Feeding the family / by Mary Swartz Rose.

Contributors

Rose, Mary Swartz, 1874-1941.

Publication/Creation

New York : Macmillan, 1929.

Persistent URL

https://wellcomecollection.org/works/zaw8str7

License and attribution

Conditions of use: it is possible this item is protected by copyright and/or related rights. You are free to use this item in any way that is permitted by the copyright and related rights legislation that applies to your use. For other uses you need to obtain permission from the rights-holder(s).

Wellcome Collection
183 Euston Road
London NW1 2BE UK
T +44 (0)20 7611 8722
E library@wellcomecollection.org
https://wellcomecollection.org

FEEDING THE FAMILY

MARY SWARTZ ROSE

THE ROYAL SOCIETY
for the Promotion
OF HEALTH
LIBRARY

Formerly

Presented by

Messrs Macmillan & Co

August 1930

22101726343

Med
K12585

FEEDING THE FAMILY

THE MACMILLAN COMPANY
NEW YORK · BOSTON · CHICAGO · DALLAS
ATLANTA · SAN FRANCISCO

MACMILLAN & CO., LIMITED
LONDON · BOMBAY · CALCUTTA
MELBOURNE

THE MACMILLAN COMPANY
OF CANADA, LIMITED
TORONTO

Digitized by the Internet Archive
in 2017 with funding from
Wellcome Library

https://archive.org/details/b29807803

© *H. Armstrong Roberts.*

"The Welfare of the Family Is Largely in the Hands of the One Who Provides the Three Meals a Day."

FEEDING THE FAMILY

By MARY SWARTZ ROSE, Ph.D.

PROFESSOR OF NUTRITION, TEACHERS COLLEGE
COLUMBIA UNIVERSITY

THIRD EDITION 21/-

NEW YORK
THE MACMILLAN COMPANY
1929

COPYRIGHT, 1916, 1924, AND 1929,
BY THE MACMILLAN COMPANY.

All rights reserved, including
the right of reproduction
in whole or in
part in any
form

Set up and electrotyped. Published October, 1916.
Revised edition. Published June, 1924. Reprinted January, July, December, 1925; September, 1926; January, 1927; March, 1928.
Third edition. Published September, 1929.

WELLCOME INSTITUTE LIBRARY
Coll. welMOmec
Call No. QU

1728768

· PRINTED IN THE UNITED STATES OF AMERICA ·

PREFACE TO THE THIRD EDITION

THE purpose of this book is to help those who regard their own health and that of their families as worthy of their best efforts, and who recognize that while many things contribute to health — sleep, fresh air and exercise, for instance — the most fundamental consideration is food. So many kinds of food are displayed in our markets, so many new commercial food products insist on their "vital" importance, so many placards offer advice about what to eat, that a guide book to good nutrition seems quite essential for the twentieth century family.

The general plan is to devote separate chapters to the food needs of the different members of a typical family group — fathers and mothers, grandparents, young men and women, growing children of various ages and babies — and then to consider the food problems of the family group as seen by the housewife who has the task of selecting the food, preparing the meals, and seeing to it that each one eats what is best for him. Since there are, unfortunately, emergencies of illness some time or other in most families, a chapter on feeding the sick has been included. There has been, however, no attempt to make this comprehensive or detailed, because the sick should be fed under a physician's guidance. The writer believes that the home feeding of the sick will be more successful if there is a clear understanding of the purposes of the diet and if a few suggestions about foods and menus can be referred to in the time of stress.

In the years which have elapsed since the first appearance of this book, there has been an increasing application of our

knowledge of the importance of a carefully chosen diet for child development and the maintenance of vigor in the adult. This has come about through the accumulation of evidence that growth is directly influenced by food and that a diet which may be adequate for the growth of the young to normal maturity may not be entirely satisfactory for the mother during the periods in which the child is directly dependent upon her for its nourishment. Both before and after birth mineral elements and vitamins greatly affect the development of the child and the vigor of his tissues. To a considerable degree they influence the ability of the mother to furnish milk adequate for growth during the critical first year. As a result of such knowledge we have increased emphasis upon the daily use of rich sources of vitamins A and D, such as egg yolk and cod liver oil, and of vitamins B and C, such as orange juice and tomato juice or their equivalents, at all times when growth is involved. Also we have now cognizance of the fact that an adult as well as a growing child will profit by a diet which is of better quality than demanded for mere maintenance; and the hope that by more liberal use of milk and green vegetables we may improve the health and increase the resistance of all the members of the family to bacterial infections of certain sorts which, while not always leading to specific diseases, do decrease the vigor of the tissues and often pave the way for more serious troubles.

Because this book has always recommended diets of this type no radical changes have been necessary in this edition, but every food plan and dietary has been scrutinized with a view to possible improvement without undue increase of cost, and a number of new food plans and dietaries have been added to exemplify more clearly the kind of food selection which will contribute to the health of every person in the family group.

To aid in quick estimations of food values the tables in the Appendix have been extensively revised, and new foods and new recipes have been added. The tables of 100-calorie por-

tions and of calories in common measures have been combined and arranged alphabetically for readier reference, and the dietary recipes have also been put in more convenient form.

The table of vitamin values in foods has been completely revised and changes in cost have been made where the former figures did not seem as representative as it is possible for such to be, considering the inevitable difference in market conditions in different localities.

Many of the young people who have been fed according to the suggestions made in these pages will soon be having families of their own and it is the author's hope that this edition may serve them as the former ones have served their parents. To the many friends in this country and abroad whose kind expressions of appreciation have been the inspiration for this third edition, the author wishes to express her sincere thanks, as well as to Professor Henry C. Sherman for his valuable advice and criticism and to those esteemed co-workers who have from time to time assisted in the preparation of the manuscript.

M. S. R.

April 17, 1929.

TABLE OF CONTENTS

PAGE

PREFACE v

LIST OF FOOD PLANS AND DIETARIES xiii

LIST OF ILLUSTRATIONS xvii

CHAPTER

I. THE SIGNIFICANCE OF FOOD 1

Introduction 1
The body a working machine 4
Fuel for the human machine 4
Sources of body fuel 5
Measurement of the fuel value of foods 7
Measurement of the fuel requirements of the body 11
The body a builder of its own tissues 14
How food supplies the material for body building . . . 15
Balance wheels for the human machine 23
The ash constituents 23
Water 24
The vitamins 24

II. CARE OF THE DIGESTIVE MECHANISM 35

The part of the mouth in good digestion 37
The part of the stomach in good digestion 39
Good digestion in the small intestine 43
Good digestion in the large intestine 44
Diet for constipation 46

III. FOOD FOR THE ADULT MAN 50

Energy requirement of the adult man 51
The sedentary man 51
The muscularly active man 58
Underweight men 64
Overweight men 72
Building material for the adult man 79
The protein or nitrogen requirement 79
Requirements for ash constituents 85
Vitamin requirements 88

CHAPTER		PAGE
IV.	Food for the Adult Woman	90
	Energy requirement	90
	Overweight women	99
	Underweight women	104
	The protein, ash, and vitamin requirements	110
	Food for the prospective mother	110
	Food for the nursing mother	117
V.	Food for the Baby	123
	Preparation for weaning	129
	Care of the baby's milk	132
	Daily food program for breast-fed baby	134
	Artificial feeding	136
	Energy requirement	137
	The protein requirement	138
	The ash requirements	138
	The vitamin requirements	139
	Emergency infant foods	145
VI.	Food for the Two-year-old Child	147
VII.	Food for Children Three and Four Years Old	157
VIII.	Food for Children Five to Seven Years Old	167
IX.	Food for Children Eight to Twelve Years Old	179
X.	Food in Adolescence and Youth	194
XI.	Food after Fifty	214
XII.	Food for the Family Group: Menus	224
	The construction of the menu	226
	Types of meal plans	226
	Food combinations from the scientific standpoint	229
	Food combinations from the esthetic standpoint	235
	Summer and winter menus	238
XIII.	Food for the Family Group: Cost of Food	246
	Factors in market cost	247
	Market cost and fuel value	250
	Cost of proteins, ash constituents, and vitamins	253
XIV.	Food for the Family Group: Food Plans and Dietaries	266
	Planning a family dietary	267
	Essentials in the family dietary	268
	Planning the menu	270
	Calculation of the dietary	273

CHAPTER PAGE

Cost of the family dietary 278
Reducing the cost of the dietary 280
Dietaries costing less than one and three-fourths cents per 100 Calories 286
Family dietaries at the lowest cost 291

XV. Food for the Sick and Convalescent 308

Energy requirements in sickness 310
Fluid diet 311
Soft or semi-solid diet 315
Light or convalescent diet 316
Diet in minor illness 318
Acute indigestion 319
Intestinal putrefaction 320
Diet in fevers 323
Diet in tuberculosis 328
Diet in diabetes 335

APPENDIX

TABLE

I. 100-Calorie Portions and Calories in Common Measures . 348
II. Dietary Recipes 384
III. Vitamin Values of Foods 432
IV. Fuel Values in Relation to Cost 436
V. Height and Weight of Men at Different Ages . . 439
VI. Height and Weight of Women at Different Ages . . 439
VII. Height and Weight of Boys of School Age . . . 440
VIII. Height and Weight of Girls of School Age . . . 441
IX. Height and Weight of Boys from Birth to School Age . 442
X. Height and Weight of Girls from Birth to School Age . 443

Index 445

LIST OF FOOD PLANS AND DIETARIES

PAGE

1. FOR A SEDENTARY MAN:
   - A day's food plan costing 2½ to 3 cents per 100 Calories . . 53
   - A dietary costing 2½ to 3 cents per 100 Calories 55
   - A day's food plan costing 1½ to 1¾ cents per 100 Calories . . 56
   - A dietary costing 1½ to 1¾ cents per 100 Calories 57

2. FOR A MAN DOING SEVERE MUSCULAR WORK:
   - A day's food plan costing 1¼ to 1¾ cents per 100 Calories . . 60
   - A dietary costing 1¼ to 1½ cents per 100 Calories 61
   - A dietary costing 1½ to 1¾ cents per 100 Calories . . . 62

3. FOR A MODERATELY ACTIVE MAN:
   - A day's food plan costing 1¾ to 2 cents per 100 Calories . . 63
   - A dietary costing 2 cents per 100 Calories 65

4. FOR AN UNDERWEIGHT MAN:
   - A day's food plan costing 2½ to 3¼ cents per 100 Calories . . 68
   - A fattening dietary costing 2¾ to 3 cents per 100 Calories . . 69
   - A day's food plan costing 1½ to 1¾ cents per 100 Calories . . 70
   - A fattening dietary costing 1½ to 1¾ cents per 100 Calories . . 71

5. FOR AN OVERWEIGHT MAN:
   - A day's food plan costing 2¾ to 3½ cents per 100 Calories . . 75
   - A reducing dietary costing 3 cents per 100 Calories . . . 76
   - A day's food plan costing 2½ to 3 cents per 100 Calories . . 77
   - A reducing dietary costing 2 to 2½ cents per 100 Calories . . 78

6. FOR AN ACTIVE WOMAN:
   - A day's food plan costing 2½ to 3 cents per 100 Calories . . 93
   - A dietary costing 2½ to 3 cents per 100 Calories 94
   - A dietary costing 1¾ to 2 cents per 100 Calories 95

7. FOR A SEDENTARY WOMAN:
   - A day's food plan costing 2½ to 3½ cents per 100 Calories . . 96
   - A dietary costing 2½ to 3½ cents per 100 Calories 97
   - A dietary costing 1¾ to 2¼ cents per 100 Calories 98

PAGE

8. For an Overweight Woman:
A day's food plan costing 2½ to 3½ cents per 100 Calories . . 102
A reducing dietary costing 2½ to 3½ cents per 100 Calories . . 103

9. For an Underweight Woman:
A day's food plan costing 2½ to 3 cents per 100 Calories . . 106
A fattening dietary costing 2½ to 3 cents per 100 Calories . . 107
A day's food plan costing 1½ to 1¾ cents per 100 Calories . . 108
A fattening dietary costing 1½ to 1¾ cents per 100 Calories . . 109

10. For a Nursing Mother Doing Moderate Muscular Work:
A day's food plan costing 1½ to 1¾ cents per 100 Calories . . 116
A dietary costing 1½ to 1¾ cents per 100 Calories 121

11. For a Child 1½ to 2 Years Old:
A day's food plan costing 2 to 2½ cents per 100 Calories . . 155
A dietary costing 2¼ cents per 100 Calories 156

12. For a Child 3 to 4 Years Old:
A day's food plan costing 2 to 2½ cents per 100 Calories . . 165
A dietary costing 2¼ cents per 100 Calories 166

13. For a Child 5 to 7 Years Old:
A day's food plan costing 2 to 2½ cents per 100 Calories . . 177
A dietary costing 2 to 2¼ cents per 100 Calories 178

14. For a Child 8 to 10 Years Old:
A day's food plan costing 1¾ to 2½ cents per 100 Calories . . 191
A dietary for a child 8 years old costing 1¾ to 2¼ cents per 100 Calories 192
A dietary for a child 10 years old costing 1¾ to 2¼ cents per 100 Calories 193

15. For Boys and Girls 14 to 16 Years Old:
A day's food plan costing 1¾ to 2 cents per 100 Calories . . 201
A dietary for a 16-year-old boy costing 1¾ to 2¼ cents per 100 Calories 202
A dietary for a 16-year-old girl costing 2 to 2½ cents per 100 Calories 203

16. For an Elderly Person:
A day's food plan 220

17. For an Aged Person:
A day's food plan 221
A dietary 222

PAGE

18. For the Family Group:

A dietary costing $2\frac{1}{4}$ to $2\frac{3}{4}$ cents per 100 Calories 274
A dietary costing 2 to $2\frac{1}{4}$ cents per 100 Calories 282
A dietary costing $1\frac{3}{4}$ cents per 100 Calories 293
A dietary costing $1\frac{3}{4}$ cents per 100 Calories 298

19. For a Convalescent:

A general food plan 317

20. For Typhoid Fever:

Modified milk diets 325
A mixed fluid diet 326
A soft diet 327

21. For Tuberculosis:

A day's food plan for a moderate-priced diet 330
A moderate-priced dietary 331
A low-priced dietary 332
A plan for low-priced diets 333

22. For Diabetes:

A dietary yielding 40 grams protein, 130 grams fat, 50 grams carbohydrate 342

23. For Diabetes:

A dietary yielding 50 grams protein, 170 grams fat, 70 grams carbohydrate 343

24. For Diabetes:

A dietary yielding 65 grams protein, 200 grams fat, 80 grams carbohydrate 344

LIST OF ILLUSTRATIONS

"The welfare of the family is largely in the hands of the one who provides the three meals a day" . . . . . *Frontispiece*

PAGE

A respiration calorimeter for measuring the energy requirement of babies . . . . . *facing* 13

Foods containing approximately the same amount of vitamin A . . . . . *facing* 26

Foods containing approximately the same amount of vitamin B (B + G) . . . . . *facing* 28

Foods containing approximately the same amount of vitamin C . . . . . *facing* 30

100-calorie portions of fruits . . . . . *facing* 52

"The baby's sole business is to grow" . . . . . *facing* 132

"It often takes time and patience to establish essential foods in the child's diet, but the earlier one begins the easier it will be" *facing* 150

"Children, like flowers, thrive best when they have, beside the right kind of nourishing food and care, plenty of sunshine and out-of-door air" . . . . . *facing* 160

"Regular meals, suitable food, happy associations, and interesting things to do are essential to child health" . . . *facing* 176

"You cannot fill the head when the stomach is empty" *facing* 186

"Sunshine and rest are important aids to the utilization of food" . . . . . *facing* 196

100-calorie portions of salads and salad accessories . *facing* 206

"With a little knowledge it is not necessary to have elaborate cookery or many kinds of foods to keep a man well-nourished" *facing* 216

Differences in the nutritive value of proteins 257

100-calorie portions of beverages . . . . . *facing* 311

"It is the reflection of good physical health in a child's character which makes the effort to improve his health most worth while" . . . . . *facing* 316

A traveler's dietary scale set up and in case . . . *facing* 335

FEEDING THE FAMILY

CHAPTER I

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 to another's shoulders. Menus may be written, but they seldom fulfill 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 entrusted 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 power declines. 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, rooted in ancient tribal or religious taboos, or the result of misinterpreted experiences. There are people to-day who solemnly affirm that fish and milk are a dangerous combination, based on who knows what unhappy coincidence! If an unusual food has been eaten at the same time as an onset of acute illness, the food often gets the blame, though the evidence is wholly circumstantial. The coincidence of the brain and fish both having rather high percentages of phosphorus has at least given us the pungent advice addressed to the young man who wanted some quantitative dietetic instruction as to the amount of fish needed to develop his brain — "Eat a whale!"

In the light of modern scientific research these traditions and false impressions give way to exact knowledge of what food does for the body and how it does it. By patient steps, through Lavoisier's brilliant insight into the relation between the intake of oxygen 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; Rubner's accurate researches establishing definite relationship between food consumption and body activity; Eijkmann's demonstration that a specific disease may be produced by one diet and cured by another; Hopkins's brilliant conception of subtle elements in food regulating nutritional processes; Osborne and Mendel's control of growth through changes in the quality of a single chemical component of the dietary; McCollum's demonstration that old age may be deferred through a well-assorted diet — 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 the power to develop can be analyzed and a young animal made to grow or be 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 power 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 bring good foods into disrepute. Meals of many kinds are found to be good, and simplicity may

be cultivated without fear of dietary deficiency when one knows the A, B, C of good nutrition.

The Body a Working Machine

In considering the part which food plays in human life, one of the most important conceptions 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 one is lying asleep or perfectly quiet, the heart goes on with 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 moves 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 somewhat 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 kinds of material which serve as body fuel, *protein*, *fat*, and *carbohydrate*, are found variously distributed in all sorts 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 proteins from the vegetable proteins, 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]

[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 and II, 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.

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 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. 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 incomplete 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.

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

But, as we have seen, most of our foods are mixtures of these substances in varying proportions, and almost always we find associated with the energy-yielding substances water, mineral matter and vitamins, 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, composed largely of 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 per pound; 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 fuel 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
Tapioca	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 10 cents a pound being nearly 12 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 many calories 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	$\frac{3}{4}$–$1\frac{1}{4}$ cups
Milk	$\frac{5}{8}$ cup, whole; $1\frac{1}{8}$ cups, skim
Cream	$\frac{1}{4}$ cup, thin; $1\frac{2}{3}$ tablespoons, very thick
Butter, olive oil, or other fat	1 tablespoon
Bread	1 slice 3 in. × $3\frac{1}{2}$ 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; $1\frac{1}{2}$ large fig
Eggs	1 exceptionally large; $1\frac{1}{3}$ medium
Meat (beef, lamb, mutton, veal, chicken)	About 2 ounces of cooked lean meat
Bacon (cooked crisp)	About $\frac{1}{2}$ ounce (4 small thin slices)
Potatoes	1 medium
Sugar	2 tablespoons granulated; $3\frac{1}{2}$ "full-size" lumps
Cocoa (made with milk)	$\frac{2}{3}$ cup
Cream of bean soup	$\frac{1}{2}$ cup
Macaroni and cheese	$\frac{1}{2}$ cup
Rice pudding	$\frac{1}{2}$ cup
Ice cream (made with thin cream)	$\frac{1}{4}$ cup
Milk sherbet	$\frac{1}{4}$ cup
Sponge cake	$1\frac{3}{4}$ in. cube
Nuts (shelled almonds, peanuts, pecans)	About $\frac{1}{2}$ ounce
Sweet chocolate	About $\frac{3}{4}$ ounce

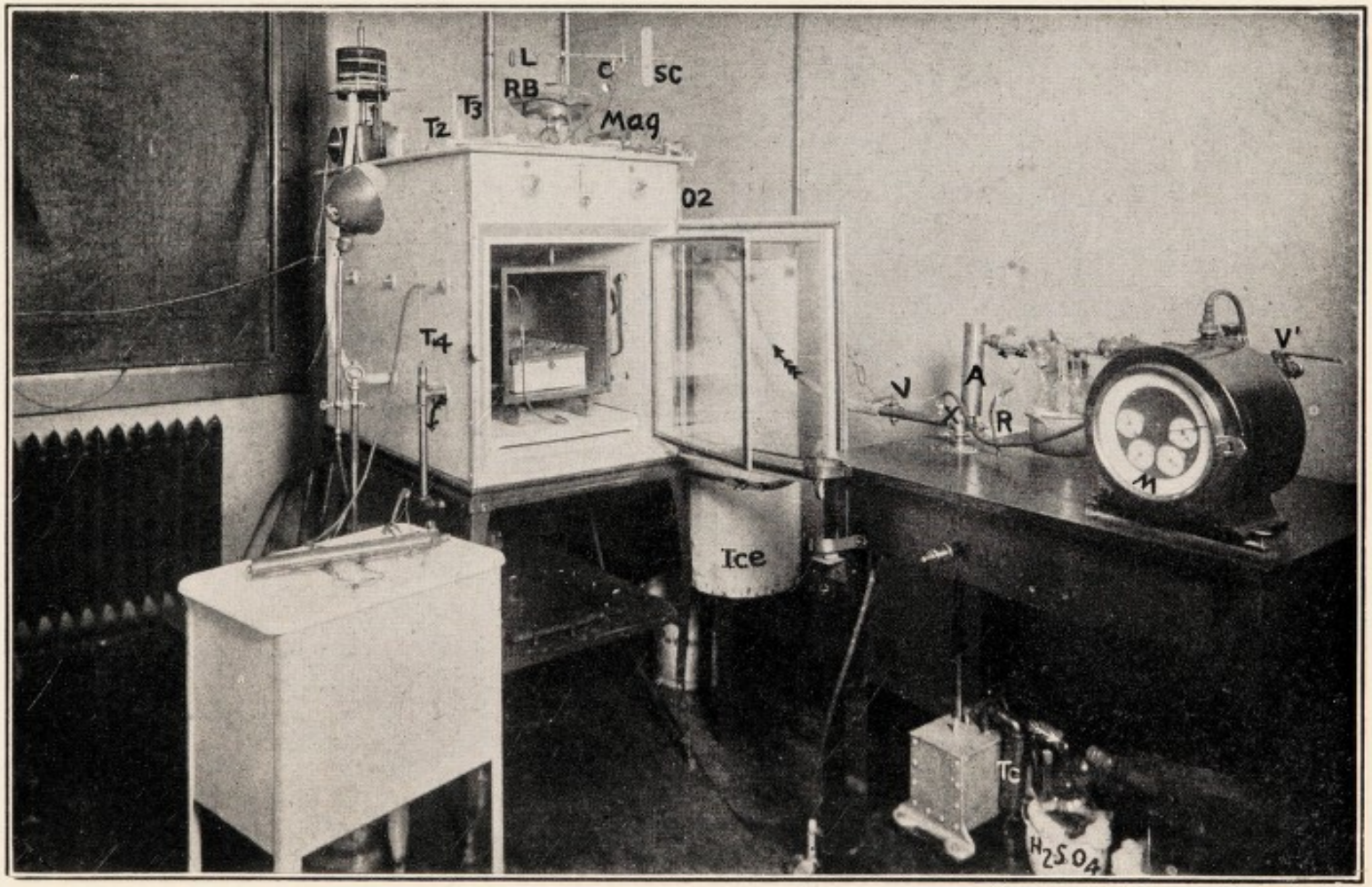
Measurement of the Fuel Requirements of the Body

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

[1] For fuller details see Table I of the Appendix.

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 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



Courtesy of Professor John R. Mutlin.

A Respiration Chamber for Measuring the Energy Requirement of Babies
(The baby's bed can be seen inside the chamber.)

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 simpler devices, measuring the energy output indirectly, through determination of the amount of oxygen consumed or of carbon dioxide given off by the lungs, are now widely used. The illustration opposite shows a calorimeter with its door open and a baby's bed inside. The advantage of such a chamber is that here 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 consumed by 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

[1] Lusk, Graham, *Fundamental Basis of Nutrition*. Yale University Press (1923).

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 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 Substance

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 are 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, about	3.0 per cent
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, Fluorine, Manganese, Silicon	Very minute quantities

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 life 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

[1] Sherman, H. C., *Chemistry of Food and Nutrition*, 3rd Edition, page 265. The Macmillan Company (1926).

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 18 or more 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 18 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

Clara Elgene Peck

classic 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.

The total amount of 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 yields. The table at the top of the following page shows these protein and nitrogen values for a number of foods rich in protein.

Sulphur needed for the building of body proteins is found mostly in two closely related amino acids — cysteine and cystine. These are not evenly distributed in all proteins. Some have little or none and some have a great deal. Often one protein present in a food will have but little and another in the same food will be rich in sulphur. This is the case with milk. One of its proteins (casein) has very little; another (lactalbumin) has a great deal. The result is that milk will supply enough sulphur for growth. In the main, we feel that if the diet is diversified the various proteins will yield the body sufficient sulphur when its nitrogen requirement is met.

[1] There are 453.6 grams in one pound, and 28.35 grams in one ounce.

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	3 ounces (cooked)	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-inch 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

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 and teeth. 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	PHOSPHORUS GRAMS
Spinach	2½ cups (cooked)	0.285
Buttermilk	1⅛ cups	0.271
Haddock	5 ounces (uncooked)	0.259
Codfish, fresh	5 ounces (uncooked)	0.252
Lettuce	2 large heads	0.224
Celery	4 cups of ¼-inch pieces	0.201
Cauliflower	½ medium head	0.200
Asparagus	20 stalks	0.177
Cheese, cottage	5½ tablespoons	0.175
Beef, lean	2¼ ounces (uncooked)	0.147
Beans, dried	⅛ cup (uncooked)	0.137
Milk	⅝ cup	0.134
Rhubarb	4 cups of 1-inch pieces	0.134
String beans	2¼ cups of 1-inch pieces	0.126
Eggs	1⅓ eggs	0.122
Peas, dried	2 tablespoons (uncooked)	0.120
Egg yolk	2 yolks	0.118
Turnips	2 cups of ½-inch cubes	0.117
Tomatoes	1¾ cups (cooked)	0.113
Corn, green	½ cup	0.102
Oatmeal	1 cup (cooked)	0.099
Onions	3–4 medium	0.093
Cabbage	5 cups (shredded)	0.092
Bread, graham	2 slices ¼-inch thick	0.084
Peanuts	2 dozen singles	0.073
Potatoes	1 medium	0.069

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 new-born 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 becoming adjusted to the outer world. It is found in a variety

of foods, among the most valuable being egg yolk, liver, and green vegetables, especially spinach. Bread and cereals from whole grains also add materially to the iron content of the diet.

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

FOOD MATERIALS	MEASURE OF PORTION	IRON GRAMS
Spinach	2½ cups (cooked)	0.0151
Cabbage	5 cups (shredded)	0.0035
Beans, string	2⅓ cups of 1-inch pieces	0.0027
Celery	4 cups of ¼-inch pieces	0.0027
Egg yolk	2 yolks	0.0023
Beef, lean	2½ ounces (uncooked)	0.0021
Strawberries	1⅓ cups	0.0021
Eggs	1⅓ eggs	0.0021
Beans, dried	⅛ cup (uncooked)	0.0020
Tomatoes	1¾ cups (cooked)	0.0018
Peas, dried	2 tablespoons (uncooked)	0.0017
Potatoes	1 medium	0.0016
Raisins	¼ cup	0.0014
Carrots	3–4 medium	0.0013
Beets	2–4 medium	0.0013
Turnips	2 cups of ½-inch cubes	0.0013
Bread, graham	2 slices ¼-inch thick	0.0010
Onions	3–4 medium	0.0010
Figs	1½ large	0.0010
Oatmeal	1 cup (cooked)	0.0010
Prunes	4–5	0.0010
Milk	⅝ cup	0.0004
Bread, white	2 slices	0.0004

Calcium is essential for strong bones and teeth. In combination with phosphorus it is the chief mineral element of these tissues. By far the most valuable source of calcium is milk, 100 calories of milk yielding as much as can be obtained 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. Vegetables, though less striking a source of calcium than milk, yield enough to be of some importance. Recent investigations have shown that they are more useful to the adult than to the growing child. Milk should be the chief reliance for calcium all through the period of growth.

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

FOOD MATERIAL	MEASURE OF PORTION	CALCIUM GRAMS
Celery	4 cups of $\frac{1}{4}$-inch pieces	0.421
Cauliflower	$\frac{1}{2}$ medium head	0.403
Buttermilk	$1\frac{1}{8}$ cups	0.294
Spinach	$2\frac{1}{2}$ cups (cooked)	0.281
Cheese, American	$1\frac{1}{8}$-inch cube	0.212
Milk, whole	$\frac{5}{8}$ cup	0.174
Cabbage	5 cups (shredded)	0.143
Carrots	3–4 medium	0.124
Asparagus	20 stalks 8 inches long	0.122
Beans, string	2 cups of 1-inch pieces	0.110
Onions	3–4 medium	0.069
Beets	2–4 medium	0.064
Figs	$1\frac{1}{2}$ large	0.051
Tomatoes	$1\frac{3}{4}$ cups (cooked)	0.050
Beans, dried	$\frac{1}{8}$ cup (uncooked)	0.047
Eggs	$1\frac{1}{3}$ eggs	0.045
Peas, fresh	$\frac{3}{4}$ cup	0.026
Bread, whole wheat	2 slices $\frac{1}{4}$-inch thick	0.020
Raisins	$\frac{1}{4}$ cup	0.019
Prunes	4–5	0.018
Oatmeal	1 cup (cooked)	0.017
Potatoes	1 medium	0.016
Bread, white	2 slices $\frac{1}{4}$-inch thick	0.011
Beef, lean	$2\frac{1}{4}$ ounces (uncooked)	0.008
Cracker, soda	4 crackers	0.006
Cornmeal	1 cup (cooked)	0.005

The other elements which go to make up the body structure are not only required in comparatively small amounts, but are almost sure to be provided if the diet contains the range of foods which will insure the four already mentioned. In goitrous regions, however, some attention must be given to

sources of iodine. This substance is essential to the normal functioning of the thyroid gland. When the iodine supply is deficient the gland tends to enlarge, simple goiter being the result. The ocean is the source of iodine, and consequently goiter is of rare occurrence near the seacoast. But in various parts of the world there are great inland areas where it is prevalent. In the United States, for example, the Great Lakes region and portions of the Northwest are distinctly goitrous.

Goiter tends to develop in prenatal life, at adolescence, especially in girls, and in women during pregnancy. Its eradication depends upon the administration of iodine in suitable forms and amounts. Very little is contained in ordinary foods, rich supplies being found only in sea foods, in sea salt which has not been highly purified, and in drinking water which has its origin near the ocean or has derived iodine from the soil through which it passes. Fruits and vegetables vary in their iodine content according to the soil in which they grow. Where the drinking water has little iodine, the foods grown in the district are not likely to be rich in it.

In all goitrous regions some plan should be adopted by which everyone may be protected against any iodine deficiency. Experience has shown that one of the most practical means of safeguarding the whole population is by the general use of iodized table salt. The amount of iodide added is small (about one part in 5000 parts of salt) and as stated editorially in the Journal of the American Medical Association,[1] there is no reason to believe that the prolonged use of iodide in small doses under ordinary conditions is detrimental, but on the contrary, the results along various lines of experimentation and observation indicate that it is beneficial. Sea

[1] Iodide and Health. *Journal of the American Medical Association*, Vol. 91, page 1720 (1928).

foods are the best dietary sources of iodine; next come vegetables and fruits grown near the sea, but such as have been analyzed have been found to yield scarcely one-tenth as much as salmon, cod, or halibut, and not one twenty-fifth as much as oysters, clams, and salmon roe.

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.

The Ash Constituents

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. These and all the other chemical elements in the body except carbon, hydrogen, oxygen, and nitrogen are grouped together under the term *ash constituents*, because they constitute the part left behind as ash when food materials are burned. They are sometimes styled "salts" or "mineral matter." When any one of these elements is withheld or is insufficient in amount a young animal's growth is interfered

with. Moreover, the efficiency of each element is enhanced by proper amounts of the others.

As in the case of the Three Musketeers it is " each for all and all for each " — none functions at its best except as part of a well-balanced diet. Iron builds good red blood more efficiently when a trace of copper is present too. Phosphorus and calcium, both essential to sound teeth and strong bones, can be utilized only when they are brought into proper relationship to each other. Rickets, that disease of early childhood characterized by failure of the bones to deposit calcium phosphate properly, may be produced experimentally in animals by diets low in phosphorus but high in calcium, and vice versa. Were it not for a special vitamin (see vitamin section following) which enables the body to use these two substances in varying proportions, we should have to pay special attention to the balance between them. Even with this vitamin present good supplies of both are necessary.

Water

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. It also plays an important rôle in the regulation of body temperature. A liberal daily supply is essential to the best health and should be regularly provided for in the scheme of living of every person young or old. Four to six glasses a day in addition to what is obtained in food is usually sufficient.

The Vitamins

Besides the fuel foodstuffs, water, and ash constituents or mineral matter, there are substances existing in minute quantities in foods which exercise a profound influence upon

nutrition. These are known as vitamins. For a long time these eluded the food chemist because of the exceedingly small amounts present in ordinary quantities of food. They were missed in the ordinary analysis, partly for this reason, and partly because some of them very easily change their form and lose their identity when subjected to the usual manipulations of the chemical laboratory. Hence it was through observations of the effects of various dietary restrictions upon men and animals that we came to realize their true value in nutrition, and to study our foods in order to know where to find each one. Just as the great physicist Millikan measures invisible atoms and studies the arrangement of the still more minute ions which compose them, so the chemist, without seeing a vitamin with the naked eye or even a microscope, can devise means to measure the amount of any vitamin in any food. So far he is dependent upon the use of carefully standardized laboratory animals for his measurements and the work proceeds slowly. But highly concentrated preparations of several vitamins have already been made, and with plenty of material available, it is only a matter of time until we are able to weigh vitamins as we do proteins, fats and carbohydrates.

