proposed as a standard. Their food, as already pointed out in the chapters especially devoted to their requirements, cannot be provided as cheaply as that for healthy adults, because of their greater need of the relatively expensive building materials — protein and ash. When the cost of food is as high as it is in New York City, it is difficult to provide an ideal dietary for children for less than one cent per 100 Calories. Milk at eight or nine cents per quart can no longer be used freely, but with care one quart a day per child can be provided as long as the average cost of the dietary is not under three-quarters of a cent per 100 Calories. Sometimes economy can be effected by buying two grades of milk, the better reserved for the little children and for table use, the less expensive used in cookery. Condensed milk may also be used in cookery or for the adults, and this is usually cheaper than fresh milk at nine cents a quart. When the dietary costs less than three-quarters of a cent per 100 Calories, a quart of milk per day can be furnished only to the children under seven or eight years of age, and not more than a pint for each of the others. Cheap substitutes for the rest of the milk are soups made from dried beans, peas, lentils, or peanut butter for young children, and these legumes cooked in other ways for older children and adults. Cereals from whole grains can also be used to advantage to supplement the milk. The purchase of butter is seldom wise when the dietary is to cost less than one cent per 100 Calories. Oleomargarine is equally valuable as fuel, and when fresh is sweet and clean and good — much better than inferior butter, which lacks the fine texture and flavor which we pay for in high-priced butter. Still cheaper fats than oleomargarine can be used in cookery, such as the lard substitutes made from cottonseed oil, suet, carefully tried out beef fat, and salt fat pork. Cottonseed oil is equal in fuel to olive oil and costs much less.

Dried fruits and vegetables must be very largely substituted for fresh. Bananas are usually cheap, and at certain seasons so are apples and oranges. Other fresh fruits must be purchased with care and only when their cost is at its very lowest. Bananas may be regarded as a staple fresh fruit, high in fuel value, low in price, and easy to prepare. They are often cheapest when at their best, *i.e.*, when the skins have darkened and the fruit is soft, though still firm. Digestive difficulties usually arise from eating them too green or too fast. As they ripen, considerable starch is changed to sugar, so they have a higher flavor as well as greater digestibility when fully ripened. Baking the ripe banana in the skin, if properly done, produces a more succulent food of fine flavor. They must be quickly baked till soft and the juice begins to flow, but no longer, or the juice all oozes out and they become tough and dark and lose much of their flavor. Bananas baked before the skins darken will never be as palatable as the fully ripened ones, though they are more digestible than if eaten raw. Unripe bananas are best baked without the skins and basted with a syrup. These may be used as a dessert, while those baked in the skins may take the place of a vegetable in the menu. Bananas can be mashed and stewed with a little water, flavored with lemon juice and sugar, making a palatable sauce. The many and varied uses of apples are too well known to require comment. It is upon the dried fruits, however, that emphasis is to be placed in economical dietaries. Dates, raisins, prunes, peaches, figs, apricots, and apples may usually be obtained for less than one and one-half cents per 100 Calories (dates for less than one cent), and their uses are many and varied. Dates, figs, raisins, and apples will make bread crumbs or flour and cheap fat acceptable in the form of steamed puddings or plain cake. Raisins make a good sauce when stewed tender in a little water; their own store of sugar will make it sufficiently sweet. These stewed raisins may be used over rice or cornstarch blancmange as a change from milk. Dates may also be cooked soft in a little water, then put through a coarse sieve, making a palatable marmalade without added sugar. The addition of a little sugar and lemon juice will make a richer sauce, however. Dates make an excellent filling for sandwiches; or chopped dates, figs, and raisins may be combined. Dates may be served with breakfast cereals, being especially good with wheat preparations. Raisin or date bread will be appreciated by children. The fruit, cut in small pieces, is added to the dough when kneading for the pan.

Stewed figs, served in their own juice or with milk or cream, make a pleasing dessert. Prunes are often badly cooked and not as highly esteemed as they might be. Long, slow cooking in plenty of water to cover them well is necessary to make them soft and juicy, no sugar being added during the process. When done, they should be moderately sweetened and allowed to stand at least twenty-four hours before serving. They will then be plump and well seasoned to the center. Prunes of the cheapest grades are often little but skin and stone, and even careful cooking will not make them attractive. Hence it pays to buy prunes of good quality. The addition of a few slices of lemon while cooking gives a pleasant change of flavor. Prunes keep well, and there are many uses for them. Prune whip or prune soufflé, made of sifted prune pulp and whites of eggs, is an attractive and wholesome dessert. The juice may be stiffened with gelatin and served as prune jelly. Prunes and brown bread may be baked with milk and eggs like a plain bread pudding. A prune pie may be made with two crusts and a filling of prune pulp thickened with a little cornstarch. Variety can be given to the menu by combinations of the more inexpensive fruits. Dried peaches stewed with raisins, prunes stewed with apricots, dates baked with dried apples in a pie, are all attractive combinations.

Besides the dried legumes (peas, beans, lentils), the cheapest vegetables are usually potatoes, cabbage, onions, carrots, turnips, and parsnips. While tomatoes are expensive as fuel, they have almost as great value for flavor as onions. Man demands a diet of pronounced and varied flavor; bread, cereals, beans, potatoes, and the like are too bland to be wholly satisfying. The secret of making an acceptable dietary at a low cost is to develop the characteristic flavor of the mild foods as far as possible (usually by long, slow cooking) and to include in the day's ration some of the highly flavored foods. Tea and coffee are most useful for flavor, but they lack the ash constituents and fuel value which the fruits and vegetables also contribute, and hence should not be exclusively depended upon. Too often children as well as adults make a breakfast of nothing but bread and coffee. Cereal and milk would be much more wholesome and "staying."

Meat is too expensive a source of protein to be depended upon for this foodstuff. It is to be regarded rather as a source of flavor and of fat. A little salt pork, bacon or ham will cause a large dish of baked beans to be relished; creamed salt fish or dried beef will make bread (toast) or potatoes more acceptable; a small portion of beef or mutton will give character to a stew of vegetables and dumplings, or to the pastry and gravy which yield most of the fuel in a meat pie.

Aside from milk, the best sources of protein will be the legumes, including peanuts, especially in the form of peanut butter, and the less expensive kinds of cheese, including cottage cheese. Besides the ordinary baked beans and bean soup, many attractive dishes can be made from the sifted pulp of well-cooked beans of different kinds. It may be molded around a center of seasoned bread crumbs and baked in a loaf to be served with a brown or tomato sauce; or, again, a casserole may be lined with bean pulp, the center filled with corned beef hash, a cover of pulp laid over it, and the dish baked and served with a sauce. Lentils cooked and ground in a food chopper may be made into an excellent loaf with chopped peanuts or chopped beef.

Cheese is valuable for its flavor as well as its food value. The United States Department of Agriculture has published a bulletin giving many recipes for this useful and economical food.[1] It will give flavor to such bland foods as rice, macaroni, bread, and hominy in a variety of ways, not fully appreciated by many house-

[1] *Cheese and its economical uses in the diet.* Farmers' Bulletin, 487.

wives. It can be successfully combined with lentils, nuts, potatoes, or tomatoes, adding to their food value and giving an agreeable change from the ordinary ways of preparing these foods.

Family Dietaries at the Lowest Cost

If we try to plan a dietary for our family requiring about 14,000 Calories at a cost of less than one cent per 100 Calories, we shall find that we cannot afford much more than five quarts of milk if we have to pay seven or more cents per quart for it; this will give a quart apiece for each of the three younger children, a pint apiece for each of the older ones, and a pint for the adults. By using butter less freely than in the other dietaries, we may be able to provide it here, but to reduce the cost to three-quarters of a cent per 100 Calories it will be necessary to pay no more than 24 cents per pound — the usual city cost of oleomargarine, which may be substituted for all the butter. To compensate for the reduction in the amount of butter, some increase in the amount of bread, breakfast cereal, and sugar has been made. Prune pulp has been substituted for orange juice for breakfast for the little children, and bananas for oranges for the rest. Cereal coffee to which an equal volume of hot milk is added will give the older children a wholesome beverage and a cup of this may be more satisfying, though not more nutritious, than a half cup of milk would be. Eggs cannot be used every day, even for the young children, when the cost of the dietary must be less than one cent per 100 Calories. Therefore a rice pudding without eggs has been chosen and cookies with very high fuel value in proportion to the number of eggs used. Oatmeal cookies fulfil this condition, though oatmeal wafers would be still cheaper, since they can be made without any eggs at all.

A meat substitute for luncheon — macaroni and cheese — instead of creamed dried beef, and the use of salt fish for dinner instead of fresh will effect further economy. A rearrangement of Menu II, following these ideas, is given below:

MENU II

BREAKFAST:
- Oranges (smaller)
- Wheatena with cream (top milk)
- Toast
- Coffee for adults
- Milk for children

LUNCHEON:
- Creamed dried beef on toast
- Baked bananas
- Boston brown bread
- Rice pudding II [1]
- Tea for adults
- Milk for children

DINNER:
- Baked halibut, white sauce
- Potatoes on the half shell
- String beans, buttered
- Bread and butter

MENU III

BREAKFAST:
- Bananas (prune pulp for two youngest)
- Wheatena with milk
- Toast
- Coffee for adults
- Cereal coffee for older children
- Milk for younger children

LUNCHEON:
- Macaroni and cheese
- Boston brown bread
- Stewed apricots
- Oatmeal cookies
- Tea for adults
- Milk for youngest children

DINNER:
- Creamed salt cod
- Baked potatoes
- Boiled onions
- Bread and butter

[1] See Table III, Appendix, p. 383.

Cold slaw
Chocolate blancmange with thin cream and sugar
Plain cookies

Rice pudding III[1] with milk and sugar

Worked out in detail for the family, as shown in the dietary below, this menu fulfills the requirements quite as well as either of the more expensive ones. Some changes in the little children's meals will be noted, as well as those for the older children and adults, such as the substitution of prune pulp for breakfast, the use of some of the macaroni without the cheese for the three-year-old's dinner, split pea instead of green pea purée, and apple sauce for apricots.

FAMILY DIETARY NUMBER III

Fuel Value: about 14,300 Calories Cost: $\frac{3}{4}$–1¢ per 100 Calories

Food	Measure	Protein Calories	Total Calories
Breakfast:			
Milk for baby	1 cup	34	170
Milk for 3-year-old	1 cup	34	170
Wheatena for 3-year-old	4 tbsp.	4	33
Prune pulp for baby	$\frac{1}{2}$ tbsp.	—	25
Prune pulp for 3-year-old	1 tbsp.	1	50
Bananas for 6	6 bananas	30	600
Wheatena for 6	$4\frac{1}{2}$ cups	72	600
Toast for 6	12 slices	84	600
Butter for 6	3 tbsp.	3	300
Milk for cereal coffee for children aged 6, 9, 12	$1\frac{1}{2}$ cups	51	255
Milk[2] for coffee for adults	3 cups	102	510
Sugar for coffee and cereal for adults, cereal coffee for children	6 tbsp.	—	360
			3673

[1] See Table III, Appendix, p. 383.

[2] See note to Dietary No. I.

Food	Measure	Protein Calories	Total Calories
Lunches:			
10 A.M.			
For baby:			
Oatmeal jelly	2 tbsp.	3	16
Milk for jelly	$\frac{1}{4}$ cup	34	170
Milk to drink	$\frac{3}{4}$ cup		
For 3-year-old:			
Milk	$\frac{3}{4}$ cup	26	127
Bread	1 slice	7	50
For 6-year-old:			
Milk	$\frac{3}{4}$ cup	26	127
Crackers	2 crackers	5	50
			540
Family Luncheon (for 6):			
Macaroni and cheese	6 cups	204	1200
Boston brown bread	10 slices	50	500
Butter	5 tbsp.	5	500
Stewed apricots	$1\frac{1}{2}$ cups	24	600
Oatmeal cookies	6 cookies	88	800
Milk for 6-year-old	$\frac{3}{4}$ cup	26	127
Sugar for adult's tea	2 tbsp. (scant)	—	100
Tea for adults	—	—	—
			3827
Afternoon Meals:			
2 P.M.			
For baby:			
Egg yolk	1 yolk	11	56
Bread	$\frac{1}{2}$ slice	3	25
Milk	1 cup	34	170
For 3-year-old:			
Split pea soup	$\frac{3}{5}$ cup	26	100
Bread	1 slice	7	50
Butter	1 tsp.	—	33
Finely chopped creamed macaroni with $\frac{1}{2}$ egg	$\frac{1}{2}$ cup	30	160
Apple sauce	$\frac{3}{8}$ cup	1	100
			694

Food	Measure	Protein Calories	Total Calories
5:30 P.M.			
For baby:			
Oatmeal jelly	2 tbsp.	3	16
Milk for jelly	$\frac{1}{4}$ cup	34	170
Milk to drink	$\frac{3}{4}$ cup		
For 3-year-old:			
Cream toast	$1\frac{1}{2}$ slices toast 6 tbsp. sauce	20	150
Rice pudding III[1] . . .	$\frac{2}{5}$ cup	8	100
Milk for pudding . . .	$\frac{1}{3}$ cup	11	56
Sugar for pudding . . .	1 tsp.	—	20
Milk to drink	$\frac{5}{8}$ cup	19	100
For 6-year-old:			
Cream toast	$1\frac{1}{2}$ slices toast $\frac{1}{2}$ cup sauce	33	250
Rice pudding III[1] . . .	$\frac{3}{5}$ cup	12	150
Milk for pudding . . .	$\frac{1}{2}$ cup	17	85
Sugar for pudding . . .	2 tsp.	—	40
			1137
Family Dinner:			
Creamed salt cod for 5 . .	4 cups	243	747
Baked potatoes for 5 . . .	8 medium	88	800
Boiled onions for 4 . . .	8 medium	26	200
Bread for 5	10 slices	70	500
Butter for 5	5 tbsp.	5	500
Rice pudding III[1] for 5 . .	4 cups	80	1000
Milk for pudding	$1\frac{1}{2}$ cups	51	255
Sugar for pudding	3 tbsp.	—	180
			4182
Night Lunches:			
10 P.M.			
Milk for baby	$\frac{3}{4}$ cup	26	127
Tea with $\frac{1}{2}$ cup hot milk for grandmother	1 cup	17	85
Sugar for tea	2 tsp.	—	40
Cracker for grandmother .	1 cracker	3	25
			277
Total for day		1791	14,330

[1] See Table III, Appendix, p. 383.

The food values for the three different menus are:

	Protein Calories	Total Calories
Menu I	2202	14,410
Menu II	2106	14,414
Menu III	1791	14,330
Requirement of family	1424–2061	14,252

The protein in the first two exceeds all demands of necessity, but not far enough to make it objectionable unless it be from the point of expense. In the third, reduction in the amount of milk and eggs brings the protein within desirable limits, and, since it it derived quite largely from milk, especially for the children, there can be no question of its being ample for all body needs. In fact, it is evident that in this last dietary we have not reached the lowest cost at which it is possible to maintain our family, though we have reached the lowest point at which it can be done easily with prices as high as those of New York City. In any further reduction especial care will have to be taken to keep the protein and ash constituents adequate, as these are expensive items in any dietary. It becomes increasingly difficult to provide variety of diet. Cereal products, dried beans and peas, a few staple fresh vegetables, such as potatoes, onions, cabbage, and tomatoes in limited quantities, dried fruits, and one or two fresh ones, as apples and bananas, very fat meats, such as fat beef plate and fat salt pork, and a limited amount of milk must be the chief reliance of the housewife. The temptation is often great to use large quantities of sugar and syrup or molasses rather than cereals, because of the high flavor and the fact that these require no cooking. But the ash constituents of the grains and legumes assume greater importance when fruits, vegetables, and milk must be limited, and it is worth while to try to make acceptable as much oatmeal, barley, buckwheat, whole wheat preparations, beans, peas, and the like as one possibly can, these being also good sources of protein. The needs of the children cannot be ideally met when the dietary falls to two-thirds of a cent per 100 Calories, except in districts where milk and fruit and vegetables are very cheap. With a limited number of foods to choose from, the day's menu will be very simple, variety being obtained by changes from day to day rather than by a number of different dishes in one meal. The following menu and dietary illustrate what can be done for about two-thirds of a cent per 100 Calories, allowing one quart of milk for each of the two youngest children, a pint for each of the others and one pint for the adults — four quarts in all.

Menu IV

Breakfast:

Stewed dried apples (prune pulp for baby)
Cornmeal mush with milk and sugar (oatmeal for 3-year-old)
Bread
Pork fat
Sausage for father and mother
Cereal coffee for older children and adults
Milk for youngest children

LUNCHEON:

Baked samp with cheese
Stewed raisins
Brown bread
Oleomargarine
Oatmeal wafers
Tea for adults
Cocoa for children

DINNER:

Beef stew with vegetables
Bread
Oleomargarine
Date pudding with liquid sauce

FAMILY DIETARY NUMBER IV

Fuel Value: About 14,300 Calories   Cost: $\frac{2}{3}$–$\frac{3}{4}$¢ per 100 Calories

Food	Measure	Protein Calories	Total Calories
BREAKFAST:			
Milk for baby	1 cup	34	170
Prune pulp for baby	$\frac{1}{2}$ tbsp.	—	25
Milk for 3-year-old	1 cup	34	170
Oatmeal for 3-year-old	$\frac{1}{2}$ cup	9	50
Dried apple sauce for 3-year-old	2 tbsp.	—	50
Cornmeal mush for 6	$3\frac{1}{3}$ cups	50	500
Dried apple sauce for 6	$2\frac{1}{4}$ cups	6	600
Sausage for 2	$\frac{1}{4}$ lb. (raw wt.)[1]	100	500
Bread for 6	12 slices	84	600
Milk for cereal coffee for children aged 6, 9, 12	$1\frac{1}{2}$ cups	51	255
Milk for coffee for adults	$\frac{1}{2}$ cup	17	85
Milk for mush	2 cups	68	340
Sugar	8 tbsp.	—	480
			3825

[1] Fat used on bread.

Food	Measure	Protein Calories	Total Calories
Lunches:			
10 A.M.			
For baby:			
Oatmeal jelly	2 tbsp.	3	16
Milk for jelly	$\frac{1}{4}$ cup	34	170
Milk to drink	$\frac{3}{4}$ cup		
For 3-year-old:			
Milk	$\frac{3}{4}$ cup	26	127
Bread	1 slice	7	50
For 6-year-old:			
Milk	$\frac{1}{2}$ cup	17	85
Crackers	4 crackers	10	100
			548
Family Luncheon (for 6):			
Baked samp with cheese	$4\frac{1}{2}$ cups	132	953
Boston brown bread	10 slices	50	500
Oleomargarine	5 tbsp.	5	500
Stewed raisins	2 cups	18	600
Oatmeal wafers	8 wafers	88	800
Cocoa I[1] for children	3 cups	70	500
Sugar for adults' tea	2 tbsp. (scant)	—	100
Tea for adults	—	—	—
			3953
Afternoon Meals:			
2 P.M.			
For baby:			
Milk	1 cup	34	170
Bread	$\frac{1}{2}$ slice	3	25
For 3-year-old:			
Split pea soup	$\frac{3}{5}$ cup	26	100
Bread	2 slices	14	100
Oleomargarine	2 tsp.	—	66
Baked potato	1 small	9	75
Baked apple	1 small	1	75
			611

[1] See Table III, Appendix, p. 358.

Food	Measure	Protein Calories	Total Calories
5:30 P.M.			
For baby:			
Oatmeal jelly	3 tbsp.	4	25
Milk for jelly	$\frac{1}{3}$ cup	34	170
Milk to drink	$\frac{2}{3}$ cup		
For 3-year-old:			
Cream toast . . . . , .	1 slice 6 tbsp. sauce	20	150
Bread	1 slice	7	50
Oleomargarine	1 tsp.	—	33
Rice pudding III[1] . . .	$\frac{2}{5}$ cup	8	100
Sugar for pudding . . .	1 tsp.	—	20
Milk for pudding . . .	$\frac{1}{4}$ cup	34	170
Milk to drink	$\frac{3}{4}$ cup		
For 6-year-old:			
Cream toast	$1\frac{1}{2}$ slices $\frac{1}{2}$ cup sauce	33	250
Rice pudding III[1] . . .	$\frac{4}{5}$ cup	16	200
Milk for pudding . . .	$\frac{1}{4}$ cup	8	42
Sugar for pudding . . .	2 tsp.	—	40
			1250
Family Dinner (for 5):			
Beef stew with vegetables .	$4\frac{3}{4}$ cups	183	1132
Bread	10 slices	70	500
Oleomargarine	5 tbsp.	5	500
Date pudding I[1]	5 servings	50	1000
Brown sugar sauce . . .	$2\frac{1}{2}$ cups	—	660
			3792
Night Lunches:			
10 P.M.			
Milk for baby	1 cup	34	170
Tea with $\frac{1}{2}$ cup hot milk for grandmother	1 cup	17	85
Sugar for tea	2 tsp.	—	40
Cracker	1 cracker	3	25
			320
Total for day		1526	14,299

[1] See Table III, Appendix, pp. 380 and 383.

Dried apples have been substituted for fresh fruit for breakfast, and stewed raisins for stewed apricots, cornmeal for farina, samp for macaroni, oleomargarine for butter, oatmeal wafers without eggs for oatmeal cookies, date pudding with brown sugar sauce for rice pudding with milk and sugar. Thus the cost has been reduced without any material change in the amount of fuel or of the ash constituents. Beef has been substituted for fish for dinner because it has more fat and also gives more flavor.

The children whose supply of milk has been limited have been given warm beverages (cereal coffee and cocoa) to make their small allowance of milk more attractive. The sugar and cocoa also contribute to the total fuel value of their dietary. Other modifications or additions to the menu are indicated in the dietary. The sausage put in for breakfast for the father and the mother adds to the flavor of that meal, making the cornmeal mush and bread more acceptable; the fat is a cheaper source of fuel than oleomargarine, and the protein makes up for some of that lost by cutting down the milk. Instead of using the fat on the bread, one might fry the cornmeal mush for the adults in it for a change, and serve this with syrup, leaving more milk for the children.

Some changes in the children's meals have been made, either for economy, or to save extra cooking, or to supply a more digestible food than that provided in the meals for the older members of the family. Oatmeal is used instead of cornmeal for the three-year-old's breakfast, as better suited to his digestive powers. Prune pulp has been retained for the baby for the same reason. No change has been made in the morning lunches except a decrease in the amount of milk and an increase in the number of crackers for the six-year-old child. The egg has been omitted from the baby's two o'clock meal for the sake of economy. An egg yolk should be given a couple of times a week, even if it cannot be afforded every day. Baked potato and more oleomargarine take the place of the macaroni with egg for the three-year-old. This change decreases the amount of protein, but with the full allowance of milk this is of no particular importance. The use of whole wheat bread to compensate for some of the iron lost by not using eggs for these two young children would be advisable.

If the dietary must be kept under a cost of two-thirds of a cent per 100 Calories, not more than three quarts of milk can usually be allowed, and, if possible, one of these should be bought for six cents a quart, this milk to be cooked in all cases. The two quarts of good grade must be reserved for the two youngest children, and the other distributed as the menu demands. Some menus which will supply a balanced ration under these conditions are given below.

Menus for Very Low-Priced Family Dietaries
(allowing three quarts of milk per day)

I. Breakfast:

Cornmeal mush { fried and served with corn syrup for adults
steamed and served with milk for children

Bread
Oleomargarine
Coffee for adults
Apple sauce or date pulp for 3-year-old; orange juice for baby

LUNCHEON OR SUPPER:

Pork and beans — bean soup for young children
Bread
Oleomargarine
Tea with milk and sugar for adults
Milk for youngest children
Cereal coffee or cocoa for older children

DINNER:

Lentil soup
Hashed browned potatoes
Bread
Oleomargarine
Tea for adults
Milk for youngest children
Dried apple and date pie with cheese, for father, mother, and oldest child
Dried apple sauce for others

The breakfast and morning lunches for the children will be practically the same in all these menus, following the plan in Dietary IV.[1] The afternoon lunches will follow the family luncheon as closely as possible. In the menu above, part of the beans are put through a sieve and made into soup for the two o'clock dinner of the little ones. Baked potato and baked apple or stewed prunes may be used for the three-year-old, as in Dietary IV.[2]

The half past five meal for the baby will not change with changes in the menu for the rest of the group. Other suggestions for the three-year-old will be found in the chapter on feeding young children (pages 128–134).

[1] Page 274. [2] Page 275.

Lentil soup with bread may here take the place of cream toast, and cornmeal mush, if cooked all day, may be substituted for the rice pudding. Little change can be made in the night lunches.

Since the meals for the two youngest and the supper for the six-year-old cannot follow the regular family menu, and are very simple, no attempt has been made to describe them in detail, but suggestive notes with each menu will indicate ways of adapting these to the children, thus saving extra labor.

II. Breakfast:

Hominy with milk and sugar
Fried potatoes } for adults and oldest child
Baking powder biscuit } for adults and oldest child
Toast and milk for other children
Coffee for adults
Apple sauce, prune pulp, or orange juice for two youngest

Luncheon or Supper:

Vegetable soup with croutons
Whole wheat bread
Peanut butter
Stewed dried peaches with raisins

Dinner:

Pork sausage baked with parsnips
Baked potatoes
Bread
Oleomargarine
Steamed cranberry pudding
Everyday sauce,[1] flavored with nutmeg

[1] Water, cornstarch, sugar, and oleomargarine.