Discovery of the vitamins began with the ushering in of the twentieth century, although the name was not coined until 1911. Knowledge of one of them led to the search for others, and in fairly rapid succession six or seven have been assigned places in this group of dietary essentials and designated by different letters of the alphabet from A to G.[1]

[1] For a fuller discussion of the vitamins, consult Sherman and Smith's *The Vitamins*, The Chemical Catalog Company (1922); McCollum and Simmonds' *Newer Knowledge of Nutrition*, 3rd Edition, The Macmillan Company (1925); or Rose's *Foundations of Nutrition*, Chapters IX and X, The Macmillan Company (1927).

Vitamin A

Vitamin A is essential to growth, reproduction, and lactation, and the maintenance of bodily vigor at every stage of existence. On a diet containing every dietary essential except this one vitamin, a young albino rat (the standard animal for testing for vitamin A) will soon show a decline in the rate of growth, finally cease to grow at all, and develop many symptoms of physical unfitness, such as rough and falling hair, poor appetite, disturbed digestion, running nose and ears, and usually in the course of time a characteristic eye disease known as xerophthalmia.

If at this stage we add to the diet some food containing vitamin A, the eye disease will promptly clear up, the nasal or ear congestion will abate, the hair will cease to fall out and gradually become glossy again, appetite and digestion will return to normal, and growth will be resumed.

Striking as is the influence of vitamin A upon the growing animal, its effects on the reproductive capacity of the adult are equally impressive. Two pairs of well-fed adult animals, one pair on a diet devoid of vitamin A, the other on a diet containing it, will not show any bad effect of the diet for a long time, because reserves of this vitamin may be stored in the body, and tide over periods of temporary shortage. But the pair deprived of the vitamin A will have very few, if any, offspring, and what few they may have will be weak if not still-born. The mother will be unable to suckle the young properly, and that family will die out unless the young are put upon a better diet.

Animals placed at weaning on a diet with a low supply of vitamin A may be able to grow to full adult size if they have received a good store from their mother before birth and during the nursing period, but they will not be of full vigor, as is shown by later maturity and earlier onset of senility; they

FOODS CONTAINING APPROXIMATELY THE SAME AMOUNT OF VITAMIN A

	Weight (oz.)	*Measure*
Lettuce	4.8	1 very small head
Tomatoes	3.5	2 small
Milk	9.0	1⅛ cups
Bananas	8.7	2 medium
Beans, string	5.6	50
Egg yolk	0.3	⅔ yolk
Peas	3.0	½ cup
Butter	0.5	1 in. cube
Carrots	0.6	½ very small
Spinach	0.3	1 large leaf

are prone to succumb to lung infection in early adult life, at a period when young men and women most frequently develop tuberculosis. Young animals deprived for a time of the vitamin and then given a full supply again are frequently more susceptible to infection in various organs and tissues than other animals which have had a full supply throughout their whole period of growth. The more rapid the rate of growth and the greater the size, the more vitamin A is needed. It seems safe to say that several times as much vitamin A as is necessary to secure normal growth can be profitably used in promoting general vigor.

These effects on animals are confirmed in various ways for the human race. A discerning physician of Copenhagen, Dr. Bloch, has reported a large number of cases of eye disease among poor children in Denmark, whose diet had no whole milk — only separator skim milk — and whose eye disease was cured by giving them whole milk with its greater supply of vitamin A. Similarly a Japanese physician, Dr. Mori, has reported cases of eye disease in children on a diet largely rice, cured by the addition of chicken livers. In Roumania, during the war, an American scientist of note, Dr. Gideon Wells, observed among children cases of eye disease which he was able to cure by diet. In India, Dr. McCarrison, long of the British Medical Corps, has had wide opportunity to study the effect of very limited diets, and he adds his testimony that lack of vitamin A is detrimental to human welfare in all the ways which have been described for the white rats.

At the present time, the amount of vitamin A present in any given food is measured in " units," one unit being the amount of the vitamin required to cause a white rat weaned at the age of 28 days, from a mother on a standard diet, to gain at the rate of 3 grams per week for a period of 8 weeks. The number of vitamin A units in 100-calorie portions of some common foods are given in the following table.

UNITS OF VITAMIN A IN 100-CALORIE PORTIONS OF FOODS

FOOD MATERIAL	MEASURE OF PORTION	UNITS OF VITAMIN A
Apples, fresh	1 large	88
Bananas	1 medium	358
Beans, string, fresh	2⅓ cups of 1-inch pieces	850
Beets, fresh	4 beets, 2-inch diam.	38
Butter	1 tbsp.	430
Cabbage	3½ cups, chopped	189
Carrots, fresh	1⅔ cups of ½-inch cubes	10140
Cauliflower	1 small head, 4½-inch diam.	195
Cheese, American	1⅛-inch cube	500
Collards	1½ cups, cooked	7713
Eggs, whole	1⅓ eggs	1339
Egg yolk	2 yolks	1643
Grapes, fresh	1 large bunch	69
Lemon juice	1⅛ cups	28
Lettuce	2 large heads	2164
Milk, whole	⅝ cup	319
Orange juice	1 cup	179
Peas, green	¾ cup	661
Peppers, green	5 peppers, 3½ inches long	3834
Potatoes, sweet	½ medium	537
Potatoes, white	1 medium	34
Rutabagas	1⅔ cups of ½-inch cubes	45
Spinach, fresh	2½ cups	23060
Tomatoes	2 cups, scant	2633
Turnip greens	2½ cups, cooked	1702
Turnips, fresh	2 cups of ½-inch cubes	49

Vitamin B

Vitamin B, like vitamin A, is essential for growth, reproduction, and lactation. Its withdrawal from the diet has a much more immediate and pronounced effect upon appetite and digestion, so that food is generally refused, and if eaten, remains in the digestive tract to make trouble instead of being absorbed and used by the body. Both rats and pigeons very quickly manifest a characteristic disease of the nervous system known as polyneuritis or beri-beri when this vitamin is withheld from the diet. The body becomes distorted, the

FOODS CONTAINING APPROXIMATELY THE SAME AMOUNT OF VITAMIN B (B + G)

	Weight (oz.)	*Measure*
Bananas	8.2	2 medium
Spinach	2.0	½ cup cooked
Potatoes	6.5	1 large
Apples	7.4	1 large
Milk, whole	5.0	⅝ cup
Peas, fresh	0.7	¼ cup
Tomatoes	3.6	2 small
Prunes	1.3	3 large
Orange (juice only)	5.0	2 large
Cabbage	5.5	½ very small head

gait uncertain, and paralysis finally causes death unless the vitamin is supplied. If given in time, improvement is almost immediate and return to normal condition occurs within a day or so. Partial deprivation may not result in acute disease but in a low state of health with poor appetite, poor digestion, nervousness, and other more or less vague symptoms, from all of which recovery is prompt when the lacking vitamin B is supplied.

The young growing creature suffers from lack of vitamin B very quickly since little can be held in reserve in the tissues. The more rapid the rate of growth and the larger the organism, the more is needed. Very much more is required for lactation than for growth or even for reproduction.

Measurements of vitamin B were well under way when it was discovered that another was closely associated with it, vitamin G. This will necessitate new measurements as we have no way of computing how much growth when a given food was fed is to be attributed to the influence of vitamin B and how much to vitamin G, since both are essential to growth. Until we have further information, it seems well, however, to record what we have learned about the growth-promoting power of some foods which furnish a mixture of vitamins B and G.

The foods tabulated on the following page are expressed in terms of vitamin units, one unit being the amount of the food containing vitamins B and G which, when fed as a daily allowance to a newly weaned four-weeks-old white rat, just maintains its weight over a period of 8 weeks.

Vitamin C

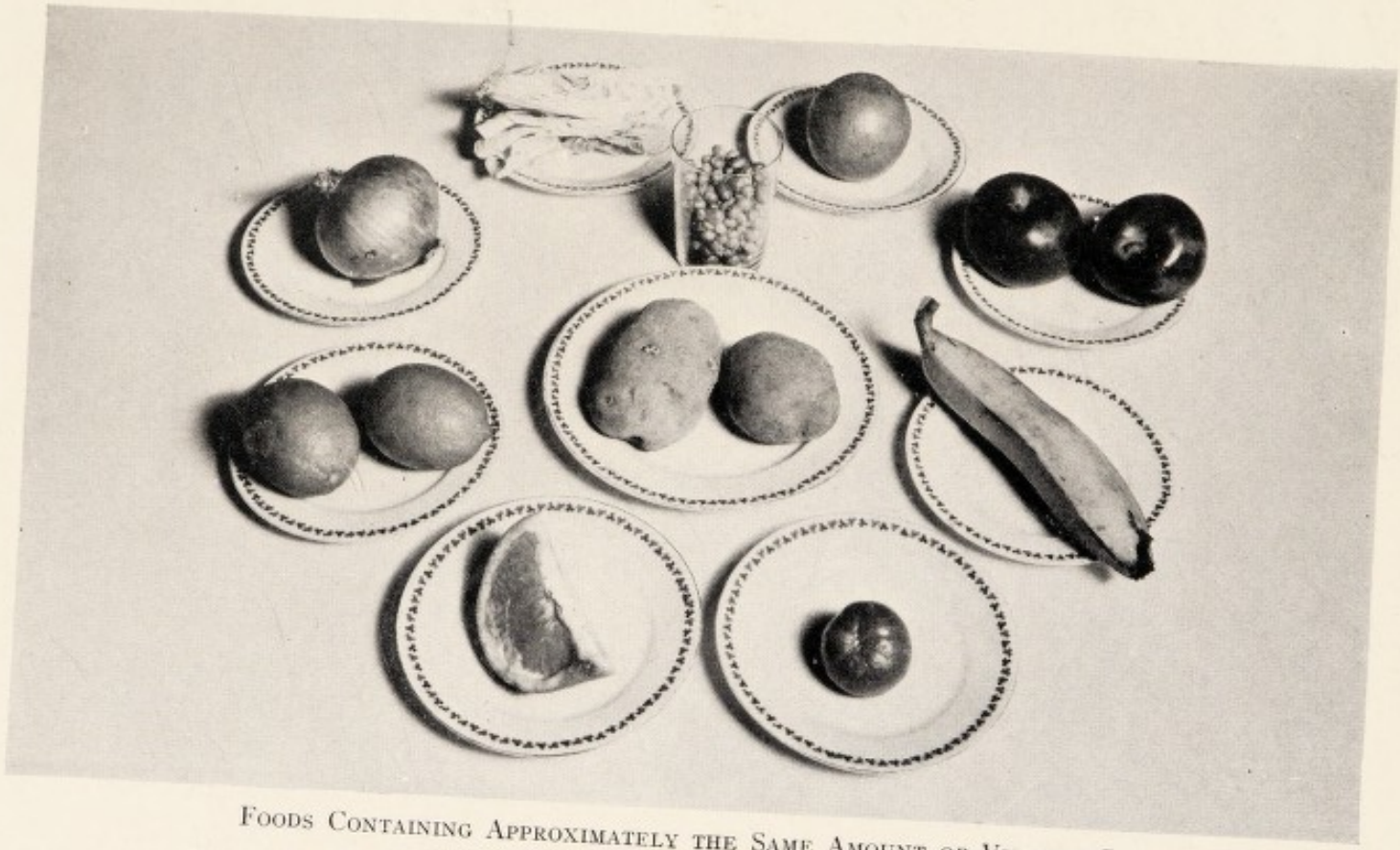
In the absence of vitamin C a very characteristic disease develops, namely, scurvy. This is a disorder affecting many parts of the body. The ribs may exhibit beading similar to that in rickets, while hemorrhages into the skin, the intestines,

and the muscles commonly develop. In extreme cases, the teeth may become loosened in their sockets. Anemia and pains in the joints are sometimes attributed to other causes, when in reality due to scurvy. In the young, growth is

UNITS OF A MIXTURE OF VITAMINS B AND G AS FOUND IN 100-CALORIE PORTIONS OF NATURAL FOOD MATERIALS

FOOD MATERIAL	MEASURE OF PORTION	UNITS OF VITAMIN MIXTURE *
Apples, fresh	1 large	46
Bananas	1 medium	29
Beans, string, fresh	2½ cups of 1-inch pieces	80
Cabbage	3½ cups, chopped	158
Cantaloupe	1 melon, 4½-inch diam.	72
Carrots, fresh	1⅔ cups of ½-inch cubes	64
Collards	1½ cups, cooked	227
Eggs, whole	1⅓ eggs	39
Egg yolk	2 yolks	49
Flour, Graham	3 tbsps.	60
Flour, whole wheat	4½ tbsps.	60
Grapes, fresh	1 large bunch	30
Lemon juice	1⅛ cups	84
Lettuce	2 large heads	202
Milk, whole	⅚ cup	48
Muskmelon	1 melon, 4½-inch diam.	72
Oats, rolled	½ to ¾ cup	60
Onions, fresh	3–4 medium	45
Orange juice	1 cup	77
Peaches, fresh	3 medium	69
Peas, green	¾ cup	220
Peppers, green	5 peppers, 3½ inches long	77
Potato, white	1 medium	34
Prunes, dried	4 medium	44
Rutabagas	1⅔ cups of ½-inch cubes	73
Spinach, fresh	2½ cups	323
Tomatoes	2 cups, scant	185
Turnip greens	2½ cups, cooked	420
Turnips, fresh	2½ cups of ½-inch cubes	73
Wheat, shredded	1 biscuit	60

* The number of units is that of the vitamin (B or G) which, in each given case, *is present in smaller proportion.* Many of the foods are doubtless better sources of *one or the other* of these vitamins than the figure given would therefore indicate.



FOODS CONTAINING APPROXIMATELY THE SAME AMOUNT OF VITAMIN C

	Weight (oz.)	*Measure*
Onion, raw	5.3	1 large
Cabbage, raw	3.1	¼ small head
Peas, canned	4.2	¾ cup
Orange (juice only)	2.0	1 large
Apples, raw	12.7	2 large
Lemons (juice only)	2.0	2 large
Potatoes, cooked	12.0	2 large
Bananas, raw	6.7	1 large
Grapefruit	2.5	¼ small
Tomatoes	2.0	1 very small

affected, though not so markedly as when vitamin A or B is withheld. The development of the teeth may be retarded by lack of a plentiful supply of vitamin C in the mother's diet before the baby is born. After birth, even the breast-fed baby should soon get vitamin C in the form of orange juice, since the quantity in mother's milk is not very liberal at best.

UNITS OF VITAMIN C IN 100-CALORIE PORTIONS OF FOODS

FOOD MATERIAL	MEASURE OF PORTION	UNITS OF VITAMIN C
Apples, fresh	1 large	13
Bananas	1 medium	17
Beans, string, fresh	2½ cups of 1-inch pieces	80
Beets, fresh	4 beets, 2-inch diam.	14 [a]
Cabbage	3½ cups, chopped	107 [b]
Carrots, fresh	1⅔ cups of ½-inch cubes	14 [c]
Collards	1½ cups, cooked	20 [a]
Corn, green	⅓ cup	10 [d]
Grapefruit	½ large	106
Lemon juice	1⅛ cups	127
Milk, whole	⅝ cup	5 [e]
Onions, fresh	3–4 medium	41 [f]
Orange juice	1 cup	115
Pears, fresh	2 medium	7
Peas, green	¾ cup	53 [d]
Peppers, green	5 peppers, 3½ inches long	429
Potatoes, white	1 medium	13 [g]
Spinach, fresh	2½ cups	28 [h]
Strawberries, fresh	1⅓ cups	128 [i]
Tomatoes	2 cups, scant	220 [i]
Turnip greens	2½ cups	40 [a]

[a] Home cooked.
[b] Uncooked; largely destroyed in cooking.
[c] Uncooked.
[d] Canned.
[e] Value unheated; partly destroyed upon heating.
[f] Values raw, loses ⅓ in cooking 20 minutes.
[g] Boiled.
[h] Values cooked; canned somewhat richer than home cooked and raw about 15 times as rich as home cooked.
[i] Values raw or cooked; no loss in canning, or cooking.

Vitamin C is not stored in the body to any considerable degree, hence daily supplies are needed to maintain the best health. The relative amounts in many common foods have been measured by means of the guinea pig, which is very sensitive to lack of vitamin C and quickly develops scurvy.

A unit of vitamin C is the smallest daily dose which will keep a standard guinea pig completely free from scurvy.[1]

The units of vitamin C in 100-calorie portions of some common foods are given in the table on the previous page.

Vitamin D

Vitamin D is essential for the proper development of the bones and teeth and the prevention of rickets. A certain small amount seems also necessary for normal growth. In the absence of vitamin D it is difficult for the bones to secure from the blood stream the calcium and phosphorus necessary to calcification. Bow legs are often noticed, but more serious are the misshapen jaws, contracted thorax and pelvis which are not as easily outgrown. Rachitic children are especially susceptible to decaying and protruding teeth and, what is even more serious a menace to health, to bronchitis, pneumonia and other disturbances of the respiratory tract.

We find vitamin D less widely distributed in food than are the other vitamins. Cod liver oil has so much more than any ordinary food that we count it our richest source; but egg yolk has considerable, and there are important amounts in milk and in butter. We are independent of food in regard to this vitamin so long as we have plenty of sunshine. The ultra-violet rays of the sun, playing on the body, produce vitamin D in the skin. Hence rickets is not a disease of the

[1] Vitamin C is more easily destroyed than any other vitamin. The loss in cooking vegetables is often very great, hence daily use of some raw fruit or vegetable is recommended.

tropics. We can imitate nature by means of a lamp emitting a large proportion of ultra-violet rays (the quartz mercury vapor lamp) and increase thus the amount of vitamin D in our bodies. It is also possible to increase the vitamin D content of many kinds of food by irradiation. Cod liver oil has the advantage of being rich in both vitamins A and D, and therefore its use for growing children is desirable, even though we also make use of sunshine and other ways of increasing our store of vitamin D.

Vitamins E and F

Before a baby is born it must secure its nourishment entirely from its mother. If the connection between mother and child be destroyed, the developing offspring dies. Vitamin E has been found essential in the maintenance of this connection. When rats are reared on a diet lacking vitamin E they grow normally, and appear to be healthy, but they become sterile. Males are affected as well as females, though in a different way. Other dietary deficiencies affect reproduction but no other causes failure of placental function and brings about the death of the embryo.

From the oil of the wheat germ has been made an extract containing vitamin E of which five thousandths of a gram daily is sufficient to maintain normal fertility in a female rat. Vitamin E is transferred from mother to offspring before birth and can be stored for a relatively long time in the body. It is found abundantly in beans and seeds generally, and also occurs in milk fat. Practically there is much more need of emphasis on vitamins A, B, C, and D in human nutrition than upon vitamin E.

The term vitamin F may be said to be held in reserve at the present time, awaiting further developments in vitamin research, as investigators are not yet agreed as to its identity.

Vitamin G

In the study of vitamin B many different species of animal have been used, and tests for its presence have included the onset of polyneuritis in pigeons or other birds, and the retardation of growth in rats or dogs. It was discovered that a food which cured polyneuritis did not always promote growth, and vice versa. Yeast has for a long time been a valued source of vitamin B for experimental work, but marked irregularities in the behavior of yeast were noted, and finally Dr. Goldberger of the United States Public Health Service showed that yeast which has been heated at a high temperature for a considerable time would no longer cure polyneuritis, and would not promote growth when fed as the sole source of vitamin B, but would cure pellagra. His observations having been confirmed by others, we now add to the category of vitamins the antipellagric vitamin, vitamin G. This is also essential for growth. In many foods both B and G are present, and investigation of the relative amounts of each in common foods is rapidly being undertaken. We know that milk is relatively high in vitamin G and low in vitamin B, while cereal grains are high in vitamin B and low in vitamin G. This explains the cure of pellagra by adding milk and eggs and certain vegetables as tomatoes and carrots (now also known to be rich in vitamin G), to a diet in which cereals had too prominent a place.

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 keep it functioning well, 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 which prevents 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 simplified 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, or 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, zwieback, 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

[1] Technically known as a disaccharid.

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. This is illustrated by the eating of hard and soft candy. If the hard candy is sucked it becomes greatly diluted by the saliva, while the soft candy, quickly swallowed, is diluted but little. 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 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 breadstuffs 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, such as oats, corn, and wheat, have their starch grains sealed within pockets of cellulose, which the body enzymes cannot soften and which are only with the greatest effort finely ground by chewing. Hence these are commercially treated to make them more digestible. Oats are crushed into very thin flakes (rolled oats) which may

also be thoroughly steamed or toasted in the factory. Wheat is flaked or ground into light or dark granules (farina) which can be cooked thoroughly in a comparatively short time. Corn is made into cornmeal, which still requires long cooking to soften thoroughly, or is cooked and rolled into flakes which are toasted ready to eat when they reach the household. By such commercial treatment, the long time formerly required for cooking cereals in the home to render them easy to digest has been greatly reduced, to the convenience of the housewife, whose main care nowadays is to see that they are prepared for the table in such a way as to make them most palatable.

Besides helping to grind and soften all hard, coarse food and to digest starch, 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 power-

ful 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 signal to the stomach to get ready to receive food, and important for sending the food down in such condition 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 sipped 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 the 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 carbohydrates 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 by a sedentary or delicate person hard to digest. The same is true of other foods in which a considerable amount of fat is intimately mixed with proteins or carbohydrates or both, such as fat meats, rich sauces, pastries, and 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 if not pasty. Thus bread, in which eight-tenths of the calories are in the form of carbohydrate, constitutes nearly half the diet of the very poor and furnishes fully one-third of the calories in the diet of a great many people all over the world. 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 with 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 heed 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 foundation 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, because of less general physical activity. In the second place, food is likely to be too highly refined. Substantial material is necessary for intestinal muscles to contract upon. If they have to push along only a little stream of soft or fluid material they grow flabby and weak. The only kind of substance that will stay in the tract is something that cannot be digested! Animals get ballast in the form of sand, or bones, or the woody parts of plants. In their natural state many of the foods of man contain considerable woody fiber or 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 and then remove the more fibrous parts before they go to the table; we extract only the juice of fruits discarding pulp and skins, 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 prob-

lematic 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 vegetables. From a careful study, the conclusion has been reached in the Mayo Clinic, Rochester, Minnesota, that a general rule for adults should be two pounds of fruit and vegetables daily.

Finally, habit plays a large part in intestinal activity, 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 advertisement 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 regularity, 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, asparagus, lettuce, spinach, onions, dried beans and lentils with their hulls, raisins, figs, prunes, and other fruits eaten with their skins, cereals from which the bran has not been removed, such as rolled oats and whole wheat. When still more ballast is required, bran itself can be used in various ways, the pleasantest being as bran bread, muffins, or crackers.

Clara Elsing Peck

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, or boiled in water, flavored and cooled, it makes an edible jelly.[1] Successful results from the use of such foods depend largely upon taking a sufficient quantity and including them in the diet every day.

(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 gas or other discomfort. Liberal serving of fruit at every meal has much to recommend it as a means of counteracting constipation.

(3) Foods tending to yield a little gas in the intestines, such as honey, molasses, spinach, onions, cauliflower, and some others. These ferment slightly; the gas generated breaks up hard masses in the intestine and also acts as a slight stimulant to movement. Carbonated mineral waters may bring about the same result partly because the mineral salts dissolved in them are laxative and partly through the gas with which they are charged. Honey and molasses are best restricted to adults and taken with coarse breads. They must not be used too freely or they will disturb digestion. The vegetables are most effective when eaten raw. Lettuce is now very widely distributed all the year round, and a large serving every day, eaten plain or with a little salad dressing,

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

is an excellent custom. Raw cabbage, shredded and seasoned with a little salt is a good alternative. Along with a large serving of a raw vegetable every day should go at least two large servings of cooked fibrous vegetables such as spinach, asparagus or kale.

(4) A lubricant. For people whose digestion of fat is rather imperfect, fat in liberal quantities is often laxative. Such persons 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 because fat is digested, hence an indigestible, non-irritating lubricant has been sought and found by modern science in the form of highly purified mineral oil. This cannot be absorbed and helps to soften the residues in the large intestine and aid in their easy elimination. If movement is very sluggish, the oil may slip through without carrying feces with it. If this happens, other laxative materials should be used at the same time (agar-agar for instance) and effort made to improve the activity of the intestinal muscles by suitable exercise.[1]

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. Better results will be obtained if common salt, one teaspoonful to a quart of water, be added. The drinking of water freely is very desirable, as it helps to flush out the system and carry waste products off through the kidneys, even if it does not of itself correct constipation.

[1] Some very practical exercises will be found in the *Handbook on Positive Health*, Foundation for Positive Health, Revised Ed., pages 61–92 (1928).

SOME ANTI-CONSTIPATION MENUS[1]

For Healthy Adults

I

Breakfast: An orange
Cut oats, cream
Bran muffins and honey
Milk to drink (1 cup)[2]

Luncheon: Scalloped corn
Triscuit
Baked apple

Dinner: Vegetable soup
Roast beef
Spinach (large serving)
Baked potatoes (skins eaten)
Cabbage salad (large serving)
Graham bread
Stewed loganberries or figs

II

Breakfast: Stewed prunes
Shredded wheat, cream
Tomato omelet
Graham toast
Milk to drink (1 cup)[2]

Luncheon: Pork and baked beans
Boston brown bread
Sliced pineapple
Oatmeal macaroons

Dinner: Boiled mutton, caper sauce
Stewed onions (large serving)
Lettuce salad, French dressing (large serving)
Bran wafers
Lemon jelly, whipped cream

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

[2] Buttermilk would be more laxative than sweet milk.

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 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 largest food requirement is adequate fuel for his varied activities.

Some of the general principles governing choice of fuel foods 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,[1] and his daily intake of food corresponds closely to his daily expenditure of energy.

[1] See Appendix, Table V, Height and Weight for Men at Different Ages.

Energy Requirements of the Adult Man

In the long run, one must gain weight with a surplus of fuel and lose weight with a shortage. Hence the simplest way to tell whether one's energy intake is appropriate is by keeping track of body weight. But if one finds that he is gaining or losing, changes in the diet can be more intelligently effected and the desired results more speedily attained if he knows both his energy requirement and the energy content of food consumed. It is not assumed that many people will need to " count their calories " every meal or every day, but that each may use such knowledge to work out for himself a practical food program and to make such changes from time to time as circumstances require. The nature of these changes for the sedentary and the active, the thin and the fat, are discussed in the following pages.

The Sedentary Man

Studies of healthy adult men lying at rest in a respiration calorimeter, 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 (which somewhat increases energy expenditure, the effect varying with kind and amount of food) 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 move-

ment 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; these have been carefully measured in scientific laboratories.

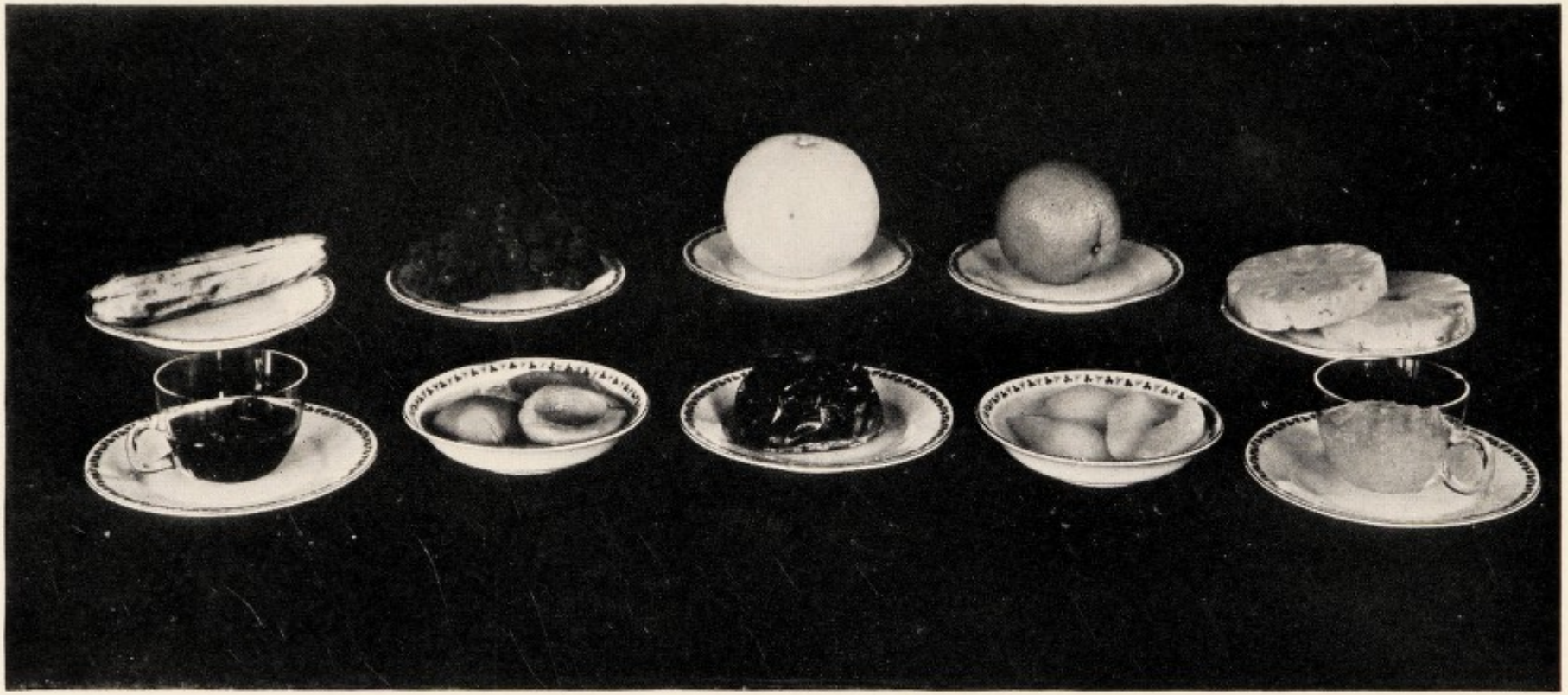
Sitting quietly in a chair, with only the movements usually incident to sedentary living, such as changes of posture, muscular activity in reading, writing, or talking, will make the total fuel cost per hour about three-fifths of a calorie per pound. Hence a man of average weight, spending eight hours 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



100-Calorie Portions of Fruit[1]

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

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

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 17 to 22 cents a day, or from three-fourths to four-fifths of a cent per 100 calories, but this diet will be deficient in ash constituents and vitamins. Reference to Table IV of the Appendix, showing costs per 100 calories of some common foods, will make it clear that the range of foods which can be used in a dietary costing less than one cent per 100 calories is quite limited. To secure all the elements for good nutrition, with good appetite and digestion, it is generally necessary 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 proteins, ash constituents and vitamins and sufficiently easy of digestion for the ordinary sedentary person.

The dietaries worked out from this food plan (pp. 55–57) show in detail how the following of such a scheme will insure a well-balanced ration.[1]

A Day's Food Plan for a Sedentary Man

Cost Liberal

Fuel Requirement:	2200–2800 Calories	Cost: 2½–3¢ per 100 Calories
Breakfast:	Fruit or fruit juice	75–150 Calories
	Cereal	50–100 Calories
	Eggs or Liver and bacon or Creamed dried beef on toast	100–200 Calories

[1] Most of the recipes used in the menu in this and following dietaries are given in the Appendix, Table II.

BREAKFAST: — (*Continued*)

Toast or Rolls (hard and crisp) or Muffins (occasionally)	100–200 Calories
Butter	100 Calories
Cream for coffee or milk to drink	100–170 Calories
Top milk for cereal	100–200 Calories
Sugar for cereal (and coffee if taken)	50–100 Calories
	700–900 Calories

LUNCHEON:

Vegetable plate (3 or more hot, cooked vegetables) or Broiled fish or Cheese dish	150–200 Calories
Rolls or bread	100–200 Calories
Butter	50–100 Calories
Fruit or pudding (pie occasionally)	200–400 Calories
Milk to drink (or cream and sugar for coffee)	150–200 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
Butter	50–100 Calories
A seasonable vegetable (cooked)	100–150 Calories
Lettuce, celery, or other crisp vegetable	50–150 Calories
Pudding (made with milk) or Stewed fruit or Ice cream (occasionally)	200–300 Calories
	900–1200 Calories

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

Cost Liberal

Fuel Value: 2400 Calories Cost: 2½–3¢ per 100 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
BREAKFAST:				
Grapefruit (C, B)[1]	½ medium	10.0	7	100
Shredded wheat biscuit (B)	1 biscuit	0.9	13	100
Scrambled egg (A, B)	⅓ cup	2.5	24	110
Bacon	2 small pieces	0.3	7	50
Graham toast (B)	3 small pieces	1.2	14	100
Butter (A)	2 tsp.	0.3	—	67
Top milk (10 oz.)(A, B)	¼ cup	2.7	9	100
Whole milk (A, B)	⅝ cup	5.1	19	100
Sugar	1 tbsp. (scant)	0.5	—	50
Coffee	1 cup	—	—	—
				777
LUNCHEON:				
Cream of baked bean soup (B, A)	¾ cup	3.9	22	150
French rolls	1 roll	1.3	12	100
Butter (A)	½ tbsp.	0.2	—	50
Apple pie	1 piece(4.5 in.)	4.8	9	300
Cream, thin (A, B)	2 tbsp.	0.9	2	50
Sugar	2 tsp.	0.3	—	40
Coffee	1 cup	—	—	—
				690
DINNER:				
Clear tomato soup (C, B, A)	½ cup	3.7	4	50
Saltines	2 crackers	0.3	3	33
Roast veal (shoulder)	small serving	2.1	66	100
with stuffing	⅛ cup	0.8	9	100
Gravy (brown sauce)	3 tbsp.	1.7	7	50
Boiled potatoes (C, B)	1 medium	3.6	11	100
Green peas, (buttered), (B, A, C)	¾ cup	3.0	21	100
Lettuce (C, A, B) French dressing	1 serving	0.6	—	50
Snow pudding	1 cup	3.3	15	150
Boiled custard (A, B)	⅓ cup	2.2	13	100
Macaroons	2 macaroons	0.8	6	100
				933
Total for day			293	2400

[1] These letters in parenthesis indicate vitamins present, the one for which the food is most significant coming first. "B" stands for both vitamin B and vitamin G, since we know too little as yet regarding G to designate it separately.

A Day's Food Plan for a Sedentary Man

Cost Minimal

Fuel Requirement: 2200–2800 Calories Cost: $1\frac{1}{2}$–$1\frac{3}{4}$¢ per 100 Calories

Breakfast:	Raisins, figs, or prunes	100–200 Calories
	Cereal	100–150 Calories
	Toast or hard rolls	100–200 Calories
	Butter substitute	75–150 Calories
	Milk to drink (or top milk for coffee)	150–200 Calories
	Milk for cereal	75–150 Calories
	Sugar for cereal (and coffee if taken)	75–150 Calories
		650–900 Calories
Luncheon:	Thick vegetable soup or Scalloped potatoes or Baked split peas and bacon or Creamed string beans on toast with bacon	200–300 Calories
	Whole wheat or rye bread	100–150 Calories
	Butter substitute	100–150 Calories
	Stewed fruit or simple salad	150–250 Calories
	Milk to drink (or top milk and sugar for other beverage)	100–170 Calories
		650–800 Calories
Dinner:	Pot roast or Baked fish or Shepherd's pie or Pan broiled round steak	150–200 Calories
	Potatoes or Turkish Pilaf	100–200 Calories
	A plainly cooked vegetable (stewed cabbage or mashed turnips or scalloped tomatoes)	100–150 Calories
	A raw vegetable or fruit salad (raw carrots and celery; raw cauliflower and lettuce; raw red cabbage and onion; raw apple and celery)	50–150 Calories
	Whole wheat or bran bread	50–150 Calories
	Butter	100 Calories
	Junket or other milk pudding or Milk sherbet or Fruit	150–250 Calories
		900–1200 Calories

A DIETARY FOR A SEDENTARY MAN BASED ON THE PRECEDING PLAN

Cost Minimal

Fuel Value: 2408 Calories Cost: 1½–1¾¢ per 100 calories

	Measure	Weight Oz.	Protein Calories	Total Calories
BREAKFAST:				
Apple (C, B)[1]	1 medium	5.6	2	75
Cornmeal and cream of wheat, half and half (B)	¾ cup	6.8	12	100
Milk (A, B)	1 cup	8.5	34	170
Sugar	1½ tbsp.	0.7	—	75
French toast (B)	2 slices	2.8	20	200
Coffee	1 cup	—	—	—
				620
LUNCHEON:				
Scalloped potatoes with cheese (⅛ oz.) (A, B, C)	1 cup	6.3	22	190
Whole wheat bread(B)	2 slices (¼ in.)	1.4	16	100
Butter or butter substitute (A)[2]	1 tbsp.	0.5	—	100
Stewed apricots (B)	⅜ cup	4.0	6	150
Milk to drink (A, B)	¾ cup	6.3	25	128
				668
DINNER:				
Swiss steak with gravy[3]	Slice 4 in. × 2 in. × ⅝ in.	2.2 (meat only)	73	325
Baked potatoes (C, B)	1 large	4.5	16	150
Mashed turnips (C, B)	½ cup	4.5	6	75
Whole wheat bread(B)	1 slice (¼ in.)	0.7	8	50
Butter or butter substitute (A)	1 tbsp.	0.5	—	100
Cranberry sauce (C)	½ cup	3.0	—	200
Bread custard pudding (A, B)	½ cup	4.3	34	220
				1120
Total for day.			274	2408

[1] B includes vitamins B and G.

[2] Some butter substitutes have added vitamin A.

[3] Two tbsp. dripping and 1 tbsp. flour added for gravy.

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 people 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 callings involve 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, 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 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:

ENERGY REQUIREMENTS FOR DIFFERENT KINDS OF ACTIVITY

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

ENERGY REQUIREMENTS FOR DIFFERENT OCCUPATIONS

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. Bread made from whole wheat flour will help to insure ash constituents without adding to the cost. At least a pint of milk should be found in the day's dietary, and green vegetables should be used as freely as possible, selecting them with regard to season to keep the cost moderate. Cabbage and canned tomatoes will take the place of more expensive vegetables in the winter. Cabbage should be eaten raw or cooked *only a few minutes* as one of its important contributions to the diet is vitamin C which is easily

destroyed by cooking. The flavor and digestibility of cooked cabbage is also better if the time of cooking is very short.

A Day's Food Plan for a Man Doing Severe Muscular Work

Fuel Requirement: 3500–4000 Calories Cost: $1\frac{1}{4}$–$1\frac{3}{4}$¢ 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
	Butter substitute	150–300 Calories
	Milk for cereal and coffee	200–350 Calories
	Sugar for cereal and coffee	100 Calories
		1000–1200 Calories
Luncheon:	Dried beans, peas, or lentils (baked, or in soup or stew) or Macaroni and cheese or Cheese	200–400 Calories
	Rye or whole wheat bread	200–400 Calories
	Fruit, fresh or as sauce (bananas, apples, apricots, prunes)	100–150 Calories
	Cake or pie	200–400 Calories
	Milk to drink (with or without coffee)	100–200 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

Two dietaries based on this plan are given below, one for 4000 calories at minimum cost and one for 3600 calories at a slightly higher cost level.

A Dietary for a Man Doing Severe Muscular Work, Based on the Preceding Plan, I

Fuel Value: 4058 Cost: 1¼–1½¢ per 100 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
Oatmeal mush (B)[1]	1½ cups	9.6	34	200
Creamed dried beef (A, B)[2]	¾ cup	6.0	40	250
Old New England corn bread	Piece 2½ × 3 in. × 1 in.	3.0	24	300
Butter substitute	2 tbsp.	0.9	—	200
Milk for cereal and coffee (A, B)	1 cup	8.5	34	170
Sugar for cereal and coffee	2 tbsp. (scant)	0.9	—	100
Coffee	1 cup	—	—	—
				1220
Luncheon:				
Kidney bean stew (B, C, A)	1¾ cups	17.1	91	350
Rye bread (B)	¼ loaf	2.8	26	200
Butter substitute	2 tbsp.	0.9	—	200
Banana (B, C)	1 medium	5.5	5	100
Molasses cookies I[3]	3 large	1.8	12	200
Milk, hot, for coffee (A, B)	½ cup	4.3	17	85
Sugar for coffee	1 tbsp. (scant)	0.5	—	50
Coffee	1 cup	—	—	—
				1185
Dinner:				
Stuffed beef heart	1 serving	4.0	84	400
Potatoes, boiled (C, B)	2 small	5.4	16	150
Carrots (A, B)	4 small	7.8	10	100
White bread	⅜ loaf (6 slices)	4.2	42	300
Butter substitute	2 tbsp.	0.9	—	200
Date pudding II (B)[3]	1 serving	3.5	22	310
Brown sugar for clear sauce	2 tbsp.	0.8	—	100
Milk for coffee (A, B)	¼ cup	2.1	8	43
Sugar for coffee	1 tbsp. (scant)	0.5	—	50
Coffee	1 cup	—	—	—
				1653
Total for day			465	4058

[1] B includes B and G. [2] Vitamins from milk.

[3] See Table II, Appendix, pp. 402 and 413.

A Day's Dietary for a Man Doing Severe Muscular Work Based on the Preceding Plan, II

Fuel Value: 3673 Calories Cost: 1½–1¾¢ per 100 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
Wheatena (B)[1]	1½ cups	12.0	24	200
Liver (A, B) and	Slice 3½ in. × 2½ in. × ⅜ in.	2.1	63	100
Bacon	4 small slices	0.5	13	100
Toast	¼ loaf	2.8	28	200
Butter substitute[2]	2 tbsp.	0.9	—	200
Milk for cereal and coffee (A, B)	1¼ cups	10.6	43	210
Sugar for cereal and coffee	2 tbsp.	0.9	—	100
Coffee	1 cup	—	—	—
				1110
Luncheon:				
Split pea soup (B)	2 cups	18.4	80	335
Rye bread (B)	¼ loaf	2.8	26	200
Butter substitute	2 tbsp.	0.9	—	200
Apple sauce (B)	¾ cup	6.9	3	200
Gingerbread II[3]	Piece 2 in. × 2 in. × 2 in.	2.2	16	200
Milk for coffee (A, B)	¼ cup	2.1	8	43
Sugar for coffee	1 tbsp.	0.5	—	50
Coffee	1 cup	—	—	—
				1228
Dinner:				
Stuffed flank steak	Slice 3 in. diam. 1 in. thick	5.1	117	300
Baked potato (B, C)	1 large	4.5	17	150
Scalloped tomatoes (A, B, C)	¾ cup	7.2	17	150
White bread	¼ loaf	2.8	28	200
Butter substitute	2 tbsp.	0.9	—	200
Creamy rice pudding with raisins (A, B)	⅘ cup	3.0	15	200
Milk for pudding (A, B)	½ cup	4.3	17	85
Sugar	1 tbsp. (scant)	0.5	—	50
				1335
Total for day			515	3673

[1] B includes B and G. [2] Some butter substitutes contain Vitamin A.
[3] See Table II, Appendix, p. 406.

The moderately active man has the advantage over his sedentary brother in that his exercise is likely to give him better appetite and digestion; and he is more fortunately situated than the man doing severe muscular exercise, in that he does not have to buy so many calories with his money. If one has to buy 4000 calories for 60 cents, he must proceed on a plan suitable for 1½ cents per 1000 calories; but if only 3000 calories are required, there will be fifteen cents which can be used to make the dietary richer in vitamins. Since we have learned that a diet which is adequate for the maintenance of the adult can be improved, increasing vigor and resistance to disease, such an investment may be regarded as distinctly advantageous. The following food plan and dietary offer suggestions for the man whose occupation is one involving a moderate amount of physical labor.

A Day's Food Plan for a Moderately Active Man

Fuel Requirement: 3000–3300 Calories Cost: 1¾–2¢ per 100 Calories

Breakfast:	Cereal (home cooked or ready-to-eat as preferred)	100–200 Calories
	Creamed fish or Bacon or Scrambled egg	70–150 Calories
	Milk for cereal	170–200 Calories
	Toast or Muffins	100–200 Calories
	Butter or butter substitute	100–300 Calories
	Sugar for cereal and coffee	100 Calories
	Top milk for coffee	100 Calories
		900–1000 Calories
Luncheon:	Hash or Sausage, sauerkraut and potato or Baked Lima beans, tomato sauce	250–350 Calories
	Bread	150–250 Calories
	Butter or butter substitute	150–250 Calories

LUNCHEON — *Continued:*		
	Raw apple or banana or Raw vegetable (celery, lettuce or greens)	50–100 Calories
	Pudding or pie	150–200 Calories
	Milk to drink	150–170 Calories
		1000–1100 Calories
DINNER:	Swiss steak or Baked pork tenderloin or Salmon loaf	200–300 Calories
	Potatoes or Rice	150–200 Calories
	Bread	100–200 Calories
	Butter	150–200 Calories
	Cooked vegetable (turnips, carrots, peas)	100–150 Calories
	Lettuce, watercress, celery, or other raw vegetable, plain or with salad dressing	50–100 Calories
	Fruit tapioca or shortcake with milk or Milk pudding or Plain cake and milk to drink	200–250 Calories
		1100–1200 Calories

Underweight Men

Men who are very thin require more calories per pound of body weight than those who have a better weight in proportion to their height. Tables showing what are considered desirable weights from the point of view of health may be consulted with profit and are for convenience included in the Appendix. A reasonable store of body fat is desirable not only as reserve fuel for possible emergencies, but even more because it serves as a protection against jars and bruises and as padding for internal organs, helping to support them in proper position, so that they may work to best advantage. Most important of all it is a sign of well-nourished tissues, less liable to mental and physical fatigue, to nervous disturbances, and to tuberculosis and other infections.

A Day's Dietary for a Moderately Active Man Based on the Preceding Plan

Fuel Value: 3000 Calories Cost: 2¢ per 100 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
Flaked wheat (B)[1]	1 cup	9.0	20	150
Milk for cereal (A, B)	1 cup	8.5	34	170
Bacon	4 small slices	0.5	13	100
Graham muffins (B)	2 small	2.1	20	150
Butter substitute[2]	1½ tbsp.	0.8	—	150
Sugar for cereal and coffee	2 tbsp.	0.9	—	100
Top milk for coffee (A, B)	3 tbsp.	1.8	5	100
				920
Luncheon:				
Sausages	5 small	2.2	40	200
Sauerkraut (B)	1⅓ cups	6.6	12	50
Mashed potato (B, C)	½ cup	3.1	7	100
White bread	2 slices	1.4	14	100
Butter substitute[2]	1 tbsp.	0.5	—	100
Apple, raw (B, C, A)	1 medium	6.0	2	80
Cottage pudding	1 slice	1.1	7	100
Lemon sauce	⅛ cup	1.5	—	100
Milk to drink (A, B)	1 cup	8.5	34	170
				1000
Dinner:				
Veal pie with carrots and potatoes (B, C, A)	1 serving	8.5	40	400
Whole wheat bread (B)	2 slices	1.4	16	100
Butter (A)	1 tbsp. (scant)	0.5	—	100
Cole slaw (C, B, A)	¾ cup	2.1	5	75
Tapioca-cornmeal pudding (A, B)[3]	½ cup	5.8	36	320
Milk for pudding (A, B)	½ cup	4.3	17	85
				1080
Total for day			322	3000

[1] B includes B and G.
[2] Some butter substitutes contain vitamin A.
[3] Vitamins from milk.

Even if a thin person does not store fat easily, he should persist in eating a diet whose total calories are somewhat in excess of what will maintain his weight. It is possible to get

accustomed to a low state of nutrition and not to realize that one might feel gayer and more vigorous with a higher food intake. The undernourished body tries to conserve its forces by lowered activity, as a general rule. In such cases, trusting to appetite is not safe, and unless special measures, such as change of climate or much life out-of-doors, or specially interesting food, are employed to stimulate a better appetite, there will be no improvement.

The underweight often need more sleep and rest; chronic fatigue may be the prime cause of the poor nutritional state. A "rest cure" may be impossible, but ten minutes of lying down before dinner is something that can usually be accomplished, and the habit of relaxing from time to time can be cultivated. Sitting in the sunshine is a great aid to relaxation, and fresh air is a tonic to a poor appetite.

A health examination should be sought, to be sure that there is no actual disease responsible for a persistent failure to gain weight. It is believed today that the best weight for most adults is the standard weight for height at age thirty. Up to this age, it is better to weigh more rather than less than the average for height and age. After thirty, it is usually easier to gain weight with each succeeding decade, and most elderly persons have to guard against too much rather than too little body fat.

A poorly-assorted diet, as well as one deficient in total calories, may be the cause of emaciation. At any rate, since food is the only source of body substance, persistent high feeding, without indigestion, of a well-balanced diet must be a part of every weight-increasing program. Simple foods are best. Liberal use of butter, cream, and bacon is a great help in increasing the fuel value of the diet. Vegetables can be seasoned with butter, served with cream sauce, or used as salads with mayonnaise, French or cream dressings. Milk can be enriched with cream, and hot milk or cream can be

flavored with tea, coffee, or cocoa according to preference. A tablespoonful of cod liver oil daily will not only add its calories, but also greatly increase the supply of vitamin A, so essential to a high resistance to disease. Many times the undernourished are anemic, and will benefit from more liberal use of egg yolk and liver, both valuable sources of iron and also of vitamin A. The simple use of milk as a beverage at each meal, in addition to the customary diet, may furnish the extra calories which make a little storage of fat possible. Fruit juices can be reinforced by the addition of milk sugar, which will give extra calories without excessive sweetness, and these are generally relished. Custards and creams of various sorts are valuable means of adding calories to a meal.

Regularity in food consumption is very important. There must be a definite program consistently adhered to. Not a meal must be neglected. An extra meal, besides the customary three a day, may prove advantageous, if it does not impair the appetite for the other meals too much. But it should be scheduled, like the other meals, and taken as regularly as they. A glass of hot malted milk in the late afternoon may prove restful as well as nourishing, or a piece of sweet chocolate in the middle of a long morning may mean less fatigue before noon as well as one or two hundred more calories for the day. Large increases in food intake should not be made too suddenly, lest digestion be overtaxed. Two or three hundred additional calories every day, regularly taken, will have a beneficial influence even if there be no immediate gain in weight. Considerable change in the quality of the tissues can, in fact, take place with no apparent difference in weight, and this, for an adult, is even more significant than weight gains. Systematic exercise, to aid in muscle building, should, if possible, supplement the dietary program. Enough extra calories must be allowed for this or the exercise will result in loss rather than gain.

A Day's Food Plan for a Fattening Dietary for a Sedentary Man

Cost Liberal

Fuel Requirement: 3500–3800 Calories
Ordinary Requirement: 2500–2800 Calories — Cost: $2\frac{1}{2}$–$3\frac{1}{4}$¢ per 100 Calories

Breakfast:	Fruit juice	100–200 Calories
	Cereal	100–150 Calories
	Butter for cereal	100 Calories
	Egg or bacon	70–100 Calories
	Muffins or Toast	150–300 Calories
	Butter for muffins or toast	200–300 Calories
	Cream, thin	250–400 Calories
	Sugar	100–150 Calories
	Coffee if desired	— —
		1000–1200 Calories
Luncheon:	Stuffed pepper or Creamed meat or Salad with mayonnaise	200–300 Calories
	Olives or Celery stuffed with cream cheese or Jelly	100–200 Calories
	Ry-crisp or crusty roll	100–150 Calories
	Butter	100–150 Calories
	Top milk (upper 18 ounces)	250–300 Calories
	Stewed fruit or Ice cream	150–200 Calories
		1000–1200 Calories
Dinner:	Roast meat with stuffing and gravy or Broiled steak or Fish with egg sauce	250–400 Calories
	Buttered or creamed vegetable	150–250 Calories
	Potatoes	100–200 Calories
	Fruit or vegetable salad with Oil or cream dressing	150–250 Calories
	Nuts, plain or salted	100–150 Calories
	Roll or bread	75–150 Calories
	Butter	100–200 Calories
	Bavarian cream or Tapioca cream or Custard pie or Fruit with cream	200–350 Calories
		1200–1600 Calories

A Fattening Dietary for a Sedentary Man Based on the Preceding Plan

Cost Liberal

Fuel Value: 3595 Calories

Ordinary Requirement: 2500 Cost: 2¾–3¢ per 100 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
Grape juice (B)[1]	½ cup	3.5	—	100
Farina with 4 dates (B)	¾ cup	7.1	14	200
Scrambled egg (A, B)	½ cup	4.3	40	200
Toast	1 slice	0.7	7	50
Butter (A)	1 tbsp.	0.5	—	100
Cream, thin (A, B)	⅚ cup	6.3	18	350
Sugar	2 tbsp. (scant)	0.9	—	100
Coffee	1 cup	—	—	—
				1100
Luncheon:				
Creamed chicken (A, B)[2] on	½ cup	3.6	36	218
Toast	2 slices	1.4	14	100
Butter (A)	2 tbsp.	0.9	—	200
Lettuce salad (C, A, B)	1 serving	1.8	2	10
Boiled dressing (A, B)	2 tbsp.	1.4	5	50
Saltines	2 saltines	0.2	4	32
Vanilla ice cream II (A, B)[3]	½ cup	4.0	12	200
Milk for café au lait (A, B)	⅝ cup	5.1	19	100
				910
Dinner:				
Cream of corn soup (A, B)	¾ cup	6.3	20	165
Roast beef	2½ slices	4.0	115	250
Baked potato (C, B)	1 medium	3.0	11	100
Buttered Lima beans (B, A)	⅜ cup	2.6	23	150
Whole wheat bread (B)	1 slice	1.4	16	100
Butter (A)	3 tbsp.	1.4	—	300
Baked apple (C, B)	1 large	4.5	3	200
Cream, thin (A, B)	½ cup	4.0	12	220
Sugar	2 tbsp.	1.0	—	100
				1585
Total for day			371	3595

[1] B includes B and G.

[2] From milk and butter.

[3] See Table II, Appendix, p. 407.

A Day's Food Plan for a Fattening Dietary for a Sedentary Man

Cost Minimal

Fuel Requirement: 3500–3800 Calories

Ordinary Requirement: 2500–2800 Calories Cost: 1½–1¾¢ per 100 Calories

Breakfast:	Stewed dried fruit	100–150 Calories
	Cooked cereal	150 Calories
	Butter substitute in cereal	100 Calories
	Milk	250–350 Calories
	Toast	150–200 Calories
	Butter substitute for toast	100–150 Calories
	Jam for toast	100–150 Calories
		1000–1200 Calories
Luncheon:	Baked split peas with bacon or Cheese fondue or Baked bananas and rice	250–350 Calories
	Milk to drink	160 Calories
	Raisin or Boston brown bread	200–250 Calories
	Butter substitute	150–200 Calories
	Ginger bread, chocolate icing or Cocoa tapioca or Prune pudding	200–300 Calories
		1000–1200 Calories
Dinner:	Baked sausage or fish or Irish stew with dumplings or Liver and noodle loaf	300–350 Calories
	Potatoes	100–200 Calories
	Cooked carrots or turnips or string beans and butter substitute	150–250 Calories
	Tomato jelly or red cabbage and onion salad	100–200 Calories
	Bread	100–150 Calories
	Butter substitute	100–150 Calories
	Milk to drink	160 Calories
	Squash pie or Brown betty or Junket with hermits	250–350 Calories
		1400–1600 Calories

A Fattening Dietary for a Sedentary Man Based on the Preceding Plan

Cost Minimal

Fuel Value: 3610 Calories
Ordinary Requirement: 2500 Calories Cost: 1½–1¾¢ per 100 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
Stewed dried apricots (B)[1]	⅜ cup	4.0	10	150
Wheatena and cream of wheat, half and half with 1 tbsp. butter substitute stirred in (B)	¾ cup	6.0	12	200
Milk for cereal (A, B)	¾ cup	6.4	26	120
Hot milk for café au lait (A, B)	¾ cup	6.4	26	120
Sugar for café au lait	1 tbsp. (scant)	0.5	—	50
Whole wheat toast (B)	2 slices 3¼ in. × 3¼ in. × ⅓ in.	1.4	14	100
Butter substitute[2]	1½ tbsp.	0.8	—	150
Apple butter (B)	2 tbsp.	1.5	1	100
				990
Luncheon:				
Baked bananas (B, A)	2 bananas	11.0	10	200
Steamed rice	1 cup	6.0	13	150
Butter substitute[2]	1 tbsp.	0.5	—	100
Rye bread (B)	4 slices 3½ in. × 4 in. × ¼ in.	2.4	20	150
Peanut butter (A, B)	1½ tbsp.	0.9	28	150
Milk to drink (A, B)	⅝ cup	5.1	19	100
Chocolate blanc mange (A, B)	⅝ cup	4.8	20	250
Milk for blanc mange (A, B)	⅝ cup	5.1	19	100
				1200
Dinner:				
Veal and pork loaf	Slice 4 in. × 6 in. × ⅜ in.	4.2	120	300
German fried potatoes (C, B)	1 cup	5.8	10	200
Buttered Lima beans (B, A)	⅜ cup	2.5	24	150
Whole wheat bread (B)	1 slice 3¾ in. × 3⅛ in. × ½ in.	1.4	16	100
Butter substitute	1 tbsp.	0.5	—	100
Red cabbage cole slaw (C, B, A)	1 cup	2.8	6	100
Milk to drink (A, B)	1 cup	8.5	34	170
Coffee junket (A, B)	¾ cup	6.0	14	200
Hermits (B)	2½ cookies 2 in. diam.	0.9	6	100
				1420
Total for day			448	3610

[1] B includes B and G. [2] Some butter substitutes contain vitamin A.

Overweight Men

The disadvantages of thinness are perhaps more fully appreciated by men than those of being overweight. A "lean and hungry look" does not suggest serenity, jollity, and prosperity, as does a little corpulence. But because some store of body fat is desirable, it does not follow that increase in weight should have no limit. During childhood and youth, weight somewhat over the average for height and age is desirable; but by the age of 35 or 40, and thereafter, statistics indicate that a weight normal for the individual at age thirty is better than the heavier weight commonly found in more mature people.

As men grow older they tend to less and less activity; they are willing to sit for hours, a thing no healthy boy would do; they give up active sports like swimming and tennis and take to golf and poker. Their internal as well as their external activities slow down, only a trifle at first, but each year a little more, so that in the course of time the sum of the decrease is considerable. Yet their appetites may be as keen as ever, and interest in eating as an amusement decidedly on the increase. What is the result? More fuel is taken in than is burned off. It is a simple matter of arithmetic. If you eat 3000 calories a day when you could maintain your weight on 2500, you have started to store "excess baggage." That 500 calories a day stored steadily will soon mean pounds of fat on the bathroom scales. "You eat too much, no matter how little it is, *even if it be only one bird-seed daily*, if you store it away as fat," says Dr. Lulu Hunt Peters in her amusing but practical "Diet and Health with Key to the Calories."

Too much fat is detrimental to the best health. It is apt to interfere with the healthy play of the muscles, causing them to deteriorate and laying the foundation for weakness of the heart. Excessively fat people seem predisposed toward gout

and diabetes. It is usually much easier to keep the weight from becoming excessive than it is to take off fat once it has accumulated. Sudden gains in weight, as sudden losses, should be brought to the attention of a physician, but steady gains in weight in a healthy person mean that he has been eating beyond his requirements, and he should devise a plan which will keep his food intake in proper relation to his needs. Increasing exercise will help to burn off fat, but as Dr. Russell H. Wilder says in "Your Weight and How to Control It," "The appetite is tremendously stimulated thereby, so that restricting the diet becomes an exquisite torture. Excessive exercising is a tedious ordeal for most persons and sooner or later is neglected. In the meanwhile the habit of eating a great deal has been formed, and this habit, as well as the appetite, continues long after the exercising has been given up; thus pound after pound is added to the weight and any reduction that has resulted from the exercising is overbalanced." Far better is it to be forewarned of the tendency to take on weight in adult life, and make a systematic plan of eating which shall keep the food intake close to requirement.

A fat man requires less fuel per pound of body weight than a thinner man. Fat represents "dead weight." The actual amount of working muscle may be no more and perhaps actually less than in another man who tips the scales at a lower figure but has no cushion on the back of his neck and no "bay window" in front. For this reason overweight people often complain that they stay fat when they eat less than their thinner friends. They will! They must eat less than they themselves need if they are to burn off any superfluous fat. Reducing the food intake below the daily calorie requirement will always reduce weight if persisted in, year in and year out. A few days or weeks will do no good. The exact number of calories which will result in a definite weight loss in a given time cannot be stated. Losing weight is, physiologically

speaking, more complicated than it appears to be. A weight loss of more than one or two pounds a week is not desirable, except under the immediate supervision of a physician. The first thing is to find out approximately how many calories are required according to age, weight, and activity and then plan to take one-fourth off this calorie allowance if only a little overweight, one-third off if from 20 to 25 per cent overweight, and one-half off if over 25 per cent overweight, watching the scales from week to week.

Foods very high in fuel value, as fats and cooked foods containing much added fat, are to be avoided, and bulky foods of low fuel value used to satisfy the appetite. Even then, considerable self-denial is necessary, because eating enters so much into the social life of adults, and it takes real forethought and resolution not to follow the crowd. Clear soups should take the place of cream soups, butter and cream should be almost eliminated, sugar used very sparingly if at all, and cakes, pies, confectionery, nuts as side dishes, and soda fountain delicacies avoided entirely. Green vegetables of all kinds, raw or plainly cooked, such as cabbage, celery, lettuce, spinach, kale, Brussels sprouts, cauliflower, asparagus, should be freely eaten. Bread and cereals should for the most part be omitted but bran can be used as a breakfast food or in muffins. Fresh fruits should be substituted for made desserts. Strictly lean meats, simply cooked (no sauces or gravies) may be used liberally in conjunction with generous quantities of green vegetables. At least one cup of whole milk (or skim milk and butter equivalent to the cream in the whole milk) should be included in every day's diet, and another cup of skim milk can often be used to advantage. One egg or the same number of calories of cheese a day is also desirable.[1]

[1] Further helpful suggestions will be found in *Your Weight and How to Control It*, Part IV, George H. Doran Co. (1927), and in the *Calorie Cook Book*, Donahey, M. D., The Reilly and Lee Co. (1923).

For a man of sedentary occupation whose normal weight is 154 pounds, the day's energy requirement has already been estimated as approximately 2400–2500 calories. This man would need very few more calories to maintain 50 pounds of fat, or a total body weight of 200 pounds. If he weighs 200 pounds and wishes to reduce 50 pounds in a year, he would need to deduct at least 500 calories per day from his requirement calculated for his height, *normal weight*, and usual activity, and for more rapid deduction he would need to subtract as many as 1000 calories from his daily requirement.

A Day's Food Plan for a Reducing Diet for an Overweight Man

I

Food Allowance: 1400–1500 Calories
Ordinary Intake: 2500–2800 Calories — Cost: $2\frac{3}{4}$–$3\frac{1}{2}$¢ per 100 Calories

Breakfast:	Fruit or fruit juice, unsweetened	100 Calories
	Eggs (1 or 2)	70–140 Calories
	Whole wheat or bran bread	25–50 Calories
	Milk	75–85 Calories
	Coffee	— — Calories
		300–400 Calories
Luncheon:	Clear meat or vegetable broth	10–25 Calories
	Cracker or croutons	15–25 Calories
	Broiled fish or steak	150–200 Calories
	Cooked leafy vegetable (no butter)	25–50 Calories
	Turnips or carrots or potato	50–75 Calories
	Butter for one vegetable	50 Calories
	Raw fruit or lettuce or celery	50–100 Calories
		400–500 Calories
Dinner:	Fruit cocktail (no sugar) or Raw oysters or clams	50–100 Calories
	Strictly lean meat	150–200 Calories
	Cooked green vegetable (no butter)	25–50 Calories
	Potato or bread	75–100 Calories
	Butter for potato or bread	50 Calories
	Cracker and cheese or Raw fruit	75–100 Calories
	Milk	75–85 Calories
		500–600 Calories

A Reducing Dietary for an Overweight Man Based on the Preceding Plan

Cost Liberal

Fuel Value: 1450 Calories
Ordinary Requirement: 2500 Calories

Cost: 3¢ per 100 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
Orange (C, B, A)[1]	1 large	9.5	7	100
Eggs (A, B)	2 eggs	4.8	54	150
Graham bread (B)	1 thin slice	0.5	5	30
Coffee (unsweetened)	1 cup	—	—	—
Hot milk for coffee (A, B)	½ cup	4.3	17	85
				365
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 (B)	10 stalks	8.0	16	50
Potato, boiled (C, B)	small	2.7	8	75
Butter for potato and asparagus (A)	½ tbsp.	0.3	—	50
Apple, raw (C, B, A)	1 medium	4.9	2	65
				490
Dinner:				
Raw oysters (A)	6 oysters	3.6	25	50
Roast beef, strictly lean	large serving	5.8	162	250
String beans, plain boiled (A, B, C)	½ cup	2.0	5	25
Potato, boiled (C, B)	1 small	2.7	8	75
Tomatoes, sliced, with vinegar, salt and pepper (C, B, A)	1 medium	7.7	8	50
Cheese, pineapple[2] (A, B)	Piece 1⅛ in. diam., ⅜ in. thick	0.4	12	50
Water cracker	1 cracker	0.1	1	10
Coffee (unsweetened)	1 cup	—	—	—
Hot milk for coffee (A, B)	½ cup	4.3	17	85
				595
Total for day			493	1450

[1] B includes B and G.

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

A DAY'S FOOD PLAN FOR A REDUCING DIET FOR AN OVERWEIGHT MAN

II

Food Allowance: 1800–2000 Calories
Ordinary Intake: 2800–3000 Calories — Cost: 2½–3¢ per 100 Calories

BREAKFAST:	Fruit or fruit juice, unsweetened	100 Calories
	Egg or small lamb chop, fat removed	70–100 Calories
	Toast or rolls or bran muffins	100–150 Calories
	Butter	50–75 Calories
	Milk	85–100 Calories
	Coffee	— —
	Sugar	50 Calories
		500–600 Calories
LUNCHEON:	Lean meat and green vegetables or Hot vegetable plate (3 or 4 vegetables) or Turkish pilaf and bacon or Thick vegetable soup	150–200 Calories
	Crisp roll	100–150 Calories
	Butter	50 Calories
	Milk	160 Calories
	Banana or other raw fruit or Lettuce salad	100–150 Calories
		550–650 Calories
DINNER:	Roast veal or other lean meat	200–250 Calories
	Potato	100–150 Calories
	Cooked green vegetable	50–75 Calories
	Bran bread	100 Calories
	Butter for potato and bread	100 Calories
	Raw fruit or plain gelatin jelly or Fruit salad (mineral oil dressing)	100–150 Calories
		700–800 Calories

For the first few days a reducing diet seems difficult, but the stomach soon gets adjusted to receiving less food, and as long as the diet is adequate in everything but calories there will soon come a feeling of well-being. Care should be taken to drink liberal amounts of water, and if necessary, a tablespoonful of mineral oil may be taken to avoid constipation, although with sufficient vegetables low in fuel value this is hardly likely to be necessary.

A Day's Dietary for a Reducing Diet for an Overweight Man

Cost Moderate

Fuel Value: 1855 Calories
Ordinary Requirement: 3000 Calories Cost: 2–2½¢ per 100 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
Freshened prunes (B)[1]	4 medium	1.4	3	100
Egg (A, B)	1 egg	1.9	25	70
Bran muffins (B)	1 muffin	2.0	22	115
Butter (A)	½ tbsp.	0.3	—	50
Milk (A, B)	⅝ cup	5.1	19	100
Sugar	2 tbsp.	0.4	—	50
Coffee				—
				485
Luncheon:				
Broiled halibut with lemon	Piece 3½ in. × 1¼ in. × 1½ in.	5.0	92	150
Brussels sprouts (A, B)	1½ cups	8.3	15	50
Graham roll (B)	1 roll	1.3	12	100
Butter (A)	½ tbsp.	0.3	—	50
Milk to drink (A, B)	1 cup	8.5	34	170
Sliced banana with orange (C, A, B)	1 banana, ¼ cup orange	7.5	5	125
Sugar	1 tsp.	0.2	—	25
				670
Dinner:				
Broiled Hamburg steak	2 cakes 2½ in. diam., ⅞ in. thick	4.0	110	200
Baked potato (B, C)	1 medium	3.0	11	100
Peas (A, B, C)	¾ cup	3.5	28	100
Triscuit	2 squares	0.5	6	50
Butter (A)	1 tbsp.	0.5	—	100
Coffee jelly (A, B)	½ cup	4.5	10	50
Whipped cream (A)	2 tbsp.	0.9	2	100
				700
Total for day			394	1855

[1] B includes B and G.