This menu can be quite easily adapted to the children's needs. Their breakfasts will be like those in Dietary IV,[1] except that hominy may be substituted for oatmeal if hominy grits be used. Vegetable soup put through a sieve will serve for the two o'clock dinner of the three-year-old, and bread and peanut butter take the place of the baked potato; stewed dried peaches that of the baked apple. The family evening meal is not suited to the requirements of the young children. For their half past five supper, some such plan as outlined in Dietary IV[2] had best be followed.

III. BREAKFAST:

Farina with milk and sugar
Graham gems baked in a thin sheet
Brown sugar syrup
Cereal coffee for all but two youngest children
Milk for two youngest children

LUNCHEON OR SUPPER:

Split pea soup
Bread
Oleomargarine
Sliced bananas with sugar
Gingerbread

DINNER:

Lentil-meat loaf
Tomato sauce
Mashed potatoes
Scalloped dried apples
Cocoa for children
Tea for adults

[1] Page 274. [2] Page 276.

Baking the gems in a thin sheet will make them suitable for all but the two youngest children. The syrup should be given very sparingly, if at all, to the children. The split pea soup can be used for the three-year-old's dinner and the six-year-old's supper. Gingerbread and scalloped apples may also be served for the latter's supper.

IV. Breakfast:

Oatmeal mush $\begin{cases}\text{with corn syrup for adults}\\ \text{with milk for children}\end{cases}$
Corned beef hash
Bread
Coffee for adults

Luncheon or Supper:

Baked beans with salt pork
Boston brown bread
Tapioca-Indian meal pudding with raisins
Milk for children
Tea for adults

Dinner:

Braised stuffed heart with vegetables
Baked potatoes
Rye bread
Oleomargarine
Dried peach pudding

Part of the baked beans can be put through a sieve and made into soup for the three-year-old's dinner and the six-year-old's supper. Junket can easily be made for dessert for the children's half past five supper.

V. Breakfast:

Flaked wheat with milk and sugar
Buckwheat cakes with corn syrup
Coffee for adults
Cocoa for children

Luncheon or Supper:

Escalloped potatoes with cheese
German coffee bread
Oleomargarine
Apricot tapioca with caramel sauce
Tea for adults
Cereal coffee for children

Dinner:

Braised chuck rib of beef
Stewed cabbage
Browned potatoes
Bread and oleomargarine
Steamed fig pudding
Everyday sauce

Potato soup may be made for the three-year-old's luncheon, and the six-year-old's supper. For the latter, thoroughly toasted coffee bread will also be acceptable. All except the baby may have the apricot tapioca, but it should be served with milk instead of sauce for the three- and six-year-old children.

VI. Breakfast:

Oatmeal mush with milk and sugar
Cornbread baked in a thin sheet
Oleomargarine
Coffee for adults
Cereal coffee for children

Luncheon or Supper:

Corn chowder with croutons
Rye bread and oleomargarine
Stewed prunes
Tea for adults

Dinner:

Baked split peas with bacon
Cabbage and potato salad
Molasses cake
Cocoa

Some of the corn chowder can be put through a sieve and some of the baked split peas made into a purée for the three-year-old's dinner and supper. Rice molded and served with prunes would make a good dessert for the young children.

CHAPTER XV

FOOD FOR THE SICK AND CONVALESCENT

A DISCUSSION of the problems of feeding a family would be incomplete without some reference to the care of the sick and convalescent. Few families are so fortunate as to escape illness entirely. Good feeding is one of the greatest factors in maintaining health, but it must be supported by other conditions fostering nutrition, such as sanitary and cheerful surroundings, freedom from chill, exhaustion, overwork, or worry. A well-fed person is much better able to resist the attacks of harmful bacteria than an undernourished one, but if their number is very great on account of impure water or food, they may overwhelm his strong defenses. Thus the best care to set a well-balanced table may fail to maintain health if the housewife works without the help of the community in securing a sanitary environment. Personal infringements on the laws of health, other than those in regard to food, undermine the resistance of the body to disease; fatigue, and chill, often, for instance, pave the way to colds and indigestion, which in their turn lower resistance still more. Then a stray germ which would be promptly destroyed if the person were in vigorous health, may find a favorable soil in which to flourish. So, in one way and another, illness may enter the home where food is dispensed with intelligent care, and special adaptations of the diet to the needs of the patient have to be considered.

When the case is serious enough to demand the care of a physician, he will give advice concerning the diet, and his directions should be implicitly obeyed. It requires knowledge and experience to diagnose disease and prescribe suitable food, and no book can take the place of the skillful doctor. In sickness, even more than in health, every person is a law unto himself and all rules must be modified according to the requirements of the individual. This can be done successfully only by one who is able to judge accurately the patient's true condition.

The physician's advice is, however, often very general, especially where the diet is not a prominent factor in the treatment, and the home nurse is frequently at a loss to know how to carry out his instructions to the best advantage. She must obey the doctor, please the patient and not over-strain the family pocket book, and sometimes the three seem quite irreconcilable. Moreover, many minor disturbances for which no physician is called require some modification of the ordinary family diet. The better the general principles of feeding are understood, the more successfully such emergencies can be met, especially if this knowledge is supplemented by some acquaintance with the lines of dietetic treatment which have proven most successful in practice.

At the outset one must free one's mind from any notion that any particular food is a specific for any disease. As has already been pointed out, there are in health many choices of food, whether for fuel, building, or regulating materials. So in sickness, though the range of choice may be more limited, some flexibility is usually possible. There is no magic diet for any disease. Even in the well-known case of diabetes, where the power to utilize carbohydrates is reduced to a low plane or lost, the avoidance of certain articles of food, while it may be important, is by no means the only feature of the diet. The aim of this chapter is to point out a few dietetic procedures which conform to the general principles involved and which have been shown by experience to be "safe and sane." For more detailed suggestions and other modes of treatment, the reader must consult the specialist in nutrition or refer to the writings of experts in the treatment of any particular disease.[1]

Energy Requirements in Sickness

In sickness, as in health, the internal work of the body goes on at the rate of about two-fifths of a Calorie per pound per hour during sleep and about three-fifths of a Calorie per pound per hour during waking hours spent in bed. Seldom is the expenditure of energy less in sickness than under the same conditions of activity in health, and it may be more, particularly in cases of fever. In the first few days of illness, fasting or taking of very little

[1] Much practical information about feeding in disease is to be found in *Diet in Health and Disease* by Friedenwald and Ruhräh.

food does no harm and has the advantage of giving the digestive tract a chance to rest. But the energy for body work must still be supplied, so it is drawn from the reserves of the body itself at the rate of about one-half a Calorie per pound per hour for the 24-hour day, if the patient is lying quietly in bed; in other words, a man of average weight, confined to his bed, will need about 1850 Calories per day. How long it will be wise to depend upon the body to furnish its own fuel wholly or in part depends upon circumstances. In disturbances of short duration, such as attacks of acute indigestion, it is quite safe to fast one to three days, or until the cause of disturbance is removed. Nature will quickly bring the digestive tract back to normal, so that in a few days a simple diet ample for all body needs can safely be taken. But in disease which is likely to run a long course and draw severely upon body tissues, food for fuel must be supplied as nearly as possible in accordance with energy expenditure, to save the patient from being very much weakened and having to undergo a long period of convalescence to regain what he has lost.

Fluid Diet

When for any reason the person is below par physically, care must be taken to provide a diet easy of digestion. Some of the ways in which this may be done have already been considered in Chapter II. Since all food must eventually be reduced to fluid form for absorption, a liquid diet is usually regarded as the type easiest to digest, and is often prescribed by the physician.

By this he means a diet which includes: (1) broths and clear soups of various kinds; (2) beef juice and tea; (3) cereal gruels; (4) milk, either plain or modified in such a way as to make it more digestible, more nutritious, or more attractive to the patient; (5) raw eggs in combination with water, milk, fruit juices, cocoa, or other fluid; (6) cream soups of various kinds.

Broths and clear soups and beef tea have little or no fuel value, from a pint to a quart being required to yield 100 Calories. Their chief virtues are that they are agreeable to taste, comforting when hot or refreshing when cold, and when they contain meat extracts (as they usually do) stimulating to the flow of the gastric juice. Broths can be made the carriers of extra nutriment by the addition of eggs, by thickening with cereal flours, such as barley or rice flour, or by combination with ordinary cereal gruels.

Beef juice, made by pressing the juice from slightly warmed beef or from finely chopped beef which with a little added water has been kept at a temperature of 150° F. for two hours (to draw out the juice) has a fuel value of about 100 Calories per pint. It is an expensive fuel, since a pound of lean meat yields only about four ounces ($\frac{1}{2}$ cup) of juice, or about 25 Calories. It ranks with eggs and milk as an easily digested protein food, but it is not as attractive in flavor as beef broth or beef tea, and is served only in small quantities.

Cereal gruels are useful in many cases in which the appetite is poor or the digestive and assimilative powers very weak. They are neither stimulating nor irritating and are rapidly digested and absorbed. When made from cereal flours, one ounce (4 level tablespoonfuls) to the quart, they have a fuel value of from 70 to 90 Calories per quart. They may be made as thick as two ounces to the quart, doubling their fuel value (140 to 180 Calories per quart). If the cereal gruel is dextrinized,[1] thus rendering it more fluid, as high as six ounces may be used per quart, the fuel value then ranging between 400 and 600 Calories per quart, according to the kind of cereal flour used. It is evident that a man could not drink enough thin cereal gruel to furnish a day's quota of energy, and of a thick gruel dextrinized he would have to drink three or four quarts. The virtue lies in allaying hunger and thirst and furnishing a little bland, easily digested food. Like broths, gruels may be enriched by the addition of eggs, cream, or milk.

Milk is one of the most valuable foods for the sickroom. It is for most people easy of digestion in its natural state, if taken slowly, and can be made still more digestible in various ways. As already pointed out many times, it contains all kinds of material required by the body, and may be considered as "a diet" in itself. Its usefulness can often be increased (1) by changing its flavor, which is not always agreeable, especially to adults, (2) by altering the relative proportions of protein, fat, and carbohydrate, or (3) by combining it with some-

[1] Cereal gruels are dextrinized by adding to the cooked gruel, when cooled to about 100° F., a small amount of a commercial preparation of malt diastase. This causes the thick gruel to liquefy rapidly by changing the starch into dextrins and malt sugar.

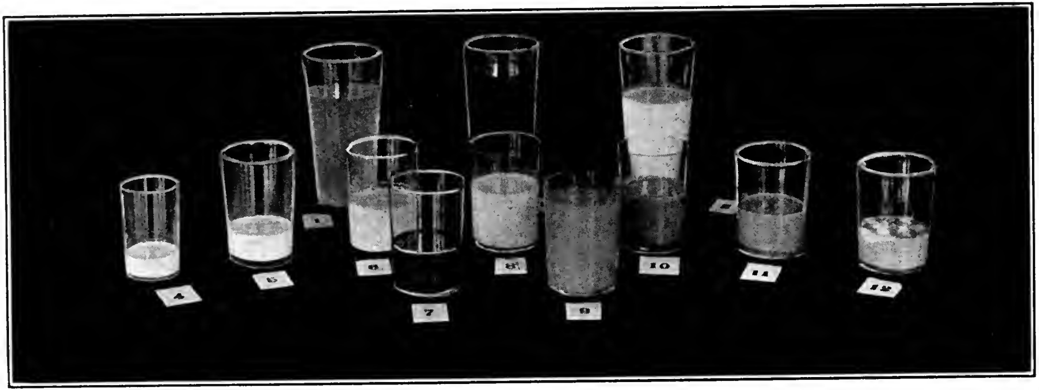
thing which prevents the formation of large or hard curds in the stomach. The general principles of milk modification have already been discussed in Chapter V. They are applicable in all cases where digestion and assimilation are concerned, as well as in the feeding of infants. Just how milk shall be prepared depends upon the individual to be fed. "Some like it hot, some like it cold," and a few like it warm from the cow. Those who find its sweetness unpleasant often enjoy the mild acid flavor of buttermilk and zoolak or the faint tang of fermented milk (kumiss). Coffee, tea, or cocoa may be added for their flavor; malted milk not only changes the taste but adds to the fuel value and ease of digestion. With malted milk a number of different flavors are possible. For example, it may be served hot, slightly salted, or cold with a little fruit juice and sugar. Cereal gruels are added to milk chiefly to make it easier to digest. Raw eggs add to its food value and the eggnog may be flavored in a variety of ways — with vanilla, nutmeg, coffee, beef broth, or pineapple juice. Since whole milk has a fuel value of about 675 Calories per quart, it follows that three quarts of milk will cover the energy requirement of the average man in bed, unless his disease is one demanding an extraordinary amount of fuel. Two and one-half quarts of milk plus two eggs will yield the same amount of energy in a little less bulky form. By the addition of some cream the volume may be reduced still further with ease.

What are known as "albuminized" beverages are in reality combinations of white of egg (a kind of protein called albumin) with various fluids, such as milk, broth, orange, lemon, pineapple, or grape juice, or even water alone to make a soothing drink of some nutritive value, to be taken when the irritability of the digestive tract is particularly great. The white of one egg has an average fuel value of 13 or 14 Calories. One white combined with half a cup of milk results in a drink yielding nearly 100 Calories. One white plus the juice of one medium sized orange and a teaspoonful of sugar will supply from 55 to 60 Calories.[1]

More nourishment is gained, of course, by introducing the yolk as well as the white of the egg. An eggnog made with one egg, three-fourths of a cup of milk, three-fourths of a tablespoonful of sugar, and one tablespoonful of brandy will yield about 230 Calories; others will yield from 125 to 200 Calories. All of these present the egg in agreeable fluid forms which can be adapted to the palate of the most fastidious. Indeed, the chief reliance for nourishment in fluid diet, it will be perceived, is upon milk and eggs. Even cream soups generally owe their food value largely to milk and are to be regarded as among the devices for making milk acceptable. Several illustrations of the nutritive value of cream soups will be found among the Dietary Recipes of Table III, in the Appendix.

If a fluid diet is to be maintained but for a short time (a few days), no attempt is usually made to meet the full energy requirement of the patient. The diet

[1] Recipes for various foods for invalids with their fuel value stated may be found in Pattee's *Practical Dietetics*.



100-CALORIE PORTIONS OF BEVERAGES[1]

Food Material	Weight (oz.)	Measure	Food Material	Weight (oz.)	Measure
1. Lemonade	11.0	$1\frac{2}{5}$ cup	7. Grape juice	3.5	$\frac{1}{2}$ cup (scant)
2. Beef juice	14.1	$1\frac{2}{3}$ cup	8. Milk, whole	5.1	$\frac{5}{8}$ cup
3. Buttermilk	9.9	$1\frac{1}{8}$ cup	9. Orange juice	8.2	1 cup
4. Cream, thick (40 % fat)	0.9	$1\frac{1}{3}$ tablespoon	10. Cocoa ($\frac{1}{2}$ milk)	5.5	$\frac{3}{5}$ cup
5. Cream, thin (18.5 % fat)	1.8	$\frac{1}{4}$ cup	11. Cocoa (all milk)	3.8	$\frac{2}{5}$ cup
6. Eggnog	3.7	$\frac{1}{2}$ cup (scant)	12. Cocoa (milk and whipped cream)	2.9	$\frac{1}{3}$ cup

[1] Cf. Appendix, Tables I and III.

relieves sensations of hunger and thirst, and the dilute food has a better chance of digestion than more concentrated would have, for, when one is not taking any exercise, body processes are apt to be sluggish. The fluid diet should be administered in small amounts at frequent intervals. A liquid meal leaves the stomach quickly and enters the circulation quickly. If meals are too far apart, less food is given than the patient can advantageously take. If too large amounts are given at once, too much work is thrust upon the enfeebled system. An illustration of a typical fluid diet, showing amounts and time of meals, is given below. It will yield from 800 to 900 Calories.

A Typical Menu for a Fluid Diet

7 A.M.	1 cup coffee with $\frac{1}{4}$ cup milk
9 A.M.	Albuminized lemonade; 2 tbsp. lemon juice, 2 tbsp. sugar, egg white, 1 cup water
11 A.M.	1 cup broth
1 P.M.	1 cup gruel made with milk
3 P.M.	Albuminized lemonade (as above)
5 P.M.	1 cup tea with $\frac{1}{4}$ cup milk
7 P.M.	1 cup broth
9 P.M.	1 cup gruel made with milk
11 P.M.	1 cup broth

When a fluid diet is to be given over a considerable period of time, running into weeks, more attention must be paid to its fuel value. To keep the food dilute and administer over 1000 Calories per day, meals may have to occur every two hours throughout the twenty-four. The best example of a very simple dietary of this type will be found in the discussion of typhoid fever.[1] A simple illustration of a more varied menu, to yield about 1800 Calories, is given below. Such a menu is adapted to convalescence or other cases of weakness, where digestion is not greatly impaired.

7 A.M.	1 cup milk
9 A.M.	1 cup milk flavored with coffee essence
11 A.M.	Albuminized orange juice; ½ cup orange juice, 2 tsp. sugar, white of one egg, ½ cup water
1 P.M.	Cream soup with one egg, or broth with one egg and ¼ cup cream
3 P.M.	Grape juice eggnog; one egg, ½ cup milk, 1 tbsp. sugar, ¼ cup grape juice, 1 tbsp. cream
5 P.M.	Gruel made with milk
7 P.M.	1 cup tea made with ½ cup milk and 2 tbsp. cream
9 P.M.	Gruel flavored with beef extract
11 P.M.	1 cup hot malted milk; 1 cup milk, 3 tbsp. malted milk

Soft or Semi-Solid Diet

The so-called soft or semi-solid diet represents an intermediate step between fluid diet and a very simple, wholesome, mixed diet, the latter often designated in hospitals as light or convalescent diet. Soft diet is generally more acceptable to the patient than a wholly fluid diet, and has the advantage of less bulk in proportion to fuel value. The foods most commonly included are any of the fluid foods mentioned in the preceding section and, in addition, a considerable variety of simple dishes, such as toast softened with water, milk, or broth; custards, baked, steamed or "boiled"; whips, soufflés,

[1] See page 305.

junkets, blancmange, gelatin jellies, ice creams, ices, and sherbets. Meats, fish, and green vegetables are omitted. The following menu will give some idea of what foods are permissible. It will yield from 2000 to 2200 Calories.

A TYPICAL MENU FOR A SOFT OR SEMI-SOLID DIET

7 A.M.	1 cup hot milk (may be flavored with tea or coffee)
9:30 A.M.	½ cup grape or pineapple juice
	1 cup thick farina gruel served with rich milk
	1 thin slice toast with butter
12 M.	1 cup beef broth with the white of 1 egg
	1 thin slice toast with butter
2:30 P.M.	⅔ cup chicken soufflé
	½ thin slice toast
	½ cup lemon jelly with 1 tbsp. whipped cream
5 P.M.	1 cup milk flavored with tea or cocoa
	½ thin slice toast
7:30 P.M.	½ cup bouillon
	1-egg omelet
	½ cup cocoa or caramel junket
10 P.M.	1 cup gruel or malted milk (made with milk)
	1 thin slice toast

Light or Convalescent Diet

The treatment of convalescence depends, of course, upon the nature of the disease. The severity and duration of the attack, the strength of the patient, and the nature of the diet during the acute stage are all factors to take into account in directing the diet during recovery, and no rule will exactly fit every case. But we may assume that the digestive tract will participate in the weakness of the rest of the body, even when not itself the seat of disturbance, and regard special attention to the diet as essential to rapid and complete restoration to health. If a fluid diet has been given, it will be followed by a semi-fluid one, and this in turn by one more like the patient's ordinary diet, but free from any foods which might overtax the system. When no special directions are given, except to take a "light" diet, it is permissible to provide a fairly liberal food supply, allowing some surplus over daily energy requirements to replenish depleted cells and restore lost weight, but seeing to it that the extra amount is not so great as to upset digestion at any time. For adults an allowance of from 2200 to 2500 Calories per day is usually sufficient, since convalescents are not indulging in active exercise. Aside from such regulations as the physician may prescribe, the main point is to limit the diet strictly to foods that are not likely to disturb digestion, and to see that building materials are generously represented. Some of the ways of adapting food to digestive difficulties have been discussed in Chapter II, and many of the suggestions made in regard to selection of food for children (Chapters VI–IX) can be applied to the convalescent. It is well to keep in mind also the following points:

1. The diet should be simple — only a few kinds of food at a time and those plainly but very carefully cooked and seasoned.

2. Meals should be served with strict regularity; a half hour of waiting may destroy all desire for food.

3. The appetite should be tempted by the appearance of the

tray — attractive dishes neatly arranged, no food slopped over, hot dishes hot and cold dishes cold *when they reach the patient*, a pleasant surprise in the shape of a pretty garnish, a flower or a new dish.

The following outline shows the type of food which should be chosen.

General Plan for Convalescent Diet

Breakfast: Coffee or tea with milk and a little sugar
- Diluted fruit juice or cooked fruit, such as pears, prunes, apples
- A thoroughly cooked cereal (cooked 3 to 8 hours and strained if necessary) with thin cream and a little sugar
- A soft-cooked egg
- Dry toast — butter to spread it served separately

Dinner: Meat broth or soup (rice, barley, potato, pea, asparagus)
- Roast or broiled lean beef, chicken, mutton, lamb, or fish
- Potatoes baked, boiled, or mashed, or macaroni or rice
- Toast, stale bread, or plain crackers and butter
- A simple custard, ice cream, junket, cereal pudding, gelatin jelly, or mild stewed fruit
- Milk, to be flavored as desired

Supper: Milk, served as soup, milk toast, or beverage, as preferred
- An omelet, soufflé, or small chop
- Toast or stale bread and butter
- Stewed or baked fruit (prunes, apples, pears, bananas)

If lunches are required between these meals, an eggnog, a glass of milk and a cracker, a cup of broth and a slice of toast, are safe to choose.

Diet in Minor Illness

There are many times when diets of the types indicated above (fluid, semi-solid, and light or convalescent) may be profitably followed. On occasions of strain, nervous or otherwise, the digestive functions are likely to be depressed, and if given their usual amount of work to do may rebel and precipitate a fit of acute indigestion. If, however, the diet is made lighter for a few days, they will regain their normal state with no mishaps. A light meal is always in order when one is weary; passing quickly into the circulation, it helps to relieve the sense of fatigue. Nutritious soups are excellent for this purpose; so are milk toast, bread, rice, or other cereals with milk, especially if the milk or the cereal is taken hot.

Colds and influenza are often contracted because of weariness or exhaustion, and frequently accompanied by constipation. At first a light laxative diet of low fuel value is best — hot lemonade or orangeade, broths or gruels with crisp toast, baked potatoes, mild stewed fruits and vegetables being the chief articles of diet. This should be followed in a few days by one of full fuel value, and as soon as the cold seems to be "broken" by one of a little higher value than usual, to aid the body in complete recovery. For additional fuel at such times, fats such as butter, cream, bacon, olive and cod-liver oil, seem especially desirable, with liberal use of milk, eggs, and fruit. This "full feeding" should be continued until all traces of the cold are gone. It will do much to aid in quick recovery, and without it a cold may hang on a long time and even be the beginning of more serious troubles, such as chronic catarrh, bronchitis, pneumonia, or even tuberculosis.

Acute Indigestion

During an attack of acute indigestion it is best to refrain from food, or to take only broth, tea, white of egg, or modified milk, for a day or two, until the irritated digestive tract has partially recovered, then to take a semi-solid diet, followed by a light diet, as outlined previously[1]. Sugars, which are irritating to the lining of the stomach and likely also to ferment, should be avoided. Fruit and vegetables must be introduced again cautiously. Baked potatoes, baked apples, and prunes are safest to begin with. Bread should be oven-dried or toasted crisp. Eggs, lean roast or broiled meat and fish, oysters, buttermilk, butter, cream, and bacon are all desirable. Under-feeding for a few days is better than over-feeding in this case. Only small quantities should be taken at one time. The following menu illustrates what may well be taken as soon as comparative comfort has been secured by rest and lighter feeding.

MENU FOR DIET IN CONVALESCENCE FROM ACUTE INDIGESTION

7 A.M. Glass of water — preferably hot

8 A.M. BREAKFAST:
Coffee with hot milk
Soft-cooked egg
Small serving of bacon
Two thin slices of toast with butter

[1] See also "The Part of the Stomach in Good Digestion," page 34.

11 A.M. A glass of buttermilk or sweet milk (preferably hot) and a plain cracker

2 P.M. DINNER:
Small serving of lean roast meat, chop, or broiled steak
Pulled or toasted bread with butter
Cup custard, junket, or cornstarch blancmange
Milk or tea or coffee half milk to drink

6 P.M. SUPPER:
Cup of broth
Plain or milk toast or omelet
Bread, tapioca, or other cereal pudding

Intestinal Putrefaction

The control of intestinal putrefaction depends largely upon the diet. As indicated in Chapter II,[1] protein food should be limited and the kind carefully considered. Meat proteins are very readily attacked by putrefactive bacteria and should be avoided. Milk protein is most satisfactory, and one may choose not only the various beverages, but also cottage and other cheeses as meat substitutes. Vegetable proteins may also be used, as those in cereals and bread, peas, and beans. Not more than two protein Calories per pound of body weight should be taken per day by an adult. A liberal use of green vegetables and fruits not only helps to carry off putrefactive products from the intestine, so that they will not be absorbed to circulate in the body and do harm, but these foods by their tendency to ferment a little actually hinder the action of the putrefactive bacteria. Constipation is very likely to be associated with

[1] See page 39.

putrefaction, and most of the measures used to combat it [1] may be tried when it is associated with putrefaction. Persistence is essential to success in the treatment of intestinal disturbances. One needs the patience of Job and grim determination not to backslide. The following suggestions may be helpful in planning a diet.