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 maintain 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 daily losses which are a part of normal life.

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 a small daily amount 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 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 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 needed 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, but 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 together, 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 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 compounds 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 protein in terms of the total day's fuel. An allowance of two protein calories per pound of body weight for an average man means about 300 protein 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 or when on a reducing diet, in which case care should be taken that he has at least two protein calories per pound regardless of the total energy intake. By reference to the dietaries already given it will be seen that the protein supply falls within the limits suggested here.

That proteins are composed of amino acids of different kinds, and that the nutritional efficiency of any particular protein or mixture of proteins is really a matter of just what

amino acids it is capable of yielding, has already been pointed out in Chapter I. Fortunately, proteins are of many kinds, and usually several are associated in any single food. Cereal proteins *alone* do not yield a protein mixture which can be depended upon exclusively, but milk, eggs, and meat, each and all, make good any amino acid deficiencies in the cereal foods, even when used with them in rather small amounts. This is another reason why a pint of milk in the diet of an adult every day is a good rule.

Liebig, the first great student of protein in nutrition, thought that meat, being most like man's muscle, would be most efficient in replacing it. He had no idea that all proteins are literally taken to pieces in the digestive tract and all the parts (amino acids) reassembled by the cells according to their needs. Liebig's notion has been slow in giving way to the newer conception 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. It also agrees well with the unskilled or careless cook, since it is acceptable even when badly treated whereas a delicately flavored vegetable may be utterly ruined by 2 minutes extra cooking or too much salt or even too much water.

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 during the growth of the young are found in milk and eggs. The value

of milk as a source of protein for growth cannot be disputed. Ordinary meat has certain disadvantages as the sole or chief protein food of the diet. Associated more or less intimately with the protein of 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 reduced. 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 18 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 46 cents (with beef at 55 cents a pound in the market) and 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 37.7 cents (with milk at 15 cents per quart), but leaving only 1300

calories to be obtained from other sources. If eggs are chosen, 9 portions will be required, costing 44 cents (with eggs at 60 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 a rich supply of ash constituents and vitamins which will 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.

Requirements for Ash Constituents

Attention has already been called in Chapter I 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. The results of ash starvation would not be manifested so quickly as those of deprivation of vitamins, water, fuel, or protein (nitrogen) because the amounts lost daily are small and in an adult the reserves in the body are comparatively great. 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 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:

Phosphorus	1.32 grams
Calcium	0.67 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 Grams	Phosphorus Grams	Iron Grams
Bread, white (1¾ loaves)	20.7	216	1500	0.165	0.525	0.0053
Beef, lean	9.0	216	400	0.029	0.556	0.0077
Butter	2.8	4	600	0.012	0.012	——
Total		436	2500	0.206	1.093	0.0130

(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 Grams	Phosphorus Grams	Iron Grams
Milk (7½ cups)	61.2	228	1200	2.088	1.608	0.0042
Bread, white (1½ loaves)	17.9	187	1300	0.143	0.455	0.0046
Total		415	2500	2.231	2.063	0.0088

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

	Weight Oz.	Protein Calories	Total Calories	Calcium Grams	Phosphorus Grams	Iron Grams
Bread, white (1½ loaves)	17.9	187	1300	0.143	0.455	0.0046
Beef	6.8	163	300	0.024	0.442	0.0062
Butter	2.3	3	500	0.010	0.010	——
Milk (2½ cups)	20.4	76	400	0.696	0.536	0.0014
Total		429	2500	0.873	1.443	0.0122

(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 Grams	Phosphorus Grams	Iron Grams
Milk ($7\frac{1}{2}$ cups) .	61.2	228	1200	2.088	1.608	0.0042
Bread, graham ($1\frac{1}{2}$ loaves) . .	17.6	177	1300	0.260	1.092	0.0125
Total . .		405	2500	2.348	2.700	0.0167

If some foods known to be rich in iron, calcium, and phosphorus be included each day, the ash constituents will generally be adequately provided for, without detailed calculations like those just cited. Milk is the most valuable source of calcium; a single 100-calorie portion will supply one-fourth of the day's requirement. 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. With the exception of milk, the foods just named, also fruits and green vegetables, are rich sources of iron.[1] A large serving of spinach will of itself supply one-third of the day's iron requirement. It has been found that traces of copper and perhaps other substances in vegetables and whole grain cereals and in apricots and pineapples among fruits, enable the body to utilize iron better than it otherwise could. Liver also contains some of these substances and being also rich in iron, is a far better source than ordinary muscle meat. If one makes it a general rule to have a pint of milk (including that concealed in various foods by cookery) in the dietary program to insure the

[1] For calcium, phosphorus, and iron in 100-calorie portions, see pages 21, 19, and 20 respectively.

calcium and phosphorus supply, and adds some vegetable rich in iron daily, using eggs, meat (including liver), and cereals with the bran retained from time to time, but not necessarily all of them every day, there is little likelihood of the diet of the adult being deficient in ash constituents.

Vitamin Requirements

The necessity for a variety of vitamins in the diet has already been pointed out. While the quantity needed is not so great in the adult as in the growing child, their presence in the diet is essential to the maintenance of health and resistance to disease. One can live on a higher plane of vitality only when the diet is well-balanced in regard to these as well as all other factors. Scientific investigation has not yet gone far enough to tell definitely how much is required, but it seems certain that one or two first-class sources of each should be included in the diet daily. With a little forethought, even a very economical diet (precluding the use of butter and generally of eggs) may still have its vitamin A from milk, liver, and such vegetables yielding the vitamin as may be available from time to time. At almost any season at least one may be had — lettuce, tomatoes, carrots, beet and dandelion greens, making almost the cycle of the seasons. Vitamin B is so widely distributed in fruits and vegetables that a diet regularly containing generous allowances of almost any of these in addition to a pint of milk a day will be safeguarded against any shortage. Vitamin C is best insured by a fairly regular supply of fresh fruits and vegetables known to be rich in the vitamin. Many vegetables lose the greater part of their vitamin C in cooking, hence the practice of eating some raw vegetable every day is a wise one. Tomatoes, fortunately, are about equally efficient whether raw, cooked or canned, and potatoes, if cooked as quickly as possible, retain much of this vitamin. Cabbage, spinach, and other leafy vegetables

should be cooked only a very few minutes, and with the least possible water. Vitamin D may be secured by daily exposure to the direct rays of the sun. In winter when there is little sunshine, a daily tablespoonful of cod liver oil will add not only vitamin D but also vitamin A. A concentrated preparation of cod liver oil in tablet form is available for those not inclined to take the natural oil. Vitamin G is provided in eggs, milk, and many fruits and vegetables which furnish vitamin B. A pint of milk a day is probably an adequate safeguard against a deficiency of vitamin G.[1]

With a little knowledge, it is not necessary to have elaborate cookery or many kinds of food to keep a man well nourished. So simple a ration as milk and graham bread (see page 87) will supply everything but vitamin C. Add an orange or a tomato a day and a sunbath (as milk is not very rich in vitamin D) and one might subsist in health without further thought about food. The bread-butter-beef-milk diet shown to be adequate in calories, protein, calcium, phosphorus, and iron (page 86) needs the addition of something for vitamin C and for ballast. Spinach, lettuce, turnip tops, kale or cabbage would fulfill both requirements and at the same time furnish those substances which favor iron utilization. Once a feasible plan has been worked out, variety may be secured by changes from one food to another of the same general character. Thus one cereal may generally be replaced by another or by bread; one kind of meat by another; one green vegetable by another, giving that variety which is convenient and helps to maintain good appetite. Warm food usually adds to the ease with which a meal is digested, and often to its relish.

[1] For information as to the vitamin content of various foods, consult the Appendix, Table III.

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	Teachers
Bookkeepers	Seamstresses
Stenographers	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 rest, 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. 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. They are also arranged with a view to insuring an adequate supply of proteins, ash constituents, and vitamins.

A Day's Food Plan for an Active Woman

Fuel Requirement: 2600–3000 Calories Cost: 2½–3¢ 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
	Toast or muffins	50–150 Calories
	Sugar	50–100 Calories
	Coffee	—
		600–800 Calories
Luncheon:	Thick vegetable 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

I

Fuel Value: 2865 Calories Cost: 2½–3¢ per 100 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
Canned pineapple (B,[1] A, C)	1 slice	1.2	—	50
Cornflakes (B)	⅜ cup	0.5	3	50
Milk (A, B)	1 cup	8.5	34	170
Fish balls (B)	2 small	2.6	21	150
Toast	2 slices	1.1	14	100
Sugar	1 tbsp. (scant)	0.5	—	50
Butter (A)	1 tsp.	0.1	—	30
Cream, thin (A, B)	¼ cup	1.8	5	100
Coffee	1 cup	—	—	—
				700
Luncheon:				
Cheese soufflé (A, B)	¾ cup	2.5	27	150
Turkish pilaf (C, B, A)	1 cup	7.5	9	100
Corn muffins (B)	2 small	2.4	26	200
Butter (A)	1 tbsp.	0.5	1	100
Canned apricots (B)	½ cup	4.8	5	100
Chocolate loaf cake	Piece 2½ in. × 2½ in. × 1½ in.	1.8	10	200
Milk (A, B)	1 cup	8.5	34	170
				1020
Dinner:				
Vegetable soup (B)	¾ cup	6.0	18	25
Pork chops	1 large	2.4 (Raw weight)	92	250
Glazed sweet potatoes (A, B)	2 halves	5.2	10	250
Mashed turnips (C, B)	¾ cup	4.5	7	50
Cole slaw (C, B, A)	½ cup	1.4	3	50
Rolls	2 small	1.5	15	120
Butter (A)	1 tbsp.	0.5	1	100
Apple tapioca (C, B)	⅜ cup	5.4	2	150
Cream sauce (A, B)	¼ cup	1.7	5	150
				1145
Total for day			342	2865

[1] B includes B and G.

A Dietary for an Active Woman, Based on the Preceding Plan

II

Fuel Value: 3005 Calories Cost: $1\frac{3}{4}$–2¢ per 100 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
Stewed seedless raisins (B)[1]	2 tbsp. uncooked	1.0	3	100
Shredded wheat biscuit (B)	1 biscuit	1.0	14	100
Milk for cereal (A, B)	1 cup	8.5	34	170
Top milk for coffee (A, B)	$\frac{3}{8}$ cup	3.0	10	100
Sugar for cereal and coffee	2 tbsp. (scant)	0.9	—	100
Date muffins (whole wheat and dates) (B)	2 small muffins	2.2	16	200
Butter substitute[2]	1 tbsp.	0.5	1	100
				870
Luncheon:				
Creamed salmon on toast (A, B)	$\frac{1}{2}$ cup salmon and 1 slice toast	2.4	22	200
Baked potatoes (B, C)	1 medium	3.0	11	100
Bread, whole wheat (B)	$1\frac{1}{2}$ slices $3\frac{3}{4}$ in. × $3\frac{1}{8}$ in. × $\frac{1}{2}$ in.	2.1	24	150
Butter substitute	$1\frac{1}{2}$ tbsp.	0.8	2	150
Red cabbage cole slaw (C, B, A)	1 cup	2.8	6	100
Canned peaches (B)	2 large halves and 3 tbsp. juice	7.5	6	100
Cookies	2, diam. $2\frac{1}{4}$ in.	0.9	6	100
Milk (A, B)	$\frac{1}{2}$ cup	4.3	17	85
				985
Dinner:				
Broiled Hamburg steak with gravy	2 balls 2 in. diam. $\frac{3}{4}$ in. thick, $3\frac{1}{3}$ tbsp. gravy	4.6	76	200
Escalloped potatoes (B, C, A)	$1\frac{1}{4}$ cups	7.0	18	200
Fried parsnips (B)	7 pieces $3\frac{1}{2}$ in. × $1\frac{1}{2}$ in. × $\frac{1}{3}$ in.	5.0	10	100
Apple sauce (B)	$\frac{3}{8}$ cup	3.5	1	100
Lettuce, with salt, sugar, lemon juice (A, B, C)	3 or 4 large leaves	2.0	3	10
Bread, white	2 slices 3 in. × $3\frac{1}{2}$ in. × $\frac{1}{2}$ in.	1.4	14	100
Butter substitute	1 tbsp.	0.5	1	100
Blueberry pie	Piece $4\frac{1}{2}$ in. at circumference	4.8	9	340
				1150
Total for day			304	3005

[1] B includes B and G.

[2] Some butter substitutes contain vitamin A.

A Day's Food Plan for a Sedentary Woman

Fuel Requirement: 1800–2300 Calories Cost: 2½–3½¢ 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: 2½–3½¢ per 100 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
Orange (C, B,[1] A)	1 orange	9.5	7	100
Omelet (A, B)	1 egg	2.0	28	100
Toast	1 slice	0.5	7	50
Butter (A)	1 tsp.	0.1	—	30
Cocoa I[2]	¾ cup	6.7	16	120
				400
Luncheon:				
Corn à la Southern	½ cup (scant)	4.2	20	125
Fruit salad (C, B) (mayonnaise)	½ cup	3.0	6	200
French rolls	1 roll	1.3	12	100
Butter (A)	2 tsp.	0.3	—	66
Milk (A, B)	¾ cup	6.3	24	124
Sugar cookies	2 large	1.0	7	100
				715
Dinner:				
Cream of pea soup (B, A)	⅔ cup	5.2	16	100
Croutons, fried	½ doz.	0.4	3	50
Lean roast beef	Slice 5 in. × 6 in. × ⅛ in.	1.5	42	150
Baked potato (C, B)	1 medium	3.0	11	100
Spinach à la crême (A, B, C)	⅓ cup (scant)	1.8	4	45
Tomato salad (C, B, A) (French dressing)	1 serving	4.5	3	170
Saltines	1 saltine	0.1	1	15
Tapioca cream (A, B)	1 cup	7.0	30	255
				885
Total for day			237	2000

[1] B includes B and G.

[2] See Table II, Appendix, p. 397.

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

II

Fuel Value: 2035 Calories Cost: $1\frac{3}{4}$–$2\frac{1}{4}$¢ per 100 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
Orange (C, B,[1] A)	½ orange	4.7	3	50
Cream of wheat (B)	⅜ cup	3.0	6	50
Cornmeal muffins (B)	2 small	2.4	26	200
Butter (A)	2 tsp.	0.3	—	60
Top milk for cereal and coffee (10 oz.)(A, B)	⅜ cup	3.1	14	150
Sugar	1 tbsp.	0.6	—	60
Coffee	1 cup	—	—	—
				570
Luncheon:				
Creamed salmon on toast (A, B)	¾ cup and 2 slices	7.0	77	350
Cole slaw (C, B, A)	½ cup	1.4	3	50
Bread	1 slice	0.7	7	50
Butter (A)	½ tbsp.	0.2	—	50
Apple sauce (C, B)	⅜ cup	3.5	1	100
Sponge cake (A, B)	Piece 1½ in. × 1½ in. × 2 in.	0.9	11	100
Russian tea	1 cup	—	—	—
Sugar for tea	½ tbsp.	0.3	—	30
				730
Dinner:				
Stuffed steak	Slice 3 in. diam., ⅔ in. thick	2.2	78	200
Tomato sauce (C, B, A)	⅓ cup	2.5	5	100
Browned potatoes (C, B)	1 medium potato	3.5	11	125
Boiled onions (B, C)	2 onions	5.0	10	100
Bread	1 slice	0.7	7	50
Butter (A)	½ tbsp.	0.2	—	50
Coffee jelly	½ cup	4.0	4	40
Whipped cream (sweetened) (A, B)	1½ tbsp.	0.7	1	70
				735
Total for day			264	2035

[1] B includes B and G.

Overweight Women

To eat out of proportion to one's need either on the side of meagerness or superfluity is culpable in the light of modern knowledge. A witty writer who applied herself to the problem of reducing her weight testified thus: "I removed 50 pounds in seven months, and this without exercising anything but my intelligence." This means that she was able to make her food intake less than her energy expenditure and burn off her superfluous calories. A pound of body fat means 4000 calories which have been taken in excess of need. The only way to get rid of that extra pound is to create a discrepancy between food intake and energy output. One may do it by increasing the output — exercising something more than one's intelligence — but that will tend to increase appetite, and then it becomes harder than ever to keep one's food consumption under restriction. So for most overweight persons, it is more practical to take only one "daily dozen" instead of five or six — just enough to keep the muscles in good tone; and to restrict the calories in the food so that the proper weight is established and maintained. For women, as for men, the normal weight at thirty is regarded as the most favorable to health in subsequent years. (See Table VI in the Appendix.) Those who inherit a propensity to store body fat very easily may even have to be on guard before thirty, but most women begin to manifest this tendency after rather than before this age. The time to begin to adjust the diet is when the tendency to store fat begins to appear. Once "great excess" has accumulated, the problem of its removal without harm becomes more complicated; severe reducing should be carried on only under the supervision of a physician who can regulate the treatment so that the general health is not impaired. Sudden loss of pounds of supporting fat leaves weakened muscles unfavorably situated to grow vigorous again.

Building up must in this case accompany tearing down. A wise woman will not let her body become encumbered with too much fat, but will check her weight on the scales at least every month or two and immediately proceed to curb any tendency for appetite to take on more than activity works off. In the early stages of growing fat, "counting the calories," with care that the other essentials of the diet are at the same time fully provided, will result in better health and longer enjoyment of it. Mr. Henry T. Finck, the well-known musical critic, who wrote for the benefit of mankind his facetious yet earnest "Girth Control," puts the situation very aptly, quoting Shakespeare thus:

> "Make less thy body hence and more thy grace;
> Leave gormandizing; know the grave
> Doth gape for thee thrice wider than
> For other men."

Then he asks, "How could Shakespeare, so many years ago anticipate the latest life insurance figures? . . . What are the insurance companies' figures? They show that when you are about fifty years old every pound of overweight means 1 per cent taken from your life expectancy. If at fifty you weigh 50 pounds too much, your life expectancy is reduced by 50 per cent — that's easy to remember.

"In other words you will live only half as many years more as you would if you enjoyed normal weight. *Keep that fact before you every time you sit down to eat.*"[1] In the diet lies the only real solution of the fat problem. Yet many women believe that some panacea can be found which without any effort on their part can transform them into girlish slimness practically overnight. Dr. Arthur J. Cramp, who speaks authoritatively for the American Medical Association, has studied obesity cures for years and says that practically all so-called "cures"

[1] Italics not in the original text.

Clara Elsene Peck

either contain dangerous drugs or are simply shrewd schemes for fooling the gullible. If the latter "work" it is because somehow or other they induce the one taking the cure to eat less calories than she spends. How much better, then, to reduce by "exercising one's intelligence!" In a study of overweight college women made at the University of Illinois, it has been found that it is often necessary to reduce the total calories per day to 1000 or less in order to bring about satisfactory loss of weight, but that it can be done with no injury to health or efficiency if the person lives a well-regulated life, with suitable sleep, fresh air and exercise, and eats a diet which is adequate in every other dietary essential except calories. The best way for an individual to proceed is to find out from Table VI in the Appendix her normal weight for height using figures for age 30 if above that, and then estimate her total energy requirement per day as indicated on page 91. Suppose her normal weight to be 145 pounds, and her occupation sedentary, then her total energy requirement would perhaps be 2300 calories per day. But her actual weight is 195 pounds. Taking 2300 calories may be actually enough to maintain this weight since so much of it is mere fat which does not use calories but helps to conserve them. Hence to lose anything at all she must cut her intake down 500 or 1000 calories per day, making a total intake of not over 1800 calories per day. With a reduction of only 500 calories per day it may take a whole year to get rid of 50 pounds, but "slow and sure" is a good rule in reducing. It is most important to work out a plan which can be remembered and stick to it. If food cannot be resisted, one should not eat with other people. For some it is easier to omit one meal a day; others suffer less from hunger if they eat more frequently but less at a time. The essential thing is to see that no more than the pre-determined number of calories are eaten on any day — not excepting Sundays, holidays, or afternoon

teas. A suggestive food plan and dietary will indicate the general character of a reducing program.

A Day's Food Plan for a Reducing Diet for an Overweight Woman

Fuel Requirement: 900–1200 Calories
Ordinary Requirement: 2400–2600 Calories Cost: 2½–3½¢ per 100 Calories

Breakfast:	Fruit or fruit juice, unsweetened	50–100 Calories
	An egg (or ½ cup skim milk)	60–75 Calories
	Toast or bran bread	50 Calories
	Milk (with or without coffee)	40–50 Calories
	Coffee (if desired)[1]	— —
		200–300 Calories
10:30 A.M.:	Vegetable bouillon or very weak tea with lemon	— —
	Bran or cellu wafer[2] or water cracker	0–10 Calories
		(May be omitted)
Luncheon:	Lean meat or fish or skim milk cheese	100–200 Calories
	Lettuce or other raw vegetable salad (mineral oil dressing)[3]	25–50 Calories
	Whole wheat, rye, or bran bread	50–75 Calories
	Butter	50–75 Calories
	Milk (can be postponed to 10:30 P.M. if desired)	85 Calories
		300–400 Calories
4:00 P.M.:	Tea with lemon[1]	— —
	Bran or cellu wafer	0–5 Calories
Dinner:	Lean meat or fish or oysters	150–250 Calories
	Potato or carrots or peas	50–75 Calories
	Cooked leafy vegetable	15–30 Calories
	Butter	25–50 Calories
	Raw vegetable salad (mineral oil dressing)	25–75 Calories
	Fresh raw fruit (no sugar)	50–75 Calories
	Coffee (if desired)[1]	— — Calories
		350–500 Calories

[1] Saccharine may be used for sweetening.
[2] No food value.
[3] Mineral oil has no food value.

A Reducing Diet Suggested for an Overweight Woman

Fuel Value: 1025 Calories

Ordinary Requirement: 2400 Calories Cost: 2½–3½¢ per 100 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
Apple (C, B)[1]	1 small	4.9	2	65
Egg (A, B)	1 egg	2.4	27	75
Toast	1 slice	0.5	7	50
Coffee[2]	1 cup	—	—	—
Skim milk (B, A)	½ cup	9.3	16	45
10:30 A.M.:				
Bouillon (Vegex) (B)	1 cup	8.0	—	—
Water cracker	1 cracker	0.1	1	10
Luncheon:				
Lean cold pot roast of beef	Slice 5 in. × 5 in. × ⅛ in.	2.4	97	150
Rye bread (B)	2 thin slices	0.7	7	50
Lettuce and cottage cheese salad				
Lettuce (C, A, B)	ad libitum			
Cheese (A, B)	2½ tbsp.	—	40	35
French dressing (mineral oil)	ad libitum			
4:30 P.M.:				
Tea with lemon[2]	1 cup	—	—	—
Bran wafer	1 wafer	0.1	1	10
Dinner:				
Boiled cod with lemon	large serving	8.2	209	225
Boiled potato (C, B)	½ medium	1.8	6	50
Cauliflower (plain) (B)	large serving	3.0	6	25
Butter (A)	1 tsp. (scant)	0.1	—	30
Watercress and egg salad				
Watercress (C, A, B)	ad libitum			
Egg (A, B)	1 egg	—	27	75
French dressing (mineral oil)	ad libitum			
Orange (C, B, A)	½ large	4.7	3	50
Black coffee	demi-tasse	—	—	—
10:30 P.M.:				
Hot whole milk (A, B)	1 cup	8.5	34	85
Total for day			483	1025

[1] B includes B and G.

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

Underweight Women

Women of nervous temperament are apt to be too thin. They expend much energy in heightened muscular tension, while 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 causes of nervous excitement or irritation and avoidance of much muscular exertion, limiting exercise to the lighter forms, are great helps in adjusting the balance between intake and outgo of energy. Long hours of sleep not only conserve energy at the time but tend to decrease nervous tension during the waking hours. Experimental studies have shown that under-nutrition of itself tends to stimulate activity, so that rest and food both are necessary for getting an energy balance favorable to the individual.

To be more than ten per cent under weight for one's height usually means lessened physical efficiency.[1] This is not always realized by any means. Studies of under-weight college women have shown that they regarded themselves as well, and were quite surprised at how much more buoyant they felt, and how much less easily fatigued, when they began to gain in weight.

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. An improved state of nutrition generally means a better appetite and also better digestion, so that what is a great effort at first will become easier later on. 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

[1] See Appendix, Table VI, Height and Weight for Women at Different Ages.

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 malted milk, buttermilk, zoolak, or koumiss; so that it is one of the easiest foods to add to the diet. Fruit juices from sweet fruits, or with their fuel value increased by the addition of milk sugar, make agreeable and nutritious beverages. Raw eggs are easily swallowed and give a good return for the effort made, whether taken plain or modified by being beaten up with milk, cream, or fruit juice. The idea that raw eggs are not well digested has been refuted by careful experiments on human beings which showed that raw whites (the part in question) are almost as completely digested as cooked ones. 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; a tablespoonful of cod liver oil daily will not only add calories, but also vitamins A and D to increase the vigor of the tissues; a piece of sweet chocolate giving 200 calories may be a welcome after-dinner tit-bit or a dozen almonds may supply 100 calories that otherwise would not be eaten. 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, and rest should be sought — long hours of sleep at night and a short period of lying flat and relaxed (if only ten minutes) in the middle of the day; but even a slight surplus of food 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 over a long time, with enough sunshine, fresh air, and exercise to promote good appetite and digestion. One example of a fattening diet has already been given;[1] others, approximating a little more closely the average requirement of a woman, are presented on the following pages.

A Day's Food Plan for a Fattening Diet for a Thin Woman

Fuel Requirement: 3000–3200 Calories
Ordinary Requirement: 2400–2600 Calories Cost: 2½–3¢ per 100 Calories

Breakfast:	Fruit or fruit juice	100–150 Calories
	Cereal	75–100 Calories
	Egg, bacon, or chop	70–100 Calories
	Toast, muffin, or roll	100–150 Calories
	Butter	100–150 Calories
	Cream, thin	200–300 Calories
	Sugar	50–100 Calories
	Coffee (if desired)	— —
		800–900 Calories
10:30 A.M.:	Hot milk, flavored with cocoa, malted milk, postum	150–250 Calories
Luncheon:	Hot cooked vegetable with cream or butter	100–200 Calories
	Fruit salad or stewed fruit	100–150 Calories
	Roll or triscuit	75–100 Calories
	Butter	75–100 Calories
	Custard or gelatin jelly or plain cake	150–200 Calories
	Cream or milk for dessert	100–200 Calories
		800–1000 Calories
4:00 P.M.:	Hot weak tea with milk or lemon and sugar Sandwich or crackers or Eggnog or buttermilk	100–200 Calories
Dinner:	Stuffed steak with gravy or fish with egg sauce	200–250 Calories
	Potatoes, mashed, scalloped, hashed in cream	150–200 Calories
	Cooked vegetable with cream or butter	50–100 Calories
	Raw vegetable or fruit salad, cream or mayonnaise dressing	100–200 Calories
	Nuts, plain or salted or jelly or jam	100–150 Calories
	Ice cream or pudding	200–300 Calories
		900–1100 Calories

[1] See page 69.

A Fattening Dietary Suggested for a Thin Woman

Cost Liberal

Fuel Value: 3000 Calories
Ordinary Requirement: 2400 Calories Cost: 2½–3¢ per 100 Calories

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

[1] B includes B and G.

[2] Two tbsp. milk sugar instead of cane sugar. See Table II, Appendix, page 397.

A Day's Food Plan for a Fattening Diet for a Thin Woman

Fuel Requirement: 3000–3200 Calories
Ordinary Requirement: 2400–2600 Calories Cost: 1½–1¾¢ per 100 Calories

Breakfast:	Figs, dates, raisins, or stewed fruit	100–150 Calories
	Crisp dry cereal	50–100 Calories
	Milk	350 Calories
	Toast or muffin	100–150 Calories
	Butter substitute	100 Calories
	Jam	100 Calories
	Sugar	100 Calories
	Coffee (if desired)	— —
		800–900 Calories
10:30 A.M.:	Milk	160 Calories
	(Cold or hot, plain or flavored) or vegex bouillon with crackers. May be taken with luncheon if preferred.	
Luncheon:	Baked Lima beans or split peas with bacon or Scalloped vegetable or Chowder with crackers	150–200 Calories
	Whole wheat bread or roll	100–150 Calories
	Butter substitute	100–150 Calories
	Peanut butter or Cheese or Jelly	100–150 Calories
	Steamed cranberry or other fruit pudding with hard or creamy sauce	250–300 Calories
		700–950 Calories
4:00 P.M.:	Hot cocoa or weak tea and crackers	100–200 Calories
	(May be taken with dinner if preferred)	
Dinner:	Meat pie or pot roast or Ham scalloped with potato or Veal stew with rice	200–250 Calories
	Cooked vegetables (potato, turnip, parsnips, etc.)	100–150 Calories
	Raw green vegetable salad with French or boiled dressing	100–150 Calories
	Bread or toasted crackers	75–150 Calories
	Butter substitute	75–100 Calories
	Lemon pie or stewed fruit and cookies or pudding	250–350 Calories
		900–1100 Calories

A Day's Fattening Dietary for a Thin Woman

Cost Minimal

Fuel Value: 3091 Calories
Ordinary Requirement: 2400 Calories — Cost 1½–1¾¢ per 100 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
Tomato juice (A, B, C)[1]	½ cup	4.0	—	50
Cornflakes (B)	⅓ cup	0.5	3	50
Milk for cereal (and coffee if taken) (A, B)	2 cups	17.0	66	340
Whole wheat muffin (B)	1 muffin 2¾ in. diam.	1.7	16	133
Butter substitute[2]	2 tbsp.	1.0	1	200
Carrot marmalade (A, B)	1 tbsp.	1.5	1	50
Sugar for cereal (and coffee if taken)	2 tbsp. (scant)	0.9	—	100
Coffee				—
				923
10:30 A.M.:				
Vegex bouillon (B)	1 cup			
Graham crackers (B)	2½ crackers 2½ in. × 2¾ in. × ¼ in.	0.8	9	— 10
Luncheon:				
Scalloped cabbage (B, A)	½ cup	4.8	11	150
Whole wheat bread (B)	Slice 3¾ in. × 3⅛ in. × ½ in.	1.4	16	100
Butter substitute	1 tbsp.	0.5	1	100
Cottage cheese (A, B)	2½ tbsp.	1.6	38	50
Jelly	2 tbsp.	1.5	—	100
Steamed blueberry pudding	⅓ cup	2.4	22	220
Clear sauce	¼ cup	2.7	—	80
				800
4:00 P.M.:				
Hot cocoa with milk (A, B)	⅞ cup	8.0	34	200
Saltines	3 crackers	0.3	6	50
				250
Dinner:				
Veal stew with rice	⅘ cup	6.0	32	200
Buttered kale (A, B)	½ cup	2.0	7	100
Toasted whole wheat muffins (B)	1 muffin 2¾ in. diam.	1.7	16	133
Butter substitute	1 tbsp.	0.5	1	100
Cabbage and apple salad, boiled dressing (C, B, A)	1 cup	3.8	10	150
Norwegian prune pudding (B)	⅜ cup	5.1	4	250
Milk for pudding (A, B)	½ cup	4.2	17	85
				1018
Total for day			311	3091

[1] B includes B and G.

[2] Some butter substitutes contain vitamin A.

The Protein, Ash, and Vitamin Requirements

Just as the laws which control energy requirement operate in the same way for women as for men, so under ordinary conditions the requirements for protein and ash constituents differ little for the two sexes. 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] No more is known about the quantitative vitamin requirements of women than of men, but from animal experimentation there would appear to be no difference in the needs of the sexes with the exception of extra demands of maternity. Foods which insure a liberal supply of the mineral elements will in the main carry vitamins, though there are exceptions, so that tables should be consulted if one wishes to know the vitamin content of any particular food.[2]

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 food when the nutritive requirements are really very much increased are common errors due to lack of knowledge of the fate and function of foods.

[1] See discussion of phosphorus, calcium, and iron content of foods, pages 18–23.

[2] Appendix, Table III.

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 which the body can recombine into its own kinds of protein; the proteins of milk and eggs, the combined proteins of milk or eggs and cereals, and many of the proteins of vegetables will yield exactly the same kinds 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. In certain regions there is the possibility of insufficient iodine for the best functioning of the thyroid gland. The regular use of iodized table salt or of a suitable preparation of iodine prescribed by the physician (who should always be supervising a pregnant woman) is desirable to forestall the possibility of development of simple goiter in the mother and for the welfare of the child.

Shortage of any one of the vitamins has been shown to have disastrous effects upon reproduction. The body does not carry large reserves of vitamins B, C, D,and G and must have new supplies constantly. While it does have the power of storing vitamin A, often this has not been taken by the mother through her own developing years in sufficient amounts to allow much storage and in any case the demands of the unborn child for this vitamin are very great. Hence vitamin A should always be well represented in the mother's diet. In animal experiments it has been shown repeatedly that the

offspring are born stronger and their mothers are able to nurse them better with less cost to themselves when vitamins A, B, and G are liberally supplied. The teeth of a child are largely determined before birth and shortages of ash constituents and of all the vitamins, but especially vitamins C and D, affect them very unfavorably. The teeth begin to develop very early and not only the temporary set but even some of the permanent ones are well formed before birth. For normally arched jaws, well-placed teeth and a strong coat of enamel to protect against early decay, liberal supplies of calcium, phosphorus, and vitamin D are particularly important. No mother should feel that she has done her full duty by her child unless she pays special attention to getting a rich store of vitamin D, either through long sun baths (exposed to the direct rays of the sun, not through window-glass) or by taking cod liver oil or preferably both. The best way to equip a child with the best teeth his heritage allows is through attention to the nutrition of the mother during pregnancy and lactation. At no other time is a diet supplied with proteins adequate for growth, ash constituents of all kinds (especially calcium, phosphorus, and iron), and all of the known vitamins going to bring as big a return as when given to the mother upon whom an infant is depending for all its sustenance.

For the most part, the same kinds of food which constitute a well-balanced diet for 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 disturbance results from substances necessary in the process of placenta formation getting into the general circulation and affecting the digestive tract for a time. 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. Serious digestive disturbances should always be referred to a physician very promptly. Any increase in the amount of food required on account of the developing child before the end of the fourth month of gestation has been shown to be insignificant. 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 before pregnancy. They will be practically in proportion to her increase in body weight. 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 2800 calories. The increased requirements for building material and vitamins will be best met by the liberal use of milk and eggs, supplemented by fruit and green vegetables, sun baths, and cod liver oil. Frequent small meals are often utilized to better advantage than a few large meals especially in the last two or three months; in fact, many 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 carefully prepared to make them most palatable, or in simple puddings.

2. Milk, from a pint to a quart per day. This may be used as a beverage with meals, or between meals, or employed in making cocoa, custards, milk sherbets, and other dishes. Sweet milk may be flavored in any way desired. Cocoa syrup is convenient to have at hand to stir into cold or hot milk and so are soluble coffee, postum, and malted milk. Sweet milk may also be replaced by buttermilk, zoolak, kumiss, etc., if these are better liked or more easily digested. Cottage or other mild cheese may also replace a part (not all) of the milk.

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. Some kind of fresh fruit once a day is desirable. When impossible to obtain, tomatoes canned or fresh can be used as a substitute.

4. A green vegetable, as spinach, peas, beans, lettuce, cabbage, brussels sprouts, chard, etc. These may be served as salads, buttered, creamed, or in soups, but it is worth while to learn to eat lettuce as one would celery, with no dressing but a little salt. Lettuce is almost if not quite as valuable as spinach or peas, and has the advantage of requiring no cooking. A large serving every day, no matter what other vegetables are eaten, would be a good rule. Many other vegetables are more delicious raw than people generally realize. Carrots cut into thin "straws," kohl-rabi, rutabaga, or white turnips in small cubes and sprigs of fresh cauliflower are all very appetizing raw. If cooked the time should be as short as possible. Steaming or preparation which will conserve the juices will help to save valuable ash constituents and

vitamins. Five minutes is quite long enough to cook spinach, and 10 or 15 minutes is ample for cabbage. Brussels sprouts should not be steamed long enough to make them soft. Cabbage or lettuce when not green have comparatively little vitamin A, but like celery and cauliflower are valuable for ash constituents, vitamins B and G and when raw for C. Pea and spinach soups made with milk are often useful when digestion is poor.

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

6. Butter, olive oil, bacon, peanut butter, or butter substitute in moderate quantities to add to the fuel value of the diet. If whole milk and green vegetables are used freely there is not likely to be any shortage of vitamin A, but if the milk fat is not used, butter or a substitute known to contain vitamin A is desirable to replace it, unless cod liver oil is taken regularly. Peanut butter has proteins of excellent quality in addition to its high caloric value and may be regarded as an economical meat substitute rather than a butter substitute. It makes a delicious soup simply stirred into hot milk and seasoned with salt, or a delightful adjunct to bread and butter, when beaten smooth with as much cream as it can be made to take up. A well-balanced meal can be secured from 2 sandwiches of whole wheat bread with this creamed peanut butter filling to which some seeded raisins have been added, and a glass of milk. For the sake of ease of digestion, fats 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 in-

creased by the use of milk or eggs, which, as already indicated, also give desirable increases in building and regulating material. In economical dietaries bread should be made with milk and preferably from whole wheat, rye, or other dark flours. It will add then to the laxative quality of the diet, as well as to its ash content. Such bread is good for any one, but most needed when green vegetables and milk cannot be bought freely.

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 butter substitute containing vitamin A
Hot milk flavored with powdered coffee or postum or cocoa
Freshened prunes [1]

LUNCHEON: Cream of tomato soup
Cold corned beef
Whole wheat bread and butter or butter substitute
Hermits
Tea or coffee (one-half milk) or cocoa

DINNER: Lamb stew with vegetables (carrots, potatoes, onions)
Cole slaw
Whole wheat bread and butter or butter substitute
Custard or orange cream pie
Glass of milk

II

BREAKFAST: Wheatena, milk, and sugar
Dates, graham bread, and butter or butter substitute
Hot milk flavored with powdered coffee or postum or cocoa

LUNCHEON: Macaroni and cheese
Stewed tomatoes
Graham or rye bread and butter or butter substitute
Tea or coffee (one-half milk)

DINNER: Baked split peas with bacon
Boston brown bread
Stewed onions
Apple betty, milk and sugar
Glass of milk

[1] Soaked 24 hours then drained and allowed to stand 24 hours to "ripen."

III

BREAKFAST: Shredded wheat biscuit, hot milk, butter, salt, and sugar
Rye bread and butter or butter substitute and apple jelly
Hot milk flavored with powdered coffee or postum or cocoa
Stewed dried peaches and raisins

LUNCHEON: Vegetable soup with crackers
Whole wheat bread and peanut butter
Figs (stewed or raw)
Cocoa or glass of milk

DINNER: Corned beef hash
Stewed cabbage
Whole wheat bread and butter or butter substitute
Raw carrot straws, plain or with French dressing
Rice or tapioca pudding (made with milk, molasses, and raisins)
Glass of milk

These menus may be supplemented by a cup of gruel or milk, and graham or whole wheat crackers, if an extra meal is desired in the middle of the morning or in the late afternoon. A glass of fruitade or a cup of hot weak tea with lemon in the late afternoon may be refreshing and add to the total water intake, which should be very liberal. Dried lemon powder can be had which keeps indefinitely and obviates the need of cutting a fresh lemon, which would be too expensive. Prune juice with a little added lemon powder makes an acceptable mid-afternoon beverage.

Food for the Nursing Mother

When the baby is born we begin to realize more clearly that he has food requirements all his own. The sum total of the energy requirement of mother and child has been found to be the same just before birth and just after. But after birth we can study the baby by himself, see what his demands upon his commissary department amount to, and then add these requirements to those of the mother for her own maintenance to get her total daily food requirement. The baby grows rapidly and his food requirements increase daily. 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. These must certainly be added to the mother's diet or they will be drawn from her body reserves.

The following estimates of the increased energy demands made by the nursing infant are calculated on the basis of a ten per cent increase over estimated requirements which seems a reasonable allowance since we cannot calculate the baby's requirements more closely than this.

Additional fuel requirements for nursing a baby:

First 3 months	60 calories per pound of infant's weight
Second 3 months	50 calories per pound of infant's weight
Third and fourth 3 months . .	40–45 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 if she were doing hard muscular work, i.e.*, 2800 to 3000 calories per day; while a woman actively employed and secreting a large quantity of milk may need as much as 5000 calories.

Not only is there this increase in the energy requirement, but the construction of milk demands extra quantities of such important materials as protein, calcium, phosphorus, and vitamins. 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 phosphorus, and 76 per cent in calcium. 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 proteins of the very best quality for growth. 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 130 calories of lean beef, 30 of liver or kale, 10 of spinach, 100 calories of egg yolk or 300 calories of whole wheat bread will meet the additional need for iron. The use of green vegetables, liver, and whole grain cereals will insure good conditions for the efficient use of the iron provided. This shows that with a little care in the selection of foods there need be no danger of shortage of these important elements. The milk, spinach, and egg yolk will add materially to the supply of vitamin A, and care to have some fresh fruit and potatoes, tomatoes, or some raw vegetable regularly in the diet will insure enough of vitamin C. The vitamin D content of the body may be enriched by sunbaths or cod liver oil or both. All of these foods will help to maintain a high intake of vitamins B and G needed in very large amounts by a rapidly growing baby.

A liberal supply of water is also necessary since more water is required to help the body take care of extra food successfully, and since the milk which the baby gets every day contains considerable water which must be derived from the mother's supply. A quart of milk a day will furnish part of this water, but in addition at least four glasses of water or other liquid should be taken during the day. A glass of water on arising, one just before each meal and one on going to bed is a good rule, easy to remember and convenient to put into practice.

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 all dietary essentials, is suitable for good milk production. In the past, the importance of vitamins A and B (possibly G) in milk production has not been sufficiently recognized. With our present knowledge almost every mother who is not ill can nurse her baby at least through the most critical part of its life, the first three or four months, and 95 out of every hundred for the first 7 or 8 months.[3] At the same time it must be borne in mind that the mammary glands are very sensitive to nervous influences, and lack of sleep and rest and disturbances of digestion react very unfavorably upon the milk-secreting mechanism. Rest and an adequate diet eaten with regularity will do much to keep digestion good but any food which is known to disagree with the mother, or whose effect is doubtful, should be refrained from. The increased demands for food make the work of the digestive tract extraordinarily great, hence 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 intelligently chosen, and sunshine, exercise, fresh air, and mental diversion are provided. For the few months which are so critical in the life of the baby, less

[1] See page 116.

[2] See pages 69 and 107.

[3] For suggestions regarding details of breast feeding consult *Nutrition of Mother and Child*. Moore, C. U., J. B. Lippincott and Co. (1927).

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

Fuel Value: 3245 Calories Cost: 1½–1¾¢ per 100 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
¾ wheatena and ¼ cream of wheat (B)[1]	¾ cup	6.0	12	100
Milk (A, B)	⅝ cup	5.1	19	100
Sugar	1 tbsp. (scant)	0.5	—	50
Whole wheat bread (B)	2 slices	1.4	16	100
Butter substitute[2]	¾ tbsp.	0.4	—	75
Cocoa II (A, B)[3]	⅝ cup	7.6	32	200
Stewed prunes (B)	5 prunes and juice	6.0	4	200
				825
Luncheon:				
Cream of tomato soup (C, B, A)	1 cup	8.0	28	250
Cold corned beef (with fat)	1 small serving	2.0	42	200
Whole wheat bread (B)	3 slices	2.1	24	150
Butter substitute	1½ tbsp.	0.7	1	150
Milk for tea (A, B)	⅓ cup	2.6	10	50
Sugar for tea	2 tsp.	0.3	—	35
Gingerbread	1 small piece	1.2	8	100
Tea	1 cup	—	—	—
				935
Dinner:				
Lamb stew with vegetables	2 cups	17.0	67	350
Cole slaw	½ cup	1.4	3	50
Whole wheat bread (B)	3 slices	2.1	24	150
Butter substitute	1 tbsp.	0.5	—	100
Custard pie (A, B)	1 large piece	7.6	36	400
Milk for tea (A, B)	⅓ cup	2.6	10	50
Sugar for tea	2 tsp.	0.3	—	35
				100
Lunch at Night:				
Bread	2 slices	1.3	14	50
Butter substitute	½ tbsp.	0.3	—	100
Peanut butter (B, A)	2½ tsp.	0.6	19	100
Milk (A, B)	⅝ cup	5.1	19	1485
Total for day			388	3245

[1] B includes B and G.

[2] Some butter substitutes contain vitamin A.

[3] See Table II, Appendix, page 396.

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, meeting the requirements of the nursing mother also engaged in physical labor (from one of the menus on page 116), is given on the preceding page.

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, as it gives both extra food and extra water.

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. A similar study made by the Children's Bureau of the United States Department of Labor in 1915 in Johnstown, Pennsylvania, showed that at every month of the first year the mortality of the artificially-fed babies was from two to four times as great as for the breast-fed, while that of babies with mixed feeding lay between the other two. Of course the highest mortality was among the youngest infants, the mortality of artificially-fed babies at 2 months

of age being 237 per 1000, while at eight months it had fallen to 53 per 1000. On the other hand the mortality of breast-fed babies at two months was only 72, and at eight months 26 per 1000.

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 once 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-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 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. Statistics collected by a great American life insurance company place the death rate among bottle-fed babies, even in the present era of better feeding, at 10 times that among breast-fed babies. 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. Such evidence as that cited above, impressing the importance of breast-feeding, has stimulated effort to help mothers nurse their babies. In 1923 and 1924, a special breast feeding demonstration was instituted in Nassau County, New York, under the auspices of the New York State Department of Health and the Brooklyn Pediatric Society. Its purpose was to show the value of breast feeding. A nurse representing the Demonstration visited each mother as soon as her baby's birth certificate was filed, to instruct her in the

desirability of keeping the baby on the breast and in the best way to accomplish this. The Demonstration dealt with 2,815 babies. Under such supervision, the result was that nine tenths of the mothers nursed their offspring for at least one month after birth and nearly two thirds did so for eight months. The infant mortality rate of these babies was 49 per thousand, while that of the whole county for the same period was 64 per thousand. The gains from breast feeding are not all shown by mortality statistics, however. Merely to be alive is not enough. How well were these babies? The statistician who studied the records, comparing the morbidity of children nine months breast fed with those *less than nine months breast fed*, reports as follows: "The greatest difference is found, as would be expected, in diseases of the digestive tract; where the ratio is almost 3 to 1 in favor of breast feeding. Respiratory disease shows the next highest variation. Note especially the prevalence of pneumonia and bronchitis among the infants with limited infectious diseases, especially whooping cough, measles, and chickenpox. One third, or 37.1 per cent, of the children prematurely weaned became sick, as over against only one eighth, or 12.5 per cent, of those who were nine months breast fed. Three fourths, or 28.4 per cent of these were weaned within fifteen days after birth. Thus the data prove quite conclusively not only that there is more sickness among children deprived of breast feeding, *i.e.*, more widely distributed, but also that a higher percentage of these children are sick. There is sufficient evidence to show that the feeding which a child is given plays an extremely vital part in his claim on health." Now we know that with proper care in pregnancy and regular supervision after birth, most mothers can nurse their babies successfully. If the milk supply is insufficient it can be increased by mechanical stimulation of the breasts, and if it becomes necessary to give additional food the discarding

of the natural food is not justified on this account. Only when it fails entirely, or there is some serious disturbance of the mother's health which makes nursing unwise, should artificial feeding be adopted as the sole means of sustenance.[1]

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 not only at the present time but in future years; must avoid indigestible food, or food that spoils her appetite so as to prevent sufficient quantities of food being taken; must have regular hours for meals and rest; get direct sunshine or its equivalent in ultra-violet light or cod liver oil, also fresh air and exercise; 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 likewise 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,

[1] For a fuller discussion of the details of successful breast-feeding consult *Nutrition of Mother and Child.* Moore, C. U., J. B. Lippincott Company (3rd Ed. 1927).

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. He must have sun baths regularly, with the sun's rays playing directly on the skin. Clothing and window glass keep out the ultra-violet rays. Beginning at the age of 3 or 4 weeks, the baby born in the spring or summer should be in the direct sunlight for 10 or 15 minutes, increasing the time 3 to 5 minutes daily until he lies directly in the sun one hour in the morning and one hour in the afternoon, care being always taken not to burn the baby. The winter baby must take his sun bath in a place sheltered from the wind, possibly indoors in front of an open window with a screen arranged to ward off drafts.[1]

Above all, the baby must get his meals regularly. With definite hours for feeding, the quality of the milk is more uniform, and the alimentary tract responds better to the food. The stomach needs an interval of rest between meals, and the secretions of the whole 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, but nowadays babies are fed much less frequently than they used to be, with benefit to their digestion and more freedom for their mothers. For the first three months it is customary to feed them six times in twenty-four hours, and after that only five times till the ninth or tenth month, then going on a four-meal schedule. Schedules are generally arranged as follows:

[1] For further directions read the leaflet *Sunlight for Babies*, Eliot, Martha M., M. D., obtainable from the Government Printing Office, Washington, D. C.

SUGGESTED SCHEDULE OF HOURS FOR INFANT FEEDING

	NUMBER OF FEEDINGS PER DAY	HOURS FOR FEEDING	
		A.M.	P.M.
First three months	6	2, 6, 10	2, 6, 10
Fourth to tenth month	5	6, 10	2, 6, 10
Eleventh and twelfth months . .	4	7, 10	2, 6

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 if possible 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. 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.

Preparation for Weaning

The age at which a baby may be weaned depends upon the finding of other food which contains all the essentials for growth in a form in which the baby can digest them with ease. It is always difficult to feed a very young baby any food but his mother's milk. Each month it becomes increasingly easier, and in enlightened communities where good clean cow's milk is available and mothers receive expert guidance in the care of their babies through local health stations, private physicians, or at least government publications such as those of the Children's Bureau of the United States Department of Labor,[1] it is safe to wean babies sometime between the ninth and twelfth months.

But preparation for weaning should begin some time before this, so that the baby will not have to get adjusted to too many new foods all at once. We should start a program of gradual adjustment which will give plenty of time to establish in turn each of the foods essential to the diet when the child is weaned, introducing but one at a time, and allowing the child to become fully accustomed to each before another is added.

Since mother's milk is often not rich in vitamin D, special pains must be taken to supplement this for the child, practically from birth. The best method is undoubtedly by sun baths, but in the cold, cloudy winters of many regions, there is no opportunity for daily exposure to a sun that does not shine. Fortunately cod liver oil is an effective source of vitamin D and only a little is needed if begun before rickets has developed at all. It is well to give the baby born in the

[1] *Prenatal Care, Infant Care, The Care of the Pre-School Child* (free upon request).

fall or winter in a northern climate a few drops daily from the age of four weeks. Ten drops can be easily given from a medicine dropper, once a day. By the second month this should be increased to 15 drops, by the third or fourth to a half teaspoonful, by the fifth or sixth to one teaspoonful, which should be sufficient until the end of the nursing period if sun baths are also given whenever possible. The antirachitic effect of the sunshine in a northern city like Toronto has been found to be 8 times as efficient in April or May as in December, January, and February.

By the third month some form of vitamins B and C should be given, for human milk is not rich in either one, and as the baby grows his requirements for both increase rapidly. Better digestion and better growth have undoubtedly followed the improvement of infants' diets in regard to these two vitamins. Orange juice, tomato juice, raw spinach, or cabbage juice are all suitable sources of both. At first only a teaspoonful, diluted with an equal quantity of water, should be given once a day, midway between two regular feedings. By the fourth month this can be increased to a tablespoonful, and by the fifth, to perhaps two tablespoonfuls, by which time dilution with water can be done away with. But water should be offered regularly between each two feedings, so that from two to six ounces a day are taken, for the baby's water needs are as high as his other food needs.

The next addition, at the sixth month, may be a small quantity of well-cooked cereal jelly. Cereals, being wholesome and economical, are very valuable in children's diets, and yet so many mothers seem to have difficulty in teaching older children to eat them that it has been found advisable to start this type of food very early and get the habit established before the child thinks much about his food. By beginning at the age of 6 months, the task seems to be greatly simplified. Hence from 1 to 2 teaspoonfuls of a cereal mush,

thoroughly cooked and free from any large particles, should be given just before one of the morning feedings and perhaps also one of the evening feedings. Cream of wheat, farina, or strained oatmeal will be most convenient at first. Any cereal should be cooked until the particles are clear and soft, and should be fed without any seasoning but a little salt, not too hot, not cold, just comfortably warm and of a jelly-like consistency easily fed from a spoon. The person giving it should always know how it tastes and keep it the same, day after day. The amount should be increased to 2 or 3 tablespoonfuls at 7 months, and by that time a little cow's milk may be poured over it when fed. After the first few weeks of cereal feeding, a whole wheat preparation such as wheatena may be combined with cream of wheat or some whole wheat flour may be used in the same way, increasing the iron supply of the diet.

The next addition, at the seventh month, should be a green vegetable. It is needed for vitamin B and for iron and the factors which promote iron utilization. It may be needed to make the diet a little more laxative. Also, the child accustomed to the taste of vegetables from this early age does not have to be trained (perhaps with difficulty) to eat them later on. At first only the vegetable juice should be given. A few leaves of spinach or a few cubes of carrot may be steamed in just enough water to keep moist for fifteen or twenty minutes, and one or two teaspoonfuls of the juice strained off for the baby. Soon this can be increased to 1 tablespoonful, and in the course of a month, the pulp may also be pressed through the sieve and given with the juice. A few grains of salt may be used to season, but this should not be overdone. A baby's simple foods need just the same care as any fancy delicacies for mother's parties. The only way to be sure is to taste!

By the eighth month the baby should begin to use his jaws and such teeth as he may have acquired on a dry stale crust of bread. A little later hard dry toast or zwieback (un-

sweetened) will offer still more resistance to his teeth. Once or twice a day he should have this exercise, and gradually he will learn the important lesson of chewing which not only helps in digestion and in the development of teeth and jaws but is a pleasure no child should be deprived of. At this time it may be well to introduce a little liver into the diet, as a further safeguard against anemia. The raw liver should be put through a food chopper and the pulp then rubbed through a sieve. One tablespoonful once or twice a week may be added to the vegetable pulp and thoroughly heated with it before serving.

When the child is nine months old, he will be ready to learn to take cow's milk, the food around which his diet should be built throughout the remainder of his childhood. First one may discontinue the 10 P.M. feeding entirely. Then at the tenth month discontinue the 2 P.M. breast-feeding and give a soup made of milk and the daily portion of strained vegetable; two weeks later substitute 6 ounces of warm cow's milk for the breast-feeding at 10 A.M. By the eleventh month, cow's milk may be substituted for the 6 P.M. breast-feeding (if the baby has not by this time weaned himself) and finally the breast-feeding at 6 A.M. will be stopped.

All suggestions regarding the time of weaning a baby may require modification according to the season of the year. It is much safer to postpone weaning than to attempt weaning or any other radical change in the baby's food during hot weather, and if these various supplements have been made a regular part of his diet, there is little danger of his suffering from shortage of his usual milk supply although kept on the breast a month or so longer.

The Care of the Baby's Milk

Only clean milk should be bought. Fresh milk is good when one can be sure that every precaution has been taken to keep it clean and cold and free from harmful or excessive bacteria.

The Baby's Sole Business in Life Is to Grow.

" 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. Pasteurization is the great safeguard against disease-producing bacteria. But it must be remembered that pasteurized milk needs exactly the same kind of care as fresh milk. It must be kept clean and cold and be used within a short time, for it is not " germ-proof," but even more capable of growing bacteria than before it was pasteurized, and there is not the warning that we have in fresh milk, *i.e.*, souring. It must also be remembered that whatever supply of vitamin C there may have been in the fresh milk may be reduced almost to nothing by the heating, hence a child's diet should always have some other source of this vitamin. Bringing milk quickly to a boil is as effective as pasteurization in destroying bacteria, and tends to make it easier to digest, so that either fresh or pasteurized milk may be boiled one minute and cooled again quickly if one wishes to be doubly sure of its safety.

All milk must be protected from contamination at home as well as in transit. It should be put in a cold place and covered. Milk for the baby should be thoroughly mixed so that the cream is evenly distributed, and each meal put in a clean sterile feeding bottle (washed with hot water containing washing soda, then boiled in clear water for 20 minutes), stoppered, and kept cold till used. Just before feeding, it can be warmed to body temperature in hot water. Any food left over should be used some other way, not kept for the baby. A thermos bottle should never be used to keep milk warm; germs grow fast in milk when warm.

When good liquid milk cannot be procured recourse may be had to dried milk or *unsweetened* evaporated milk. Both can now be obtained with all the original fat, and no more altered in composition than pasteurized milk (sometimes

actually less, for dried milk can be obtained which has most if not all of the original vitamin C of the fresh milk). For emergency use, or where it is impossible to keep fresh milk cold, such preserved milk is invaluable. In purchasing one must distinguish between dried whole milk, which should be used for babies, and dried skim milk, which is also an excellent food, but will not give the baby the butter fat which he should have in his diet; also between unsweetened evaporated milk and that to which sugar has been added; the former is excellent food; the latter gives a diet high in calories but low in all other dietary essentials, and so far "unbalanced" that it is hardly possible, even by skillful supplementing, to make it adequate in all respects.

Daily Feeding Program for the Breast-fed Baby from the Third to the Twelfth Month

The feeding program from the time supplements are added to the breast milk (with the exception of cod liver oil begun in the second month) to the end of the first year may be briefly summarized as follows:

Third month	Breast-feedings at 2, 6, and 10 A.M., 2, 6, and 10 P.M. At 9 A.M. give 1 teaspoonful of orange juice and increase gradually during month to 1 tablespoonful. (Raw cabbage juice, or tomato juice may be substituted for the orange juice.) Give from 10 to 15 drops of cod liver oil in the orange juice.
Fourth and fifth months	Breast feedings at 6 and 10 A.M.; 2, 6, and 10 P.M. One tablespoonful of orange juice (or tomato juice) at 9 A.M. Increase during period to 2 tablespoonfuls. Give from ½ to 1 teaspoonful of cod liver oil in the orange juice.
Sixth month	Breast-feedings at 6 and 10 A.M., 2, 6, and 10 P.M. 2 tablespoonfuls of orange juice at 9 A.M. Just before 10 A.M. breast-feeding give 1 or 2 teaspoonfuls of well-cooked cereal jelly from a spoon. Increase gradually during month to 1 tablespoonful. Give 1 teaspoonful of cod liver oil in the orange juice.
Seventh month	Breast-feedings at 6 and 10 A.M., 2, 6, and 10 P.M. 1 tablespoonful of orange juice at 9 A.M. At 10 A.M. and 6 P.M. 1 or 2 tablespoonfuls of cereal jelly. At 2 P.M., just before breast-feeding, 1 teaspoonful of cooked vegetable juice (spinach or carrot). Increase during month to 1 tablespoonful of sifted pulp and juice and continue to give 1 teaspoonful of cod liver oil in the orange juice.

Eighth month All items indicated for 7th month. In addition, a stale dry crust of bread after 10 A.M. and 2 P.M. breast-feedings. Once or twice a week add 1 tablespoonful of liver pulp (pressed from raw liver ground fine) to vegetable pulp, cooking just enough to heat to boiling point.

Ninth month Discontinue 10 P.M. feeding. Continue cereal jelly and pulp of vegetables put through fine sieve, with juice. Add one or two new vegetables to list (green peas, asparagus tips, very tender string beans). Continue to give 1 teaspoonful of cod liver oil in orange juice and give liver once or twice a week as indicated for eighth month increasing to 1 tablespoon. Substitute sifted baked potato occasionally for cereal at 6 P.M.

Tenth month Breast-feedings at 6 and 10 A.M. and 2 P.M. Substitute 6 ounces warm cow's milk for 6 P.M. breast-feeding. Continue orange juice and cod liver oil at 9 A.M. Give 2 ounces of warm cow's milk over 2 or 3 tablespoonfuls of cereal jelly at 10 A.M. and 6 P.M. At 2 P.M. give ¼ cup vegetable soup (¼ cup milk, and 1 or 2 tablespoonfuls of strained vegetable pulp, salted lightly), 1 tablespoonful of baked potato with ¼ teaspoonful of butter, 1 tablespoonful lightly sweetened apple-sauce, a small piece of stale bread crust, toast, or zwieback. By middle of month substitute 6 ounces of warm cow's milk for the 10 A.M. breast-feeding.

Eleventh month Substitute 6 ounces warm cow's milk for 6 A.M. breast-feeding in middle of month. Then change as follows:

7 A.M. 8 ounces warm cow's milk.

9 A.M. 2 tablespoonfuls orange juice and 1 or 2 teaspoonfuls cod liver oil.

10 A.M. 2 or 3 tablespoonfuls cooked cereal jelly with 2 ounces of warm cow's milk over it, 6 ounces of milk to drink. A small piece of toast.

2 P.M. ½ cup vegetable soup (2 tablespoonfuls strained vegetable pulp and milk) or milk and vegetable given separately, ½ small baked potato with a little butter, 1 teaspoonful of egg yolk (may be served on bread crumbs or potato) three or four times a week, increasing gradually to one whole yolk, 1 tablespoonful liver pulp once or twice a week. Give 1 tablespoonful cooked pulp and juice of mild fruit (as apple sauce or steamed and sifted banana) and 1 slice toast or zwieback.

6 P.M. 2 tablespoonfuls cooked cereal jelly with two ounces of warm milk over it, 6 ounces of warm cow's milk to drink, 1 slice of stale bread (2 to 4 days old) or toast, with a little butter. In latter part of month add 1 tablespoonful of sifted pulp and juice of cooked mild fruit (apples, pears, prunes, apricots, etc.).

Artificial Feeding

Unfortunately there will always be some babies deprived more or less completely of their natural food. Mothers having the best of intentions occasionally fail to produce milk, or furnish an inadequate supply, and other misfortunes 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. If possible a baby under three months of age should have part, if not all, of his milk from a wet-nurse. In some of our large cities the production of breast milk for sale is a profitable industry of growing importance.

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. With plenty of fresh unheated milk from cows having fresh food there would even be enough of vitamin C to prevent scurvy, but for sanitary reasons it is often necessary to pasteurize milk, hence we do not as a rule expect to depend on milk for this vitamin.

The first problem in artificial feeding is 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 all the essentials for growth. 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.

Much thought and care have been given by many pediatricians to the arrangement of nicely graded feeding schedules for the artificially fed infant, avoiding overfeeding on the one hand and underfeeding on the other while adjusting week by week to the increasing strength of the child. Such schedules must take into account the requirement of the baby for every one of the essentials for nutrition. Before considering any program, then, it will be well to summarize these requirements briefly.

The Energy Requirement of the Baby

The energy requirements of babies of different ages have been investigated carefully, with the infants lying quietly asleep, and not having had any food for three or four hours. In the Carnegie Nutrition Laboratory in Boston alone, more than one hundred infants have been studied in the calorimeter. Newborn babies asleep beside their mothers 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 various 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 $\frac{1}{4}$ to $\frac{1}{3}$ 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 rest of the first year about 40 calories per pound per day.

The Protein Requirement of the Baby

During the period of most rapid growth there is a constant storage of protein as the various kinds of body tissue increase in amount, and especially as the muscles grow. This protein must supply an amino acid assortment containing liberal quantities of certain of these acids which have been found to play a very significant rôle in growth, such as lysine and cystine, along with the ordinary supply of amino acids of other sorts required for human maintenance. These are guaranteed to the baby in milk. When the energy supply is properly met and the proteins in the food are of such excellent quality as those of milk, an allowance of from twelve to fifteen calories of protein in every one hundred total calories may be regarded as most satisfactory.

The Requirements of the Baby for Ash Constituents

It has already been pointed out that liberal supplies of calcium and phosphorus are necessary for normal growth of bones and teeth and for the proper functioning of the body as a whole. Here again, we can depend largely on milk, since the amount of milk which guarantees sufficient protein will also yield sufficient calcium. It seems probable that the addition of vegetables, fruit, and egg yolk to the diet of the first year makes desirable increases in the phosphorus supply which is relatively lower in milk than that of calcium.

We know that the growing child's need for iron is high, but just how far toward meeting his requirement the iron of cow's milk will go we do not know. To be on the safe side we should make it a practice to supplement the baby's diet as early as the digestive situation permits with small quantities of green vegetables, whole grain cereals, egg yolk, or liver pulp, which not only add iron but also copper and possibly other substances necessary to full use of the iron present. So-called " milk anemia " is not due to too much milk but too little of copper or something else to enable the body to use the iron, and this we now know how to supply.

The Vitamin Requirements of the Baby

As already stated, these have not yet been determined very accurately. We know from actual experiment that babies grow better, show less tendency to be anemic, and develop better teeth, if vitamin C is made a regular part of their diet from the first. So also experiments on human babies confirm those on rat babies that growth is better when more vitamin B (or both B and G probably) is furnished than is present in cow's milk diluted sufficiently to be easy to digest. Fortunately in supplying vitamin C we usually increase also the amount of vitamin B in the diet, but we find it profitable to give more orange juice or tomato juice than is really necessary just to prevent scurvy.

The need for vitamin A for growth is so clear for animals of a number of species that we cannot but be convinced that the human baby should have a liberal allowance. The quantity yielded by an amount of whole cow's milk practical for a baby from other standpoints appears to be sufficient for normal growth, but it is a good thing that the foods chosen to supply iron (*i.e.* green vegetables, egg yolk, and liver) may at the same time increase the quantity of this vitamin considerably. It is desirable that the tissues carry a rich store at all times

and the quantity needed for growth increases as the child becomes larger.

The best way of guarding against rickets must also be considered. With plenty of sunshine to which the baby is actually exposed regularly for several hours a day, no special need of vitamin D may be apparent, but in most northern regions of the United States, one cannot depend upon sunshine altogether, and a small amount of cod liver oil is such an easy way of securing protection against rickets, that no mother who knows the far-reaching effects of vitamin D deficiency would forego the security which can be so easily obtained. Commercial irradiation of milk and other foods is under way and in the future we will undoubtedly have several alternatives to cod liver oil, but in deciding whether or not to adopt them, it might be well to consider also the high vitamin A value of cod liver oil, which has done so much in recent years for the young child.

Daily Food Program for Artificial Feeding

The schedule of hours for feeding artificially will on the whole be the same as for a breast-fed baby, but since babies bottle-fed from birth are apt to be more delicate, they are sometimes fed every three hours for two or three months longer than the breast-fed baby, *i.e.*, till the end of the fifth or sixth month.

As to the quantity of milk needed, it has been noted that an ounce and one-half of milk per pound of the baby's weight will give the daily supply of protein. To this must be added some easily digested carbohydrate food which will dissolve in the milk, preferably milk sugar, corn syrup, or some form of so-called malt food (*e.g.*, dextri-maltose). This will add to the fuel value of the diet and at the same time make it easier to digest. The amount to be added is determined by finding the calories yielded by the milk allowance for the day

and deducting this from the total calories required. Thus an ounce and a half of milk per pound for a 14-pound baby would mean 21 ounces for the day, furnishing approximately 420 calories.[1] A four-months-old baby of this weight, requiring perhaps 45 calories per pound, would need 630 calories per day. Deducting the calories furnished by the milk, we have left 210 calories to be secured from about $1\frac{3}{4}$ ounces of the carbohydrate food selected.