A Suggestive Menu for Counteracting Intestinal Putrefaction

7 A.M. Glass of water or dilute fruit juice

BREAKFAST: Thoroughly cooked cereal, with cream
Dry, crisp toast and butter
Fresh or stewed fruit

LUNCHEON: Hot vegetable dish, as escalloped cauliflower, cabbage, tomatoes, or potatoes; macaroni, rice, or hominy, with cheese; macaroni or rice with tomatoes; or stuffed tomatoes or peppers
Twice baked crusty rolls, or toast and butter
Cereal pudding or fruit dessert

DINNER: Vegetable or milk soup
Egg, cheese, or nut dish
Cooked green vegetable
Vegetable, fruit, or cheese salad
Simple pudding, or frozen dessert, or crackers, cheese and coffee

10 P.M. Glass of hot water

Food in Fevers

In the early stages of fever, digestion is often much disturbed — sometimes to such a degree that no food

[1] See page 42.

at all can be retained. No food should be given which cannot be readily digested and absorbed, for undigested food will do more harm than good. A liberal supply of liquid is important to relieve thirst and help in elimination of waste products, but when the digestive tract is very irritable even fluids will have to be given in small quantities at a time, though at frequent intervals. For a few days after the first onset of fever, the beverages, aside from water, may be only slightly nutritive, being confined principally to cereal waters (very thin gruels), diluted fruit juices (lemonade, orangeade, etc.), whey, and broth.

But the energy output in fever is higher than when the body is free from fever. The raised temperature may increase the energy expenditure as much as one-fourth. Thus a bedridden man with fever, instead of requiring from 1800 to 2200 Calories per day, will need from 2200 to 2800 to keep from burning up his body tissues for fuel — or about the same amount as he would require if doing moderate muscular work in health. In some diseases characterized by fever even this extra allowance is not enough to maintain the patient's body weight. In typhoid fever, for instance, the bacteria responsible for the disease cause a great wasting of body substance, which can be prevented only by feeding a diet of very much higher fuel value than the patient would need if he were simply lying in bed free from fever.[1]

The administration of food in fever calls for the exer-

[1] See discussion of "Diet in Typhoid Fever."

cise of skill and good judgment in deciding how far the patient's energy needs can be met when the alimentary tract is very sensitive and indigestion may be worse than under-feeding, and in selecting the food which can be taken most successfully. A fluid diet is safest and easiest to give, as a rule. Meals may be served at intervals of one and one-half to two hours. Milk is an ideal fever food, if modified to suit the digestive state of the patient. Whole cow's milk is so high in protein that it will make a better balanced diet if something containing little or no protein is combined with it — cream or milk sugar or both, or some cereal gruel or proprietary infants' food prepared from cereal flours, malted or otherwise. The different devices for modifying milk for infants are applicable here, but more attention should be paid to flavor for the adult, lest he tire of its monotony. The aftertaste of milk is disagreeable to many, especially when the mouth is parched with fever, and this can be avoided by carefully cleansing the mouth with water, plain or slightly acidified with lemon juice, immediately after each feeding. The outline of a fluid diet of high fuel value, on page 294, may be used in fever as soon as the digestive tract will tolerate it — usually in a few days.

Diet in Typhoid Fever

Typhoid fever furnishes a striking example of a disease in which diet is one of the most important factors in treatment. The very life of the patient depends upon absolute obedience to physician and nurse in regard to every mouthful that the patient receives. A single indiscretion in diet may prove fatal, and no one but a person expert in reading the signs of the patient's condition (often entirely unperceived by the inexperienced and untrained person) should venture to prescribe the diet. Since, however, the home nurse has the responsibility of preparing the food ordered by the doctor, she will be able to coöperate more easily and cheerfully if she understands the general principles of the dietetic treatment of the disease, and it is only with the thought of giving her this background that the following suggestions are made.

As in other cases of fever, there is an increase in the energy expended, due to the influence of the heightened temperature. There is an added expenditure due to the wasting of body substance brought about by the bacteria which cause the disease. These bacteria enter the system by way of the mouth, usually in contaminated food or water. A typhoid patient is always the victim of somebody's carelessness. Proper safeguarding of the water and milk supply in a community, with prompt isolation of any typhoid subject who may appear, will practically eliminate the disease. Typhoid bacteria find a congenial soil in the large intestine and flourish there at the expense of the intestinal wall, causing ulcers and giving off poisons which are absorbed and circulate in the blood to poison the whole body. On account of the intestinal ulcers, the diet must not cause irritation or undue distension of the intestinal walls. This is one reason why the food must be very easy to digest and absolutely free from all indigestible substances, such as cellulose, seeds, or even large undigested food fragments. In the early stages, the digestion may be greatly disturbed and little food of any kind can be given. But typhoid runs a long course (four to six weeks) and these first symptoms subside more or less completely in a comparatively short time, after which digestion may constantly improve. The power of the body to absorb and utilize food is not much impaired, so that once digestion is good the increased energy demands can be nearly, if not fully met, and the great wasting once thought inevitable prevented. There are cases on record in which the patients have actually gained weight while the disease was in progress. If such feeding is possible, the dangers of exhaustion and slow convalescence are much lessened.

For the early stages, then, it is likely that a fluid diet will be adhered to very strictly, one consisting principally of modified milk being most generally employed. The amount and nutritive value will depend upon the condition of the patient, the best success being generally obtained with from 1000 to 3000 Calories per day. The following are good examples of the modified milk diets.

MODIFIED MILK DIETS FOR TYPHOID FEVER [1]

	Calories
For 1000 Calories a Day:	
Milk, 1000 c.c. (1 quart)	700
Cream, 50 c.c. (1⅔ oz.)	100
Lactose, 50 gm. (1⅔ oz.)	200
This furnishes eight feedings, each containing:	
Milk, 120 c.c. (4 oz.)	80
Cream, 8 gm. (2 dr.)	15
Lactose, 6 gm. (1½ dr.)	24

[1] Coleman, *American Journal of Medical Sciences*, January, 1912.

	Calories
For 2000 Calories a Day:	
Milk, 1500 c.c. ($1\frac{1}{2}$ quarts)	1000
Cream, 240 c.c. (8 oz.)	500
Lactose, 125 gm. (4 oz.)	500
This furnishes seven feedings, each containing:	
Milk, 210 c.c. (7 oz.)	140
Cream, 30 c.c. (1 oz.)	60
Lactose, 18 gm. ($4\frac{1}{2}$ dr.)	72
For 3000 Calories a Day:	
Milk, 1500 c.c. ($1\frac{1}{2}$ quarts)	1000
Cream, 480 c.c. (1 pint)	1000
Lactose, 250 gm. (8 oz.)	1000
This furnishes eight feedings, each containing:	
Milk, 180 c.c. (6 oz.)	120
Cream, 60 c.c. (2 oz.)	120
Lactose, 30 gm. (1 oz.)	120

It is not necessary always to limit the kinds of food in the fluid diet for typhoid so strictly as in the diets above. Many patients can take and will enjoy a little more variety and may be given such a diet as the following:[1]

A Mixed Fluid Diet for Typhoid Fever

8 A.M.	Milk and coffee, each 120 c.c. (4 oz.)
10 A.M.	Milk, hot or cold, 240 c.c. (8 oz.)
12 noon	Oatmeal gruel, 120 c.c. (4 oz.), with milk, 60 c.c. (2 oz.)
2 P.M.	Junket with cane- and milk-sugar
4 P.M.	Oatmeal gruel, 120 c.c. (4 oz.) with milk, 60 c.c. (2 oz.)
6 P.M.	Junket with cane- and milk-sugar
8 P.M.	Hot milk, 240 c.c. (8 oz.)
10 P.M.	Whey, 180 c.c., with one whole egg and sherry
12 P.M.	Oatmeal gruel, 120 c.c. (4 oz.), with milk, 60 c.c. (2 oz.)
2 A.M.	Junket with cane- and milk-sugar

[1] F. P. Kinnicutt, *Diet Lists of the Presbyterian Hospital, New York City*, page 15.

4 A.M. Milk, 240 c.c. (8 oz.)
6 A.M. Milk, 240 c.c. (8 oz.)
15 gm. ($\frac{1}{2}$ oz.) of lactose added to each of the four milk feedings

APPROXIMATE VALUES

Protein, 71 gm. ($2\frac{1}{3}$ oz.); fat, 81 gm. ($2\frac{2}{3}$ oz.); carbohydrates, 160 gm. ($5\frac{1}{3}$ oz.); Calories, 2300.

A typhoid patient is not always limited to a fluid diet, though solid foods must be given cautiously and introduced gradually. The foods from which the diet should be chosen are:

1. Milk in various forms
2. Broths — beef, veal, chicken, mutton
3. Soups — potato, pea, bean, carefully strained and thickened with flour. Milk, cream, and egg may be used
4. Gruels — always strained
5. Eggs, raw or soft-cooked
6. Cream and butter
7. Custards, ice creams and sherbets, blancmanges, and gelatin jellies. Milk sugar used for sweetening will increase the fuel value
8. Toast
9. Breakfast cereals, thoroughly cooked and strained
10. Rice, baked and mashed potatoes
11. Apple sauce, orange juice and grape juice

Such a diet is adapted to the early stages of convalescence, when not prescribed during the fever. A dietary which illustrates the high feeding on a very simple, easily digested, mixed diet, free from anything likely to cause intestinal irritation or other disturbance, is here quoted.[1]

[1] Coleman, *American Journal of Medical Sciences*, January, 1912.

A Soft Diet for Typhoid or Typhoid Convalescence

	Calories
7 A.M.	
Egg, 1	80
Toast, 1 slice	80
Butter, 20 grams	150
Coffee	
Cream, 2 ounces	120
Lactose, 20 grams	80
9 A.M.	
Milk, 6 ounces	123
Cream, 2 ounces	120
Lactose, 10 grams	40
11 A.M.	
Egg, 1	80
Mashed potato, 20 grams	20
Custard, 4 ounces	250
Toast (or bread) 1 slice	80
Butter, 20 grams	150
Coffee	
Cream, 2 ounces	120
Lactose, 20 grams	80
1 P.M.	
Same as 9 A.M.	283
3 P.M.[1]	
Same as 9 A.M.	283
5 P.M.	
Egg, 1	80
Cereal, 3 tablespoons	150
Cream, 2 ounces	120
Apple sauce, 1 ounce	30
Tea	
Cream, 3 ounces	180
Lactose, 20 grams	80
7 P.M.	
Same as 9 A.M.	283
10 P.M.	
Same as 9 A.M.	283

[1] Lactose lemonade may be substituted for the milk mixture at three o'clock. See Table III, Appendix, page 360.

	Calories
1 A.M.	
Same as 9 A.M.	283
4 A.M.	
Same as 9 A.M.	283
Total Calories for day	3911

Diet in Tuberculosis

When the tubercle bacillus gains a foothold in the human body, it not only proceeds to destroy the organ upon which it encamps, — lungs, kidney, or whatever it may be — but it produces poisons which permeate the whole system, causing fever, loss of appetite, and other bad conditions which result in the wasting so familiar in this dread disease. There is no drug which will kill or drive out the germ: the body must elaborate its own weapons of defense, and the object of treatment is to build the person up so that resistance to the disease will become great enough to bring about a cure. Everything which will help to promote good nutrition must be emphasized — all the fresh air obtainable, carefully regulated rest and exercise, and good food in abundance. As in typhoid fever, the amount and kind of food is of great importance. But in tuberculosis the appetite is apt to be poor and fitful and is no guide whatever as to how much the patient should eat. Often he must continue eating when he does not want food at all. But this does not mean that he should be indiscriminately "stuffed." The best dieting is that which keeps his digestive tract in as good condition as possible and yet brings about a gain in weight, until he attains the highest weight which he is known to have had before contracting the disease. Fattening beyond this point seems undesirable. The amount necessary to produce a satisfactory gain in weight will vary with the individual, but the best rule which seems to have been evolved by students of the problem is to add one-third more to the diet which would be normal for the same person, with the same degree of activity (usually at rest), but without tuberculosis. Thus, taking the average requirement for a man at rest as 2000 Calories, the provision for the same person when tubercular would be about 2700 Calories. Much care must be taken in the selection and preparation of food, to see that it is easy of digestion, and the amount of food to be eaten must be carefully measured.

As to kind of food, the tubercular patient seems to profit by liberal protein and fat, but indiscriminate stuffing with these may defeat its own end. An allowance of about one-third more protein than what would be a liberal provision in a non-tubercular diet seems advisable. A man in health is abundantly supplied when he has 400 protein Calories per day: the tubercular man should, accordingly, have about 530 protein Calories per day. Since the protein is needed to reconstruct wasted tissues, the kinds best for growth should have preference — milk and eggs particularly — though other protein food can also be used to advantage, if prepared in ways easy of digestion.[1] Fat by its high fuel value helps to keep the bulk of the day's diet within practical limits — a great

[1] See Chapter II.

consideration when the appetite is feeble. Butter, cream, olive oil, cod-liver oil, bacon, oleomargarine, suet, and beef drippings can all be successfully used.

A MODERATE-PRICED DIETARY FOR TUBERCULOSIS

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
Cream of wheat	¾ cup	6.0	12	100
Cream, thin	½ cup	3.6	10	200
Poached egg	1 egg	1.6	25	70
Toast	1 slice	0.7	7	50
Butter	1 tbsp.	0.5	1	100
Sugar	2 tbsp. (scant)	1.0	—	100
Milk	1 cup	8.5	34	170
Coffee	—	—	—	—
				790
Dinner:				
Roast beef	2 slices	3.2	92	200
Gravy	¼ cup	1.7	7	50
Mashed potato	¾ cup	4.7	11	150
Turnips, creamed	½ cup	1.4	10	100
Bread	1 slice	0.7	7	50
Butter	1 tbsp.	0.5	1	100
Apple tapioca	½ cup	7.2	2	200
Milk	1 cup	8.5	34	170
				1020
Supper:				
Corned beef hash	large serving	6.0	64	250
Banana	1 large	5.5	5	100
Cream	¼ cup	1.8	5	100
Bread	2 slices	1.3	14	100
Butter	1 tbsp.	0.5	1	100
Plain cake	small piece	1.5	12	150
Cocoa with milk	⅘ cup	7.6	32	200
Milk, extra	2 cups	17.0	68	340
				1340
Total for day			454	3150

A Low-priced Tuberculosis Dietary for a Working Man

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
Oatmeal	1 cup	7.9	17	100
Bacon, broiled	5 large pieces	1.0	26	200
Bacon fat	2 tbsp.	1.0	—	200
Bread (toast)	4 slices	2.6	28	200
Sugar	4 tbsp. (scant)	1.9	—	200
Milk	$\frac{5}{8}$ cup	5.1	19	100
Coffee	—	—	—	—
				1000
Dinner:				
Pot roast	large serving	4.8	186	300
Baked potato	1 large	4.4	16	150
Bread	2 slices	1.3	14	100
Butter	1 tbsp.	0.5	1	100
Tapioca-cornmeal pudding	$\frac{1}{2}$ cup	7.2	44	400
Milk	1 cup	8.5	34	170
				1220
Supper:				
Pea soup	1 cup	10.0	43	167
Sausage	2 small	2.2	40	200
Bread	2 slices	1.3	14	100
Sausage fat	2 tbsp.	1.0	—	200
Cheese, American	$1\frac{1}{8}$ in. cube	0.8	26	100
Cocoa with milk	$\frac{4}{5}$ cup	7.6	32	200
				967
Night Lunch:				
Bread	4 slices	2.6	28	200
Butter	2 tbsp.	1.0	2	200
Peanut butter	2 tbsp. (scant)	1.1	38	200
Milk	$\frac{5}{8}$ cup	5.1	19	100
				700
Total for day			627	3887

A tempting diet of high fuel value, with a generous proportion (15 to 20 per cent) in the form of protein, is likely to be expensive. Cream, butter, eggs, choice meats, and dainty cookery and service are beyond the reach of many tubercular patients. That tuberculosis can, however, be cured on foods which are within the reach of the ordinary purse has been demonstrated at the Loomis Sanitorium in this country and at those in England under the supervision of the well-known authorities, Bardswell and Chapman. The day's dietary given on page 311, moderate in cost, is based on the day's menu served at the Loomis Sanatorium.[1]

Diets even less expensive are those of Bardswell and Chapman. The following modification of their plan, adapted to American conditions, is a very satisfactory basis for low-priced diets.[2]

A Plan for Low-priced Tuberculosis Diets

BREAKFAST:	Large dish of oatmeal, milk and sugar, 2 oz. of bacon or smoked fish, 2 slices of bread and oleomargarine
10 A.M.	3 slices of bread and oleomargarine with prune or date marmalade prepared at home
LUNCHEON:	8 oz. of soup from one of the dried vegetables (vary by making part milk), 2 slices of bread and cheese, glass of milk
DINNER:	Plate of meat stew, slice of bread and oleomargarine, dish of well-cooked vegetables, 8 oz. of rice or tapioca pudding made with milk, glass of milk

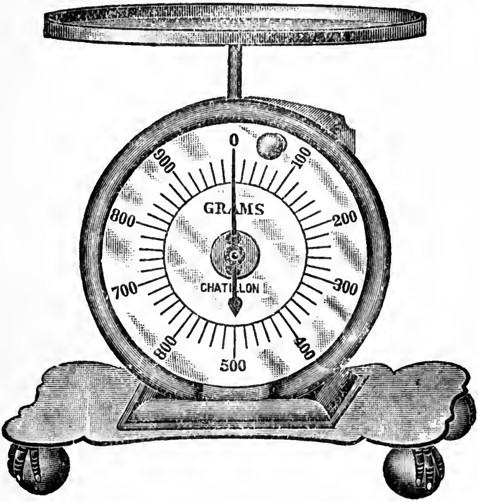
[1] King, *On the Construction of a Practical and Efficient Diet in Tuberculosis*.

[2] Gibbs, *Food for the Invalid and Convalescent*, page 81.

Diet in Diabetes

The regulation of the diet is the most important consideration in the treatment of diabetes mellitus. The most striking symptom of the disease is an impaired power of utilizing carbohydrates. These ordinarily circulate in the blood as sugar and are burned by the muscles for fuel or stored in muscles and liver. In the diabetic the sugar in the blood cannot be burned and accumulates in the blood until a certain point is reached, when it passes into the urine. Not every one who excretes sugar is a diabetic, but the appearance of sugar in the urine should be regarded with suspicion and the state of health thoroughly investigated, for the sooner this disease is treated the better the chance of arresting its progress and keeping the patient in comparatively good health and comfort. The presence of excessive sugar in the blood lowers resistance to bacterial infection and invites numerous complications, besides hastening the progress of the disease itself — that is, the disturbance of the sugar-burning power of the body. Middle-aged and elderly people ought to have their urine tested once a year as a precautionary measure.

While certain general principles in regard to diet for diabetes can be laid down, each patient presents an individual problem which must be studied, not only at the beginning of the treatment, but throughout the course of the disease. The power to burn sugar perfectly, once lost, is never completely regained; the diet must always be carefully prescribed and changed from time to time according to the development of the disease. If the loss of sugar-burning power is very great, it is likely to be accompanied by other signs of a disturbed state of nutrition, particularly the appearance of certain acids in the urine indicative of a condition called acidosis. Dietetic treatment must be directed to the control of



Courtesy of John Chatillon and Sons.

A Convenient Food Scale

acidosis, as well as to the elimination of sugar from the urine.

The first step is fasting[1] till the urine is sugar free, then beginning with small amounts of carbohydrate, preferably in the form of green vegetables, and gradually

[1] For details see Allen, *Treatment of Diabetes*, *Boston Medical and Surgical Journal*, 1915, Vol. 173, p. 241.

increasing till the person's "tolerance" or sugar-burning capacity is learned. This is important because any excess over what the tissues can utilize acts as a poison and causes the ability to burn carbohydrates to diminish, the organs concerned in the process being weakened by the strain of trying to care for more than they are able. The treatment which follows aims to increase this tolerance by supplying the patient with sufficient nourishment without overtaxing the powers of sugar-burning. The patient should be provided with scales measuring grams for weighing food, and written instructions as to the exact amounts of different foods to be eaten. The matter is too critical to be left to the crude measurements of the eye.

When a certain course is to be pursued for some time, — perhaps several months, — a general plan for the diet and a table of "carbohydrate equivalents," by means of which the menu can be varied, is most conveniently followed. Whoever has charge of the feeding of a diabetic patient should learn from the physician *exactly how much protein, fat, and carbohydrate* is to be given, and how to estimate the amount of each food to be eaten. Such tables as those below[1] give a good general outline of the foods available.

A Scheme for Planning Diabetic Diets

"Tables A and B are made up of foods that are nearly carbohydrate-free and from these lists this sort of dietary may be constructed according to the patient's preferences. These foods (Tables A and B), may be used without restriction of quantity unless there is a necessity of limiting the amount of protein con-

[1] N. B. Foster, *American Journal of Medical Sciences*, February, 1911.

sumed. In Tables C and D the foods all contain carbohydrate. These tables are to be used only when the carbohydrate tolerance of the patient is known, and then the total amount of starch-containing food should be kept well below the tolerance limit (by at least 10 grams of bread). For example, if 60 grams of white bread is assimilated without inducing glycosuria,[1] then not more than 50 grams in equivalents should be allowed. Further, foods like potatoes and fruits should be separately tested with each patient in order to determine whether there is any peculiarity of reaction toward them respecting sugar excretion.

"The order and number of meals requires consideration also; four or five meals are better than three; a second breakfast and afternoon tea may be interpolated. Half of the daily allowance of bread should be taken at the mid-day meal, and it is better that at least a third of the daily bread allowance be used as equivalents — vegetables and fruits.

"TABLE A

"FRESH MEATS: All muscle parts of beef, veal, pork, lamb, mutton, domestic and wild fowl, either roasted, boiled, or broiled, in their juices, with butter, or with mayonnaise made without flour, either hot or cold.

"VARIOUS ORGANS OF ANIMALS: Tongue, heart, brains, sweet-breads, kidneys, marrow, calves' liver, liver of game or poultry (pâté de fois gras) up to 100 grams in weight, weighed after being prepared.

"PRESERVED MEAT: Smoked meat, dried meat, smoked or pickled tongue, ham or bacon, corned beef, sausage (containing no bread). Be sure that no flour is used in preparing pickled meats.

"MEAT PEPTONES of all kinds, jellies, or aspics prepared from calves' feet, or pure gelatin; *nutrose*, *tropon*, *plasmon*, *wheat gluten*, etc.

"FRESH FISH: All fresh fish boiled, fried, or broiled. If the

[1] Glycosuria means glucose in the urine. Glucose is the kind of sugar which circulates in the blood and appears in the urine in diabetes.

fish is fried in bread crumbs and eggs the crust should be removed before the fish is eaten. All sauces that contain no flour are allowed; those that contain butter and lemon are the best.

"PRESERVED FISH: Dried, salted, and smoked, such as haddock cod, herring, mackerel, flounder, sturgeon, eels, salmon, etc. Pickled herrings, sardines in oil, mackerel in oil, anchovy, tunny-fish, etc.

"FISH PRODUCTS: Caviare, cod-liver oil.

"SHELLFISH AND CRUSTACEA: Oysters, clams, and other shellfish, lobsters, crabs, crawfish, shrimps, turtle, etc.

"TABLE B

"FOODS RICH IN FATS: Dairy products — cream, butter, yolks of eggs, cheese.

"ANIMAL FATS — bone marrow, fat of edible meats, lard, tallow (used in cooking), cod-liver oil, oleomargarine. VEGETABLE FATS — olive oil, cottonseed oil, peanut oil, peanut butter, nut butter.

"VEGETABLES containing a slight amount of carbohydrate (less than 4 per cent). These may be taken in normal quantities unless otherwise directed: asparagus, beet greens, Brussels sprouts, cabbage, celery, chard, cucumbers, endive, lettuce, sauerkraut, spinach, string beans, tomatoes (fresh).

"TABLE C

FOODS CONTAINING CARBOHYDRATES AND TO BE USED ONLY IN RESTRICTED QUANTITY

	GRAMS	GRAMS	GRAMS	GRAMS
White bread	10 Equivalent to	20 Equivalent to	30 Equivalent to	50 Equivalent to
Corn bread	12	24	36	60
Graham bread	10	20	30	50
Gluten bread	13	26	39	65
Oatcakes	25	50	75	125
Wheat flour	8	16	24	40
Hominy (boiled)	20	38	50	

	Grams	Grams	Grams	Grams
Rice (boiled)	14	28	42	
Tapioca (pudding)	15	30	45	
Macaroni (cooked)	30	60	90	
Spaghetti (cooked)	30	60	90	
Cocoa (unsweetened)	12			
Vegetables:				
Asparagus (cooked)	175	350		
Beans, red kidney	25	50		
Beans, lima	25	50		
Beets (cooked)	55	100		
Carrots (raw)	60	120		
Celery	100	200		
Corn, green, canned	25	50		
Cauliflower (raw)	80	160		
Dandelion greens	50	100		
Egg plant (cooked)	90	180		
Onions (boiled)	90	180		
Peas, green (cooked)	30	60	90	
Parsnips (raw)	40	80		
Potato (boiled)	25	50	75	
Fruits:				
Apples (raw)	35	70		
Apricots (stewed)	40	80		
Bananas	25	50		
Blackberries (fresh)	35	70		
Cherries (fresh)	25	50		
Currants (fresh)	40	80		
Gooseberries	75	150		
Grapefruit	200			
Oranges	30	60		
Peaches	50	100		
Pears	40	80		
Plums	27	54		
Prunes (stewed)	25	50		
Raspberries	42	84		
Strawberries	60	120		

When no equivalent amount is mentioned in the third column, it is to be understood that the amount given in the second column is the maximum allowable.