Water must also be added to the diet, partly because of the high rate at which chemical processes go on in the baby's body and partly because it will make the diet easier to digest. It is estimated that a baby requires fluid food yielding about 3 ounces per pound of body weight through the first three months, $2\frac{1}{4}$–$2\frac{1}{2}$ ounces per pound through the next three months, and 2 ounces through the next two months. We may estimate the water to be added to the milk by calculating the total amount of fluid required and deducting the amount of milk from this. The difference will be the water to add. Thus, a baby six months old, weighing 16 pounds and getting $2\frac{1}{4}$ ounces of fluid per pound would have altogether 36 ounces. Deducting 24 ounces of milk ($1\frac{1}{2}$ ounces per pound), the water to be added would be 12 ounces. The baby's food should be mixed for the day, then quickly brought to the boiling point and held there for three minutes, after which it should be rapidly cooled in running water. This protects against bacteria (which are found even in pasteurized milk) and makes the milk easier to digest.

The following schedule has been worked out to illustrate these principles. It should be adapted to the individual baby, preferably by conference with a physician who will examine the baby frequently in order to know just what kind of progress is being made, and to correct any unsuitable measures

[1] 20 calories per ounce is often used for approximating the energy yield of whole milk.

before they have a chance to do harm. Only thus can ideal adjustments be made.

SCHEDULE FOR ARTIFICIAL FEEDING OF WELL BABIES [1]

1st and 2d days	3 ounces of milk, 7 ounces of water; boil briskly 1 minute, add ½ teaspoonful of milk sugar,[2] cool quickly and divide into 6 feedings. The baby may not take all of any feeding. Discard what is left each time.
3d and 4th days	4 ounces of milk, 8 ounces of water, 2 teaspoonfuls of milk sugar;[2] boil 1 minute, cool and divide into 6 feedings.
5th to 7th days	5 ounces of milk, 10 ounces of water, 1½ tablespoonfuls of milk sugar; boil 1 minute, cool and divide into 6 feedings.
Beginning of 8th day to end of 1st month	Beginning with 5 ounces of milk, 10 ounces of water, and 1½ tablespoonfuls of milk sugar, increase the milk by ½ ounce every 3 days, the water by 1 ounce every 4 days, and the milk sugar by ½ tablespoonful at the end of the 3d week.
Beginning of 2d month to end of 4th month	At the end of the 1st month the baby will be getting approximately 9 ounces of milk, 15 ounces of water, and 2 tablespoonfuls of milk sugar divided into 6 feedings. Now add 1 teaspoonful of orange juice and ¼ teaspoonful of cod liver oil daily midway between the 2 morning feedings. Increase the milk by ½ ounce every 4 days, the milk sugar by ½ tablespoonful every 2 weeks, and the orange juice by 1 teaspoonful every month and the cod liver oil to ½ teaspoonful by the beginning of the 4th month; decrease the water by ½ ounce every 2 weeks. At the beginning of the 4th month the number of feedings may be decreased to 5 or the 6 feedings may be continued another month.
Beginning of 5th month to end of 7th month	At the end of the 4th month the baby will be getting approximately 21 ounces of milk, 12 ounces of water, and 4½ tablespoonfuls of milk sugar divided into 5 feedings; also 1 tablespoonful of orange juice and ½ teaspoonful of cod liver oil between the two morning feedings. Now increase the milk by ½ ounce every 2 weeks, make no change in the milk sugar. Increase the orange juice by 2 teaspoonfuls every month and increase the cod liver oil to 1 teaspoonful. At the beginning of the 6th month give

[1] Arranged in the manner suggested by Holt, L. E., and Shaw, H. L., in *Save the Babies*, published by the American Medical Association.

[2] Dextri-maltose may be substituted for the milk sugar. It agrees better with some babies. Being slightly lighter in weight than milk sugar, the amounts specified must be increased in proportion of one teaspoonful to each tablespoonful of milk sugar. Cane sugar is objectionable because too sweet. We do not wish to start a bad habit of wanting very sweet food which will soon have to be broken.

	4 teaspoonfuls of cereal jelly, 2 of these before the 10 A.M. feeding, the other 2 before the 6 P.M. feeding. Increase this by 4 teaspoonfuls once a month. By the middle of the 6th month give a crust of bread to munch before the 10 A.M. feeding, and 2 teaspoonfuls of strained green vegetable juice (preferably spinach, though carrot or slightly cooked cabbage will do) just before the 2 P.M. feeding increasing to 1 tablespoonful by the beginning of the 7th month.
Beginning of 8th month to end of 11th month	At the end of the 7th month the baby will be getting approximately 26 ounces of milk, 9 ounces of water, and 4½ tablespoonfuls of milk sugar, divided into 5 feedings; 3 tablespoonfuls of orange juice midway between 2 morning feedings with 1 teaspoonful of cod liver oil; 4 tablespoonfuls of cereal jelly (half of this at the 10 A.M. feeding, the other half with the 6 P.M. feeding) each time with a little of the milk feeding poured over it; a stale crust of bread to munch once a day, and 1 tablespoonful of strained vegetable juice at the 2 P.M. feeding; 1 teaspoonful of egg yolk may be given in a little milk increasing by 1 teaspoonful each month. Now increase the milk by ½ ounce every 10 days, decrease the water by ½ ounce every 2 weeks; the cereal jelly by 1 tablespoonful every month; use the strained pulp as well as juice of the green vegetable and increase by 1 teaspoonful each month. At the 10th month begin to decrease the milk sugar by ½ tablespoonful every 2 weeks.
Beginning of 12th month	By this time whole milk can be given and the schedule already outlined for the breast-fed baby for the 11th month can be adopted.

It is hoped that the baby can be breast fed at least for several months. In starting to feed an older baby, select a formula for one several months younger and increase the strength gradually until the child is taking the full amount of food suggested for his age.

Use of Proprietary Infant Foods

In spite of all one may say about the value of clean, fresh cow's milk, properly prepared and supplemented, 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 and an antiscorbutic such as orange juice.

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 the directions on the label of a box of food. Those not requiring the addition of milk are to be criticized because they often contain but little fat and ash; may or may not yield proteins of suitable quality for growth; and yield a very inadequate or uncertain supply of vitamins. This means danger that the baby may have his fuel needs met without getting proper building and regulating material. 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 weak bones which have to bear too much weight for their strength.

The foods sold to be used with milk serve the same 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, or plain dextri-maltose may be purchased with no more trouble.

Emergency Infant Foods

The baby's health is so very dependent upon having the right amounts of the right foods every day that every precaution must be taken against any mishaps, and especially against any failure of his milk supply. He needs food just as much when the milk train is snowed in on a cold wintry morning or when unusual summer heat has spoiled the daily supply as any other day. So it is well to have an emergency shelf just for the baby. Here may be placed either one or two cans of a reliable brand of whole, unsweetened condensed milk which will keep indefinitely until opened; or a package of dried whole milk, which will keep several months but later on will go stale and should be used in cooking and not for the baby. To make condensed milk equal in volume to fresh milk, one measure must be added to an equal measure of water. To make dried whole milk equal to fresh, three-fourths of a cup of the powder should be added to a pint of water and beaten until thoroughly mixed.

There may also be on the baby's shelf convenient little jars of canned strained vegetables — tomatoes, peas, beans, etc., and likewise of canned strained prunes, or apricots and of mixed vegetable soup with liver or without. These are very convenient if the fresh vegetable supply fails or if some emergency in the family life makes the preparation of the baby's food difficult. There may be also a package of dried orange juice (which is just as antiscorbutic as the fresh juice), of which 1 teaspoonful dissolved in water will equal the fresh juice. Tomato juice is also prepared in small bottles which obviate the opening of a large can for a tablespoonful of juice.

The End of the First Year

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 boiled cow's milk from a bottle,[1] taking in all about one quart a day, and in addition 3 tablespoonfuls of orange (or tomato) juice, 1 teaspoonful of cod liver oil, 2 tablespoonfuls of strained green vegetable pulp, from one-half to a whole yolk of an egg; 2 to 4 tablespoonfuls of thoroughly cooked, strained cereal in each of two meals, and a piece of stale bread, crisp toast, or zwieback to chew. Nothing else is needed to keep a 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 tea, coffee, sugar, sweet crackers, watermelon, and what not, it does not follow that these are desirable. 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 is to grow strong and develop good habits. Regular hours for eating, sun baths, and sleeping, regular supplies of carefully chosen food, and plenty of fresh air mean not only the development of sturdy legs and rosy cheeks, but of good eating habits and a strong digestive tract able to stand the inevitable strains of later life. Good growth in this part of the body cannot be seen directly, but it counts 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; the reward will be partly in the present — much more in the future.

[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.

CHAPTER VI

FOOD FOR THE TWO–YEAR–OLD

By following such a program as has been suggested for the first year, making every effort to maintain the supply of breast milk through the major part of the year, and cautiously yet systematically adding to the child's diet those foods which not only enhance its immediate value but also prepare for the future, there should be no special difficulty in feeding during the second year. The woes of "the second summer" and "teething" are mostly the result of bad feeding. To boast that a fifteen-months-old baby "eats everything" is not a tribute to its precocity but to the ignorance or willful negligence of its mother.

In these first two years the child must get the idea that it is his business to eat what is provided for him, and not to expect what is not offered to him. Training in good eating habits cannot begin too early. And training is necessary. No human being can safely eat according to his whims. Each must learn that eating is an important duty, to be faithfully performed day by day. In the healthy child, hunger usually makes it a pleasant duty, but not always. New foods do not always appeal, by any means. They must be "learned," sometimes by many repetitions.[1] We make the conditions

[1] For help regarding problems in child training consult *Training the Toddler*, Cleveland, Elizabeth, J. B. Lippincott Co. (1925), and *Habit Training for Children*, Thom, D. A., The Massachusetts Society for Mental Hygiene, Inc., 5 Joy Street, Boston, Massachusetts (1924).

of learning as favorable as we can. For the very little child this means first of all that he shall have the appetite which comes from good health and freedom from physical or nervous fatigue; second, that there shall be a cheerful person who can heartily commend to him the food of which he is to partake; and third, that the food itself shall be of just the same flavor and texture and temperature that it was when he had it before. Thus the habit of eating that food becomes established. When he balks, it is well to try to discover the reason. If there seems to be none, he should not be pushed too far — not required to eat too much — but made to eat enough to realize that he is *eating the food that he refused*. As fast as possible such refusals should be suppressed. It often takes time and patience to establish essential foods in the child's diet, but the earlier one begins the easier it will be.

The most important of these foods is milk. It should remain the chief staple throughout the second year, from three cups to a quart being incorporated into the diet daily. This generally means drinking two to three cups and using the rest in preparing various foods. Usually not more than a quart altogether, *including that used in cooking*, should be given, as there must be opportunity to get in other foods too. At this particular age three cups of milk and an otherwise well-assorted diet will be better than four cups and neglect of vegetables and fruit, but scientific study has year by year emphasized the importance of milk as a food for growth. In 1906 Hopkins of Cambridge University showed that animals on diets made up from highly purified protein, fat, carbohydrate, and ash constituents, would not thrive, but immediately began to improve when a little milk was added to their diet. Since then numerous experimenters, both in this country and Europe, have piled up evidence: (1) that the proteins of milk are of the very best quality for growth, and when combined with the proteins of cereals and vegetables improve

their quality, too; (2) that milk is rich in vitamin A, so that with a quart of whole milk per day in a child's diet, there is little occasion to fear shortage of this vitamin; (3) that the supply of vitamin B, while not so liberal as that of vitamin A, is still excellent, so that supplementing with vegetables and fruits makes the diet satisfactory in this respect; (4) that milk is an excellent source of the pellagra-preventing vitamin G, also essential to growth; (5) that milk is the most important source of calcium for the child's bones and teeth, and that children have a high capacity for storing calcium, best met by a quart of milk a day; (6) that milk is also a rich source of phosphorus, but that this may be supplemented to advantage by phosphorus in egg yolk and many kinds of vegetables and cereals from whole grain; (7) that besides calcium and phosphorus, milk has a rich and varied assortment of other mineral elements essential to health and growth; even its iron, though not large in amount, should not be disregarded, but supplemented by other iron-bearing foods, principally green vegetables, egg yolk, liver, and whole grain cereals which furnish in addition the copper and other substances which enable the body to build the red pigment of the blood and prevent anemia. To cut down the supply of milk after the first year is a grievous mistake. The important thing is to know what foods to add to capitalize its many contributions to an adequate diet, and adapt it to the requirements of children of different ages. What is needed after the first year is not suppression, but supplementation.

The Food Program for the Second Year

Before birth and during the first year, the hardness of the teeth, the perfection of the enamel, good occlusion and healthy roots are largely determined, but for several years longer the permanent set will be developing out of sight in the jaws, and the only way to grow good teeth is by attention

to diet. After they come through the gums, we may keep them "as good as new" on the outside by cleanliness and dental care, but we make them from what we eat. Teeth are not dead structures; they are affected by diet all the time. So the greatest change in the eating program from the first year to the second is in the direction of more exercise for the teeth and jaws through the systematic use of food to chew. The program outlined for the last month of the first year needs comparatively little modification for the second year. There should be four meals a day; the first at 7 A.M. or not later than 7 : 30 A.M.; the second at 11 : 30 or 12 : 00, depending on the hour for the first; the third at 3 : 00 P.M.; and the fourth at 5 : 30, or 6 P.M. This schedule allows for a long nap after dinner and a light meal before going out for an afternoon airing. Adequate rest is necessary to enable a child to utilize his food. Many children are undernourished primarily from lack of rest. Thirteen hours should be allowed for the night's sleep, and at 7 P.M. no two-year-old should be out of bed. If he can be in bed at 6, so much the better.

Cereals can still be used to advantage twice a day. For variety two kinds may be given the same day in the second half of the year, instead of using the same one morning and evening. Any kind selected should be cooked till thoroughly softened, and for the first part of the year put through a strainer if coarse (like rolled oats or flaked wheat). In the latter part of the year the cereals may be given unstrained. From one-half an ounce to one ounce of dry cereal cooked thoroughly can usually be fed daily. Preference should be given to cereals made from the whole grains. Oatmeal and farina from the whole wheat are rich in ash constituents, add a little vitamin B, and are economical besides. Unless there is a tendency to looseness of the bowels, oatmeal can well be used at least three or four times a week alternating with the

© *H. Armstrong Roberts.*

"It Often Takes Time and Patience to Establish Essential Foods in the Child's Diet, but the Earlier One Begins the Easier It Will Be."

whole wheat preparation. The cereal foods should be served warm with milk or thin cream (top milk) but not sugar. The less sugar as such in the two-year-old's diet the better. It should be used only where necessary to make certain foods such as stewed fruits or simple desserts palatable. It affords fuel only and tends to crowd out foods carrying building and regulating material, by its enticing flavor. Spinach is one of the popular vegetables in the nursery school, but it would never be if a lollipop came first. Sugar blunts and perverts the appetite. Every mother should understand this clearly and recognize that she does her child a kindness when she withholds it. The less the little child knows of it the better. Candy, cake of all kinds, jams, marmalades, and preserves have no proper place in the food program of young children. They are all too often the unrecognized cause of digestive disturbances, which if not serious in themselves depress the child's resistance to colds and other infections.

The use of egg yolk in little children's diets is desirable because it furnishes proteins of excellent quality, a rich supply of phosphorus and iron, and vitamins A, B, D, and G. It should be introduced cautiously, as some very young children are disturbed by it. If the quantity is not too large, there is less likelihood of trouble. It can be combined without cooking with orange juice, or mixed with soft crumbs of bread or mashed potatoes; or it can be boiled till mealy, rubbed to a paste, and spread on a piece of bread. From one-half to one yolk daily is as much as should be given. Once in a while the whole egg may be given for a change, but for children of this age who are getting 3 or 4 cups of milk a day the white is superfluous and is best withheld as it makes the protein of the diet unduly high. As an alternate to egg yolk, a tablespoonful of liver, steamed and finely ground, can be spread on bread or mixed with mashed potato or other vegetable.

Every day some fruit juice or strained pulp should be given. Orange juice and tomato juice remain the staple antiscorbutics, but now and then other fruits mild in flavor may be introduced, such as prune juice and pulp, cooked apple juice and pulp (from stewed or baked apples), pineapple or fresh peach juice carefully strained. As prunes are not antiscorbutic, a little orange juice may be advantageously added. 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 not only for vitamin C but because it helps to counteract constipation and adds a variety of mineral elements and vitamins B and G for growth. In addition to the morning orange juice (or equivalent) some cooked and sifted fruit pulp lightly sweetened (apple sauce, fresh ripe pear or apricot sauce) is desirable with the 2 P.M. and the evening feeding unless it makes the diet too laxative, in which case it should be given only at 2 P.M., that with the supper being postponed for a while longer. Commercially canned pears and apricots can be used if canned without sugar and recooked to a state of complete softness or if removed from their syrup and recooked in a little plain water. Excellent prune and apricot pulp specially prepared for little children can be purchased in small jars.

There may be some additions to the number of vegetables eaten, but spinach, carrots, string beans, and green peas are good staples, and can be used both singly and in combination with one another. A wider range is merely for the sake of convenience. Any vegetable chosen should be mild in flavor, strained through a fine sieve, and given in moderate amounts (1 to 3 tablespoonfuls). It must always be remembered that green vegetables are given for their ash constituents and vitamins, and care must be taken that the cooking process

is one which will conserve these. The flavor of vegetables depends partly on their being strictly fresh and of good quality, but perhaps quite as much upon good cooking. The time of cooking should be as short as possible and the seasoning most expertly done. Vegetables are too important in the diet to trust their preparation to careless hands.

During this year the vegetable soup made with milk and a little flour for thickening is an exceedingly practical substitute for the evening cereal. The potato should not be regarded as taking the place of green vegetables, but as occupying a little dietary niche all its own. It is so generally available, so easy to prepare and digest, so good a source of calories and the vitamins B and C to say nothing of iron and other mineral constituents, that it may well appear in the diet once a day after the first year. At first only one or two tablespoonfuls of a baked potato fresh from the oven (or its equivalent, one freshly boiled in its jacket) should be mashed and moistened with a little cream, or else seasoned with a very little butter.

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 to the child the thought of 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 clearly indicated 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 selec-

tion 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 creature 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, to prepare these foods with care, so that appetite and digestion may be fostered, and to serve them in meals of unfailing regularity.

The results of good feeding are cumulative. Each succeeding year means chances of greater strength and, what is more important in life to-day, greater endurance of strain and resistance to disease. If a child does not make good gains in height and manifest other signs of health, he should be given a thorough health examination so that any handicap may be removed at the earliest possible moment.

Clara Elgene Peck

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. An allowance of about 40 calories per pound will cover the energy needs of the second year. Four protein calories per pound will meet the need for nitrogen, and the selection of foods indicated will afford an abundance of ash constituents and vitamins.

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

Fuel Requirement: 900–1200 Calories Cost: 2–2½¢ per 100 Calories

7 A.M.:	Orange juice, 2–3 tbsp	10–25 Calories
	Strained cereal jelly, 2–3 tbsp.	25–50 Calories
	Top milk for cereal, 2–4 tbsp..	50–100 Calories
	Warm milk to drink, ¾–1 cup	125–170 Calories
	Stale bread or Dry toast or Plain zwieback — 1–2 slices	50–100 Calories
9 A.M.:	Cod liver oil, 1–2 tsp.	33–66 Calories
12 A.M.:	Yolk of egg or 1 tbsp. liver paste	25–50 Calories
	Baked potato, 1–2 tbsp.	10–20 Calories
	Stale bread or Dry toast — 1–2 slices	50–100 Calories
	Sifted spinach or Sifted green peas — 3 tbsp.	5–20 Calories
	Warm milk to drink, 1 cup	170 Calories
	Cooked and sifted fruit pulp, 1–2 tbsp.	10–25 Calories
3 P.M.:	Warm milk, 1 cup	150–170 Calories
	Hard cracker or stale bread	10–25 Calories
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
	Cooked and sifted fruit pulp	10–25 Calories
	Warm milk to drink, ⅞ cup	150 Calories

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

Fuel Value: 1114 Calories — Cost: 2¼¢ per 100 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
7 A.M.:				
Orange juice (C, B,[1] A)	2 tbsp.	1.0	—	12
Cod liver oil (D, A)	1 tsp.	0.2	—	33
Strained oatmeal jelly (B)	3 tbsp.	1.5	5	30
Top milk (10 oz.) (A, B)	2 tbsp.	1.0	5	50
Warm milk (A, B)	1 cup	8.5	34	170
Stale bread	1 slice	0.7	7	50
				345
12 A.M.:				
Yolk of egg (A, B, D)	1 yolk	0.6	11	56
Baked potato (C, B)	2 tbsp.	1.5	6	50
Toast	1 slice	0.5	7	50
Sifted spinach (A, B, C)	1 tbsp.	0.7	—	3
Warm milk (A, B)	1 cup	8.5	34	170
				329
3 P.M.:				
Warm milk (A, B)	¾ cup	6.4	24	125
Whole wheat cracker (B)	1 cracker	0.3	2	25
				150
5:30 P.M.:				
Strained oatmeal jelly (B)	2 tbsp.	1.0	3	20
Top milk (10 oz.) (A, B)	2 tbsp.	1.0	5	50
Stale bread	1 slice	0.7	7	50
Sifted apple pulp (B, C, A)	3 tbsp.	1.0	—	20
Warm milk (A, B)	⅞ cup	7.4	29	150
				290
Total for day			179	1114

[1] B includes B and G.

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, from three cups to 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; or of milk toast; or with rice or some other cereal taking up milk readily (such as crisp cornflakes). 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 drunk from a

cup or eaten with a spoon as rice pudding or delicate pink junket.[1]

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 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. This makes for palatability, which is very important. 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. Many cereal preparations are now rolled thin and thoroughly heated in the factory, but these still need time for the very dry particles to become thoroughly penetrated with moisture to be at their best as regards texture and flavor. Since these bland dishes are a very important part 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 not sugar; this should be reserved for desserts and not depended on to flavor 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. Nothing is really gained by cultivating a perverted appetite for the sake of getting a particular food eaten. To allow a

[1] Excellent suggestions for young children may be found in *Food for Young Children*, Farmers' Bulletin No. 717, U. S. Department of Agriculture; in *Every Child's Dietary for Mothers and Children*, Shackleford, Pearl S. National Federation of Day Nurseries, New York City (1927), and in *Feeding the Child from Two to Six*, Barnes, Mary F. The Macmillan Company (1928).

child to eat ice cream and oatmeal, mouthful about, is not establishing the oatmeal habit. Persistent feeding of a small amount, properly prepared, temporarily making up the deficiency in some other way (as by more plain bread and milk) seems to be the best method.

Some form of dry, rather hard bread, preferably from whole wheat or other dark flour, should be included in each meal, 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 not necessary to use dark bread exclusively, but it is so good a source of iron that to disregard it seems an opportunity lost, especially since the habit will be a good one for later years when the diet cannot be given the rigid daily supervision which is rightly given to that of the young child.

Fruit should be given at least once a day, twice if it can be afforded. If digestion is feeble, only the fruit juices and pulp previously allowed and in about the same quantity (two to four tablespoonfuls) should be given. If the child is sturdy, mild fruits of delicate texture, thoroughly cooked, such as baked apples (pulp only), freshly stewed Bartlett pears, baked or steamed banana or stewed apricots, may be gradually introduced into the diet. All of these should be cooked with little sugar and only two to four tablespoonfuls given at one time, according to the age and the strength of the child.

A fresh vegetable (green as often as possible) of mild flavor and delicate texture should be made a regular part of the daily diet; 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 are not well digested by little children, but the habit of eating

them is one which should be cultivated early. To this end one teaspoonful of finely grated carrot or minced tender lettuce, moistened with a little orange juice, may be used as the filling of a sandwich. Such fillings take the place, in little children's diets, of jellies or jams. They are just as well liked by the children and much better food education.

Delicate cabbage is possible, when other green vegetables are hard to obtain. It should be shredded exceedingly fine and steamed in an open vessel in a very little water for fifteen or twenty minutes, when the water should have mostly evaporated. A seasoning of salt and a teaspoonful of cream can then be added. Tomatoes, being at all times rich in vitamins A, B, and C, are a valuable resource especially in winter when fresh, raw vegetables are not easily obtainable. They should not be used undiluted or unstrained except in small amounts to take the place of orange juice, but some of the strained juice may be incorporated into a white sauce and this poured over a crisp soda cracker or a slice of toast makes a good main dish for a meal. Children also like a dish of scrambled eggs and tomatoes served with mashed potato. Where great economy is necessary, dried peas and beans may be used in soups, being digestible in this form and valuable for mineral constituents and vitamin B. A little tomato can be combined with either from time to time. As with cereals, exceedingly great care in cooking is necessary to make vegetables wholesome and attractive, and since in later life these become more and more a source of the indispensable ash constituents and vitamins, pains should be taken to teach children to prize 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

© *H. Armstrong Roberts.*

"Children, Like Flowers, Thrive Best When They Have, Besides the Right Kind of Nourishing Food and Care, Plenty of Sunshine and Out-of-door Air."

American Child Health Association. — *The Runabouts in the House of Health.*

are desirable, one can in time overcome many seeming aversions.

Egg yolk is still the important part of the egg as it contains all the vitamins, all the iron, and the larger part of all the other ash constituents, but a whole egg makes a good dish for a midday meal, cooked 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. Not more than one egg should be used in a day, but one yolk should be used at least three or four times a week. Long experiments in feeding diets with and without egg have shown that although excellent growth can be secured on a ration of milk, vegetables, and cereal, better growth and greater vigor are obtained when a daily portion of egg is included. As an alternative, liver, steamed and then finely chopped, in amounts not exceeding two tablespoons a day, can be used once or twice a week. This is by far the best "meat" for children as it has growth-promoting properties which ordinary (muscle) meats do not possess.

The diet for the child from two to four is to be built around milk, vegetables, fruit, cereals, and hard or at least stale bread. Egg or liver and potato once a day and butter in moderation, on bread and potatoes and in small amounts in cooked vegetables, help to make up a liberal energy supply.

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 rise of the nursery school has afforded a fine demonstration of the ease with which these principles of feeding can be carried out with young children eating in groups. They accept their foods cheerfully, do not pay too much attention to them and clear their plates (the food being served in proportion to their nutritive requirement). They are helped to acquire good food habits by the fact that "everybody is doing it," an influence not so easily commanded by the individual home, but making clear that the simple foods which are suitable, served attractively, with the full expectation that they will be cheerfully received, will be eaten and digested and promote excellent growth.

The average weight of healthy girls and boys 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 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 insistent demand for food. Throughout the growing period, the best way to meet this situation is to supply food according to the standards developed by the

study of many children, to watch weight and appetite, and to guard against possible under-feeding by supplying as extra fuel as much plain bread, milk, and cereals as the child desires. If a child is really in need of food, he will eat plain bread, dry grapenuts or cornflakes cheerfully; 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 the drinking of water between meals should be encouraged.

The meal schedule now includes three " regular " meals, *i.e.*, breakfast, dinner, and supper, with a light supplementary meal between dinner and supper. As long as this meal is given it should be just as regularly planned for as the other meals, but it should be very simple, as one does not wish the bad habit of indiscriminate eating between meals to come out of it.

The food plan and dietary given on pages 165 and 166 illustrate the practical working out of the principles discussed above, and the accompanying plan for a week's menus as given to the mothers of children in a nursery school may also afford helpful suggestions. In this arrangement there is an extra feeding of orange juice, cod liver oil and a little karo syrup in the morning when the children arrive at the school. This is an added precaution to see to it that every child has his daily portion of orange juice and cod liver oil. In the home the orange juice and cod liver oil may be given at the conclusion of breakfast instead.

The 11 : 30 luncheons and the 2 : 30 feedings of milk and cracker are given to the children at the nursery school and, together with the suggested breakfasts and suppers, will adequately meet the day's food requirements of the child from three to four years of age.

NURSERY SCHOOL MENU
WITH
SUGGESTED BREAKFASTS AND SUPPERS

HOUR	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
BREAKFAST: Calories, 250–320	Cereal, ½–½ cup Milk, 2 oz. Fruit, 2–4 tbsp. Toast, ½–1 slice Butter, ¼–1 tsp. Milk, 6 oz.	Same	Same	Same	Same
9:15 Calories, 60	Orange juice, 2 tbsp. Water, 2 tbsp. Karo, ¼ tbsp. Cod liver oil, 1 tsp.	Same	Same	Same	Same
11:30 Calories, 400–525	Pea puree with egg, 3–5 tbsp. Mashed potato, 3–5 tbsp. Toast, ½ slice Sandwich, 1 slice Butter, 1 tsp. Milk, ¾ cup Apple sauce, ¼–⅓ cup	Scalloped tomatoes, 2–4 tbsp. Creamed liver, 1–2 tbsp. Baked potato, 1 Toast, ½ slice Sandwich, 1 slice Butter, 1 tsp. Milk, ¾ cup Fruit cup, ¼–⅓ cup	String beans, 2–4 tbsp. Scrambled egg, 1 Potatoes, 3–5 tbsp. Toast, ½ slice Sandwich, 1 slice Milk, ¾ cup Butter, 1 tsp. Orange blanc mange, ¼–⅓ cup	Creamed carrots, 3–5 tbsp. Potatoes, 3–5 tbsp. Toast, ½ slice Sandwich, 1 slice Milk, ¾ cup Butter, 1 tsp. Tapioca, ¼–⅓ cup	Spinach and egg, 3–5 tbsp. Potatoes, 3–5 tbsp. Toast, ½ slice Sandwich, 1 slice Milk, ¾ cup Butter, 1 tsp. Prunes, ¼–⅓ cup
2:30 Calories, 95–135	Milk, 4–6 ozs. Graham cracker	Same	Same	Same	Same
SUPPER: Calories, 310–400	Cream of tomato soup, ¾–1 cup Croutons, 1–2 slices Milk, ¾ cup Baked banana, 1	Oatmeal ¼–½ cup Toast, 1–2 slices Butter, ½–1 tsp. Milk, ¾ cup Junket, ¼–⅓ cup	Milk toast, 2 slices Sandwich, ½–1 slice Milk, ¾ cup Apple sauce, ¼–⅓ cup	Poached egg, 1 Toast, 1–2 slices Butter, ½–1 tsp. Milk, ¾ cup Fruit cup, ¼–⅓ cup	Cream pea soup, ¾–1 cup Toast, 1–2 slices Butter, ½ tsp. Milk, ¾ cup Rice pudding, ¼–⅓ cup

TOTAL CALORIES — LARGER CHILDREN, 1465 SMALLER CHILDREN, 1100

A Day's Food Plan For a Child Three to Four Years Old

Fuel Requirement: 1100–1400 Calories Cost: 2–2½¢ per 100 Calories

7 A.M.:	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
9 A.M.:	Cod liver oil, 1 tsp. in 2 tbsp. orange juice		48 Calories
12 A.M.:	Egg, soft cooked		60–80 Calories
	Baked or mashed potato, 1 small		50–75 Calories
	Sifted green vegetable, as spinach, asparagus tips, peas, 2–4 tbsp.		5–15 Calories
	Milk to drink, ¾–1 cup		130–170 Calories
	Buttered stale bread, 1–2 slices or Zwieback		75–150 Calories
	Plain custard or junket or Cereal pudding	¼–⅔ cup	100–200 Calories
3 P.M.:	Milk, 1 cup		170 Calories
	Bread and butter, 1 slice or Whole wheat cracker		50–75 Calories
5:30 P.M.:	Bread and milk or Milk toast or Cereal and milk or Baked potato and cooked vegetable with bread and butter		200–300 Calories
	Mild cooked fruit, as apple sauce, stewed pears, steamed (and warm) mashed banana		25–150 Calories

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

Fuel Value: 1371 Calories — Cost: 2¼¢ per 100 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
7 A.M.				
Orange juice (C, B,[1] A)	3 tbsp.	1.5	—	18
Cod liver oil	2 tsp.	0.3	—	66
Wheatena (B)	⅜ cup	3.0	6	50
Top milk (10 oz.) (A, B)	2 tbsp.	1.0	5	50
Toast	1 slice	0.5	7	50
Butter (A)	1 tsp.	0.1	—	32
Milk to drink (A, B)	¾ cup	6.4	24	125
				391
Dinner:				
12 A.M.				
Baked potato (C, B)	1 small	1.5	3	50
Toast	1 slice	0.5	7	50
Bread	1 slice	0.7	7	50
Butter (A)	1 tsp.	0.1	—	32
Tapioca cream (A, B)	⅖ cup	2.8	12	100
Milk to drink (A, B)	¾ cup	6.4	24	125
				407
Afternoon Lunch:				
3:00 P.M.				
Milk (A, B)	¾ cup	6.4	24	125
Whole wheat cracker	1 cracker	0.2	2	25
				150
Supper:				
5:30 P.M.				
Steamed rice	½ cup	2.6	6	66
Top milk (10 oz.) (A, B)	¼ cup	2.1	9	100
Milk to drink (A, B)	¾ cup	6.4	24	125
Bread	1 slice	0.7	7	50
Butter (A)	1 tsp.	0.1	—	32
Stewed apricot pulp	2 tbsp.	0.5	1	50
				423
Total for day			168	1371

[1] B includes B and G.

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 at the next year's contest.

Such endeavors to improve children physically must not be limited to the first three or four years, however. Each stage of development calls for watchful care. Good health habits must be fixed, and even adults are known to lapse from good habits started in early life. How much more the irresponsible child from five to seven! We must not only help him to remember to drink water, to attend to his bowels at a stated time, to go to bed and eat meals by the clock, to keep clean, to maintain a good posture, but we must impress the desirability of all these things upon his mind. More and more we must teach him that the building of a strong body is governed by laws which he must respect. Especially in these years must we inculcate the idea that food is to be chosen for what it will do for our bodies, and that as a general proposition we must learn to like what we ought to eat.