"Table D

"This table consists of a list of food materials which are not entirely free of sugars. They are allowed in quantities stated unless the patient is on a "carbohydrate-free" diet, when they must be avoided.

"Vegetables (cooked without flour or sweetening): Dried peas and beans, either whole or in purée, turnips, carrots, salsify, green peas, lima beans, kidney beans, 2 tablespoonfuls.

"Fresh Fruit: Apples, pears, apricots, peaches, 50 grams. Raspberries, strawberries, red currants, 1 large tablespoonful. Blackberries, 2 tablespoonfuls.

"Stewed Fruit (with saccharine or crystallose): Plums, apples, pears, apricots, peaches, sour cherries, prunes, 1 heaped teaspoonful. Raspberries, gooseberries, red currants, 2 heaped tablespoonfuls.

"Dried Fruit: Plums, apricots, peaches, apples, prunes, 2 heaped tablespoonfuls.

"Levulose Chocolate (Stollwerck's), up to 15 grams.

"Cocoa (without sugar), up to 12 grams.

"How to Make Use of Table C

"The food is divided into two parts: (1) That which is free from carbohydrates, the principal fare, Tables A and B; and (2) that which contains carbohydrates, the secondary fare, Tables C and D. For instance, the equivalent of 75 grams of wheat bread are allowed in courses from Table C.

Breakfast: Principal fare, medium strong coffee or tea, cold meat, 1 egg and butter; secondary fare, 50 grams of oatcakes, the equivalent of which = 20 grams of wheat bread.

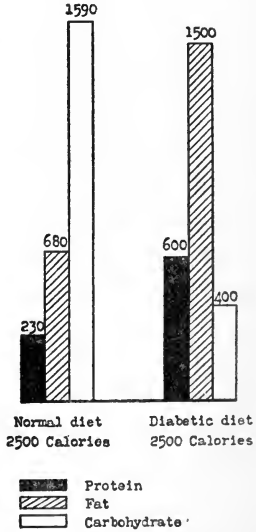
Second Breakfast: Two eggs in any form.

Dinner (midday meal): Principal fare, broth with egg, meat with green vegetables or salad (Table B), cheese, and butter. Secondary fare, 50 grams of potatoes (= 20 grams of wheat bread), 60 grams of strawberries (= 10 grams of wheat bread).

Afternoon Meal: Tea, coffee, or consommé, with casoid cakes.

SUPPER: Principal fare, plenty of hot or cold meat, with vegetables or salad, cheese and butter; secondary fare, 25 grams of Graham bread (= 25 grams of wheat bread). Total, = 75 grams of wheat bread."

Making a diabetic diet acceptable depends not only upon ability to regulate the kind and amount of food, but upon skill in cookery, and the amount of money available for food. Since carbohydrates constitute the largest part of an ordinary diet, their withdrawal changes eating habits materially, and people find it difficult to do without the familiar bread, potatoes, cereals, sugars, and fruits. Furthermore, the carbohydrate foods are relatively the cheapest part of the diet, so that a diabetic diet will always cost more than a mixed diet of the same general character.



A Comparison of the Distribution of Calories in a Typical Normal and a Severe Diabetic Diet

The large amount of fat is likely to prove disagreeable unless introduced with care into the menu. Most books on invalid cookery give recipes for diabetic diets.[1] These are very helpful because the cook is deprived of her ordinary thickening agents, such as flour,

[1] Farmer, *Food for the Sick and Convalescent.* Pattee, *Practical Dietetics.*

also of sugar and milk, and special devices are necessary to make acceptable dishes. The best fats are butter, cream, cream cheese, olive oil, bacon fat, meat fats of other kinds, bone marrow, fat and highly flavored fish (as canned sardines, salmon, mackerel, and whitefish). Green vegetables are the best fat carriers. Melted butter may be poured over those served hot and olive oil or cream dressing over salads. A small potato, according to Miss Farmer, may take up one-half its weight in butter, or one-fourth its weight in heavy cream. Potatoes, however, are not always permissible, while green vegetables such as lettuce and cabbage are. Cream can be used in place of milk in many dishes. In others, cream diluted with water, to which raw white of egg is added, will make a satisfactory milk substitute. As a rule, the best success in feeding comes from judicious use of the ordinary foods in correct amounts. Special diabetic foods on the market are expensive and not always reliable. They should not be used without knowledge of their exact composition.[1] The more the carbohydrate is removed, the greater the cost. On account of the restrictions in breadstuffs, muffins, wafers, and so forth, made with almond, soy bean, casoid,[2] or pure gluten flour are useful occasionally for the sake of variety, even for mild cases, and are a help when the carbohydrate is very greatly restricted.

[1] The composition of many diabetic foods may be found in a bulletin by Mendel and Street, *Diabetic Foods*, published by the Connecticut Agricultural Experiment Station, New Haven, Conn.

[2] The manufacturers of casoid flour publish a cookbook with some excellent recipes for the use of this carbohydrate-free flour.

Saccharine may be used for sweetening in place of sugar. It has no food value, but is intensely sweet, having 500 times the sweetness of cane sugar. The taste remains in the mouth much longer than that of sugar, and if much is used a bitter taste develops. It should, therefore, be used as little as possible to get the best results in the long run.

There is always danger of mild diabetes becoming severe; the only way to prevent this is by eternal vigilance in regard to diet, and careful living, without physical overwork or nervous strain. Even when the patient is tempted by long periods of continued well-being to disregard his dietetic limitations, he should be prevented from doing so. A diabetic patient should not have charge of his own diet. The unhappy feeling of restriction will be less and the temptation to overstep the boundaries diminished if some one else plans and prepares the meals.

In severe diabetes protein is restricted as well as carbohydrate, and the body must depend mainly on fat for fuel. Under such circumstances the fat-burning power also becomes weakened, and the general disturbance of metabolism is evidenced by acidosis. The treatment then must attempt to correct both sugar and acid excretion. No one diet will serve this purpose. Treatment can be best carried on in hospital or sanitarium — at any rate, under constant guidance of a physician.

One device for resting the impaired functions and reducing sugar in the blood is to prescribe "green" or "vegetable" days, when little food of any kind is taken. The following will serve as an illustration of this type of diet.

Green Days[1]

BREAKFAST: 1 egg, boiled or poached
Cupful of black coffee

DINNER: Spinach, with hard-boiled egg
Bacon, 15 gm. ($\frac{1}{2}$ oz.)
Salad with 15 gm. ($\frac{1}{2}$ oz.) of oil
White wine, $\frac{1}{8}$ l. (4 oz.), or whisky or brandy, 30 c.c. (1 oz.)

4:30 P.M.: Cup of beef-tea or chicken broth

SUPPER: 1 egg, scrambled with tomato and a little butter
Bacon, 15 gm. ($\frac{1}{2}$ oz.)
Cabbage, cauliflower, sauerkraut, string-beans, or asparagus
White wine, $\frac{1}{8}$ l. (4 oz.), or whisky or brandy, 30 c.c. (1 oz.)

In the home treatment of diabetes the problem of following the doctor's orders is often difficult because of expense. Carbohydrate foods are the cheapest class; the more they are excluded, the greater the cost of the diet. Some suggestions for low-priced diets are given below.

They will not cost over two cents per 100 Calories, and neither will the cost be raised much by the addition of a little more carbohydrate food when this is permitted.

[1] T. C. Janeway in Musser and Kelly, *Practical Therapeutics*.

A Low-Priced Dietary for a Diabetic Allowed 50 Grams (200 Calories) of Carbohydrate per Day

	Measure	Weight Oz.	Protein Calories	Carbohydrate Calories	Total Calories
Breakfast:					
Scrambled eggs	2 eggs	4.0	45	—	150
Bacon	8 small pieces	1.0	26	—	200
Soy bean muffins	2 muffins	2.1	50	29	167
Butter[1]	2 tbsp.	1.0	2	—	200
Cream, thick	1⅓ tbsp.	0.9	2	3	100
Coffee	1 cup	—	—	—	—
			125	32	817
Dinner:					
Hamburg steak	2 balls	4.0	170	—	200
Lentil purée	1 serving	—	30	68	175
Whole wheat bread	1 slice	0.7	8	41	50
Butter[1]	1 tbsp.	0.5	1	—	100
Cottage cheese salad[2]	1 serving	3.9	82	19	250
Coffee	1 cup	—	—	—	—
			291	128	775
Supper:					
Boiled ham	2 slices	2.5	57	—	200
Deviled egg	1 egg and 1 tsp. cream	2.3	25	—	100
Shredded cabbage[3]	1½ cups	3.4	6	21	30
Lemon jelly[4]	¾ cup	4.3	8	14	22
Brazil nuts	2 large nuts	0.5	10	4	100
Whipped cream	4 tbsp.	1.8	5	6	200
			111	45	652
Total for day			527	205	2244

[1] If butter is over 25 cents per pound, oleomargarine must be used to make this dietary cheap.

[2] Made from 5½ tbsp. cottage cheese, 1 tbsp. oil, 1 tbsp. vinegar, 5 or 6 walnuts, and lettuce.

[3] Served with salt and vinegar.

[4] Sweetened with saccharine.

A LOW-PRICED DIETARY FOR A DIABETIC ALLOWED 75 GRAMS (300 CALORIES) OF CARBOHYDRATE PER DAY

	Measure	Weight Oz.	Protein Calories	Carbohydrate Calories	Total Calories
Breakfast:					
Gluten breakfast food	$\frac{1}{4}$ cup (uncooked)[1]	1.2	68	69	150
Milk	$\frac{5}{8}$ cup	5.1	19	29	100
Toast	1 slice	0.6	7	40	50
Butter[2]	1 tbsp.	0.5	1	—	100
Bacon	4 small pieces	0.5	13	—	100
Egg	1 egg	2.0	26	—	75
Cream, thick	$1\frac{1}{3}$ tbsp.	0.9	2	3	100
Coffee	1 cup	—	—	—	—
			136	141	675
Dinner:					
Pot roast	1 serving	3.2	124	—	200
Spinach	$\frac{3}{4}$ cup	4.0	5	15	33
Bacon fat for spinach	$2\frac{1}{2}$ tbsp.	1.3	—	—	250
Bread	1 slice	0.7	7	40	50
Butter[2]	1 tbsp.	0.5	1	—	100
Coffee jelly[3]	$\frac{3}{4}$ cup	4.9	22	—	22
English walnuts	8 nuts	0.5	11	7	100
			170	62	755
Supper:					
Canned salmon	$\frac{7}{8}$ cup	3.5	90	—	200
Lettuce and cucumber salad, French dressing	1 serving	5.5	4	14	225
Toast	2 slices	1.2	14	80	100
Butter[2]	2 tbsp.	1.0	2	—	200
Cheese, American	$1\frac{1}{8}$ in. cube	0.8	26	3	100
			136	97	825
Total for day			442	300	2255

[1] Where absolute accuracy is required it is a good plan to measure or weigh cereals before cooking.

[2] If butter is over 25 cents per pound, oleomargarine must be used to make this dietary cheap.

[3] Sweetened with saccharine.

Diet in Gout

Gout is a disease of the overfed rather than the undernourished. Luxurious living, with its constant temptation to overeat, especially of protein foods, and to avoid exercise, often brings its penalty in the form of acute or chronic gout. Indulgence in alcoholic beverages, especially as an accompaniment to a sumptuous repast, increases a man's chances of acquiring the disease. Sometimes he suffers for the sins of his ancestors, the tendency to the disease being said to be transmissible. There are usually disturbances of the digestive system — gastric indigestion, intestinal putrefaction, and constipation — but the most constant symptom is an excess of uric acid in the blood, indicating a faulty elimination of this substance. Uric acid is formed in the body, but in health it is excreted in the urine, so that the amount in circulation in the blood is very small. In gout this acid accumulates in the blood and is eliminated with difficulty. The following are to be avoided: (1) all foods which disturb digestion; (2) all foods which tend to induce intestinal putrefaction and constipation; (3) all excess of total fuel and of protein food; and (4) all foods which by their composition tend to increase the amount of uric acid which the body has to get rid of. Uric acid belongs to a group of closely related substances called purins. These are found in flesh foods of all kinds and in some vegetable foods. The purins other than uric acid in these foods are mostly converted into uric acid in the body. Hence, if elimination is faulty, they raise the amount of uric acid in the blood, a condition considered very unfavorable in cases of gout, though the relation of this substance to the disease is not fully understood. The taking of alcoholic beverages also tends to hinder uric acid elimination, and these should be excluded in gout.

The treatment is largely dietetic and the diet should be adapted to the needs of the patient by the physician. Some information, however, as to the purin content of foods will be helpful in carrying out his orders. Milk, eggs, cheese, nuts, gelatin, fruits, sugars, breadstuffs made with white flour, cornstarch, tapioca, farina, rice, potatoes and other root vegetables, most green vegetables (spinach and asparagus excepted), and all kinds of fat are practically purin-free.

Sweetbreads, kidney, liver, sardines, and anchovies are very rich in purins and should be entirely avoided. Beef, veal, mutton, pork, chicken, turkey, goose and other kinds of game, fish with the exception of cod, are fairly high in purin content, and should be sparingly if at all indulged in. Boiling meat will remove some of the purins; hence boiled meats are sometimes allowed where roasted or broiled ones are not. Among vegetable foods, spinach, asparagus, peas, and beans are richest in purins, though none of these contains as much as meat. A dietary indicating the type of food best adapted to use in gout is given below.

A Day's Dietary Suggested for Chronic Gout

	Measure	Weight Oz.	Protein Calories	Total Calories
7 A.M.:				
Hot water	1 cup	—	—	—
8 A.M.:				
Orange	1 large	9.5	7	100
Rice	$\frac{3}{8}$ cup	2.0	5	50
Cream, thick	1 tbsp. (scant)	0.5	1	50
Sugar	1 tbsp. (scant)	0.5	—	50
Hot milk	$1\frac{1}{4}$ cups	10.2	38	200
Bread	4 slices	1.3	28	200
Butter	1 tbsp.	0.5	1	100
Peaches	$1\frac{1}{2}$ medium	5.3	3	50
				800
1 P.M.:				
Soft-cooked eggs	2 eggs	3.4	54	150
Baked potato	2 medium	6.0	22	200
Celery		4.8	6	25
Bread	4 slices	2.6	28	200
Butter	1 tbsp.	0.5	1	100
Peaches	$1\frac{1}{2}$ medium	5.3	3	50
Tea, very weak and unsweetened	—	—	—	—
				725
6 P.M.				
Milk	$1\frac{1}{4}$ cups	10.2	38	200
Bread	6 slices	3.9	42	300
Baked apple with whipped cream	1 small apple	2.4	1	100
Sugar	1 tbsp. (scant)	0.5	—	50
Butter	1 tbsp.	0.5	1	100
				750
Total for day			279	2275

APPENDIX

TABLE I

100-Calorie Portions of Foods as We Eat Them

Introductory Note

Most of these foods have been measured and weighed in the author's laboratory, some of them many times. Nevertheless, standardization of measures and weights is exceedingly difficult, and these tables make no claim to strict mathematical accuracy. They are presented with the hope of enabling the housewife who does not wish the burden of weighing and making calculations — or the persons who cannot go behind the scenes, *i.e.* into the kitchen — to get quickly some fair conception of the relative value of various foods as they appear on the table. The data on uncooked single food materials have been taken largely from the author's *Laboratory Handbook for Dietetics*, based on the *Analyses of American Food Materials*, published as Bulletin 28, Office of Experiment Stations, U. S. Department of Agriculture, from which latter source have also been taken some analyses of cooked foods.

	100-Calorie Portion		Distribution of Calories		
	Measure	Weight Oz.	Protein	Fat	Carbohydrate
Beverages					
Buttermilk (see Dairy Products) . .					
Chocolate I . . .	½ cup (scant)	4.1	10	48	42
Chocolate II . . .	⅓ cup	3.1	13	49	38
Cocoa I	⅗ cup	5.5	14	39	47
Cocoa II	⅖ cup	3.8	16	44	40
Cocoa III	⅓ cup	2.9	12	34	54
Cream (see Dairy Products) . .					
Egg lemonade . .	½ cup	4.8	13	24	63
Eggnog	½ cup (scant)	3.7	21	48	31
Fruit punch . . .	½ cup (scant)	1.8	1	1	98
Grape juice (see Fruits)					
Lactose lemonade .	⅓ cup (scant)	2.6	—	—	100
Lemonade	1⅖ cups	11.0	—	—	100
Milk (see Dairy Products)					
Orange juice (see Fruits)					
Bread, Biscuit, and Muffins					
Baking powder biscuit	2 small biscuit	1.3	11	27	62
Bread, Boston brown	¾ in. slice 3 in. diam.	1.8	10	10	80
Graham	3 slices ⅜ in. × 2 in. × 3¼ in.	1.4	14	6	80
Old New England corn	piece 2½ in. × 1 in. × 1 in.	1.0	8	30	62
White	2 slices 3 in. × 3½ in. × ½ in.	1.3	14	6	80
Whole wheat . .	2 slices 2½ in. × 2¾ in. × ¼ in.	1.4	16	3	81
Corn cake	slice 2 in. × 2 in. × 1 in.	1.2	10	24	66

	100-Calorie Portion		Distribution of Calories		
	Measure	Weight Oz.	Protein	Fat	Carbohydrate
Bread, etc. — *Cont'd*					
Crackers, graham	2 crackers	0.8	9	20	71
Oyster	24 crackers	0.8	10	22	68
Saltines	6 crackers	0.8	10	26	64
Soda	4 crackers	0.9	10	20	70
Croutons (fried)	15 croutons, ½ in. cubes	0.8	7	49	44
Croutons (toasted)	27 croutons, ½ in. cubes	1.4	14	4	82
Griddle cakes	1 cake 4½ in. diam.	1.8	14	25	61
Muffins, cornmeal	¾ muffin	1.2	13	25	62
Graham	¾ muffin	1.4	13	16	71
One egg	⅘ muffin	1.2	12	24	64
Twin mountain	⅔ muffin	1.0	9	36	55
Popovers	1 popover	2.0	18	27	55
Rolls, French	1 roll	1.3	12	8	80
Sandwich, club	⅙ sandwich	1.5	15	69	16
Date	1 triangle 3 in. × 3½ in. × 4⅗ in.	1.1	6	27	67
Date and cream cheese	1 triangle 3 in. × 3½ in. × 4⅗ in.	1.0	10	39	51
Toast, cream	⅗ slice toast and ⅕ cup sauce	2.2	13	43	44
French	slice 3 in. × 3 in. × ½ in.	1.4	10	48	42
Waffles	⅖ waffle 6 in. diam.	0.9	14	35	51
Zwiebach	3 pieces 3¼ in. × ½ in. × 1¼ in.	0.8	9	21	70
Cake and Cookies					
Angel cake	piece 1¼ in. × 2 in. × 2½ in.	1.3	12	1	87
Apple sauce cake	piece 1½ in. × ½ in. × 3¾ in.	0.8	5	11	84
Chocolate loaf cake	piece 2½ in. × 2½ in. × ⅞ in.	0.9	5	41	54
Chocolate drop cookies	1½ cookies 2¼ in. diam.	0.8	8	52	40

	100-Calorie Portion		Distribution of Calories		
	Measure	Weight Oz.	Protein	Fat	Carbohydrate
Cake, etc. — *Cont'd*					
Cream puff shells	$1\frac{1}{2}$ puffs	0.8	10	68	22
Doughnuts	$\frac{1}{2}$ doughnut	0.8	6	45	49
Fruit cake	piece $1\frac{7}{8}$ in. × $1\frac{7}{8}$ in. × $\frac{3}{8}$ in.	0.9	6	26	68
Gingerbread I	piece 1 in. × $1\frac{2}{3}$ in. × 2 in.	1.1	7	21	72
Gingerbread II	piece 1 in. × 2 in. × 2 in.	1.2	8	22	70
Hermits	$2\frac{1}{2}$ cookies 2 in. diam.	0.9	6	29	65
Lady fingers	2–4 fingers	1.0	10	13	77
Macaroons	2 macaroons	0.8	6	33	61
Marguerites	2 crackers	0.9	10	41	49
Molasses cookies I	3 cookies 2 in. diam.	0.7	6	34	60
Molasses cookies II	$2\frac{1}{2}$ cookies $2\frac{1}{4}$ in. diam.	0.9	6	32	62
Oatmeal cookies	$\frac{3}{4}$ cooky 3 in. diam.	0.7	11	21	68
Oatmeal wafers	1 wafer $2\frac{3}{4}$ in. diam.	0.5	11	23	66
One egg cake	$1\frac{3}{4}$ in. cube	1.0	8	32	60
Peanut cookies	$1\frac{3}{4}$ cookies 2 in. diam.	0.8	11	43	46
Plain cookies	2 cookies $2\frac{1}{4}$ in. diam.	0.9	6	33	61
Sponge cake	piece $1\frac{1}{2}$ in. × $1\frac{1}{2}$ in. × 2 in.	0.9	11	19	70
Sponge cake, hot water	piece 2 in. × $2\frac{3}{4}$ in. × $\frac{7}{8}$ in.	0.9	7	7	86
White mountain icing	$2\frac{1}{2}$ tbsp.	1.0	1	—	99
Candies, Confections, and Sugars					
Cherries, candied	10 medium cherries	1.0	1	—	99
Chocolate fudge	piece $1\frac{1}{2}$ in. × $\frac{3}{4}$ in. × 1 in.	0.9	2	20	78
Chocolate nut caramels	piece 1 in. × 1 in. × $\frac{4}{5}$ in.	0.7	4	32	64

	100-Calorie Portion		Distribution of Calories		
	Measure	Weight Oz.	Protein	Fat	Carbohydrate
Candies, etc. — *Cont'd*					
Chocolate, milk, sweetened	piece $2\frac{1}{4}$ in. × 1 in. × $\frac{1}{8}$ in.	0.7	7	58	35
Coconut caramels	piece 1 in. × 1 in. × $\frac{5}{6}$ in.	0.7	3	24	73
Corn syrup	$1\frac{3}{4}$ tbsp.	1.5	—	—	100
Ginger, crystallized	6 pieces $1\frac{1}{2}$ in. × $\frac{3}{4}$ in. × $\frac{1}{4}$ in.	1.0	1	—	99
Honey	1 tbsp.	1.1	1	—	99
Maple sugar	4 tsp.	1.1	—	—	100
Maple syrup	$1\frac{1}{2}$ tbsp.	1.2	—	—	100
Molasses	$1\frac{1}{2}$ tbsp.	1.2	3	—	97
Penouche	piece 1 in. × 1 in. × $1\frac{2}{5}$ in.	0.9	2	18	80
Sugar, white, granulated	2 tbsp. (scant)	0.9	—	—	100
White, loaf	$3\frac{1}{2}$ lumps (full size)	0.9	—	—	100
White, powdered	2 tbsp.	0.9	—	—	100
Brown	2 tbsp.	0.9	—	—	100
Cereals					
Cornflakes	$1\frac{1}{4}$ cups	1.0	6	4	90
Cornmeal, cooked	$\frac{2}{3}$ cup	6.0	10	5	85
Farina, cooked	$\frac{3}{4}$ cup	6.0	12	4	84
Grapenuts	3 tbsp.	1.0	12	2	86
Hominy grits, cooked	$\frac{4}{5}$ cup	6.8	9	1	90
Macaroni, cooked	1 cup	5.2	15	2	83
Macaroni and cheese (see Eggs and Cheese Dishes)					
Macaroni croquettes	1 croquette	1.2	10	45	45
Macaroni, tomato sauce	5 tbsp.	3.6	10	36	54
Oatmeal, cooked	1 cup	7.9	17	16	67
Popcorn, popped / unpopped	$1\frac{1}{2}$ cups / $\frac{1}{8}$ cup	0.6	11	11	78
Puffed corn	$1\frac{1}{4}$ cups	1.0	6	4	90

	100-Calorie Portion		Distribution of Calories		
	Measure	Weight Oz.	Protein	Fat	Carbohydrate
Cereals — *Cont'd*					
Puffed rice . . .	1⅓ cups	1.0	9	1	90
Puffed wheat . . .	1⅔ cups	1.0	15	3	82
Rice, steamed . .	¾ cup	4.0	9	1	90
Rice fondue (see Eggs and Cheese Dishes)					
Rice with cheese and tomatoes (see Eggs and Cheese Dishes) . . .					
Turkish pilaf . .	1 cup	7.5	9	22	69
Wheat, flaked, cooked	⅔ cup	6.0	13	3	84
Wheat, shredded . .	1 biscuit	0.9	13	5	82
Custards, Puddings, and Ices					
Apple snow . . .	1 cup	2.1	6	2	92
Apple tapioca . .	¼ cup	3.6	1	1	98
Boiled custard . .	⅓ cup (scant)	2.2	13	44	43
Brown Betty . . .	⅕ cup	2.1	3	35	62
Chocolate blanc mange . . .	¼ cup (scant)	1.9	8	33	59
Coffee jelly . . .	1¼ cups	9.9	11	—	89
Cornstarch blanc mange . . .	¼ cup	2.7	9	24	67
Cottage pudding . .	slice 1¾ in. × 2 in. × 2½ in.	1.1	7	26	67
Cup custard . . .	⅓ cup	3.3	17	39	44
Date pudding I . .	slice 1 in. × 1 in. × 1½ in.	0.8	5	30	65
Date pudding II . .	slice 3 in. diam. ½ in. thick	1.1	7	27	66
Lemon ice	½ cup (scant)	3.1	—	—	100
Lemon jelly . . .	½ cup	3.8	9	—	91
Lemon milk sherbet	¼ cup	1.9	4	12	84
Peach ice cream .	¼ cup	1.8	4	51	45

	100-Calorie Portion		Distribution of Calories		
	Measure	Weight Oz.	Protein	Fat	Carbohydrate
Custards, etc.—*Cont'd*					
Prune soufflé	2/5 cup	1.8	10	—	90
Raspberry sherbet	1/4 cup	2.1	1	—	99
Rice pudding I	1/2 cup (scant)	3.1	18	32	50
Rice pudding II (creamy)	1/4 cup	2.2	12	27	61
Rice pudding III	2/5 cup	1.5	8	7	85
Snow pudding	2/3 cup	2.2	10	—	90
Spanish cream	1 cup	2.5	18	28	54
Tapioca-cornmeal pudding	2 tbsp.	1.8	11	20	69
Tapioca cream	2/5 cup	2.8	12	28	60
Vanilla ice cream I	2 1/2 tbsp.	1.6	4	63	33
Vanilla ice cream II	1/4 cup	2.0	6	55	39
Dairy Products and Fats					
Bacon fat	1 tbsp.	0.4	—	100	—
Beef drippings	1 tbsp.	0.4	—	100	—
Butter	1 tbsp. (scant)	0.5	1	99	—
√ Buttermilk	1 1/8 cups	9.9	33	13	54
Cheese, American pale	1 1/8 in. cube	0.8	26	71	3
Cottage	5 1/2 tbsp.	3.2	76	9	15
Full cream	piece 2 in. × 1 in. × 3/8 in.	0.9	25	72	3
Neufchatel	2 tbsp.	1.1	23	75	2
Swiss	slice 4 1/2 in. × 3 1/2 in. × 1/8 in. (1 1/2 cu. in.)	0.8	25	73	2
Cream, thin (18% fat)	1/4 cup	1.8	5	86	9
thick (40% fat)	1 1/3 tbsp.	0.9	2	95	3
whipped	2 tbsp.	0.9	2	95	3
Milk, condensed, sweetened	1 1/2 tbsp.	1.1	11	23	66

	100-Calorie Portion		Distribution of Calories		
	Measure	Weight Oz.	Protein	Fat	Carbohydrate
Dairy Prod. — *Cont'd*					
Milk, condensed, unsweetened . .	$3\frac{3}{4}$ tbsp.	2.1	23	51	26
skim	$1\frac{1}{8}$ cups	9.6	37	7	56
top 10 oz. . . .	$\frac{1}{4}$ cup	2.1	9	78	13
top 12 oz. . . .	$\frac{3}{8}$ cup	3.0	10	75	15
whole	$\frac{5}{8}$ cup	5.1	19	52	29
Oleomargarine . .	1 tbsp.	0.5	1	99	—
Olive oil	1 tbsp.	0.4	—	100	—
Eggs and Cheese Dishes					
Eggs, à la goldenrod	$\frac{1}{3}$ serving	2.0	18	42	40
raw (in shell) . .	$1\frac{1}{3}$ eggs	2.7	36	64	—
scrambled . . .	$\frac{1}{4}$ cup	2.1	20	76	4
whites	7 whites	6.9	97	3	—
yolks	2 yolks	1.0	17	83	—
timbale	$\frac{3}{8}$ cup	4.2	26	55	19
Cheese soufflé . . .	$\frac{1}{2}$ cup	1.7	18	70	12
Cheese straws . .	$2\frac{2}{3}$ straws 5 in. × $\frac{3}{8}$ in. × $\frac{3}{8}$ in.	0.8	17	52	31
Macaroni and cheese	$\frac{1}{2}$ cup	2.1	17	39	44
Rice fondue with crackers . . .	$1\frac{1}{4}$ saltines and $2\frac{1}{2}$ tbsp. sauce	1.4	22	48	30
Rice with cheese and tomatoes . . .	$\frac{1}{4}$ cup	2.1	19	42	39
Samp baked with cheese . . .	$\frac{1}{2}$ cup	4.0	14	20	66
Welsh rarebit . .	$1\frac{1}{2}$ tbsp. rarebit and $\frac{1}{2}$ slice toast	1.3	22	57	21
Fruits					
Apple, baked, with 2 tbsp. sugar . .	$\frac{1}{2}$ large apple	2.3	1	3	96
baked, with whipped cream	$\frac{1}{2}$ serving	2.4	1	31	68
fresh	1 large	7.5	3	5	92
Apple sauce . . .	$\frac{3}{8}$ cup	3.5	1	3	96

	100-Calorie Portion		Distribution of Calories		
	Measure	Weight Oz.	Protein	Fat	Carbohydrate
Fruits — *Cont'd*					
Apricots, canned	3 large halves and 2 tbsp. juice	4.8	5	—	95
dried	9 halves	1.3	7	3	90
dried, stewed	$\frac{1}{4}$ cup	2.7	4	2	94
Bananas	1 large	5.5	5	6	89
Blackberries, fresh	$\frac{1}{2}$ cup (50 berries)	6.1	9	16	75
stewed	$\frac{1}{4}$ cup	2.2	2	4	94
Cantaloupe	1 melon $4\frac{1}{2}$ in. diam.	18.0	6	—	94
Cherries, stoned	1 cup	4.5	5	9	86
Cranberry jelly	2 tbsp.	1.5	—	1	99
Cranberries, fresh	2 cups	7.6	3	12	85
Cranberry sauce	$\frac{1}{4}$ cup (scant)	1.5	—	1	99
Currants, fresh	$1\frac{1}{2}$ cups	6.2	11	—	89
Dates, unstoned	3–4 dates	1.1	2	7	91
Figs, dried	$1\frac{1}{2}$ large	1.1	5	1	94
Grapes, Concord	1 large bunch	4.9	5	15	80
Grape juice	$\frac{1}{2}$ cup	3.5	—	—	100
Grapes, Malaga	22 grapes	3.7	5	15	80
Huckleberries, fresh	1 cup	4.7	3	7	90
Lemons	3 large	11.4	9	15	76
Lemon juice	$1\frac{1}{8}$ cups	9.0	—	—	100
Olives, green	6–8 olives	1.6	1	83	16
ripe	6–8 olives	1.7	3	90	7
Oranges	1 large	9.5	7	2	91
Orange juice	1 cup	8.2	—	—	100
Peaches, fresh	3 medium	10.5	6	3	91
canned	2 large halves and 3 tbsp. juice	7.5	6	2	92
stewed	$\frac{1}{2}$ cup	3.5	2	—	98
Pears, canned	3 halves and 3 tbsp. juice	4.7	2	4	94
fresh	2 medium	6.3	4	6	90
Pineapple, canned	1 slice and 3 tbsp. juice or $\frac{1}{4}$ cup shredded	2.3	1	4	95
fresh	2 slices 1 in. thick	8.2	4	6	90

	100-Calorie Portion		Distribution of Calories		
	Measure	Weight Oz.	Protein	Fat	Carbohydrate
Fruits — *Cont'd*					
Plums, fresh	3–4 large	4.4	5	—	95
Prunes	4 medium	1.4	3	—	97
stewed	2 prunes and 2 tbsp. juice	2.8	2	—	98
Prune pulp	2 tbsp.	1.4	2	—	98
Raisins	¼ cup	1.1	3	9	88
Raspberries	1⅛ cups	5.3	10	14	76
Rhubarb, fresh	4 cups of 1 in. pieces	15.3	10	27	63
stewed	½ cup	1.7	1	2	97
Strawberries, fresh	1⅓ cups	9.0	10	14	76
Watermelon (edible portion)		11.7	5	6	89
Meats and Fish (Cooked)					
Beef, corned, boiled (less ¾ fat content)[1]	slice 4½ in. × 1½ in. × ⅚ in.	3.0	53	47	—
corned, boiled (with fat)		1.0	21	79	—
dried	4 thin slices 4 in. × 5 in.	2.0	67	33	—
dried, creamed I	⅓ cup	2.4	16	65	19
dried, creamed II	⅓ cup	2.3	20	62	18
flank, fat, stewed[2]		0.9	20	80	—
Hamburg steak, broiled	cake 2½ in. diam. ⅞ in. thick	2.0	55	45	—
heart, stuffed	slice 2½ in. × 2¼ in. × ¼ in.	1.0	21	68	11
loaf	slice 4 in. × 6 in. × ⅛ in.	1.4	40	60	—
pie	¼ serving	1.7	10	43	47

[1] 15% of weight lost in cooking.
[2] Bull. 162, Office of Experiment Stations, U.S. Dept. Agriculture.

	100-Calorie Portion		Distribution of Calories		
	Measure	Weight Oz.	Protein	Fat	Carbohydrate
Meats, etc. — *Cont'd*					
rib, lean, roasted	slice 5 in. × 2½ in. × ¼ in.	1.6	46	54	—
round, lean, boiled [1]		2.2	90	10	—
round, lean, pot roast [1] . . .		1.6	62	38	—
round steak, lean, pan broiled [1] .	slice 4 in. × 3 in. × 1⅛ in.	2.0	48	52	—
round steak, stuffed	slice 3 in. diam. ⅓ in. thick	1.7	39	49	12
round steak, Swiss style	slice 4 in. × 1 in. × ⅝ in.	1.2	35	48	17
sirloin steak, lean, broiled . . .	slice 2 in. × 1½ in. × ¾ in.	2.0	47	53	—
sirloin steak, medium fat, broiled	slice 1¾ in. × 1½ in. × ¾ in.	1.3	31	69	—
stew with vegetables	⅖ cup	3.0	16	45	39
Fish					
Bluefish	medium serving	2.4	72	28	—
Codfish, balls . .	1 ball 2 in. diam.	1.7	14	65	21
creamed . . .	½ cup	2.5	32	46	22
Halibut steak, broiled . . .	piece 3 in. × 2¼ in. × 1 in.	3.0	61	39	—
Mackerel, Spanish, broiled . . .		2.6	56	44	—
Salmon, canned .	½ cup (scant)	1.8	45	55	—
creamed, on toast	¼ cup salmon and ½ slice toast	2.4	22	42	36
loaf	¼ cup	2.1	37	52	11

[1] Bull. 162, Office of Experiment Stations, U. S. Dept. Agriculture.

	100-Calorie Portion		Distribution of Calories		
	Measure	Weight Oz.	Protein	Fat	Carbohydrate
Fish — *Cont'd*					
Sardines, canned .	3–6 sardines	1.7	46	54	—
Tunnyfish à la Newburg	¼ cup (scant)	1.8	36	60	4
canned . . .	½ cup	2.8	70	30	—
Frankforters . . .	1 sausage	1.1	31	67	2
Lamb, chops, broiled	1 chop (piece 2 in. × 2 in. × ½ in.)	1.6	40	60	—
leg, roast	slice 3½ in. × 4½ in. × ⅛ in.	1.8	41	59	—
Mutton, leg, roast .	slice 3 in. × 3¾ in. × ⅛ in.	1.2	33	67	—
Pork, bacon . . .	4–5 small slices	0.5	13	87	—
ham, boiled . . .	slice 4¾ in. × 4 in. × ⅛ in.	1.3	29	71	—
sausage . . .	1⅔ sausages 3 in. long ¾ in. diam. (after cooking)	1.1	20	78	2
Poultry					
Capon, roast . .	slice 4 in. × 2½ in. × ¼ in.	1.7	51	49	—
Chicken, broiled .		2.6	80	20	—
canned . . .		0.9	23	77	—
creamed . . .	¼ cup (scant)	1.6	16	73	11
Turkey, roast . .		1.3	40	60	—
roast with stuffing		1.9	36	52	12
stuffing . . .	⅙ cup	0.8	9	48	43
Shell Fish (uncooked)					
Clams	12 clams or ⅔ cup	7.6	56	8	36
Lobster, canned .	¾ cup	4.3	86	12	2
Oysters	⅔ cup solid or 6–15 oysters	7.2	49	24	27
Scallops	¾ cup	4.8	80	1	19
Shrimp	½ cup	3.2	91	8	1
Veal, cutlets, breaded	⅖ serving	2.0	30	52	18

	100-Calorie Portion		Distribution of Calories		
	Measure	Weight Oz.	Protein	Fat	Carbohydrate
Veal — *Cont'd*					
leg, roast	slice 2 in. × $2\frac{3}{4}$ in. × $\frac{1}{8}$ in.	2.3	71	29	—
kidney		2.1	54	46	—
liver		2.1	47	53	—
Nuts (Edible Portion)					
Almonds	12–15 nuts	0.5	13	76	11
Brazil nuts	2 nuts	0.5	10	86	4
Butternuts	4–5 nuts	0.5	17	81	2
Coconut, prepared .	$\frac{1}{5}$ cup	0.6	4	77	19
Chestnuts, Italian .	7 nuts	1.5	10	20	70
Filberts	8–10 nuts	0.5	9	84	7
Hickory nuts . . .	15 nuts	0.5	9	85	6
Nut loaf	$\frac{1}{4}$ cup	1.4	16	62	22
Nut and cheese roast	slice $1\frac{1}{4}$ in. × $1\frac{1}{4}$ in. × $\frac{3}{4}$ in.	0.9	15	68	17
Peanuts	20–24 single nuts	0.6	19	63	18
Peanut butter . .	$2\frac{1}{2}$ tsp.	0.6	19	69	12
Pecans	12 meats	0.5	5	87	8
Pine nuts	$\frac{1}{4}$ cup	0.6	22	73	5
Walnuts, English . .	8–16 meats	0.5	11	82	7
Pies					
Apple	Sector $1\frac{1}{2}$ in. at circumference [1]	1.6	3	41	56
Cranberry	Sector $1\frac{3}{4}$ in. at circumference [2]	1.4	2	18	80
Cream with meringue	Sector $1\frac{9}{10}$ in. at circumference [3]	1.6	10	37	53
Custard	Sector 2 in. at circumference [1]	1.9	9	32	59
Lemon meringue . .	Sector 1 in. at circumference [1]	1.0	5	27	68

[1] Pie 9 inches in diameter. [2] Pie 8 inches in diameter.
[3] Pie 10 inches in diameter.

	100-Calorie Portion		Distribution of Calories		
	Measure	Weight Oz.	Protein	Fat	Carbohydrate
Pies — *Cont'd*					
Mince	Sector 1 in. at circumference [1]	1.2	8	39	53
Plain pastry	$\frac{1}{4}$ of 1 crust, 9 in. diam.	0.7 [2]	6	58	36
Raisin and cranberry	Sector 1 in. at circumference [3]	1.0	3	27	70
Rhubarb	Sector $1\frac{3}{5}$ in. at circumference [1]	1.7	5	18	77
Squash	Sector 2 in. at circumference [1]	1.8	10	25	65
Salads and Dressings					
Banana salad	1 small serving	2.6	12	36	52
Boiled dressing	$\frac{1}{4}$ cup	2.8	10	64	26
Cheese and pineapple salad	$\frac{1}{2}$ serving	1.7	9	58	33
Chicken salad	1 small serving	1.6	12	86	2
Cold slaw	1 cup	2.8	6	78	16
Egg salad	$\frac{2}{5}$ serving	1.4	14	85	1
French dressing	$1\frac{1}{2}$ tbsp.	0.6	—	100	—
Fruit salad	$\frac{1}{4}$ cup fruit and $\frac{1}{2}$ tbsp. dressing	1.5	3	75	22
Lettuce salad with French dressing	1 small serving	1.2	1	95	4
Mayonnaise dressing	1 tbsp.	0.5	1	97	2
Potato salad	$\frac{1}{2}$ serving	1.7	3	68	29
Sardine salad	$\frac{1}{3}$ serving	1.1	27	63	10
Tomato and cucumber salad	$\frac{5}{8}$ serving	2.0	4	81	15
Tomato and lettuce salad	$\frac{1}{2}$ serving	2.7	3	86	11
Waldorf salad	$\frac{2}{5}$ serving	1.2	4	76	20

[1] Pie 9 inches in diameter.
[2] Weight uncooked, 0.9 ounces.
[3] Pie 8 inches in diameter.

	100-Calorie Portion		Distribution of Calories		
	Measure	Weight Oz.	Protein	Fat	Carbohydrate
Sauces					
Brown sauce . . .	½ cup	3.4	14	49	37
Brown sugar sauce .	5 tbsp.	3.0	—	—	100
Charlotte russe filling	⅙ cup	1.5	4	74	22
Cream filling I . .	3⅓ tbsp.	1.8	10	24	66
Cream filling II . .	¼ cup	1.2	5	77	18
Cream sauce . . .	⅙ cup	1.1	3	68	29
Hard sauce . . .	1 tbsp.	0.7	—	50	50
Lemon sauce . . .	⅛ cup	1.5	—	30	70
Tomato sauce . . .	5 tbsp.	2.5	5	70	25
White sauce . . .	¼ cup	2.4	8	70	22
Soups					
Asparagus, cream of	½ cup (scant)	4.0	17	56	27
Baked bean, cream of	½ cup	2.6	15	45	40
Bouillon	4 cups	33.6	84	8	8
Celery, cream of . .	½ cup	3.6	11	61	28
Corn chowder . .	⅖ cup	3.3	12	43	45
Corn, cream of . .	½ cup	3.9	12	38	50
Green pea, cream of	⅔ cup	5.2	16	46	38
Lentil	1 cup	9.0	17	27	56
Lentil and tomato .	⅚ cup	6.7	28	3	69
Oyster stew I . . .	½ cup (scant)	3.5	18	58	24
Oyster stew II . .	½ cup (large)	4.7	16	63	21
Peanut butter, cream of	⅓ cup (scant)	2.6	18	54	28
Potato	½ cup (scant)	4.2	15	38	47
Spinach, cream of (for children especially)	⅗ cup	4.2	16	56	28
Split pea	⅗ cup	6.0	26	2	72
Tomato, canned . .	¾ cup	7.0	12	12	76
clear	1 cup (scant)	7.4	8	48	44
cream of	⅜ cup	3.2	11	63	26
Vegetables					
Asparagus, fresh .	20 large stalks 8 in. long	15.9	32	8	60

	100-Calorie Portion		Distribution of Calories		
	Measure	Weight Oz.	Protein	Fat	Carbohydrate
Vegetables — *Cont'd*					
Asparagus on toast	$\frac{2}{3}$ serving	4.6	13	46	41
Beans, baked, canned	$\frac{1}{3}$ cup	2.7	21	18	61
Lima, fresh	$\frac{1}{2}$ cup	2.9	23	5	72
Lima, buttered	$\frac{1}{4}$ cup	1.7	16	36	48
Lima, dried	$\frac{1}{8}$ cup	1.0	21	4	75
string	$2\frac{1}{4}$ cups of 1 in. pieces	8.5	22	7	71
Beets	4 beets 2 in. diam. ($1\frac{1}{3}$ cups sliced)	7.7	14	2	84
Cabbage, shredded	5 cups	11.2	20	9	71
Carrots	4–5 young carrots 3–4 in. long	10.1	10	5	85
Cauliflower	1 very small head	11.5	23	15	62
Celery	4 cups of $\frac{1}{4}$ in. pieces	19.1	24	5	71
Corn à la Southern	$\frac{1}{3}$ cup	3.4	16	41	43
canned	$\frac{1}{3}$ cup	3.6	11	11	78
fresh	$\frac{1}{2}$ cup	3.5	12	10	78
on cob	2 ears 6 in. long	9.0	12	9	79
Cucumbers	$2\frac{1}{2}$ cucumbers 7 in. long	23.5	19	12	69
Kidney bean stew	$\frac{1}{2}$ cup	4.9	26	18	56
Lentils, baked	$\frac{1}{4}$ cup (scant)	1.6	24	20	56
dried	$2\frac{1}{2}$ tbsp.	1.0	29	3	68
Lentil meat loaf	slice $1\frac{3}{4}$ in. $\times$ $2\frac{1}{2}$ in. $\times$ $\frac{3}{4}$ in.	1.1	28	14	31
Lettuce	2 large heads	18.5	25	14	61
Macaroni (see Cereals)					
Mushrooms, fresh	22 mushrooms 1 in. diam.	7.9	31	8	61
stewed	$\frac{3}{5}$ cup	2.3	8	75	17
Onions, raw	3–4 medium	7.2	13	6	81
scalloped	$\frac{1}{3}$ cup	2.5	8	59	33
Parsnips, stewed	7 pieces $3\frac{1}{2}$ in. $\times$ $1\frac{1}{2}$ in. $\times$ $\frac{1}{3}$ in.	5.8	10	7	83

	100-Calorie Portion		Distribution of Calories		
	Measure	Weight Oz.	Protein	Fat	Carbohydrate
Vegetables — *Cont'd*					
Peas, canned . . .	¾ cup (drained)[1]	4.4	26	3	71
creamed . . .	½ cup (scant)	2.7	18	37	45
green, shelled . .	¾ cup	3.5	28	4	68
Peppers, stuffed I .	1 pepper	4.7	17	16	67
stuffed II . . .	1 pepper	7.0	11	21	68
stuffed III . . .	⅖ pepper	2.5	16	55	29
Potatoes, sweet, raw	½ medium	3.6	6	5	89
sweet, baked . .	½ medium	3.0	6	5	89
sweet, glazed . .	½ small	2.1	4	7	89
white, baked . .	1 medium	3.0	11	1	88
white, boiled . .	1 medium	3.6	11	1	88
white, chips . .	8–10 large pieces	0.6	5	63	32
white, creamed .	⅖ cup	2.7	9	50	41
white, mashed . .	½ cup (scant)	3.1	7	48	45
white, raw . . .	1 medium	5.3	11	1	88
white, scalloped .	⅝ cup	3.5	9	30	61
Radishes	3 doz. red button	12.0	18	3	79
Spinach, boiled, chopped	2½ cups	21.0	12	8	80
with egg . . .	⅘ cup	7.6	22	60	18
à la crême . . .	⅗ cup	4.1	10	70	20
Succotash, canned .	⅓ cup	3.5	15	9	76
Tomatoes, canned .	1¾ cups	15.6	21	8	71
fresh	2–3 medium	15.5	16	16	68
stuffed	1 tomato	4.0	13	45	42
Turkish pilaf (see Cereals)					
Turnips, creamed .	½ cup	1.4	10	50	40
raw	2 cups ½ in. cubes	9.0	13	5	82

[1] Water drained off estimated as 30 per cent can contents.

TABLE II

Food Values in Terms of Common Measures

Introductory Note

This table is designed to supplement Table I, as an aid in the estimation of the food value of various dishes made in the kitchen. It consists of information as to the food value of materials which the cook is accustomed to using by measure and generally uncooked. In harmony with modern culinary practice, level measurements have been employed throughout. By this means we secure greater exactness and uniformity in the quantity meant by a half-pint cupful, a tablespoonful, or a teaspoonful. Even thus, the quantities obtained by measurement are rather variable. Foods which pack down easily, such as flour or chopped fruits, give a cupful whose weight will vary a great deal, while other foods, like butter and granulated sugar, give a cupful of much more constant weight. Similarly, a tablespoonful of sugar is a fairly constant quantity, while a tablespoonful of molasses, cream, or olive oil, weighs more or less according to the viscosity of the material or one's interpretation of a level tablespoonful of a liquid which can actually be heaped up to some extent on the spoon.

It is believed that the weights given in the table are fair averages, but the difficulties inherent in producing such a table must be borne in mind. To get a quantity exactly corresponding to the food values stated for any measurement, the food must actually be weighed. And, strictly speaking, weights in *ounces* are too crude for the purpose. The gram (28.35 grams equal 1 ounce) is the unit upon which the calculation of Calories is based.[1] This is a unit too small to have much significance in the kitchen, but it is mentioned here to explain any discrepancies which seem to occur between the weights and food values as given in the table. Anyone wishing accurate data on food values by weight can find them elsewhere.[2]

With this table, in conjunction with Table I, anyone can estimate the food values of a given recipe, if it is not to be found in Table III. For example, suppose one makes a cake by the following recipe:

3 eggs	1 tbsp. butter
1 cup sugar	1 cup flour
½ tbsp. milk	2 tsp. baking powder
¼ tsp. salt	

Referring to the table for the total fuel value of each ingredient,

3 eggs	= 3 × 70 Calories	= 210 Calories
1 cup sugar	= 1 × 840 Calories	= 840 Calories
½ tbsp. milk	= ½ × 14 Calories	= 7 Calories
1 tbsp. butter	= 1 × 109 Calories	= 109 Calories
1 cup flour	= 1 × 395 Calories	= 395 Calories
Total for recipe		1561 Calories

The salt has no fuel value, and the small amount contributed by starch in baking powder may be disregarded.

[1] 1 gram of protein yields 4 Calories.
1 gram of fat yields 9 Calories.
1 gram of carbohydrate yields 4 Calories.