An interesting study of child health has been made in a mountain county of Kentucky. The children were between two and eleven years of age. Of a total of 149 children only 7 per cent were reported " excellent " in nutrition, and only 18 per cent even " good." What is the hope for the future if the oncoming generation is so manifestly unfit? Only about one-fourth of these children were having a diet which included all the constituents necessary to nourish their bodies. Four-fifths of these little children were estimated to be harming themselves by eating between meals, more than half by indulgence in tea or coffee. Their only salvation (so far as they can be considered " saved ") lay in the fact that in this community milk was a staple article of food, three-fourths of the children having at least a pint daily. A strong contrast is seen in another community, where an equally large number of children with all sorts of background and heredity, but with

Clara Elcene Peck

an intelligently controlled environment, constitute a group with a percentage of underweight strikingly low, showing that we have it largely within our power to determine whether our children are below par or not.

In communities where the general level of living is better than in the mountain district cited above, we still find an amazing number of children with defective teeth. An interesting study of the teeth of 400 school children in two townships of Massachusetts has shown very strikingly the relationship between a good diet and good teeth. In one district the prevailing industry is dairying; in the other, almost all milk was imported even for domestic use. Careful examination of the teeth and diet of the children showed that in the township which had its own good cows and used milk freely, the children's teeth were much stronger and freer from defects, while those who had a diet in which milk was very sparingly and intermittently used, had much poorer teeth.[1] It is now realized that the character of children's teeth is almost wholly determined before they are six years old, and as has been already stated, it is diet more than any other one thing which seems to determine the quality of teeth.

Sunshine and rest are important aids to the utilization of food by children. We must not be content merely with supplying them good food. We must safeguard them against fatigue. There must be long hours of sleep and not too much excitement or hard work during the waking hours. We must free them from physical defects which cause malnutrition by interference with normal breathing (enlarged tonsils and adenoids) or by poisons derived from diseased teeth; we must see that there is no latent tuberculosis or other bacterial disease handicapping their progress. All through

[1] Davies, E. S. *The Food Consumption of Rural School Children in Relation to Their Health.* Massachusetts Agricultural Experiment Station, Bull. No. 241 (1928).

childhood, weighing should be done at regular intervals and tables of weight and height of normal children consulted[1] as an aid in judging of progress and these should be supplemented by thorough physical examination at least once a year.

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 flavor. It is still wise to give 1 or 2 teaspoonfuls of cod liver oil daily, especially in the winter months. 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 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 con-

[1] See Appendix, Tables VII and VIII.

taminated 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 choices.

Cereals should still be served without sugar, but with plenty of milk. The warm cooked cereal should always be the staple breakfast dish, dark cereals being served more frequently than light. 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 scraped ripe apples, 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 are best cooked for young children, baked in their skins or steamed in a covered vessel in a very little water. Care must be taken in baking not to let the juice ooze out, as it will if they are cooked too long. If this happens they will be tough and unpalatable. If properly ripe (showing a few black " freckles " on a yellow skin) they will not need water nor sugar. Perfectly ripe bananas may also be cut in small cubes and covered with orange juice to make a well-liked dessert. Preserves of all kinds and very sweet canned fruits must be avoided.

With potato once a day, orange juice several times a week, tomato juice once or twice a week, and some variety in the other fruits and vegetables, there need be no concern about shortage of vitamin C. Green vegetables should still be cooked, and mashed, chopped 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. A cream sauce to which a little tomato juice or mild grated cheese has been added poured over crisp toast or soda crackers makes an attractive supper dish.

Potatoes should always be mealy. Baking is the safest method of cooking, but plain boiled and mashed potatoes are not objectionable if not over-cooked or allowed to stand about after cooking before they are served. Fried ones must never be offered.

The temptation to add hot breads, biscuits, rolls, waffles, 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, hard cookies, graham, whole wheat, or other crackers may be given at the end of the meal. Soft cake should not be given at all.

When the functions of foods were far less well understood than they are today, more emphasis than the facts justify was placed upon meat in the young child's dietary. We now know that a diet of whole wheat bread and milk, with no

other addition but a small amount of common table salt will not only support growth of experimental animals through as many as twenty-one generations, but that the last members of the family will be more vigorous — larger and stronger than the first generations. On a diet of bread and meat there is good growth for a period corresponding to about two years in the life of a child but after that the animals decline in weight, become wretched in health and if not put on a better diet soon die. There is never any second generation. On egg and bread there is nearly as good growth as on milk and bread, and a vigorous second generation can be obtained. Such experiments have made very clear the relative value in the diet of these different foods. Since meat is of no special value for growth when the diet is adequate in protein (as it will be with a good supply of milk) there is not much room for it in the diet of the young child after suitable amounts of vegetables, fruits, eggs, and cereals have been provided, and there is danger that meat, with its higher flavor, will make these blander foods seem less attractive, just as sugar tends to do.

Besides the fact that meat lacks calcium and vitamins, so essential to growth, it is more liable to intestinal putrefaction than milk, and hence is a less desirable source of protein, for the products of putrefaction have a deleterious effect upon health. The tendency to produce them appears to be greater in the young child than in older persons, children of three or four showing more signs of putrefaction on a diet of which meat is a regular part than do children of six, and these in turn more likely to do so than children of eight. Milk feeding will cause the signs of putrefaction to disappear so the advantage again is decidedly with the milk.

It used to be thought that meat was essential for protein and also for iron. Now we know that milk proteins are equally efficient for growth and that so-called " milk anemia "

is not due to anything more than a lack of copper and some additional iron, which can be supplied in green vegetables, certain fruits such as apricots and pineapple, egg yolk, and whole wheat, which are also valuable for other reasons.

When an arctic explorer lives on "nothing but meat" it is worth while to remember, first that he is a full grown adult and has no marked need of the growth-promoting factors upon which emphasis must be laid in childhood, and second that his so-called meat diet is not steaks, roasts, and chops as ordinarily eaten, but a diet with a moderate amount of protein (120 grams or so per day) and the rest fat, derived from liver, kidney, and other parts which contain the vitamins essential even to adult health.

If the traditional feeling that meat has special virtues cannot be overcome by consideration of scientific facts, the substitution of a little liver is a good way to appease the Moloch of tradition! A small amount of meat, superimposed on an excellent diet, will do no harm, but one further point regarding any extensive meat consumption by young children is perhaps worthy of mention. 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 one more good source of iron. But, as already shown, dry bread makes excellent chewing material, with none of the disadvantages of meat. 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, liver pulp, and fruit juice, or who are sick enough to need a stimulant. The chief merit of meat broths seems to be to induce the eating of cereals or vegetables which may be cooked in them, and this can usually be accom-

plished in some other way. Broths almost inevitably limit the amount of milk taken, and do not seem in any way to justify the regard in which they have been held in the past as a food for children. It appears unkind to put a busy housewife to the trouble and expense of making them when there is so little to be gained thereby.

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

ENERGY REQUIREMENTS FOR FIFTH, SIXTH, AND SEVENTH YEARS

YEAR	WEIGHT IN POUNDS (FOR MEDIUM HEIGHT)	CALORIES PER POUND
Fifth	41	36–38
Sixth	45	35–37
Seventh	50	34–36

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, it is well to have a liberal supply for periods of rapid development.

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 not later than 10:30 or 11; a substantial dinner at 12:30 or 1, 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 with time for a bowel movement afterwards. *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 next meal, which is often the noon 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 going to school should have there a mid-morning lunch, to take the place of the one which he has formerly enjoyed at home. It should be of the simplest character; a glass of milk or of orange juice and a cracker, a bowl of cereal and milk or even an apple 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 early — 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

[1] For information on the school feeding movement, see *School Feeding: Its History and Practice at Home and Abroad*, Bryant, Louise Stevens, J. B. Lippincott Company (1913), and *Malnutrition and School Feeding*, Gebhart, John C., United States Bureau of Education, Bull. No. 37 (1921).

© *H. Armstrong Roberts.*

REGULAR MEALS, SUITABLE FOOD, HAPPY ASSOCIATIONS, AND INTERESTING THINGS TO DO ARE ESSENTIAL TO CHILD DEVELOPMENT.

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 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: 2–2½¢ per 100 Calories

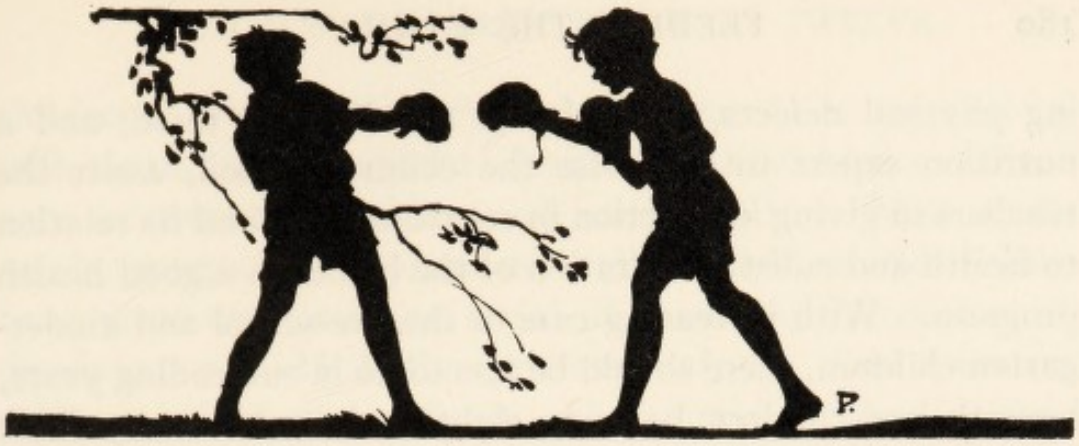
Breakfast: 7–7:30 A.M.	Orange, or Baked apple, or Prunes	50–100 Calories
	Well-cooked cereal	50–100 Calories
	Milk	150–200 Calories
	Dry toast or stale bread	50–100 Calories
	Butter, or Cream, or Bacon fat	25–50 Calories
10–10:30 A.M.	Milk	125–175 Calories
	Bread	50–75 Calories
	Butter	25–50 Calories
Dinner: 12:30 P.M.	Soft cooked egg (occasionally lean beef or lamb or chicken or minced liver)	50–75 Calories
	Mashed or sifted vegetable, as spinach, peas, string beans, carrots	10–25 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 Creamed vegetable on toast, or Milk toast, or Bread and milk	150–300 Calories
	Stewed fruit, custard, or junket, with or without plain cookies	100–200 Calories

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

Fuel Value: 1608 Calories — Cost: 2–2¼¢ per 100 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
7:30 A.M.				
Baked apple (C, B)[1]	1 apple	4.0	1	100
Oatmeal (B)	½ cup	4.0	8	50
Milk to drink (A, B)	¾ cup	6.4	24	125
Milk for cereal (A, B)	¼ cup	1.2	5	25
Toast	2 slices	1.0	14	100
Butter (A)	½ tbsp.	0.2	—	50
				450
10:30 A.M.				
Milk (A, B)	⅝ cup	5.1	19	100
Whole wheat crackers (B)	2 crackers	0.4	5	50
				150
Dinner:				
12:30 P.M.				
Split pea soup (B, A)	⅜ cup	6.0	26	100
Croutons (toasted)	27 croutons	1.4	14	100
Spinach (A, B, C)	½ cup	4.2	4	33
Bread	2 slices	1.3	14	100
Butter (A)	½ tbsp.	0.2	—	50
Stewed prunes (B)	6 small	2.8	2	100
				483
Supper:				
5:30 P.M.				
Baked potato (C, B)	1 medium	3.0	11	100
Bread	2 slices	1.3	14	100
Milk (A, B)	¾ cup	6.4	24	125
Creamy rice pudding (A, B)	½ cup	4.4	24	200
				525
Total for day			209	1608

[1] B includes B and G.



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. We attend to his clothing and shelter — how much more important to see that he has proper food!

Fortunately we now have some communities which maintain, either through public or private agencies for conserving and developing child health, a school physician for periodic health examinations and general supervision, a school nurse to assist the physician and attend to the correction of hamper-

ing physical defects, a dentist to care for the teeth, and a nutrition expert to supervise the children's food, assist the teachers in giving instruction in regard to food and its relation to health and enlist coöperation of the homes in a good health program. With increasing care of the pre-school and kindergarten children, there should be less to do in succeeding years, nevertheless children between eight and twelve carry little reserve material in their bodies and their food must literally meal by meal yield liberal amounts of fuel and body-building material if they are to grow rapidly taller without becoming so far underweight as to menace health and future growth. They need to be interested in taking care of themselves and learning to choose their own food intelligently. There is probably no school period in which the returns on such instruction are greater. Weekly weighing and charting of each child's progress have proven a valuable stimulus to effort on the part of many children.

Whether food education be carried on in the school or not, it certainly should be in the home. There are now available many helps for fathers and mothers whereby they may interest and instruct their children in regard to food in addition to training them by precept and example in good eating habits.[1] If a child has a persistently poor appetite which cannot be cured by plenty of rest and sleep and a suitable feeding schedule, he should have a thorough physical examination to determine the cause.

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

[1] For discussion and reading references consult *Nutrition Work with Children.* Roberts, Lydia J., University of Chicago Press (1926).

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 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 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, 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. Pains should be taken to cook 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.

Raw vegetables should now be made a more important part of the diet, beginning with a little tender lettuce, or cabbage very finely shredded, or grated carrot. A little orange juice makes a good dressing for such a "salad." A little later finely cut celery, apple, and other fruits can be added. The habit of eating some crisp raw vegetable daily is a good one to establish, but care must be taken to see that such food is properly masticated; and highly seasoned salad dressings of all kinds should be absolutely avoided.

By the time a child is eight or nine years old, meat may be more regularly 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 their importance is commonly exaggerated. Children in whom the taste for sugar has not been cultivated do not exhibit a marked craving for sweets. They may even object, like a fine big boy of eight who took exception to a mid-morning lunch of zwieback of a common sweetened variety, complaining, "It's too sweet! It's too sweet!" In any case sweets should never be given between meals nor at the beginning of any meal. Not only candy, but the delectables of the soda fountain and ice cream parlor, are out of place for anybody except at the end of a

regular meal, and even then are not desirable for children. The less they know about such sweets the better.

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. 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 confections from chocolate and nuts are too difficult of digestion. Plain sweet chocolate is a good substitute for candy if used in small amounts and if it does not keep the child awake at night, but better 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 now and then for the same purpose.

Nuts in their natural state or salted 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. When ground to a paste, however, the first objection is removed and peanut and other nut butters are an acceptable addition as the need for more food becomes pressing. No fried food, pastries, tea or coffee, rich sauces, or meat salads with mayonnaise dressing should ever be offered to young children.

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. This extra mid-morning or mid-afternoon lunch is often served at school, where it generally consists of a half pint of milk and a cracker or two. Orange juice has been found a beneficial school lunch, if not prohibited by cost. Such feeding should not supplant the home breakfast or noonday meal, but it may be a valuable supplement to either of these. It is particularly valuable for the children in the early years of school life, and is often a great aid in bringing underweight children into better condition. Teachers report not merely gains in weight but better behavior and better school progress after the institution of milk feeding. Incidentally, it is of value in teaching children to drink milk. The desire to do like the rest overcomes prejudices which may fill the child's whole horizon at home.

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

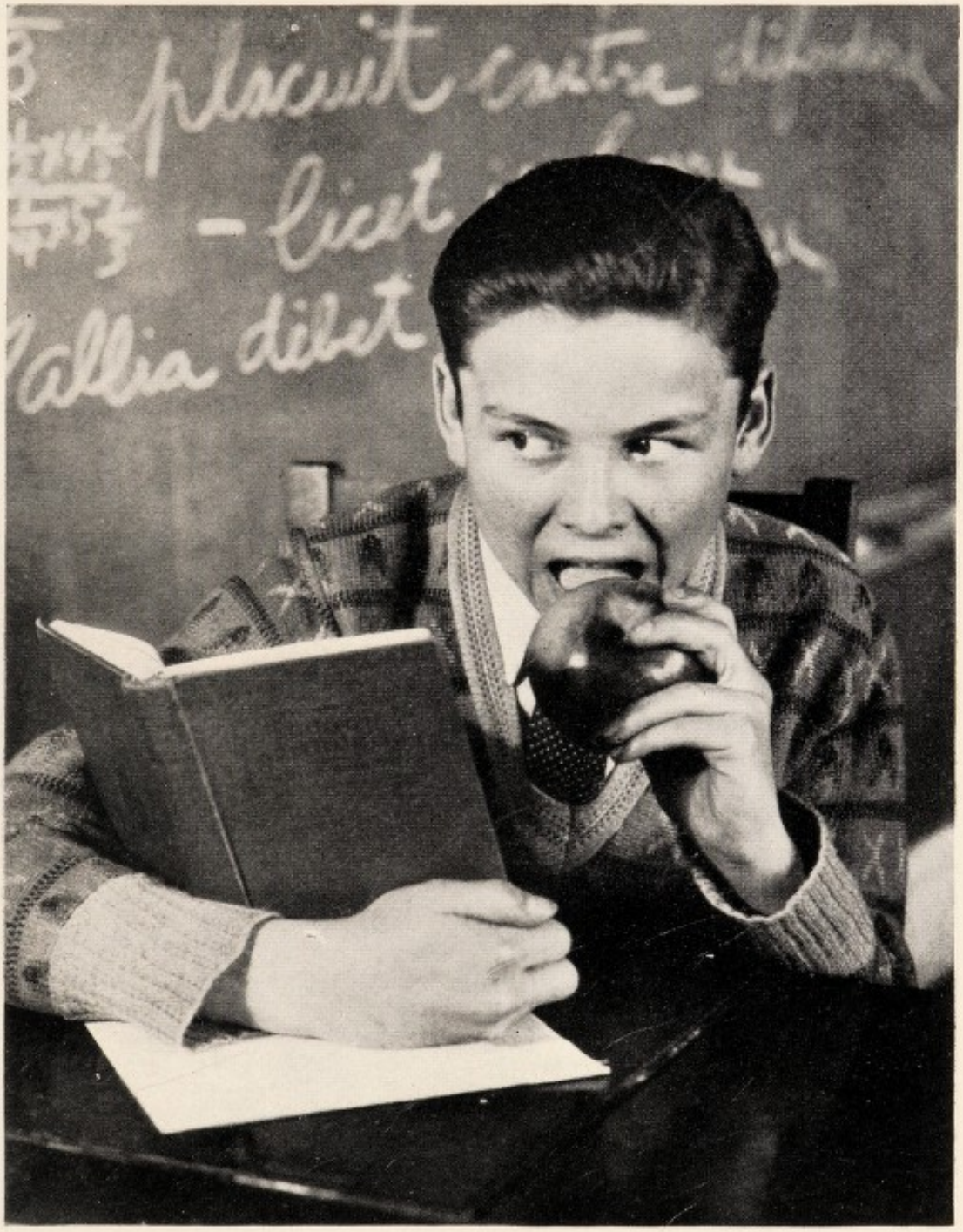
that it may be suitable in kind and amount, and appetizing when the box is opened. Three or four kinds of food are quite enough to provide at a time, for at best the busy housewife usually finds her wits taxed to furnish wholesome lunches with much variety.

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. An occasional chicken liver may be set aside for lunch box sandwiches. For the older children, chopped meat, cheese of various kinds and especially cottage cheese, and jellies are also desirable. Sandwiches of raisin or date bread without other filling than butter or of plain bread with a peanut butter and raisin filling will help to give variety and many calories.

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. Ripe tomatoes are juicy enough to take the place of other fruit for the older children and their richness in vitamins makes them as valuable as oranges.

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.



© *H. Armstrong Roberts.*

"You Cannot Fill the Head When the Stomach Is Empty."

Holt. *Food, Health and Growth.*

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 hundreds of rural schools shows that it results in improved physical condition of teachers and 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. All school lunch work should be considered educational and should be an important factor in reducing malnutrition.

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 other dishes; milk or cocoa should always be obtainable.

In the New York City Elementary Schools the food is cooked in central kitchens and distributed by auto trucks to the different schools, where it is served by pupils of the cooking classes or by those appointed by the principal in schools having no cooking. " Milk is the food around which menus are built " says a printed report of this work.[1] " Each day it is introduced by means of a cream soup or a milk dessert. Graham or whole wheat bread is always used, except when the crumbs of dried white bread are needed for a certain

[1] *School Lunches*, New York City Elementary Schools (1923). This contains the recipes of the dishes used in the lunches.

For further suggestions regarding school luncheons see *School Lunches*, Farmers' Bulletin No. 712, U. S. Department of Agriculture (1924), and *The Lunch Hour at School*, Bureau of Education, U. S. Department of the Interior (1920).

recipe. . . . Vegetables, cereals and fruits make up the balance of foods served." A sample week's menu is given below.

MENU

	Calories per Serving
Monday:	
*Cocoa	268
Graham bread and butter sandwich	130
Fresh fruit — two kinds / Stewed fruit — 1 kind } average portion	95
Tuesday:	
Lima beans and barley soup	177
Buttered roll (white)	275
*Stewed tomatoes, thickened with bread crumbs	50
Chocolate cornstarch pudding	235
Wednesday:	
Cocoa	268
*Lima beans with tomato sauce	125
Buttered graham roll	250
Baked apple, or fresh fruit, average portion	95
Thursday:	
Vegetable soup with barley	185
*Baked beans	182
Rye bread and butter sandwich	250
Rice custard	165
Friday:	
Cream of Lima bean soup	172
Peanut butter sandwich	250
Scalloped corn	85
Gingerbread or molasses cookies	208

All dishes marked * cost two cents; all others three cents. In addition to the regular menu there are offered daily for 1 cent each:

1 glass of whole milk (124 Calories)
1 bar sweetened chocolate or 1 wrapped stick of candy (125 Calories)
1 sweetened cracker / 2 to 4 sweetened crackers } 180 Calories

A study of the food actually purchased by the children shows that the average tray carries about 1150 Calories.

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 following will show the general type of food to be chosen.

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 night meal 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 may 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. A healthy child of eight years may be anywhere from 43 to 51 inches in height and weigh from 39 to 75 pounds, and in later years even more individual variation is possible.[1] 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	32–35
10–12		30–34

[1] See Appendix, Tables VII and VIII.

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

Fuel Requirement: 1700–2000 Calories Cost: 1¾–2½¢ per 100 Calories

Breakfast: 7–7:30 A.M.	Mild fruit, raw, 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
	A little shredded raw cabbage or other crisp salad vegetable with fruit juice or salt	Calories negligible
	Bread, rice or other nutritious pudding / or / Stewed fruit, with cookies	150–200 Calories
Supper: 5:30–6 P.M.	Cream soup / or / Milk toast / or / Scalloped vegetable / or / Baked potato with 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: $1\frac{3}{4}$–$2\frac{1}{4}$¢ per 100 Calories

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

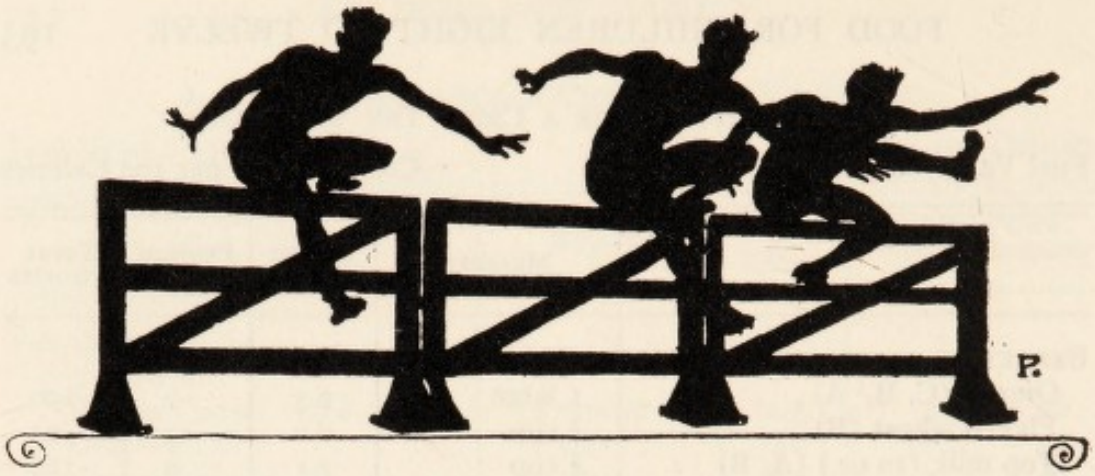
[1] B includes B and G.

A Day's Dietary for a Child Ten Years Old

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

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
Orange (C, B,[1] A)	1 large	9.5	7	100
Flaked wheat (B)	$\frac{2}{3}$ cup	6.0	13	100
Top milk (10 oz.) (A, B)	$\frac{1}{4}$ cup	2.1	9	100
Milk (A, B)	$\frac{3}{4}$ cup	6.4	24	125
Toast	2 slices	1.0	14	100
Butter (A)	$\frac{1}{2}$ tbsp.	0.3	—	50
				575
Dinner:				
Hamburg steak	1 ball	1.3	41	75
Baked sweet potato (A, B)	1 potato	4.5	9	150
Bread	2 slices	1.3	14	100
Butter (A)	1 tbsp.	0.5	—	100
Creamed peas and carrots (A, B, C)	$\frac{2}{3}$ cup	5.0	14	75
Shredded lettuce with orange juice (C, B, A)	2 leaves	0.4	—	—
Bread pudding (with raisins) (A, B)	$\frac{3}{4}$ cup	6.0	18	200
Milk (A, B)	$\frac{3}{4}$ cup	6.4	24	125
				825
Supper:				
Potato soup (A, B, C)	$\frac{3}{4}$ cup	6.3	22	150
Saltines	6 crackers	0.8	10	100
Whole wheat bread (B)	2 slices	1.4	16	100
Butter (A)	$\frac{1}{2}$ tbsp.	0.3	—	50
Stewed apples (B, C)	$\frac{2}{3}$ cup	5.0	1	100
Molasses cookies	6 very small	0.7	6	100
				600
Total for day			242	2000

[1] B inclues B and G.



CHAPTER X

FOOD IN ADOLESCENCE AND YOUTH

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 woman 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 drifting into the habit of 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 or a sliced banana with cream or orange juice, 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. Green vegetables should be used as freely as possible, especially in the dietary of growing girls who need a rich supply of iron and vitamin A. 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 raw 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. Although cooked vegetables seem more substantial to voracious boys, they should be taught the value of lettuce, celery, and the like, as sources of ash and vitamins.

Meat should be provided in moderate amounts, two to four ounces a day. It is generally liked, and if wisely used, adds to the palatability of an otherwise adequate diet. As an addition to the protein content of the diet, cheese may 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. Griddlecakes, 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 soft 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.

© *H. Armstrong Roberts.*

"Sunshine and Rest Are Important Aids to the Utilization of Food."

Bread and cereal puddings, custards, and blanc manges 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 if provided 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 youth of keen appetite it is often wise to provide access to some very plain food, such as bread, crackers, or milk, 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
Candy:		
Sweet milk chocolate, large bars	500	.05
Almond bars	600	.05
Assorted penny candy	100	.01
Beverages:		
Milk	140	.03
Cocoa	110	.03

[1] The School Lunch Service, Department of Education, The City of New York. Division of Reference and Research. Bulletin No. 3 (1914).

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 in the food plan on page 201.

The energy requirements of this period are approximately:

Age in Years		Protein Calories per Pound	Total Calories per Pound
10–13	Girls	3	32–27
	Boys	3	34–30
14–17	Girls	3	27–18
	Boys	3	30–23

This means that the total daily requirement for girls from fourteen to seventeen will be from 2400 to 2800 calories; for boys of the same age from 2600 to 4000 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 at regular hours 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 for a Boy Fourteen to Sixteen Years of Age

Fuel Requirement: 3000 Calories — Cost: 1¾–2¢ per 100 Calories

Breakfast:	Fruit	50–100 Calories
	Cereal	200–250 Calories
	Milk	300–350 Calories
	Bread	150–300 Calories
	Butter or butter substitute	200–300 Calories
		900–1000 Calories
Luncheon:	Macaroni and cheese, or Hot roast beef sandwich, or Bean soup and crackers	200–300 Calories
	Cocoa or milk	150–250 Calories
	Bread	200–300 Calories
	Butter	200–300 Calories
	Baked custard, or Rice pudding, or Baked apple	250–300 Calories
		1000–1200 Calories
Dinner:	Meat, or Bean loaf, or Scalloped eggs with ham	200–300 Calories
	Potatoes, or Macaroni, or Rice	150–200 Calories
	Green vegetable, cooked	50–150 Calories
	Fresh fruit or vegetable salad	100–200 Calories
	Bread	200–300 Calories
	Butter	200 300 Calories
	Ice cream, or Tapioca cream, or Chocolate blanc mange	250–300 Calories
	Milk or cereal café au lait	150–250 Calories
		1100–1500 Calories

A Day's Dietary for a Boy Aged Sixteen Years

Fuel Value: 3640 Calories Cost: $1\frac{3}{4}$–$2\frac{1}{4}$¢ per 100 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
Banana (B,[1] C)	1 large	5.5	5	100
Oatmeal (B)	$1\frac{1}{2}$ cups	15.8	34	200
Milk (A, B)	$1\frac{1}{2}$ cups	12.7	48	250
Cornmeal muffins (B)	2 small muffins	3.2	36	275
Butter (A)	1 tbsp.	0.5	—	100
Sugar	1 tbsp. (scant)	0.5	—	50
				975
Luncheon:				
Macaroni and cheese (A, B)	1 cup	4.2	34	200
Graham bread (B)	3 slices	1.4	14	100
Butter (A)	1 tbsp.	0.5	—	100
Cocoa II (A, B)[2]	$\frac{4}{5}$ cup	7.6	32	200
Stewed rhubarb (C, B)	$\frac{3}{4}$ cup	2.5	1	150
Gingerbread I [2]	2 small pieces	2.2	14	200
				950
Afternoon Lunch:				
Graham bread (B)	3 slices	1.4	14	100
Butter (A)	1 tbsp.	0.5	—	100
				200
Dinner:				
Swiss steak	2 slices	2.2	70	200
Mashed potatoes (C, B)	$\frac{7}{8}$ cup	6.2	14	200
Stewed tomatoes (C, B, A)	$\frac{3}{4}$ cup	6.7	9	120
Cole slaw (C, B, A)	$\frac{3}{4}$ cup	2.1	5	75
Bread	4 slices	2.7	28	200
Butter (A)	2 tbsp.	1.0	—	200
Brown Betty (B, C)	$\frac{3}{4}$ cup	6.1	9	300
Milk (A, B)	1 cup	8.4	34	170
Sugar	1 tbsp.	0.5	—	50
				1515
Total for day			401	3640

[1] B includes B and G.

[2] See Table II, Appendix, pp. 397 and 405.

A Day's Food Plan for a Girl Fourteen to Sixteen Years of Age

Fuel Requirement: 2400–2800 Calories Cost: 2–2½¢ per 100 Calories

Breakfast:	Fruit (fresh if possible) or fruit juice	50–100 Calories
	Cereal or fruit as substitute (banana, prunes or figs)	75–150 Calories
	Top milk for cereal or fruit	100–200 Calories
	Toast	50–100 Calories
	Butter	75–100 Calories
	Sugar	50–100 Calories
	Milk for cereal coffee	50–100 Calories
	Cereal coffee	
		500–700 Calories
Luncheon:	Vegetable soup and crackers or 2 cooked vegetables or Meat and vegetable plate or Fruit salad	200–250 Calories
	Sandwich or Nut or raisin bread and butter	150–250 Calories
	Ice cream or Fruit gelatin jelly with whipped cream or Baked apple and cream	150–250 Calories
	Cocoa or milk	150–200 Calories
		900–1000 Calories
Dinner:	Rice and meat timbale, tomato sauce or Potatoes scalloped with ham or Broiled Hamburg steak	150–200 Calories
	Potatoes or any other vegetable or baked banana	100–150 Calories
	Another cooked vegetable, preferably green (Swiss chard, Brussels sprouts, peppers, broccoli, new cabbage)	50–75 Calories
	Stewed fruit or Fruit salad or Raw crisp vegetable	25–100 Calories
	Bread	50–100 Calories
	Butter	75–100 Calories
	Charlotte Russe or Spanish cream or Rice dainty	150–200 Calories
	Cereal café au lait	100–150 Calories
	Sugar	50–75 Calories
		1000–1100 Calories

A Day's Dietary for a Girl Aged Sixteen Years

Fuel Value: 2350 Calories Cost: 2–2½¢ per 100 Calories

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
Orange (C, B,[1] A)	½ large	4.7	3	50
Oatmeal (B)	¾ cup	7.9	17	100
Top milk (12 oz.) (A, B)	⅜ cup	3.0	10	100
Whole milk (A, B)	⅝ cup	5.1	19	100
Toast	2 slices	1.0	14	100
Butter (A)	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 [2] with whipped cream (A, B)	¾ cup	7.0	16	155
Baked apple (B, C)	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 (C, B)	1 medium	3.0	11	100
Stuffed peppers	1 small	2.6	9	50
Banana salad (A, B, C)	1 serving	3.0	13	110
French rolls	2 small	1.9	18	150
Butter (A)	1 tbsp.	0.5	—	100
Washington pie (A, B)	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] B includes B and G.

[2] See Table II, Appendix, p. 397.

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, milk, and apple pie, provided they are sufficient in amounts to cover his fuel needs and in such proportions as to insure adequate protein, ash constituents, and vitamins. Outdoor life and fresh air are sauce to his appetite and tonic to his digestion. Sunshine enables him to manufacture his own vitamin D. 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 fare of the

sedentary man, in quantities not exceeding his daily needs, and daintily prepared, since his living conditions foster neither keen appetite nor vigorous digestion. 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 and soda fountain sweets, with little regard to after-effects. The food plans already suggested for sixteen-year-old girls and sedentary women indicate the type of diet which they should try to secure, adjusting the calories according to their individual needs. Interest in eating can be more than pleasing the palate only as they learn what food values mean. No girl or boy should be allowed to finish the elementary school or the junior high school without the fundamentals of this knowledge.