[2] Rose's *Laboratory Handbook for Dietetics.*

TABLE II

FUEL VALUE OF FOOD MATERIALS IN TERMS OF COMMON MEASURES [1]

MATERIAL	MEASURE	WEIGHT Oz.	DISTRIBUTION OF CALORIES			TOTAL CALORIES
			Protein	Fat	Carbohydrate	
Almonds, chopped	1 cup	3	76	446	63	585
shelled	1 cup	4	95	560	79	734
Apples, dried	1 cup	3	5	17	225	247
Apricots, dried	1 lb.	16	85	41	1134	1260
Barley, flour	1 tbsp.	$\frac{3}{5}$	5	2	50	57
	1 cup	8	76	23	697	796
pearl	1 tbsp.	$\frac{1}{2}$	5	1	44	50
	1 cup	$7\frac{1}{2}$	72	21	662	755
Beans, navy, dried	1 cup	7	179	32	473	684
Lima, dried	1 cup	$5\frac{1}{2}$	112	21	408	541
Bran	1 cup	$2\frac{1}{2}$	31	13	174	218
Bread crumbs, oven dried	1 cup	$3\frac{1}{2}$	52	17	304	373
soft	1 cup	2	21	6	120	147
stale	1 cup	3	34	11	194	239
Butter	1 tbsp.	$\frac{1}{2}$	—	109	—	109
	1 cup	8	8	1736	—	1744
	1 lb.	16	16	3472	—	3488
Buttermilk	1 cup	$8\frac{1}{2}$	29	12	47	88
Celery (cut in $\frac{1}{4}$ in. pieces)	1 cup	$4\frac{1}{2}$	6	1	17	24
Cheese, American, grated, dry	1 tbsp.	$\frac{1}{8}$	4	12	—	16
	1 cup	2	65	183	1	249
fresh	1 tbsp.	$\frac{1}{4}$	8	23	—	31
	1 cup	4	130	366	2	498
	1 lb.	16	523	1465	5	1993
Chocolate, unsweetened, grated	1 tbsp.	$\frac{1}{6}$	2	21	6	29
	1 square	1	15	124	34	173
Citron, chopped	1 cup	$2\frac{4}{5}$	2	11	250	263
Cocoa	1 tbsp.	$\frac{1}{4}$	6	18	11	35
	1 cup	$4\frac{1}{2}$	110	332	192	634

[1] For food values in terms of weight (grams, ounces or pounds) see Rose's *Laboratory Handbook for Dietetics*.

Material	Measure	Weight Oz.	Distribution of Calories: Protein	Fat	Carbohydrate	Total Calories
Coconut, shredded	1 cup	$2\frac{4}{5}$	20	414	101	535
Condensed milk (sweetened)	1 tbsp.	$\frac{2}{3}$	6	16	42	64
	1 cup	11	110	232	675	1017
Condensed milk (unsweetened)	1 tbsp.	$\frac{3}{5}$	6	14	7	27
	1 cup	8	87	189	101	377
Corn, canned	1 cup	9	29	28	198	255
fresh	1 cup	7	25	20	157	202
Cornmeal	1 tbsp.	$\frac{1}{3}$	3	1	29	33
	1 cup	5	52	24	428	504
Cornstarch	1 tbsp.	$\frac{1}{3}$	—	—	34	34
	1 cup	$4\frac{1}{2}$	—	—	459	459
Cottolene	1 tbsp.	$\frac{2}{5}$	—	100	—	100
	1 cup	$6\frac{1}{3}$	—	1575	—	1575
	1 lb.	16	—	4082	—	4082
Cracker crumbs	1 tbsp.	$\frac{1}{4}$	3	4	22	29
	1 cup	$4\frac{1}{4}$	52	65	350	467
Cranberries, fresh	1 cup	$3\frac{1}{2}$	2	5	39	46
Cream, thick	1 tbsp.	$\frac{2}{3}$	1	66	2	69
	1 cup	$7\frac{3}{4}$	19	791	26	836
thin	1 tbsp.	$\frac{1}{2}$	1	24	3	28
	1 cup	8	23	377	40	440
Crisco	1 tbsp.	$\frac{2}{5}$	—	100	—	100
	1 cup	$6\frac{1}{3}$	—	1575	—	1575
Currants, dried	1 cup	$5\frac{1}{2}$	15	24	463	502
Dates, stoned	1 cup	$6\frac{1}{5}$	15	44	549	608
	1 lb.	16	38	114	1423	1575
unstoned	1 cup	$5\frac{3}{4}$	12	36	460	508
	1 lb.	16	34	102	1280	1416
Egg, whole (in shell)	1 egg	$2\frac{1}{2}$	25	45	—	70
white	1 white	1	13	1	—	14
yolk	1 yolk	$\frac{3}{5}$	11	45	—	56
Farina	1 tbsp.	$\frac{1}{3}$	4	1	29	34
	1 cup	6	75	21	519	615
Figs, chopped	1 cup	$5\frac{3}{5}$	28	4	475	507
	1 lb.	16	78	13	1346	1437

Material	Measure	Weight Oz.	Distribution of Calories: Protein	Distribution of Calories: Fat	Distribution of Calories: Carbohydrate	Total Calories
Flour, buckwheat	1 tbsp.	$\frac{2}{5}$	3	1	36	40
	1 cup	$5\frac{1}{2}$	40	17	486	543
Graham	1 tbsp.	$\frac{1}{3}$	5	2	27	34
	1 cup	5	75	28	405	508
Rice	1 tbsp.	$\frac{1}{2}$	5	7	39	51
	1 cup	$8\frac{1}{2}$	85	127	655	867
Rye	1 tbsp.	$\frac{1}{3}$	2	1	30	33
	1 cup	5	38	12	446	496
Wheat, unsifted	1 tbsp.	$\frac{1}{3}$	4	1	28	33
	1 cup	$4\frac{1}{2}$	58	12	389	459
Wheat, sifted	1 tbsp.	$\frac{1}{4}$	3	1	24	28
	1 cup	4	50	10	335	395
Gelatin, granulated	1 tbsp.	$\frac{1}{3}$	37	—	—	37
Hickory nuts, chopped	1 cup	6	105	1032	78	1215
Hominy grits, uncooked	1 cup	$5\frac{1}{2}$	52	8	493	553
cooked	1 cup	9	13	2	126	141
Lard	1 tbsp.	$\frac{1}{2}$	—	117	—	117
	1 cup	8	—	1914	—	1914
Lemon juice	1 tbsp.	$\frac{1}{2}$	—	—	5	5
Macaroni, cooked[1]	1 cup	$5\frac{1}{5}$	15	2	83	100
uncooked,[2]	1 cup	$3\frac{1}{2}$	53	8	294	355
Milk, skim	1 tbsp.	$\frac{7}{10}$	2	1	4	7
	1 cup	$8\frac{1}{2}$	32	7	49	88
	1 qt.	34	132	27	199	358
whole	1 tbsp.	$\frac{7}{10}$	3	7	4	14
	1 cup	$8\frac{1}{2}$	34	88	48	170
	1 qt.	34	132	351	195	678
Molasses, cane	1 tbsp.	$\frac{4}{5}$	2	—	63	65
	1 cup	12	33	—	943	976
Oatmeal	1 cup	$5\frac{1}{2}$	107	105	424	636
Oats, rolled	1 cup	$2\frac{1}{2}$	47	46	187	280
Oleomargarine	1 tbsp.	$\frac{1}{2}$	—	105	—	105
	1 cup	7	10	1482	—	1492
Olive oil	1 tbsp.	$\frac{2}{5}$	—	100	—	100
Orange juice	1 tbsp.	$\frac{1}{2}$	—	—	6	6
	1 cup	8	—	—	104	104

[1] 1 in. pieces.

[2] 10 sticks 9 in. long.

Material	Measure	Weight Oz.	Distribution of Calories			Total Calories
			Pro-tein	Fat	Carbo-hydrate	
Peanuts, chopped	1 cup	$3\frac{7}{10}$	108	365	102	575
shelled	1 cup	$4\frac{1}{3}$	125	420	118	663
Peas, canned, drained,	1 cup	6	35	4	95	134
dried	1 tbsp.	$\frac{1}{2}$	13	1	32	46
	1 cup	$7\frac{1}{2}$	187	17	471	675
Pecans, shelled	1 cup	$5\frac{1}{2}$	60	990	95	1145
Pineapple, canned, grated	1 cup	$8\frac{1}{2}$	4	15	350	369
Pumpkin, cooked	1 cup	$6\frac{1}{2}$	7	4	59	70
Raisins	1 cup	5	15	42	432	489
	1 lb.	16	48	135	1380	1563
Rhubarb, fresh, 1 in. pieces	1 cup	4	3	7	16	26
Rice, uncooked	1 tbsp.	$\frac{1}{2}$	4	1	45	50
	1 cup	7	63	6	627	696
steamed	1 cup	$5\frac{1}{3}$	11	1	115	127
Saltines	1 cracker	$\frac{1}{10}$	2	4	10	16
Spinach, cooked and chopped	1 cup	$8\frac{1}{2}$	15	5	23	43
Squash, cooked (Hubbard)	1 cup	$7\frac{3}{4}$	8	10	92	110
Suet	1 cup	$3\frac{1}{2}$	19	730	—	749
	1 lb.	16	85	3340	—	3425
Sugar, brown	1 tbsp.	$\frac{1}{3}$	—	—	36	36
	1 cup	$5\frac{4}{5}$	—	—	625	625
	1 lb.	16	—	—	1724	1724
granulated	1 tbsp.	$\frac{1}{2}$	—	—	60	60
	1 cup	$7\frac{2}{5}$	—	—	840	840
	1 lb.	16	—	—	1814	1814
powdered	1 tbsp.	$\frac{1}{2}$	—	—	48	48
	1 cup	6	—	—	672	672
	1 lb.	16	—	—	1814	1814
Tapioca	1 tbsp.	$\frac{1}{2}$	—	—	48	48
	1 cup	$6\frac{1}{2}$	3	2	635	640
Tomatoes, canned	1 cup	9	12	5	40	57
Turnips, $\frac{1}{2}$ in. cubes	1 cup	$4\frac{3}{4}$	6	2	44	52
Walnuts, English, chopped	1 cup	3	63	493	44	600
Wheat, flaked	1 cup	3	46	10	253	309

TABLE III

Dietary Recipes

Introductory Note

Since a great deal of variation in food value is possible in the same dish, according to the recipe used, it has seemed desirable to indicate the ingredients of the dishes whose food values in terms of 100-Calorie portions have been given in Table I. Here are included almost all the combinations of food materials used in preparation of the dietaries given throughout the book, as well as a number of other dishes with which any cook is likely to be familiar. The ingredients of each recipe have been measured and weighed separately, their food values calculated on these weights, and then added together to give the food value of the whole recipe. Each dish has then been cooked and when ready to eat measured and weighed. From the weight and total Calories of the cooked product the 100-Calorie portion has in each case been estimated, then weighed out and measured as accurately as possible with ordinary kitchen equipment, *i.e.* half-pint cups divided into quarters and thirds, tablespoons and teaspoons, supplemented by an ordinary foot rule. From the scientific point of view such a method is very crude. No two people *measuring* flour for a cake will get exactly the same *weight.* Then, too, the finished cake will vary in weight according to these differences in weight of ingredients and also according to the size and shape of the pan, the intensity of the oven heat, and the length of time of baking. Furthermore, it is not possible to measure the cubical contents exactly with a ruler, as few cakes are perfectly flat on top. Moreover, a sample cut from the soft center may weigh the same as one from a hardened corner, but the measurements will not agree exactly. For such reasons, data on cooked food materials, unless prepared by the methods of the chemical laboratory instead of the kitchen, must be regarded as approximate rather than absolutely accurate. To the housewife, intent on learning to estimate food values for the general welfare of her family, these discrepancies are of no moment. A variation of a few Calories in a day's dietary has no particular significance. What she needs to know is the *approximate* food value of any dish which she is preparing. She can then estimate the food value of each individual serving without difficulty. This is why the food values for the whole recipe have been stated. Moreover, if anyone will take the trouble to measure a 100-Calorie portion, she will find it possible to remember this well enough to judge of the food value of any portion served. For example, 100 Calories of mince pie require a sector one inch on the outer circumference; a 9-inch pie is about 28 inches in circumference, and hence will yield about 2800 Calories; if each serving is three inches on the outer edge, it will contain 300 Calories — if four inches, 400 Calories, etc. Such estimates are perfectly practical for home use.

In the collection which follows, the recipes are drawn from many sources — standard cookbooks or contributions from students in the author's laboratory — and it is believed that they represent the common way of making most of the dishes, though a few have been specially arranged for economy's sake. In the latter case, the more usual way has sometimes been given in a second recipe. No attempt has been made to keep them uniform for any particular number of servings. The aim has been merely to indicate proportions of ingredients, so that the housewife can compare these recipes with her own and where they are alike multiply or divide the values of each according to the size of her family. As this book is not intended as a substitute for a cookbook, the kind and quantity of seasonings have not been given, these having no appreciable fuel value.

BEVERAGES

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories
Chocolate I ½ cup milk ½ cup water ½ sq. chocolate 1 tbsp. sugar	1 cup	9.0	23	106	94	223	½ cup (scant)	4.1	10	48	42
Chocolate II 1 cup milk ½ sq. chocolate 1 tbsp. sugar	1 cup	9.3	39	150	117	306	⅓ cup	3.1	13	49	38
Cocoa I ½ cup milk ½ cup water 2 tsp. cocoa 2 tsp. sugar	1 cup	9.0	22	63	76	161	⅗ cup	5.5	14	39	47
Cocoa II 1 cup milk 2 tsp. cocoa 2 tsp. sugar	1 cup	9.0	38	107	95	240	⅖ cup	3.8	16	44	40

COCOA III 1 cup milk 2 tsp. cocoa 3 tbsp. lactose	1 cup	9.2	39	107	174	320	$\frac{1}{3}$ cup	2.9	12	34	54
EGG LEMONADE 1 egg 2 tbsp. lemon juice 2 tbsp. sugar $\frac{2}{3}$ cup water	1 cup	9.0	25	45	120	190	$\frac{1}{2}$ cup	4.8	13	24	63
EGGNOG $\frac{3}{4}$ cup milk 1 egg 2 tsp. sugar Flavorings	1 cup	8.5	48	110	72	230	$\frac{1}{2}$ cup (scant)	3.7	21	48	31
FRUIT PUNCH 1 cup raspberry juice $1\frac{1}{8}$ cups currant juice $\frac{5}{6}$ cup orange juice $\frac{1}{2}$ cup lemon juice $2\frac{1}{3}$ cups sugar 6 cups water	3 qts.	50.2	36	27	2664	2727	$\frac{1}{2}$ cup (scant)	1.8	1	1	98

BEVERAGES — *Continued*

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories
LACTOSE LEMONADE 1 tbsp. cane sugar 2 tbsp. lemon juice 6 tbsp. lactose ⅔ cup water	1 cup	8.6	—	—	356	356	⅓ cup (scant)	2.6	—	—	100
LEMONADE 1 cup water 1½ tbsp. sugar 2 tbsp. lemon juice	1¼ cups	10.0	—	—	90	90	1⅖ cups	11.0	—	—	100

BREAD, BISCUIT, AND MUFFINS

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories
Baking Powder Biscuit 2 cups flour 4 tsp. baking powder 1 tsp. salt 1 tbsp. lard 1 tbsp. butter ¾ cup milk	24 small biscuit	14.8	128	319	735	1182	2 small biscuit	1.3	11	27	62
Boston Brown Bread 1 cup rye meal 1 cup corn meal 1 cup graham flour ¾ tbsp. soda 1 tsp. salt ¾ cup molasses 2 cups sour milk	4 loaves 3 in. diam. 4½ in. high	40.9	219	227	1814	2260	Slice ¾ in. thick	1.8	10	10	80

BREAD, BISCUIT, AND MUFFINS — *Continued*

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbohydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbohydrate Calories
CLUB SANDWICH 2 slices toast 2 slices cooked bacon 2 large leaves lettuce 3 tbsp. chopped chicken 3 tbsp. mayonnaise dressing 4 olives 2 slices tomato ½ egg	1 sandwich	9.0	91	417	101	609	⅙ sandwich	1.5	15	69	16
CORN CAKE ¾ cup cornmeal 1¼ cups flour ¼ cup sugar 5 tsp. baking powder	Loaf 6 in. × 10 in. × 1 in.	18.0	162	364	1012	1538	Slice 2 in. × 2 in. × 1 in.	1.2	10	24	66

½ tsp. salt 1 cup milk 1 egg 2 tbsp. butter										
CORNMEAL MUFFINS ½ cup cornmeal 1 cup flour 3 tsp. baking powder 1 tbsp. sugar 1 tbsp. melted butter ½ tsp. salt ¾ cup milk 1 egg	8 muffins	13.0	143	271	686	1100	¾ muffin	1.2	13	25	62
CREAM TOAST 6 slices bread 2 cups milk 3 tbsp. flour 2 tbsp. butter	6 slices toast and 2 cups sauce	21.0	124	413	421	958	⅗ slice toast and ⅕ cup sauce	2.2	13	43	44
CROUTONS (FRIED) 4 oz. bread 1 oz. fat	80 croutons ½ in. cubes	4.2	40	264	239	543	15 croutons ½ in. cubes	0.8	7	49	44

BREAD, BISCUIT, AND MUFFINS — *Continued*

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories
Croutons (Toasted) $5\frac{1}{2}$ oz. bread	112 croutons $\frac{1}{2}$ in. cubes	4.4	58	16	330	404	27 croutons $\frac{1}{2}$ in. cubes	1.4	14	4	82
Date Sandwiches 3 thin slices bread 2 tsp. butter 6 dates	3 triangles 3 in. × $3\frac{1}{2}$ in. × $4\frac{3}{5}$ in.	3.4	17	81	202	300	1 triangle 3 in. × $3\frac{1}{2}$ in. × $4\frac{3}{5}$ in.	1.1	6	27	67
Date and Cream Cheese Sandwiches 3 slices bread 2 tsp. butter 3 dates 1 tbsp. Neuchatel cheese	3 triangles 3 in. × $3\frac{1}{2}$ in. × $4\frac{3}{5}$ in.	3.0	27	114	149	290	1 triangle 3 in. × $3\frac{1}{2}$ in. × $4\frac{3}{5}$ in.	1.0	10	39	51
French Toast 12 slices bread 3 in. × 3 in. × $\frac{1}{2}$ in.	12 slices	18.0	132	588	528	1248	1 slice 3 in. × 3 in. × $\frac{1}{2}$ in.	1.4	10	48	42

4 tbsp. butter 1 egg 1 cup milk											
Graham Muffins 1 cup graham flour 1 cup white flour $\frac{1}{4}$ cup sugar 1 tsp. salt 1 cup milk 1 egg 2 tbsp. melted butter 4 tsp. baking powder	11 muffins	20.0	186	234	1040	1460	$\frac{3}{4}$ muffin	1.4	13	16	71
Griddle Cakes 2 cups flour 1 tbsp. melted butter 2 cups sour milk 1 tbsp. sugar 1 egg 1 tsp. soda $\frac{1}{2}$ tsp. salt	14 cakes $4\frac{1}{2}$ in. diam.	25.0	191	341	826	1358	1 cake $4\frac{1}{2}$ in. diam.	1.8	14	25	61

BREAD, BISCUIT, AND MUFFINS — *Continued*

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories
One Egg Muffins 2 cups flour 4 tsp. baking powder ½ tsp. salt 2 tbsp. sugar 1 cup milk 2 tbsp. melted butter 1 egg	10 muffins	16.6	160	310	846	1316	⅘ muffin	1.2	12	24	64
Old New England Corn Bread 2 cups cornmeal 1 cup flour ⅔ cup suet ⅓ cup molasses	Loaf 1 in. × 6 in. × 8½ in.	20.0	160	590	1250	2000	Piece 2½ in. × 1 in. × 1 in.	1.0	8	30	62
Popovers 1 cup flour ¼ tsp. salt											

$\frac{7}{8}$ cup milk 2 eggs $\frac{1}{2}$ tsp. melted butter	7 popovers	15.0	128	188	390	706	1 popover	2.0	18	27	55
TWIN MOUNTAIN MUFFINS $\frac{1}{4}$ cup butter $\frac{1}{4}$ cup sugar 1 egg $\frac{3}{4}$ cup milk 2 cups flour 4 tsp. baking powder	10 muffins	14.8	138	546	810	1494	$\frac{2}{3}$ muffin	1.0	9	36	55
WAFFLES 2 cups flour 2 tbsp. butter 3 eggs 1 tbsp. sugar 1 cup milk 3 tsp. baking powder	6 waffles 6 in. diam.	13.6	201	498	717	1416	$\frac{2}{5}$ waffle 6 in. diam.	0.9	14	35	51

CAKES AND COOKIES

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories
Angel Cake 1 cup sugar $\frac{3}{4}$ cup flour Whites 8 eggs 1 tsp. vanilla 1 tsp. cream of tartar	Loaf $2\frac{1}{2}$ in. × $5\frac{1}{2}$ in. × $5\frac{1}{2}$ in.	14.0	156	12	1092	1260	Piece $1\frac{1}{4}$ in. × 2 in. × $2\frac{1}{2}$ in.	1.3	12	1	87
Apple Sauce Cake 1 cup sugar 2 tbsp. butter 1 cup apple sauce 2 cups flour 1 tsp. soda $\frac{2}{3}$ cup raisins Spices	Loaf $5\frac{3}{4}$ in. × 8 in. × $1\frac{1}{2}$ in.	21.2	116	281	2077	2474	Piece $1\frac{1}{2}$ in. × $\frac{1}{2}$ in. × $3\frac{3}{4}$ in.	0.8	5	11	84
Chocolate Cake $\frac{1}{2}$ cup butter 1 cup sugar											

2 eggs $\frac{1}{2}$ cup milk $1\frac{1}{2}$ cups flour $2\frac{1}{2}$ tsp. baking powder 2 sq. chocolate	Loaf $5\frac{1}{2}$ in. × $10\frac{1}{2}$ in. × $2\frac{1}{2}$ in.	28.0	165	1252	1653	3070	Piece $2\frac{1}{2}$ in. × $2\frac{1}{2}$ in. × $\frac{7}{8}$ in.	0.9	5	41	54
Chocolate Drop Cookies $\frac{1}{2}$ cup butter 1 cup brown sugar $\frac{1}{2}$ cup milk 2 cups flour 2 eggs 3 sq. chocolate 1 cup nut meats 2 tsp. soda 2 tsp. vanilla	56 cookies $2\frac{1}{4}$ in. diam.	32.0	292	1980	1488	3760	$1\frac{1}{2}$ cookies $2\frac{1}{4}$ in. diam.	0.8	8	52	40
Cream Puff Shells 1 cup flour $\frac{1}{2}$ cup butter 4 eggs 1 cup water	20 puffs	11.6	158	1017	335	1510	$1\frac{1}{2}$ puffs	0.8	10	68	22

CAKES AND COOKIES — *Continued*

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories
GINGERBREAD I 1 cup molasses $\frac{1}{2}$ cup water $2\frac{1}{4}$ cups flour 1 tsp. soda $1\frac{1}{2}$ tsp. ginger 4 tbsp. melted butter $\frac{1}{2}$ tsp. salt	Loaf $8\frac{1}{2}$ in. × 9 in. × 1 in.	25.5	143	456	1590	2189	Piece 1 in. × $1\frac{2}{3}$ in. × 2 in.	1.1	7	21	72
GINGERBREAD II 1 cup molasses 1 cup sour milk $2\frac{1}{3}$ cups flour $1\frac{3}{4}$ tsp. soda 2 tsp. ginger $\frac{1}{2}$ tsp. salt $\frac{1}{4}$ cup melted butter	Loaf $9\frac{1}{2}$ in. × 10 in. × 1 in.	30.0	181	508	1718	2407	Piece 1 in. × 2 in. × 2 in.	1.2	8	22	70

HERMITS $\frac{1}{3}$ cup butter $\frac{2}{3}$ cup sugar 1 egg 2 tbsp. milk $1\frac{3}{4}$ cups flour 2 tsp. baking powder $\frac{1}{3}$ cup raisins	50 cookies 2 in. diam.	18.5	127	617	1372	2116	$2\frac{1}{2}$ cookies 2 in. diam.	0.9	6	29	65
MARGUERITES 1 egg white 2 tbsp. powdered sugar 12 nuts 8 saltines	8 crackers	3.7	43	164	193	400	2 crackers	0.9	10	41	49
MOLASSES COOKIES I 1 cup molasses $\frac{1}{4}$ cup lard $\frac{1}{4}$ cup oleomargarine 1 tbsp. ginger 1 tbsp. soda 2 tbsp. milk 2 cups bread flour	73 cookies 2 in. diam.	17.4	136	820	1504	2460	3 cookies 2 in. diam.	0.7	6	34	60

CAKES AND COOKIES—*Continued*

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories
Molasses Cookies II 1 cup molasses ¼ cup butter ¼ cup lard 2½ cups flour 2 tbsp. milk 1 tbsp. ginger 1 tbsp. soda 1 tsp. salt	68 cookies 2¼ in. diam.	27.0	170	949	1830	2949	2½ cookies 2¼ in. diam.	0.9	6	32	62
Oatmeal Cookies 1 egg ¼ cup sugar ½ cup skim milk ½ cup oatmeal 2 cups flour 2 tbsp. crisco 1 cup raisins ½ cup peanuts	20 cookies 3 in. diam.	18.7	290	551	1780	2621	¾ cooky 3 in. diam.	0.7	11	21	68

2 tsp. baking powder 1 tsp. salt											
Oatmeal Wafers 1 cup oatmeal 1 cup rolled oats 2 cups flour $\frac{1}{4}$ cup sugar 1 tsp. salt $\frac{1}{8}$ tsp. soda $\frac{1}{4}$ cup crisco $\frac{1}{2}$ cup hot water	30 wafers $2\frac{3}{4}$ in. diam.	15.0	327	616	1858	2801	1 wafer $2\frac{3}{4}$ in. diam.	0.5	11	23	66
One Egg Cake $\frac{1}{4}$ cup butter $\frac{1}{2}$ cup sugar 1 egg $\frac{1}{2}$ cup milk $1\frac{1}{2}$ cups flour $2\frac{1}{2}$ tsp. baking powder	Loaf $1\frac{3}{4}$ in. $\times$ $3\frac{1}{2}$ in. $\times$ $4\frac{3}{4}$ in.	16.0	123	502	959	1584	Piece $1\frac{3}{4}$ in. $\times$ $1\frac{3}{4}$ in. $\times$ $1\frac{3}{4}$ in.	1.0	8	32	60

CAKES AND COOKIES — *Continued*

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories
Peanut Cookies 2 tbsp. butter ¼ cup sugar 1 egg ¾ cup (scant) flour 2 tbsp. milk ½ cup chopped peanuts ½ tsp. lemon juice 1 tsp. baking powder ⅛ tsp. salt	18 cookies 2 in. diam.	9.3	132	493	529	1154	1¾ cookies 2 in. diam.	0.8	11	43	46
Plain Cookies ½ cup butter 1 cup sugar 1 egg ¼ cup milk 2 tsp. baking powder 2½ cups flour	60 cookies 2¼ in. diam.	26.0	166	957	1788	2911	2 cookies 2¼ in. diam.	0.9	6	33	61

SPONGE CAKE 6 eggs 1 cup sugar 1 cup flour 1 tbsp. lemon juice ½ rind one lemon ¼ tsp. salt	Loaf 10 in. × 4¾ in. × 1½ in.	16.0	192	323	1177	1692	Piece 1½ in. × 1½ in. × 2 in.	0.9	11	19	70
SPONGE CAKE — HOT WATER 2 eggs 1 cup sugar 1 cup flour 1½ tsp. baking powder 2 tsp. lemon juice ⅜ cup hot water	Sheet 8½ in. × 8½ in. × ⅞ in.	12.7	98	95	1162	1355	Piece 2 in. × 2¾ in. × ⅞ in.	0.9	7	7	86
WHITE MOUNTAIN ICING 1 cup sugar 1 egg white ½ cup water	1½ cups	8.7	12	1	840	853	2½ tbsp.	1.0	1	—	99

CANDIES

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories
CHOCOLATE FUDGE 2 cups sugar ⅔ cup milk 1 tbsp. butter 2 sq. chocolate 1 tsp. vanilla	Sheet 6 in. × 4 in. × 1 in.	20.6	56	444	1744	2244	Piece 1½ in. × ¾ in. × 1 in.	0.9	2	20	78
CHOCOLATE NUT CARAMELS ¾ cup condensed milk ¾ cup cream 2 cups sugar ¾ cup glucose 2 sq. chocolate ½ cup English walnuts ½ cup almonds	Sheet 8 in. × 4 in. × 1 in.	26.0	173	1260	2459	3892	Piece 1 in. × 1 in. × ⅘ in.	0.7	4	32	64

COCONUT CARAMELS 1 cup condensed milk $\frac{1}{2}$ cup cream $\frac{1}{2}$ cup maple syrup 2 cups sugar $\frac{2}{3}$ cup glucose 1 cup coconut	Sheet 8 in. × 4 in. × 1 in.	26.0	118	881	2736	3735	Piece 1 in. × 1 in. × $\frac{5}{6}$ in.	0.7	3	24	73
PENOUCHE 1 cup brown sugar $\frac{1}{4}$ cup milk 6 English walnuts 1 tsp. butter $\frac{1}{2}$ tsp. vanilla	Sheet 3 in. × $4\frac{1}{4}$ in. × 1 in.	8.2	22	171	749	942	Piece 1 in. × 1 in. × $1\frac{2}{5}$ in.	0.9	2	18	80

CUSTARDS, PUDDINGS, AND ICES

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories
Apple Snow 3 egg whites ¾ cup steamed apple pulp ½ cup sugar	7 cups	15.7	48	18	696	762	1 cup	2.1	6	2	92
Apple Tapioca ½ cup tapioca 4 apples ½ cup sugar 3 cups water Few grains salt	2⅓ cups	34.5	6	12	932	950	¼ cup	3.6	1	1	98
Boiled Custard 2 cups milk 3 egg yolks ¼ cup sugar ⅓ tsp. vanilla	2 cups	15.0	91	303	298	692	⅓ cup (scant)	2.2	13	44	43

BROWN BETTY 2 cups bread crumbs 4 tbsp. butter 3 large apples ½ cup sugar 1 cup water	2½ cups	25.5	44	434	762	1240	⅕ cup	2.1	3	35	62
CHOCOLATE BLANC MANGE 3 tbsp. corn-starch 2 cups milk ½ cup sugar 1½ sq. chocolate ½ tsp. vanilla	2½ cups	21.2	88	362	627	1077	¼ cup (scant)	1.9	8	33	59
CORNSTARCH BLANC MANGE 4 tbsp. corn-starch ⅓ cup sugar 2 cups milk ½ tsp. vanilla	2 cups	19.5	64	176	493	733	¼ cup	2.7	9	24	67

CUSTARDS, PUDDINGS, AND ICES — *Continued*

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories
COTTAGE PUDDING $\frac{1}{4}$ cup butter $\frac{2}{3}$ cup sugar 1 egg 1 cup milk $2\frac{1}{4}$ cups flour 4 tsp. baking powder $\frac{1}{2}$ tsp. salt	2 loaves 6 in. × 4 in. × $1\frac{3}{4}$ in.	24.3	179	549	1372	2100	Slice $1\frac{3}{4}$ in. × 2 in. × $2\frac{1}{2}$ in.	1.1	7	26	67
CUP CUSTARD 3 cups milk 3 eggs 6 tbsp. sugar	$3\frac{1}{2}$ cups	33.8	172	400	458	1030	$\frac{1}{3}$ cup	3.3	17	39	44
DATE PUDDING I $1\frac{1}{2}$ cups dates $1\frac{1}{4}$ cups flour $\frac{1}{3}$ cup sugar $\frac{3}{8}$ cup drippings $\frac{1}{2}$ tsp. cinnamon	Loaf 4 in. diam. 6 in. high	20.0	123	743	1620	2486	Slice 1 in. × 1 in. × $1\frac{1}{2}$ in.	0.8	5	30	65

DATE PUDDING II $\frac{1}{4}$ cup butter $\frac{1}{2}$ cup molasses $\frac{1}{2}$ cup milk 1 egg $1\frac{1}{2}$ cups graham flour 1 cup dates $\frac{1}{2}$ tsp. soda $\frac{1}{2}$ tsp. salt	2 loaves 3 in. diam. $4\frac{1}{2}$ in. high	24.3	157	565	1390	2112	Slice 3 in. diam. $\frac{1}{2}$ in. thick	1.1	7	27	66
LEMON ICE 1 cup water 8 tbsp. sugar 4 tbsp. lemon juice.	$1\frac{3}{4}$ cups	13.5	—	—	427	427	$\frac{1}{2}$ cup (scant)	3.1	—	—	100
LEMON JELLY $\frac{1}{2}$ cup sugar 1 tbsp. gelatin $\frac{1}{4}$ cup lemon juice $1\frac{3}{4}$ cups water	2 cups	16.8	38	—	397	435	$\frac{1}{2}$ cup	3.8	9	—	91
LEMON MILK SHERBET $2\frac{2}{3}$ cups milk $1\frac{1}{3}$ cups sugar $\frac{1}{3}$ cup lemon juice	$4\frac{1}{3}$ cups	30.8	66	179	1329	1574	$\frac{1}{4}$ cup	1.9	4	12	84

CUSTARDS, PUDDINGS, AND ICES — *Continued*

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories
Peach Ice Cream 6 peaches ½ cup sugar 1 cup thick cream 1 cup milk	4 cups	30.2	66	842	747	1655	¼ cup	1.8	4	51	45
Prune Soufflé ⅓ lb. prunes (uncooked) 5 egg whites ½ cup sugar	3⅓ cups	16.0	85	3	772	860	⅖ cup	1.8	10	—	90
Raspberry Sherbet 1 qt. raspberries 1¼ cups sugar 1 cup water 2 tbsp. lemon juice 1 egg white	3¼ cups	26.5	14	1	1241	1256	¼ cup	2.1	1	—	99

RICE PUDDING I ½ cup boiled rice ½ cup milk 1 egg 1 tbsp. sugar ¼ tsp. lemon extract	1⅓ cups	8.2	45	85	130	260	½ cup (scant)	3.1	18	32	50
RICE PUDDING II (CREAMY) 2 cups milk ¼ cup rice ⅙ cup sugar ⅛ tsp. salt	1⅔ cups	14.1	79	175	392	646	¼ cup	2.2	12	27	61
RICE PUDDING III ¾ cup rice 30 raisins 6 tbsp. sugar 1 cup milk 2 cups water ⅛ tsp. salt	4¾ cups	18.0	89	87	992	1168	⅔ cup	1.5	8	7	85
SNOW PUDDING 1 tbsp. gelatin 1 cup sugar 3 egg whites ¼ cup lemon juice 1¼ cups water	6 cups	20.0	88	1	836	925	⅔ cup	2.2	10	—	90

CUSTARDS, PUDDINGS, AND ICES — *Continued*

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories
Spanish Cream 1 tbsp. gelatin 2 cups milk 2 eggs ½ cup sugar ½ tsp. vanilla	4½ cups	11.5	82	132	251	465	1 cup	2.5	18	28	54
Tapioca-Cornmeal Pudding 5 tbsp. tapioca 4 tbsp. cornmeal 5 cups skim milk ⅓ cup molasses ⅓ cup sugar 3 tbsp. butter ½ tsp. salt	2½ cups	29.6	192	338	1154	1684	2 tbsp.	1.8	11	20	69
Tapioca Cream 2 cups milk ¼ cup sugar	3 cups	22.0	91	219	456	766	⅖ cup	2.8	12	28	60

3 tbsp. tapioca 1 egg ½ tsp. vanilla											
VANILLA ICE CREAM I 1 qt. thin cream ¾ cup sugar 1½ tbsp. vanilla	1½ qt.	37.2	92	1508	790	2390	2½ tbsp.	1.6	4	63	33
VANILLA ICE CREAM II 2 cups skim milk 1 tbsp. flour 1 cup sugar 1 egg 1 qt. thin cream 2 tbsp. vanilla	2 qt.	57.7	184	1568	1122	2874	¼ cup	2.0	6	55	39

EGGS AND CHEESE DISHES

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories
Eggs à la Golden-rod 2 cups milk 4 tbsp. flour 4 tbsp. butter 8 eggs 8 slices bread Seasonings	8 servings	45.3	404	955	928	2287	1/3 serving	2.0	18	42	40
Egg Timbale 1 egg 3/4 cup milk Seasonings	3/4 cup	7.8	49	105	36	190	3/8 cup	4.2	26	55	19
Scrambled Eggs 5 eggs 1/2 cup milk 2 tbsp. butter Seasonings	1 1/2 cups	12.7	119	440	25	584	1/4 cup	2.1	20	76	4

CHEESE SOUFFLÉ 2 tbsp. butter 3 tbsp. flour $\frac{1}{2}$ cup milk $\frac{1}{4}$ cup cheese 3 eggs Seasonings	3 cups	11.5	119	467	75	661	$\frac{1}{2}$ cup	1.7	18	70	12
CHEESE STRAWS 1 tbsp. butter $\frac{2}{3}$ cup flour 1 cup bread crumbs 2 tbsp. milk 1 cup grated cheese Seasonings	28 straws 5 in. × $\frac{3}{8}$ in. × $\frac{3}{8}$ in.	8.0	182	542	326	1050	$2\frac{2}{3}$ straws 5 in. × $\frac{3}{8}$ in. × $\frac{3}{8}$ in.	0.8	17	52	31
MACARONI AND CHEESE $\frac{3}{4}$ cup uncooked macaroni $\frac{1}{2}$ cup grated cheese 1 tbsp. flour $1\frac{1}{3}$ tbsp. butter $\frac{3}{4}$ cup milk 3 tbsp. bread crumbs	5 cups	21.0	170	390	444	1004	$\frac{1}{2}$ cup	2.1	17	39	44

EGGS AND CHEESE DISHES — *Continued*

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories
Nut and Cheese Roast 1 cup grated cheese 1 cup chopped walnuts 1 cup dry bread crumbs 2 tbsp. chopped onion 1 tbsp. butter 2 tbsp. lemon juice Salt and pepper	Loaf 3 in. × 4 in. × $1\frac{1}{4}$ in.	14.8	232	1060	266	1558	Slice $1\frac{1}{4}$ in. × $1\frac{1}{4}$ in. × $\frac{3}{4}$ in.	0.9	15	68	17
Rice Fondue on Crackers 1 tbsp. raw rice 4 tbsp. grated cheese $\frac{1}{2}$ tbsp. milk	4 crackers and 8 tbsp. sauce	4.4	72	153	96	321	$1\frac{1}{4}$ crackers and $2\frac{1}{2}$ tbsp. sauce	1.4	22	48	30

1 egg 4 saltines Seasonings											
RICE WITH CHEESE AND TOMATOES 1 cup uncooked rice 8 oz. American cheese 1 pt. canned tomatoes	4¾ cups	37.5	347	746	707	1800	¼ cup	2.1	19	42	39
SAMP BAKED WITH CHEESE 1 cup samp (uncooked) 2 oz. cheese Salt	4½ cups	38.0	132	194	627	953	½ cup	4.0	14	20	66
WELSH RAREBIT ¼ cup milk 1 cup grated cheese 1 egg 2 tsp. butter 4 slices toast Seasonings	1 cup rarebit and toast	10.7	185	478	177	840	1½ tbsp. rarebit and ½ slice toast	1.3	22	57	21

FRUITS

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories
Apple Sauce 4 large apples $6\frac{1}{2}$ tbsp. sugar Water	$2\frac{1}{2}$ cups	23.0	9	26	636	671	$\frac{3}{8}$ cup	3.5	1	3	96
Baked Apple 1 large apple 2 tbsp. sugar 1 tbsp. water	1 serving	4.5	3	5	192	200	$\frac{1}{2}$ serving	2.3	1	3	96
Baked Apple with Whipped Cream 1 large apple 1 tbsp. sugar 1 tbsp. water 1 tbsp. cream	1 serving	4.8	3	61	136	200	$\frac{1}{2}$ serving	2.4	1	31	68
Cranberry Jelly 4 cups cranberries 1 cup water 2 cups sugar	$3\frac{1}{2}$ cups	30.0	12	41	1929	1982	2 tbsp.	1.5	—	1	99

CRANBERRY SAUCE 1 cup cranberries ½ cup sugar ½ cup water	1⅛ cups	8.0	2	6	512	520	¼ cup (scant)	1.5	—	1	99
STEWED DRIED APRICOTS 1 lb. apricots 1 cup sugar Water	5¼ cups	56.4	85	41	1974	2100	¼ cup	2.7	4	2	94
STEWED PEACHES 2 peaches 2 tbsp. sugar ¼ cup water	¾ cup	5.5	4	1	153	158	½ cup	3.5	2	—	98
STEWED PRUNES 1 lb. prunes 1 cup sugar Water	48 prunes and 4 cups juice	56.0	32	—	2036	2068	2 prunes and 2 tbsp. juice	2.8	2	—	98
STEWED RHUBARB 1 cup rhubarb (¾ in. pieces) 8½ tbsp. sugar	2¼ cups	7.6	3	7	448	458	½ cup	1.7	1	2	97

MEATS, FISH, AND POULTRY

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories
Beef Loaf 2 lb. lean beef 1 egg 2 tbsp. melted butter Seasonings	Loaf 4 in. × 6 in. × $2\frac{1}{2}$ in.	26.0	719	1092	—	1811	Slice 4 in. × 6 in. × $\frac{1}{8}$ in.	1.4	40	60	—
Beef Stew with Vegetables $\frac{1}{2}$ lb. beef plate $\frac{1}{2}$ cup carrot cubes 1 onion 3 potatoes $\frac{1}{2}$ cup turnip cubes $\frac{1}{4}$ cup flour Water and seasonings	$4\frac{3}{4}$ cups	34.0	183	510	439	1132	$\frac{3}{8}$ cup	3.0	16	45	39
Codfish Balls 1 cup codfish 2 cups potato											

2 tbsp. butter 1 egg Fat for frying	10 balls 2 in. diam.	16.6	138	632	210	980	1 ball 2 in. diam.	1.7	14	65	21
CREAMED CHICKEN ½ cup canned chicken 1 tbsp. butter 1 tbsp. flour ½ cup milk	1 cup	7.2	72	315	48	435	¼ cup (scant)	1.6	16	73	11
CREAMED SALT COD 2 cups salt cod (shredded) 1 cup skim milk 1 cup water 3 tbsp. butter 4 tbsp. flour	4 cups	18.4	243	343	161	747	½ cup	2.5	32	46	22
CREAMED DRIED BEEF I ½ oz. dried beef (slice 4 in. × 5 in.) 1 tbsp. beef drippings 1 tbsp. flour ⅝ cup milk Seasonings	¾ cup	6.0	40	162	48	250	⅓ cup (scant)	2.4	16	65	19

MEATS, FISH, AND POULTRY — *Continued*

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories
CREAMED DRIED BEEF II ½ cup (2 oz.) dried beef 1 cup milk 2 tbsp. butter 2 tbsp. flour Seasonings	1⅓ cups	12.0	106	322	92	520	⅓ cup (scant)	2.3	20	62	18
CREAMED SALMON ON TOAST ¼ cup salmon ¾ cup skim milk 1 tbsp. oleomargarine 1½ tbsp. flour 2 slices toast	1 cup salmon and toast	10.0	92	178	154	424	¼ cup salmon and ½ slice toast	2.4	22	42	36

IRISH STEW WITH DUMPLINGS Stew: 2 lb. mutton 2 lb. potatoes (4 cups) ½ lb. carrots (⅔ cup) ½ lb. turnips (⅔ cup) ¼ cup flour ½ small onion Seasonings Dumplings: 2 cups flour 2 cups chopped suet ¾ cup milk 4 tsp. baking powder ½ tsp. salt	4 qts. and 12 dumplings	135.0	804	3943	2310	7057	¼ cup and ⅙ dumpling	1.9	12	56	32

MEATS, FISH, AND POULTRY — *Continued*

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories
Meat Pie Pastry: 1½ cups flour ⅓ cup crisco ¼ tsp. baking powder 1 tsp. salt Filling: ½ lb. beef rump 5 medium potatoes ½ lb. carrots 2 large) ¼ oz. salt pork 1 small onion 3 tbsp. cornstarch 1 tbsp. butter Seasonings	Pie 9 in. diam. 3½ in. deep or 8 large servings	52.0	320	1314	1416	3050	¼ serving	1.7	10	43	47

POULTRY STUFFING 2 cups soft bread crumbs 2 tbsp. melted butter ¼ cup milk Seasonings	1 cup	5.0	58	300	266	624	⅙ cup	0.8	9	48	43
SALMON LOAF 1 cup salmon ½ cup bread crumbs 1 egg 1 tsp. butter Seasonings	1½ cups	11.2	205	288	57	550	¼ cup	2.1	37	52	11
STUFFED BEEF HEART 1 beef heart (3 lb.) 9 oz. salt pork 6 oz. bread crumbs ¼ cup flour Seasonings	1 heart and gravy	48.0	940	2810	468	4218	Slice 2½ in. × 2½ in. × ¼ in. and 1 tbsp. gravy	1.0	21	68	11

MEATS, FISH, AND POULTRY — *Continued*

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories
STUFFED STEAK 2 lb. lean steak 2 oz. suet 4 oz. bread crumbs Seasonings	Roll 6 in. or 7 in. long 3 in. diam.	36.0	800	1051	256	2107	Slice 3 in. diam. $\frac{1}{3}$ in. thick	1.7	39	49	12
SWISS STEAK 1 lb. lean beef round $\frac{1}{2}$ cup flour 2 tbsp. drippings 1 slice onion 1 tbsp. vinegar Seasonings	Piece $4\frac{1}{2}$ in. × 7 in. × 1 in.	15.0	418	585	212	1215	Piece 4 in. × 1 in. × $\frac{5}{8}$ in.	1.2	35	48	17
TUNNY FISH À LA NEWBURG 2 cups tunny fish 3 tbsp. butter $1\frac{1}{2}$ tsp. flour 1 tsp. lemon juice	2 cups	16.0	318	538	37	893	$\frac{1}{4}$ cup (scant)	1.8	36	60	4

2 egg yolks ½ cup skim milk Seasonings											
Veal Cutlets 1⅛ lb. veal (trimmed) 2 eggs 4 tbsp. butter 6 tbsp. flour 1 cup bread crumbs 3 cups water Seasonings	6 servings	33.8	512	875	310	1697	⅖ serving	2.0	30	52	18

PIES

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories
Apple Pie 4 apples $\frac{1}{2}$ cup sugar Water Plain pastry for 2 crusts	Pie 9 in. diam.	28.0	64	744	1022	1830	Sector $1\frac{1}{2}$ in. at circumference	1.6	3	41	56
Cranberry Pie 2 cups cranberries 1 cup sugar $\frac{1}{3}$ cup water Plain pastry for undercrust and strips over top	Pie 8 in. diam.	21.2	28	266	1168	1462	Sector $1\frac{3}{4}$ in. at circumference	1.4	2	18	80
Cream Pie with Meringue 2 cups milk 5 tbsp. flour $\frac{1}{2}$ cup sugar	Pie 10 in. diam.	25.8	163	594	840	1597	Sector $1\frac{9}{10}$ in. at circumference	1.6	10	37	53

2 eggs Flavoring Plain pastry for undercrust											
LEMON MERINGUE PIE 3 eggs $1\frac{1}{2}$ cups sugar 2 tbsp. flour 3 tbsp. powdered sugar 2 cups water Juice 2 lemons Plain pastry for undercrust	Pie 9 in. diam.	27.0	140	729	1831	2700	Sector 1 in. at circumference	1.0	5	27	68
PLAIN PASTRY $1\frac{1}{4}$ cups flour 3 tbsp. lard 3 tbsp. butter $\frac{1}{2}$ tsp. salt Water	3 crusts 9 in. diam.	10.2 (uncooked) 8.5 (cooked)	64	653	420	1137	$\frac{1}{4}$ of 1 crust 9 in. diam.	0.9 (uncooked) 0.7 (cooked)	6	58	36

PIES — *Continued*

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories
Raisin and Cranberry Pie 1 cup cranberries 1 cup raisins 1 cup sugar 1 tbsp. flour 1 cup water Plain pastry for 2 crusts	Pie 8 in. diam.	25.0	84	702	1736	2522	Sector 1 in. at circumference	1.0	3	27	70
Rhubarb Pie $2\frac{1}{4}$ cups rhubarb $1\frac{1}{6}$ cups sugar 1 egg $2\frac{1}{4}$ tbsp. flour Plain pastry for 2 crusts	Pie 9 in. diam.	31.2	92	326	1384	1802	Sector $1\frac{3}{5}$ in. at circumference	1.7	5	18	77

SQUASH PIE $1\frac{1}{2}$ cups cooked squash 2 eggs $\frac{2}{3}$ cup brown sugar 2 tbsp. molasses $1\frac{1}{2}$ cups skim milk Plain pastry for undercrust	Pie 9 in. diam.	25.0	132	357	907	1396	Sector 2 in. at circumference	1.8	10	25	65

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories
Banana Salad 4 bananas 1 tbsp. lemon juice 8 lettuce leaves ½ cup chopped peanuts ¼ cup boiled dressing	8 servings	23.2	105	317	459	881	1 small serving	2.6	12	36	52
Boiled Salad Dressing 2 egg yolks ½ tbsp. flour 1½ tbsp. sugar 1½ tbsp. melted butter ¾ cup milk ¼ cup vinegar Seasonings	1⅛ cups	13.0	47	292	123	462	¼ cup	2.8	10	64	26

Cheese and Pineapple Salad ½ head lettuce 6 slices canned pineapple 1 cream cheese 6 tbsp. French dressing	6 servings	22.4	121	754	440	1315	½ serving	1.7	9	58	33
Chicken Salad 1 cup cooked chicken 1 cup celery 8 lettuce leaves 4 tbsp. French dressing 4 tbsp. mayonnaise dressing	8 servings	14.1	112	783	20	915	1 small serving	1.6	12	86	2
Cold Slaw 2 cups shredded cabbage ¼ cup thick cream 1½ tbsp. vinegar Seasonings	2½ cups	7.2	15	202	42	259	1 cup	2.8	6	78	16

SALADS AND DRESSINGS — *Continued*

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories
Egg Salad 2 eggs 4 leaves lettuce $2\frac{3}{4}$ tbsp. mayonnaise	2 servings	6.6	65	395	4	464	$\frac{2}{5}$ serving	1.4	14	85	1
French Dressing 4 tbsp. olive oil 2 tbsp. vinegar Seasonings	6 tbsp.	2.5	—	400	—	400	$1\frac{1}{2}$ tbsp.	0.6	—	100	—
Fruit Salad $\frac{3}{4}$ lb. grapes 3 small oranges 1 small banana 24 walnuts 9 leaves lettuce 1 cup mayonnaise dressing	6 cups	36.8	80	1780	515	2375	$\frac{1}{4}$ cup fruit and $\frac{1}{2}$ tbsp. mayonnaise	1.5	3	75	22

LETTUCE SALAD WITH FRENCH DRESSING 1 head lettuce 6 tbsp. French dressing	9 servings	11.0	13	907	30	950	1 small serving	1.2	1	95	4
MAYONNAISE DRESSING 1 egg yolk 1 tsp. sugar 1 tbsp. lemon juice 1 tbsp. vinegar $\frac{3}{4}$ cup olive oil Seasonings	$1\frac{1}{8}$ cups	8.8	12	1740	41	1793	1 tbsp.	0.5	1	97	2
POTATO SALAD 1 large potato 6 small leaves lettuce $2\frac{1}{2}$ tbsp. mayonnaise	2 servings	7.3	14	282	124	420	$\frac{1}{2}$ serving	1.7	3	68	29
SARDINE SALAD 5 sardines 2 egg yolks 1 egg white 2 leaves lettuce 1 tsp. mayonnaise	1 large serving	3.5	85	195	30	310	$\frac{1}{3}$ serving	1.1	27	63	10

SALADS AND DRESSING — *Continued*

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories
Tomato and Cucumber Salad 6 slices cucumber 3 slices tomato 3 leaves lettuce 1½ tbsp. mayonnaise	1 serving	3.7	8	149	28	185	⅝ serving	2.0	4	81	15
Tomato and Lettuce Salad 4 medium tomatoes 1 head lettuce ⅔ cup mayonnaise	6 servings	32.0	38	999	125	1162	½ serving	2.7	3	86	11
Waldorf Salad 6 walnut halves ½ medium apple ¼ cup cut celery 1 large leaf lettuce 1½ tbsp. mayonnaise	1 large serving	3.3	11	195	52	258	⅖ serving	1.2	4	76	20

SAUCES AND FILLINGS

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories
BROWN SAUCE 2 tbsp. butter ½ slice onion 3 tbsp. flour 1 cup brown stock Seasonings	1⅙ cups	7.8	32	112	84	228	½ cup	3.4	14	49	37
BROWN SUGAR SAUCE ½ cup brown sugar ½ tbsp. cornstarch 1 cup water 1 tsp. vinegar	1 cup (very full)	9.9	—	—	330	330	5 tbsp.	3.0	—	—	100
CHARLOTTE RUSSE FILLING 1 cup thick cream ½ cup skim milk ½ tsp. gelatin ¼ cup sugar 4 tbsp. water	2½ cups	17.2	44	879	254	1177	⅕ cup	1.5	4	74	22

SAUCES AND FILLINGS — *Continued*

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories
CREAM FILLING I ¾ cup sugar ¼ cup flour 2 eggs 2 cups milk 1 tsp. vanilla	2½ cups	22.7	130	293	812	1235	3⅓ tbsp.	1.8	10	24	66
CREAM FILLING II 1 cup thick cream ⅓ cup milk 1 egg white ⅓ cup sugar 1 tsp. vanilla	3 cups	14.6	56	909	205	1170	¼ cup	1.2	5	77	18
CREAM SAUCE ¾ cup thick cream ¼ cup skim milk ⅓ cup powdered sugar 1 tsp. vanilla	1½ cups	10.0	22	595	256	873	⅙ cup	1.1	3	68	29

HARD SAUCE $\frac{1}{3}$ cup butter $\frac{2}{3}$ cup powdered sugar $\frac{1}{3}$ tsp. lemon extract $\frac{2}{3}$ tsp. vanilla	$\frac{3}{4}$ cup	7.4	3	545	555	1103	1 tbsp.	0.7	—	50	50
LEMON SAUCE $\frac{1}{2}$ cup sugar 1 cup water 2 tbsp. cornstarch 2 tbsp. butter $1\frac{1}{2}$ tbsp. lemon juice	$\frac{5}{6}$ cup	10.7	1	205	478	684	$\frac{1}{8}$ cup	1.5	—	30	70
TOMATO SAUCE 1 cup tomato juice 2 tbsp. flour 2 tbsp. butter $\frac{1}{2}$ onion 1 pepper corn Salt	1 cup	8.3	18	230	84	332	5 tbsp.	2.5	5	70	25
WHITE SAUCE 1 cup milk 2 tbsp. flour 2 tbsp. butter $\frac{1}{4}$ tsp. salt	1 cup	10.0	38	286	92	416	$\frac{1}{4}$ cup	2.4	8	70	22

SOUPS

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories
CLEAR TOMATO SOUP 2 cups tomato juice 2 cups water 2 tsp. sugar 2 tbsp. butter 3 tbsp. flour Soda and seasonings	4 cups	32.0	33	210	192	435	1 cup (scant)	7.4	8	48	44
CORN CHOWDER 1 cup canned corn 2 cups potatoes 8 soda crackers 2 cups milk $1\frac{1}{2}$ tbsp. butter $1\frac{1}{2}$ oz. salt pork Seasonings	5 cups	41.7	144	540	560	1244	$\frac{2}{5}$ cup	3.3	12	43	45

CREAM OF ASPARAGUS SOUP 1 can asparagus 1 bouillon cube 4 cups milk 4 tbsp. butter 5 tbsp. flour 2 eggs Seasonings	2 qt.	60.0	250	845	415	1510	½ cup (scant)	4.0	17	56	27
CREAM OF BAKED BEAN SOUP 2 tbsp. butter 4 tbsp. flour 1⅓ cups milk 1 cup bean pulp 1⅓ cups water Seasonings	4½ cups	21.5	120	372	332	824	½ cup	2.6	15	45	40
CREAM OF CELERY SOUP 2 bunches celery 4 tbsp. butter 6 tbsp. flour 3 cups milk Seasonings	5¼ cups	40.0	128	666	303	1097	½ cup	3.6	11	61	28

SOUPS — *Continued*

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories
Cream of Corn Soup 2 cups canned corn 2 cups milk 2 tbsp. butter 2 tbsp. flour 2 cups water Seasonings	5⅓ cups	44.7	137	439	587	1163	½ cup	3.9	12	38	50
Cream of Green Pea Soup 1½ cups peas 1 cup milk 1 cup water 1 tbsp. flour 1 tbsp. butter Seasonings	3 cups	24.0	72	207	176	455	⅔ cup	5.2	16	46	38

CREAM OF PEANUT BUTTER SOUP 1 cup milk 1½ tbsp. peanut butter 1½ tbsp. flour Seasonings	1⅛ cups	9.8	68	200	102	370	⅓ cup (scant)	2.6	18	54	28
CREAM OF SPINACH SOUP 4 cups milk 2 tbsp. butter 2½ tbsp. flour 1 cup cooked spinach Seasonings	5½ cups	42.0	153	554	278	985	⅗ cup	4.2	16	56	28
CREAM OF TOMATO SOUP 2 cups canned tomatoes 2 tsp. sugar 1 qt. milk 4 tbsp. flour ⅓ cup butter ⅙ medium onion Soda and seasonings	5⅓ cups	47.6	165	927	388	1480	⅜ cup	3.2	11	63	26

SOUPS — *Continued*

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories
Lentil Soup 2 tbsp. lentils (uncooked) 1½ tbsp. flour ½ tbsp. butter 1 tsp. sugar ½ tsp. salt 2 cups water Seasonings	2 cups	18.0	34	54	112	200	1 cup	9.0	17	27	56
Lentil and Tomato Soup ½ cup lentils (cooked) 1 cup tomatoes ¼ tsp. sugar ¼ tsp. salt ½ onion ¼ tsp. lemon rind 2 cups water Seasonings	3 cups	24.2	104	12	256	372	⅚ cup	6.7	28	3	69

OYSTER STEW I 1 cup (12) oysters 2 soda crackers 1½ tbsp. butter 1 cup milk Seasonings	2 cups	16.5	85	270	109	464	½ cup (scant)	3.5	18	58	24
OYSTER STEW II 18 oysters 1⅓ cups oyster liquor 5 cups milk 4 tbsp. butter Seasonings	7 cups	64.0	224	862	274	1360	½ cup (large)	4.7	16	63	21
POTATO SOUP 3 cups milk 3 medium potatoes 1 slice onion ½ tbsp. butter 1 tbsp. flour Seasonings	4 cups	36.0	126	324	402	852	½ cup (scant)	4.2	15	38	47
SPLIT PEA SOUP ½ cup split peas 1 tsp. flour 2 cups water Seasonings	2½ cups	23.0	100	9	272	381	⅗ cup	6.0	26	2	72

VEGETABLES

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories
ASPARAGUS ON TOAST 1 can (20 stalks) asparagus 4 slices toast 1 cup white sauce	4 servings	30.8	92	309	277	678	$\frac{2}{3}$ serving	4.6	13	46	41
BAKED LENTILS $\frac{1}{2}$ cup dry lentils 1 tbsp. bread crumbs 2 tsp. butter $\frac{1}{4}$ small onion Water Seasonings	1 cup	7.0	107	86	252	445	$\frac{1}{4}$ cup (scant)	1.6	24	20	56
CORN À LA SOUTHERN 1 cup canned corn 1 egg $\frac{3}{4}$ tbsp. butter 1 cup milk Seasonings	2 cups	20.8	95	243	252	590	$\frac{1}{3}$ cup	3.4	16	41	43

Creamed Peas ¾ cup peas 5 tbsp. white sauce	1 cup	6.2	39	83	100	222	½ cup (scant)	2.7	18	37	45
Creamed Potatoes 2 cups potato cubes 2 tbsp. butter 2 tbsp. flour 1 cup milk ¼ tsp. salt	3⅙ cups	20.2	67	366	310	743	⅖ cup	2.7	9	50	41
Creamed Turnips 3 medium turnips ½ cup milk 1 tbsp. butter 1 tbsp. flour Seasonings	1½ cups	4.3	29	147	116	292	½ cup	1.4	10	50	40
Glazed Sweet Potatoes 6 sweet potatoes ¼ cup sugar ½ tbsp. butter	12 medium halves	34.3	70	107	1488	1665	1 small half potato	2.1	4	7	89

VEGETABLES — *Continued*

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories
Kidney Bean Stew ½ cup kidney beans ½ onion 1 tbsp. rice 2 small potatoes 2 cups canned tomatoes 1 tbsp. butter Seasonings	3¾ cups	36.0	189	130	411	730	½ cup	4.9	26	18	56
Lentil Meat Loaf ½ lb. round steak 1 cup cooked lentils 1 egg ¼ cup milk 4 tbsp. butter ¼ cup chopped walnuts ¼ cup bread crumbs ½ small onion	Loaf 2 in. × 3 in. × 5 in.	18.8	460	672	508	1640	Slice 1¾ in. × 2½ in. × ¾ in.	1.1	28	41	31

LIMA BEANS, BUTTERED 1 cup beans 1 tbsp. butter	$\frac{3}{4}$ cup	5.2	46	109	142	297	$\frac{1}{4}$ cup	1.7	16	36	48
MACARONI CROQUETTES 1 cup uncooked macaroni $2\frac{1}{2}$ tbsp. butter 1 cup milk 1 egg $\frac{1}{3}$ cup flour 4 tbsp. butter $1\frac{1}{2}$ cups bread crumbs	16 croquettes	25.0	208	898	904	2010	1 small croquette	1.2	10	45	45
MACARONI WITH TOMATO SAUCE 1 cup macaroni (uncooked) $1\frac{3}{4}$ cups tomatoes 3 tbsp. butter 3 tbsp. flour Seasonings	4 cups	33.0	97	318	490	905	5 tbsp.	3.6	10	36	54

VEGETABLES — *Continued*

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories
Mashed Potatoes 5 medium potatoes 3 tbsp. butter $\frac{1}{3}$ cup milk	$3\frac{1}{3}$ cups	21.8	50	330	310	690	$\frac{1}{2}$ cup (scant)	3.1	7	48	45
Nut Loaf 1 cup chopped walnuts 2 eggs 1 cup bread crumbs $\frac{2}{3}$ cup milk Seasonings	$2\frac{3}{4}$ cups	14.8	164	632	224	1020	$\frac{1}{4}$ cup	1.4	16	62	22
Scalloped Onions 4 onions (10 oz.) 1 cup milk 2 tbsp. flour 3 tbsp. butter $\frac{1}{4}$ cup bread crumbs	$2\frac{3}{4}$ cups	22.4	72	522	286	880	$\frac{1}{3}$ cup	2.5	8	59	33

SCALLOPED POTATOES 4 medium potatoes 1 tbsp. flour ½ tbsp. butter 1 cup milk 1 tsp. salt ⅛ tsp. pepper	4 cups	22.8	60	196	396	652	⅝ cup	3.5	9	30	61
SPINACH À LA CRÊME 2 lb. spinach 2 tbsp. butter ½ cup thick cream 1 tsp. sugar Seasonings	5½ cups	37.2	91	639	178	908	⅗ cup	4.1	10	70	20
SPINACH WITH EGG 2 cups finely chopped spinach 1 hard boiled egg 1 tbsp. butter Seasonings	2 cups	19.4	56	153	46	255	⅘ cup	7.6	22	60	18
STEWED MUSHROOMS ½ lb. mushrooms 3 tbsp. butter 1 tbsp. flour 1½ cups water	2½ cups	10.0	32	333	75	440	⅗ cup	2.3	8	75	17

VEGETABLES — *Continued*

	Food Value of Recipe						100-Calorie Portion				
	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories	Total Calories	Measure	Weight Oz. (cooked)	Protein Calories	Fat Calories	Carbo-hydrate Calories
Stuffed Peppers I 6 large peppers 1 cup stale bread crumbs $\frac{2}{3}$ cup brown sauce $\frac{1}{4}$ cup chopped mushrooms	6 peppers	25.4	95	85	360	540	1 pepper	4.7	17	16	67
Stuffed Peppers II 6 large peppers 2 cups boiled rice $\frac{3}{4}$ cup tomato 1 tbsp. butter 1 onion 1 tsp. salt	6 peppers	36.5	57	110	354	521	1 pepper	7.0	11	21	68
Stuffed Peppers III 6 large peppers $1\frac{1}{2}$ cups bread crumbs	6 peppers	33.9	220	738	396	1354	$\frac{2}{5}$ pepper	2.5	16	55	29

1½ cups chopped boiled ham Seasonings										
STUFFED TOMATO 1 tomato 1 tsp. butter ¼ tsp. chopped onion 2 tbsp. bread crumbs 1 tsp. chopped ham	1 tomato holding ¼ cup	4.0	13	45	42	100	1 tomato holding ¼ cup	4.0	13	45	42
TURKISH PILAF ½ cup raw rice 1 tbsp. butter 1 cup water 1¾ cups canned tomato Seasonings	5¼ cups	41.8	52	121	384	557	1 cup	7.5	9	22	69

TABLE IV

Fuel Values in Relation to Cost

A. Some Foods Costing Less than ¾ Cent per 100 Calories

Beans, baked, homemade
Beans, dried
Beans, Lima, dried
Bread
Butter (24 cents per pound)
Cottonseed oil
Cornmeal
Cornstarch
Corn syrup
Crackers, oyster
  soda
Farina
Flaked wheat
Flour
Gingerbread
Hominy
Lard
Lentils
Macaroni
Molasses
Oatmeal
Oats, rolled
Oleomargarine
Peas, dried
Pie crust
Pork, salt, fat
Rice, broken
Split pea soup
Suet
Sugar

B. Some Foods Costing ¾ to 1 Cent per 100 Calories

Apples, dried
Apple tapioca
Bacon (all fat eaten)
Baking powder biscuit
Butter (not over 32 cents per pound)
Cheese, American
Cheese straws
Chocolate cake
Chocolate cream candy
Chocolate drop cookies
Coconut caramels
Cookies, plain
Corned beef (fat eaten)
Corn flakes
Cornmeal-tapioca pudding
Cornstarch blanc mange
Cottage pudding
Cranberry pie
Currants, dried
Dates
Grapenuts
Irish stew with dumplings
Lemon ice
Lemon milk sherbet
Lemon sauce
Lentil stew
Macaroni and cheese
Macaroni croquettes
Mayonnaise dressing (cottonseed oil)
Meat pie
Milk (6 cents per quart)
Molasses cookies
Muffins
One egg cake
Peanut cookies
Penouche
Potato chips
Potato soup
Prunes
Prune pie

B. Some Foods Costing $\frac{3}{4}$ to 1 Cent per 100 Calories (*Cont'd*)

Raisin and cranberry pie
Raisins
Rhubarb pie
Shredded wheat biscuit
Steamed date pudding
Stuffed beef heart
Sugar cookies
Tapioca
White mountain icing

C. Some Foods Costing 1 to $1\frac{1}{2}$ Cents per 100 Calories

Apple pie
Apple sauce
Apple snow
Apricots, dried
Bananas
Butter (over 32 cents per pound)
Cabbage
Charlotte russe
Cheese, cream
Chestnuts
Chocolate
Chocolate blanc mange
Chocolate nut caramels
Cocoa
Codfish balls
Corn chowder
Cranberry sauce
Cream
Cream puffs
Custard, boiled
  cup
Dried beef
Eggs (under 25 cents per dozen)
Figs
Grapes
Lactose lemonade
Lentil meat loaf
Lentil and tomato soup
Lima bean soup
Mayonnaise dressing
Milk (7 to 13 cents per quart)
Mince pie
Old New England cornbread
Olive oil
Onions, scalloped
Peaches, dried
Peanuts
Peanut butter
Popovers
Pork sausage
Potatoes, Irish
Potatoes, sweet
Potato salad
Prune soufflé
Puffed rice
Rice with cheese and tomatoes (on toast)
Rhubarb
Snow pudding
Sponge cake
Tapioca cream
Tomato soup, cream of
Turnips
Vanilla ice cream
Waffles
Welsh rarebit
White sauce
Zwiebach

D. Some Foods Costing $1\frac{1}{2}$ to 2 Cents per 100 Calories

Beans, baked, canned
Beans, Lima, canned
Beans, string, fresh
Beef, flank
Beets, fresh
Blackberries, stewed

D. Some Foods Costing $1\frac{1}{2}$ to 2 Cents per 100 Calories (*cont'd*)

Boiled salad dressing
Buttermilk
Carrots, old
Cheese, cottage
  Neufchatel
Cheese soufflé
Codfish, salt
Corn, canned
Corn soup, cream of
Creamed eggs on toast
Creamed salmon on toast
Currant jelly
Eggnog
Eggs (25 to 36 cents per dozen)
French cream filling
French toast
Fruit salad
Lemon jelly
Lemon meringue pie
Macaroons
Maple syrup
Marguerites
Nut loaf
Onions
Parsnips
Peach ice cream
Peach tapioca
Pineapple, canned
Rice fondue
Rice pudding (with egg)
Spanish cream
Tomato sauce

E. Some Foods Costing 2 to 5 Cents per 100 Calories

Almonds
Apples, fresh
Asparagus soup, cream of
Beans, string, canned
Beef, lean round
Beef, loin
Blackberries
Carrots, young
Cauliflower
Cheese and pineapple salad
Chicken salad
Club sandwich
Corn, canned
Corn, green
Creamed chicken
Creamed dried beef
Egg salad
Fruit punch
Halibut
Ham
Lemonade
Lettuce and tomato salad
Oranges
Oyster stew
Pears, fresh
Sardine salad
Tomatoes
Waldorf salad
Walnuts, English

F. Some Foods Costing over 5 Cents per 100 Calories

Asparagus
Beefsteak, choice cuts
Celery
Chicken
Cod, fresh
Cranberries, fresh
Cucumbers
Gelatin

F. Some Foods Costing over 5 Cents per 100 Calories (*cont'd*)

Lettuce
Lobster
Mushrooms
Olives
Oysters, raw
Peaches, canned
Peas, canned
Pears, canned
Peppers, green
Pineapple, fresh
Salmon, canned
Sardines, canned (imported)
Scallops
Spinach
Veal, loin

TABLE V

Symonds's Table of Height and Weight for Men at Different Ages[1]

(Based on 74,162 accepted applicants for life insurance.)

Ages	15–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69
5 ft. 0 in.	120	125	128	131	133	134	134	134	131	
1 in.	122	126	129	131	134	136	136	136	134	
2 in.	124	128	131	133	136	138	138	138	137	
3 in.	127	131	134	136	139	141	141	141	140	140
4 in.	131	135	138	140	143	144	145	145	144	143
5 in.	134	138	141	143	146	147	149	149	148	147
6 in.	138	142	145	147	150	151	153	153	153	151
7 in.	142	147	150	152	155	156	158	158	158	156
8 in.	146	151	154	157	160	161	163	163	163	162
9 in.	150	155	159	162	165	166	167	168	168	168
10 in.	154	159	164	167	170	171	172	173	174	174
11 in.	159	164	169	173	175	177	177	178	180	180
6 ft. 0 in.	165	170	175	179	180	183	182	183	185	185
1 in.	170	177	181	185	186	189	188	189	189	189
2 in.	176	184	188	192	194	196	194	194	192	192
3 in.	181	190	195	200	203	204	201	198		

[1] *Medical Record*, Sept. 5, 1908.

TABLE VI

Symonds's Table of Height and Weight for Women at Different Ages[1]

(Based on 58,855 accepted applicants for life insurance.)

Ages	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64
4 ft. 11 in.	111	113	115	117	119	122	125	128	128	126
5 ft. 0 in.	113	114	117	119	122	125	128	130	131	129
1 in.	115	116	118	121	124	128	131	133	134	132
2 in.	117	118	120	123	127	132	134	137	137	136
3 in.	120	122	124	127	131	135	138	141	141	140
4 in.	123	125	127	130	134	138	142	145	145	144
5 in.	125	128	131	135	139	143	147	149	149	148
6 in.	128	132	135	137	143	146	151	153	153	152
7 in.	132	135	139	143	147	150	154	157	156	155
8 in.	136	140	143	147	151	155	158	161	161	160
9 in.	140	144	147	151	155	159	163	166	166	165
10 in.	144	147	151	155	159	163	167	170	170	169

[1] *McClure's Magazine*, Jan. 1909.

TABLE VII

Average Weight and Height of Boys at Different Ages[1]

The figures represent weight in pounds.

Ht. In.	5 Yr.	6 Yr.	7 Yr.	8 Yr.	9 Yr.	10 Yr.	11 Yr.	12 Yr.	13 Yr.	14 Yr.	15 Yr.	16 Yr.	17 Yr.	18 Yr.	19 Yr.	20 Yr.
39	35															
40	38	36														
41	39	39														
42	41	41														
43	42	42	42													
44	46	44	43													
45		46	46	45												
46		48	48	48												
47			49	50	50											
48			54	53	53	53										
49				54	55	55										
50				57	58	58										
51				59	60	60	61									
52					62	62	61	63								
53					62	65	65	67	67	67						
54					65	68	68	70	71	71						
55						69	71	75	75	76						
56						71	77	76	78	79	79					
57							77	79	80	82	82					
58							78	84	85	86	87					
59								84	86	90	91					
60								85	91	94	95	90				
61									98	97	99	96				
62									99	103	106	104	105			
63									100	107	112	112	110	118		
64										114	118	120	117	120	120	
65										122	119	122	122	120	126	125
66											121	125	125	126	129	139
67											128	129	128	131	134	132
68											133	133	130	136	136	136
69											134	136	139	139	139	139
70											136	140	143	143	144	145

[1] See footnote to Table VIII.

TABLE VIII

Average Weight and Height of Girls at Different Ages [1]

The figures represent weight in pounds.

Ht. In.	5 Yr.	6 Yr.	7 Yr.	8 Yr.	9 Yr.	10 Yr.	11 Yr.	12 Yr.	13 Yr.	14 Yr.	15 Yr.	16 Yr.	17 Yr.	18 Yr.	19 Yr.	20 Yr.
39	34															
40	37	35														
41	38	37														
42	41	39	39													
43	41	41	42													
44	45	43	44	42												
45		45	45	45												
46		48	47	47												
47			50	49	49											
48				51	51											
49				53	53	54										
50				56	56	57										
51					59	58	60									
52					63	62	62	63								
53						64	63	66	65							
54						69	68	69	68							
55							70	71	73							
56							75	75	76	78						
57								78	80	83						
58								83	86	88	89					
59								88	89	93	97	100				
60								94	94	96	100	104	109	103	99	99
61									99	100	102	109	109	106	105	111
62									104	104	106	111	110	107	111	114
63										107	109	116	110	112	113	114
64										112	118	116	117	114	119	115
65										114	118	121	125	120	123	125

[1] Taken from the Ninth Yearbook of the National Society for the Study of Education, Part I, Health and Education, by Thomas Denison Wood, A.M., M.D., 1910, with the permission of the author.

TABLE IX

Average Weights of Children from Birth to the Fifth Year

Age	Weight in Pounds
At birth	7½
1 month	9
2 months	11¼
3 months	12½
4 months	13¾
6 months	16¼
8 months	18¼
10 months	19¾
1 year	21
1 year, 3 months	22
1 year, 6 months	22½
1 year, 9 months	24
2 years, boys	26
2 years, girls	25½
3 years, boys	31¼
3 years, girls	30
4 years, boys	35
4 years, girls	34

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