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 commercial 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 moderate prices and perhaps also a nutritionist to act as a general health adviser. Very often, however, the boy or girl must patronize some public restaurant, and here we have as yet inadequate 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 young men and women of small means forced to lunch away from home. 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 crackers and milk and

100-Calorie Portions of Salads and Salad Accessories [1]

Food Material	*Weight (oz.)*	*Measure*
Saltines	0.8	6 saltines
Soda crackers	0.9	4 crackers
Mayonnaise dressing	0.5	1 tablespoon
French dressing	0.6	1½ tablespoon
Fruit salad	1.5	Very small serving
Tomato and cucumber salad	2.0	Very small serving
Chicken salad	1.6	Very small serving
Cheese straws	0.8	2⅔ straws
Graham crackers	0.8	3 crackers

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

looks more interesting, no doubt, 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 a piece of mince pie, though the cost of calories might be the same.

While the importance of fruit and vegetables is not to be lost sight of, their purchase as a part of a restaurant meal is not always good economy. The cost of an orange in a restaurant is not only the purchase price of the fruit, but a necessary charge for service, for rent and all the other things that go into " overhead " in a business. Now a boy or girl, if living at home, can usually purchase fruit outside at less cost, and make it a part of the home meal. The same is true of raw vegetables and salads. One gets a better return on one's money in a restaurant on the cooked vegetables. And if one can have these at home, it is better economy to stick to potatoes, beans, macaroni, and the like in the restaurant and make up the deficiency of this meal at home later.

Most young people need from 750 to 1200 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 any 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 from $1\frac{3}{4}$ to $2\frac{1}{4}$ cents 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

II.	Potato soup	¾ cup	200 Calories
	Croutons, toasted	25 cubes	50 Calories
	Cornmeal and raisin pudding	⅔ cup	300 Calories
	Sugar cookies	2 large	200 Calories
			750 Calories
III.	Bean soup	1½ cups	150 Calories
	Corn bread	2 in. × 4 in. × 4 in.	200 Calories
	Butter	1 tbsp.	100 Calories
	Chocolate blanc mange	½ cup	200 Calories
	with cream (thin)	¼ cup	100 Calories
			750 Calories
IV.	Cheese and nut sandwiches	2 large	415 Calories
	Dates	10	200 Calories
	Buttermilk	1½ cups	135 Calories
			750 Calories
V.	Milk	1 cup	170 Calories
	Date sandwiches	2 large	380 Calories
	Sliced orange (1) and banana (1) with		175 Calories
	Sugar	½ tbsp.	25 Calories
			750 Calories
VI.	Grapenuts	7½ tbsp.	250 Calories
	Sugar	2 tbsp.	100 Calories
	Milk	1¾ 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 tbsp.) and thin cream (3 tsp.)		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 safeguarding 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.

The only remedy is knowledge of the part which the various vitamins and mineral constituents play in nutrition and a determination to live up to the best practice known to modern science. Fruits and vegetables must be provided, and college boys and girls must have a " will 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 develop rational eating habits.

It is well to bear in mind, too, that 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 should encourage also the use of whole wheat bread and cereals from whole grains.

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 and vitamins, which are more costly than

simple fuel. While we insist on economy in the use of food materials, it must be a wise economy, avoiding waste but recognizing the necessity of an adequate food supply through all 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 the 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 certain modifications for advancing 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.

It has been shown that the rate at which animals decline in vigor can be greatly modified by diet, those having liberal supplies of the various dietary essentials retaining their youthful vigor much longer than their brothers and sisters and cousins living in the same environment, but having a diet deficient in some health-promoting constituent. Many people pass their whole lives on a low nutritional plane. They are not sick, they go about their work and carry on the functions

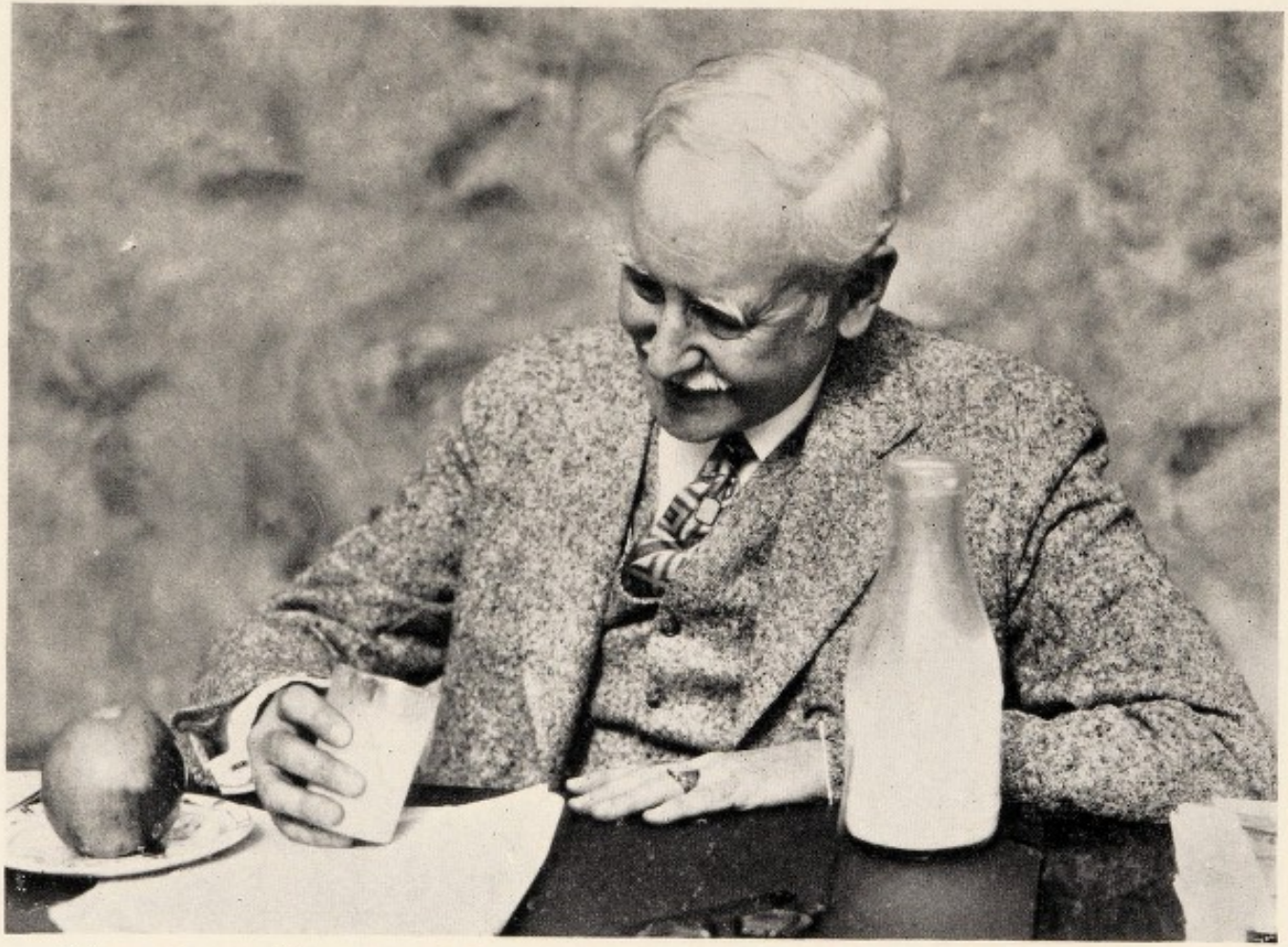
of human beings, but they never feel as well as they might. They never have " health positive " as the modern saying is. They never realize what it is to live " abundantly." To do this there must be a regular health program — physical examinations from time to time (every birthday), correction of any physical defects which may develop, suitable amounts of rest and recreation, and a diet which is known to be definitely contributing to health and not merely keeping the person alive. Many of the characteristic diseases of later life are the cumulative result of infection somewhere in the body, and immunity to infection is largely determined by the defenses against microörganisms which the body makes for itself. It has been shown repeatedly that a diet poor in vitamin A makes the individual more liable to infection, and one low in vitamin B results in poor digestion and assimilation of food, which brings about undernutrition and again renders the victim more susceptible to infections and nervous diseases. It is equally certain that a diet poor in mineral elements makes the whole organism function at a disadvantage. On the other hand there is evidence that education in regard to health and opportunities for health examinations have during the past decade actually increased the working span of human life.

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 eager to participate in it; he takes his game of tennis (if played at all) 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 at age thirty[1] is the best way to discover whether or not one's calorie intake should be cut down. If the diet has been, up to this time, a well-balanced one, with meat in moderation, milk, fruit, and vegetables freely used, and few rich foods, condiments, or stimulants, reduction is a matter of cutting down the number of calories without decreasing the supply of protein, mineral elements, and vitamins very much. Foods like sugar which yield "calories only" should be cut off first. Next come bread and pastries, whose contributions to the diet are chiefly calories. Reduction at these two points and care to take no extra servings of cereals or high-calorie desserts, may be sufficient for awhile. But sooner or later butter and cream will probably have to be curtailed, even though they do carry vitamin A. It is well to replace the vitamin A thus taken out by more green vegetables (so conveniently low in calories) and perhaps by a daily portion of egg or of cod liver oil. Each year a larger proportion of the diet should be low-calorie vegetables, plainly cooked. They will help to keep the diet rich in essential elements and laxative.

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

[1] See Appendix, Tables V and VI.



"With a Little Knowledge It Is not Necessary to Have Elaborate Cookery or Many Kinds of Foods to Keep a Man Well-nourished."

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[1]

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 a man of thirty of the same 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 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 1800 to 2000 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

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

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 zwieback, 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 so that it will digest more rapidly. 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 without indigestion.

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. 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. A vegetable extract may be used for a broth that will be rich in vitamin B.

Vegetables, also being difficult to masticate, may cause indigestion. Then they may be put through a sieve and served as a puree or in soup. A little yeast, which is a rich source of vitamins B and G, can sometimes be used with good results, especially as it tends to be laxative, too.

With the lowering of metabolism characteristic of the aged,

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 low level. 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 in old age of difficulty in getting rid of a surplus, so that a very moderate supply is best. An allowance in the day's diet of one and one-half protein calories per pound of body weight 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 may be used depends much upon the individual. If mastication is possible and fermentation or other digestive disturbance does not develop, they may be used as freely as desired. But with decreased powers of caring for them, they must be given sparingly, either cooked till soft, or the juice extracted and given by itself. Some form of vitamin C there should always be, but for this a small quantity of orange juice can easily be taken.

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 advantageous in early life (such as tea and coffee) are usually a welcome part of the aged person's menu.

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 zwieback 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
	A cooked green vegetable finely chopped	10–25 Calories
	Rice, or baked or riced potato	75–100 Calories
	Toast or zwieback 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 zwieback, or 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
	Zwieback 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
	Zwieback 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 (B,[1] A)	¾ cup	7.4	25	75
				75
8 A.M.				
Grape juice (B)	½ cup	3.5	—	100
Cream of wheat (B)	⅜ cup	3.0	6	50
Milk (top 10 oz.) (A, B)	¼ cup	2.1	9	100
Sugar	1 tsp. (scant)	0.1	—	16
Bread (toasted)	2 thin slices	0.5	7	50
Butter (A)	½ tbsp.	0.3	—	50
Bacon	4–5 small pieces	0.5	13	100
Coffee with ¼ cup milk and 1 tsp. sugar (A, B)	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 (C, B)	1 small	2.3	9	75
Butter (A)	½ tbsp.	0.3	—	50
Tapioca cream (A, B)	⅔ 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
6 P.M.				
Omelet (1 egg, 1 tsp. butter) (A, B)	——	—	25	100
Rice steamed with green peppers and tomato (C, B, A)	½ cup	3.5	7	70
Baked squash (1 tsp. butter) (A)	⅓ cup	3.0	5	50
Pulled bread	1 slice	0.5	7	50
Orange jelly (C, B, A)	½ cup	4.0	4	40
Whipped cream (A)	2 tbsp.	0.9	2	100
Cereal coffee with ¼ cup hot milk and 1 tsp. sugar (A, B)	1 cup	—	9	60
				470

[1] B includes B and G.

	Measure	Weight Oz.	Protein Calories	Total Calories
10 P.M.				
Hot malted milk (A, B) . .	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." 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 the watchful eye of a mother who understands the laws of health and holds them in the highest regard. Patient mastery of the A B C's of nutrition will be repaid a hundred fold. And some of the rewards will be immediate. One grandmother remarked: "The modern way of bringing up children *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 foodstuffs (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 eight 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 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 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 pocket-books, community customs and individual notions, as well as the state 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 individuals whom 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, 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 own particular needs. If the family is composed of adults, all sedentary, having 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 should 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 some one person demanding more variety, or engaged in work demanding high energy expenditure, 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 when there is at least one hot dish at a meal. This may be a beverage, a luncheon for instance consisting 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 vegetable or meat on toast, and the like, served with bread and butter and a beverage. The inclusion of a vegetable rich in vitamins, such as lettuce or other greens, is always desirable. 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 dessert — stewed or fresh fruit, charlotte russe, blanc mange. 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 wholesome and 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 unless one is raw and the other cooked offer no enhancement to each other and rarely add anything to the effect not already accomplished by one, and it would do just as well to eat two servings of one vegetable as one serving of each of two kinds. Every duplication of this kind makes it so much

Claro Elsche

the more difficult to provide the sauce of variety for the next time.

Foods of mild flavor and the same general texture and color, such as potatoes, rice, macaroni, samp or hominy, and other cereals, serve as "fillers-in" or carriers of calories, whereas other foods of more striking characteristics give piquancy to the meal. There is no particular advantage in multiplying such fillers-in. Served one at a time, they produce a better effect than when several are used together. When these are multiplied, there is always the likelihood that green vegetables, cooked or raw, will be slighted because there are already a sufficient number of dishes. Potatoes are not quite in the same class with the cereals because of their richness in vitamins B and C, iron and some other ash constituents, but while they may well be used at least once a day, it seems more artistic not to serve them in the same course with rice or macaroni.

Often the dessert furnishes the most energy of any single dish, amounting to as much as 300 or 400 calories per serving. 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 matter of fact, the answer depends very much upon whether one is an Englishman or an Eskimo, a Bostonian or a Bengali. The 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"?

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 more comfortable with proteins, fats, and carbohydrates well represented in each meal, starch predominating. Since we need such a variety of substances and our everyday method of getting these is somewhat hit-or-miss, we shall insure hitting oftener than missing by the general plan of adding fruit at least once a day, potato and some leafy vegetable or tomato at least once a day, and milk totaling at least a pint a day for each adult and a quart for each child. We may well add, at least for children, an egg three or four times a week if not daily, and a small portion of liver once a week.

It is desirable to keep the fuel value of any regular meal

essentially the same from day to day, but we should go a step further and see that some foods furnishing iron, phosphorus, and calcium, vitamins A, B, C, and G, and " ballast " in the form of cellulose are regularly provided for. Let us not have a feast and upset our digestions by overeating to-day, and have a famine to-morrow and a headache (perhaps a family quarrel, for such conditions breed them!), but stoke the human furnaces regularly, according to their daily 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 extra calories from fat and sugar), a vegetable with Hollandaise sauce, a salad with mayonnaise dressing, and ice cream with a chocolate nut sauce — all dishes very high in fuel; and to-morrow a bouillon, a lean fish broiled, riced potatoes, sliced tomatoes without dressing, and watermelon for dessert — a meal which may have less than 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, still less, in the same meal. Even though the family enjoys griddle cakes, pork chops, fried potatoes, and plum 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

[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.

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, or rich ice cream and cake, the chances of a good appetite for dinner are decreased; unless the person is active and out of doors, the effect is apt to be bad in the long run, even 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 quantities 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. Considerable amounts of highly acid food (as sour cherries), taken immediately after a large quantity of sweet milk to drink tend to make the milk form hard curds in the stomach, which of course interferes with digestion, but when a little acid is combined with the milk and the curd kept from forming a mass, as in lemon milk sherbet or cream of tomato soup, the product is easy to digest. Milk for babies is very commonly acidified with a little lemon juice or lactic acid, so that it may digest more readily.

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.

The results of a digestive upset can never be predicted. They may be immediate or somewhat delayed. They may apparently be slight, or seem most unpleasant. Such an upset may reduce the resistance of the body just at the moment when there is a battle on between body defenses and some invading germs, and the germ wins. The only safe thing to do is to try to live so as to avoid such disturbances.

Food Combinations from the Esthetic Standpoint

A balanced meal does not necessarily mean an artistic one. Graham bread or potatoes and perfectly fresh, unheated summer 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, milk 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, temperature, 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 artistic or novel 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. Also one's own successes should be written down in the household note book for future reference. 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 for luncheon, and a sherbet for dinner, and get a very different impression from each meal. So the country housewife welcomes little books like *Apples in One Hundred Ways* or *Vegetable Cookery*, 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 little 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 aftertaste. 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 delicious with sweet potatoes; 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 tomorrow; 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 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 and vitamins 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 Dotheboys' 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 cod liver oil becomes a partial substitute for sunshine, so that one may reasonably 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. Foods rich in protein, which alone 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, quickly cooked cabbage; 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 custard 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 not, 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 grow 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 or milk	Lettuce salad	Tapioca fruit jelly with whipped cream
	Wafers with cream cheese	Lady fingers
	Currant jelly	Milk

II

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

III

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

IV

Breakfast	Luncheon	Dinner
Fresh fruit	Minced chicken on toast	Vegetable soup
Cooked cereal and cream	Bread and butter	Bread sticks
Popovers	Jelly	Salmon loaf, cream sauce
Coffee or milk	Cocoa, tea or milk	Peas
	Marguerites	Boiled potatoes
		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 or milk	Fresh fruit	Scalloped potatoes
	Cocoa, tea or milk	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 or milk	Cocoa, tea or milk	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 those who live 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. Certain 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. Eskimos 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	Dinner	Supper
Stewed figs	Baked ham, brown sauce	Corn chowder
Oatmeal with cream	Southern sweet potatoes	Toasted crackers
Scrambled eggs	Spinach	Orange and date salad
Golden corncake	Apple pie	Bread and butter pudding
Coffee or milk	Coffee or milk	Tea or milk

II

Breakfast	Dinner	Supper
Stewed dried peaches and raisins	Cream of corn soup	Cheese soufflé
Hominy with cream	Hamburg steak with onions	Baked rice and tomatoes
Bacon	Mashed potatoes	Hermits
Graham muffins	Dried Lima beans, stewed	Tea, cocoa or milk
Coffee or milk	Steamed fig pudding, foamy sauce	

III

Breakfast	Luncheon	Dinner
Oranges	Scalloped oysters	Noodle soup
Cornmeal and cream of wheat, with cream	Parkerhouse rolls	Boiled mutton, jelly sauce
Baked sausages	Celery	Baked potatoes
Toast	Stewed apricots	Creamed onions
Coffee or milk	Ginger cookies	Cole slaw
	Tea or milk	Chocolate bread pudding, creamy sauce

IV

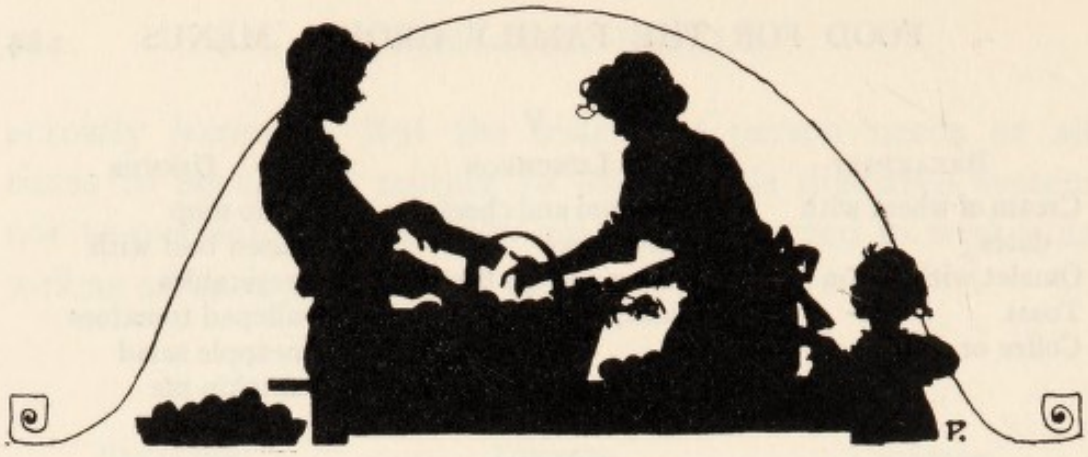
Breakfast	Luncheon	Dinner
Stewed prunes	Minced lamb on toast	Tomato bisque
Wheatena and cream	Apple and nut salad	Boiled tongue, vinaigrette sauce
Boiled eggs	Cream cheese	Savory potatoes
Toast	Crackers	Buttered parsnips
Coffee or milk	Cocoa, tea or milk	Mince pie

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 or milk	Cocoa, tea or milk	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 or milk	Cup cakes	Creamed carrots and peas
	Tea or milk	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 beyond a certain minimum 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 animals' food and care makes meat dear. In this country the passing of the great western grazing fields increased the 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 the 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, oranges from Florida, 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

Clara Elsene Peck

of loss and inconvenience of storage counterbalance 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 perhaps be bought for ten 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 15 or 18, or preferably 20, cents a pound. A piece of corned beef at 25 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 45 cents a pound will yield lean cooked meat costing no more than the actual cost of the corned beef. Unless the fat of the latter is eaten, it will not be as economical a purchase as the rump roast, 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 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 invest in. Nevertheless we shall have to know something about the cost of the various essentials of the diet in order to formulate a working program which will apportion our money so that due allowance is made for each.

Since the energy supply is the largest item in the cost of food and since the easiest way to study cost is in relation to its fuel value, all considerations of cost in this book are related to calories. In the words of Armsby, one of the world's great investigators in the field of nutrition, " The up-to-date housewife ' riseth early while it is yet night ' and giveth calories unto her household." That such emphasis is justifiable he makes clear by saying, " While it is true that a due supply of mineral matter, proteins, and vitamins in the food is equally *essential*, it is not from the present standpoint equally *important*, since comparatively slight modifications in a diet supplying sufficient energy can ordinarily remedy deficiencies

in this respect. For this reason modern studies of human dietaries give prominence to the energy relations."

If our food allowance is liberal and the fuel requirement of our family low, we may indulge more freely in food materials purely for 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 and our own task, but of absolute nutritive value. Within any food group there are choices to be made. Take the cereals for example. They come in all sorts of packages, many similar in cost; which is cheapest, which dearest? The following table shows the cost per 100 calories of eight of our well-known varieties.

FUEL VALUES AND COST OF CEREALS IN PACKAGES

	TOTAL CALORIES PER PACKAGE	PRICE OF PACKAGE (Cents)	COST PER 100 CALORIES
Rolled oats	2702	12	$0.0045
Flaked wheat	2060	23	0.0097
Cracked wheat	2325	10	0.0054
Rice	1590	10	0.0058
Shredded wheat	1243	12	0.0097
Cornflakes	815	10	0.0122
Puffed rice	470	17	0.0360
Puffed wheat	420	14	0.0330

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 deal 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]

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 15 cents, is the equivalent in fuel value of about one pound of lean round steak, costing over 40 cents, or of nine eggs, which would be cheap at 30 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 three to four times as much as milk at 15 cents per quart.

For ordinary purposes, the 100-calorie portion serves as the most convenient unit of comparison, and in the Appendix will be found a table (see pp. 436 to 438) 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 three-fourths of a cent per 100 calories. These are mostly cereal products, such as cornmeal, rolled oats, cornstarch, pearl barley, margarine, rice, 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 one cent per 100 calories, including flaked wheat, shredded wheat, white potatoes, dried beans, bread, raisins, and salt pork, while for from one to one and one-half cents we may extend

[1] Cf. *Net Weight of Foods Sold in Packages*. Street, J. P. Bull. No. 172, Conn. Agr. Exper. Sta. (July, 1912).

our list to cornflakes, plain crackers, butter at 50 cents per pound, macaroni, tapioca, and bacon. 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 two cents per 100 calories we may add olive oil, dried apples and prunes, and milk at ten 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 two cents per 100 calories, but in the city fresh fruits and vegetables will range from three cents per 100 calories for apples, onions, and cabbage, to 20 or 30 cents for lettuce, asparagus, celery, and melons. Most meats exceed three cents per 100 calories and choice cuts exceed six 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."

The Cost of Protein, Ash Constituents, and Vitamins

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 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 vitamins and other regulating factors in the diet. Sugar and oatmeal have the same fuel value per pound (1800 calories) and can generally 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 nearly one-third of a gram of calcium, or almost half the whole day's requirement for a man; one and three-fourths grams of phosphorus, which gives a good margin of safety above his daily need; and 16 thousandths of a gram of iron, which is a very liberal day's supply. It will even yield considerable vitamin B while sugar has none. 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 45 cents, estimating the market cost of the meat as 55 cents per pound. In buying 300 protein calories from oatmeal for six cents we got 1500 additional calories; from the meat for our 45 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 shortages, and begin to inquire how we can do so and also secure our vitamin supply 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

[1] See pages 18–21.

require about two and one-third quarts of milk, costing at 15 cents per quart, 35 cents. Since 300 protein calories from beef cost 45 cents, we pay more for what is no more efficient in body building. At the same time we shall find that we have obtained from milk over 1200 calories in addition to the protein calories against a surplus of only 250 calories from the meat; we also have from milk 68 times as much calcium, and over three times as much phosphorus as from the beef. The only lack will be iron, of which we get about half as much from milk as meat, but if we simply substitute whole wheat bread for white in the day's ration we can get the additional iron practically free, as we would buy bread calories anyway and whole wheat bread calories cost little if any more than white bread calories.[1] So even though we must buy some food to supply the rest of the iron, the milk will be cheaper than the meat regardless of the fact that milk will be rich in other mineral elements and in vitamins A, B, and G, while meat will furnish little vitamin B and no vitamin A.

The Cost of Protein

Protein foods are, as a rule, a more expensive item in the dietary than carbohydrates and fats. This is partly because we like them in delicate, perishable, and highly flavored forms, such as meat, fowl, fish, and shell fish. From the nutritive

[1] Data upon which these statements are based:

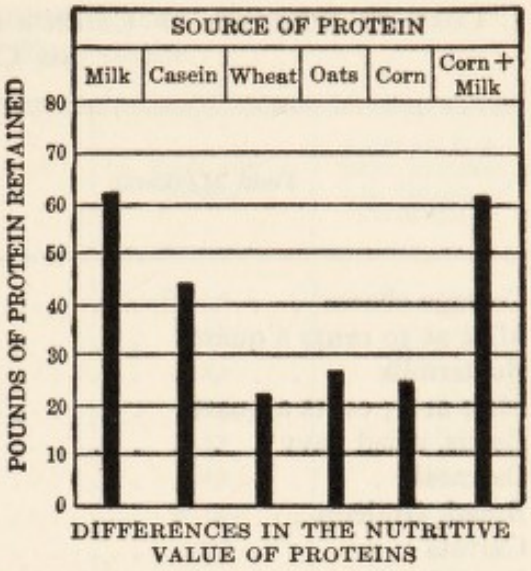
Food Material	Weight to Yield 300 Calories of Protein	This Amount will Yield			
		Total Calories	Calcium (Grams)	Phosphorus (Grams)	Iron (Grams)
Whole wheat bread . . .	1.72 lb.	1918	0.15	1.19	0.013
Beef, lean round (E. P.)	0.78 lb.	555	0.04	0.76	0.011
Milk, whole	5.37 lb.	1575	2.75	2.27	0.006

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, *i.e.*, 10 to 15 per cent of their calories in the form of protein. We must remember, of course, that the grain or legume proteins will not make an ideal amino acid assortment *by themselves*. They must be supplemented, and for practical purposes milk, eggs, and meat are all equally good supplements to depend on. It is worth while to keep in mind the remarkable supplementing power of milk as shown in the diagram on page 257.

TABLE SHOWING THE COST OF 100 PROTEIN CALORIES FROM DIFFERENT SOURCES

FOOD MATERIAL	COST PER POUND	COST OF PORTION YIELDING 100 PROTEIN CALORIES
Cheese, cottage	$0.10	$0.020
Oatmeal	0.06	0.021
Beans, dried navy	0.12	0.030
Cornmeal	0.05	0.030
Beans, dried Lima	0.12	0.036
Peanuts in shell	0.20	0.042
Cod, salt	0.22	0.050
Bread, white	0.10	0.060
Bread, Graham	0.10	0.062
Cheese, American	0.35	0.070
Macaroni	0.20	0.082
Milk at 10 cents per quart	0.05	0.085
Almonds (shelled)	0.70	0.119
Halibut	0.40	0.120
Eggs at 40 cents per dozen	0.30	0.120
Mutton, leg	0.42	0.122
Milk at 15 cents per quart	0.08	0.132
Beef, lean round	0.50	0.135
Lamb, leg	0.55	0.159
Eggs at 60 cents per dozen	0.45	0.180
Porterhouse steak	0.65	0.195

The table on page 256 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, in spite of some difference in nutritive value. One may use milk and navy beans as the chief sources and have a mixture of excellent quality at less cost than the milk alone; or one may choose porterhouse steak and have no more efficient a diet so far as protein is concerned (and less efficient in minerals and vitamins) at four or five times the cost of the beans and milk.



The Chart Shows the Number of Pounds of Protein Retained for Growth out of 100 Pounds of Each Kind of Protein Fed (University of Wisconsin)

The Cost of Calcium, Phosphorus, and Iron

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 enough of the element under consideration 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 less than a cent per 100 calories for fuel, are also the cheapest food for iron, third cheapest for phosphorus, and included in the cheapest five for calcium. Milk is a fairly economical source of fuel, protein, and phosphorus, exceptionally cheap for calcium, and dear only for iron, a condition

I. Cost of Portions of Calcium-bearing Foods to Yield 0.67 Gram of Calcium

Food Material	Cost per Pound	Cost of Portion Yielding 0.67 Gram of Calcium
Cottage cheese	$0.10	$0.016
Milk at 10 cents a quart	0.05	0.063
Buttermilk	0.05	0.070
Milk at 15 cents a quart	0.08	0.093
Beans, dried navy	0.12	0.111
Oatmeal	0.06	0.126
Bread, Graham	0.10	0.127
Carrots	0.05	0.132
Peas, dried	0.12	0.212
Spinach	0.10	0.220
Beans, dried Lima	0.12	0.250
Onions	0.06	0.260
Raisins	0.15	0.346
Cornmeal	0.05	0.409
Peanuts	0.20	0.415
Almonds	0.90	0.424
Beans, fresh string	0.15	0.471
Celery	0.25	0.472
Prunes	0.18	0.492
Bread, white	0.10	0.546
Eggs at 40 cents per dozen	0.30	0.660
Eggs at 60 cents per dozen	0.45	0.990
Cod, salt	0.22	1.180
Macaroni	0.20	1.340
Halibut	0.40	2.900
Beef, lean round	0.50	6.300

compensated again in part by the fact that its iron is 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 50 cents a pound is just as economical a source of protein as milk at 15 cents per quart. The beef is not to be considered as a source of calcium; is more than twice as expensive as milk as a source of phosphorus, and, while much cheaper than

II. Cost of Portions of Phosphorus-bearing Foods to Yield 1.32 Grams of Phosphorus

Food Material	Cost per Pound	Cost of Portion Yielding 1.32 Grams of Phosphorus
Cottage cheese	$0.10	$0.043
Oatmeal	0.06	0.045
Beans, dried navy	0.12	0.075
Cornmeal	0.05	0.078
Peas, dried	0.12	0.088
Beans, dried Lima	0.12	0.104
Bread, Graham	0.10	0.135
Buttermilk	0.05	0.149
Cheese, American	0.35	0.150
Milk at 10 cents a quart	0.05	0.155
Milk at 15 cents a quart	0.08	0.235
Cod, salt	0.22	0.284
Peanuts, shelled	0.20	0.288
Bread, white	0.10	0.310
Carrots	0.05	0.311
Raisins	0.15	0.330
Cabbage	0.04	0.398
Macaroni	0.20	0.425
Spinach	0.10	0.435
Eggs at 40 cents a dozen	0.30	0.483
Mutton, lean leg	0.42	0.570
Beef, lean round	0.50	0.665
Prunes	0.18	0.678
Lamb, lean leg	0.55	0.772
Lettuce	0.18	1.221

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 some of the green vegetables, which in general are expensive sources of fuel and protein. String beans afford cheap calcium, iron, and phosphorus; and spinach and lettuce not only compare favorably with other foods as sources of iron but are valuable for copper and other elements essential to the use of the iron present. Lettuce has been found particularly valuable in this

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
Beans, dried navy	$0.12	$0.049
Beans, dried Lima	0.12	0.050
Oatmeal	0.06	0.053
Buttermilk	0.05	0.066
Spinach	0.10	0.091
Cabbage	0.04	0.120
Bread, Graham	0.10	0.132
Cornmeal	0.05	0.182
Prunes	0.18	0.198
Raisins	0.15	0.237
Cottage cheese	0.10	0.254
Onions	0.06	0.331
Eggs at 40 cents per dozen	0.30	0.333
Bread, white	0.10	0.363
Peanuts	0.25	0.415
String beans	0.15	0.450
Mutton, leg	0.42	0.466
Eggs at 60 cents per dozen	0.45	0.486
Cod, salt	0.22	0.526
Beef, lean round	0.50	0.540
Macaroni	0.20	0.552
Almonds	0.70	0.589
Lamb, leg	0.55	0.632
Milk at 10 cents a quart	0.05	0.685
Peas, dried	0.12	0.709
Milk at 15 cents a quart	0.08	1.027

respect. 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 40 cents per dozen they may be regarded as a substitute for the cheaper cuts of meat, and when they cost as much as 60 cents per dozen they are, by the balancing of counts, cheaper than porterhouse steak and other expensive kinds of meat. 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.

The Cost of Vitamins

It is still difficult to discuss the cost of vitamins because of our meager knowledge as to the amounts present in different food materials and as to the vitamin requirements of human beings. Certain foods have already begun to stand out, however, as rich and economical sources of these dietary essentials.

The foremost is milk. The term "protective food" has been happily applied to it because its liberal use protects against dietary deficiencies of so many sorts, and particularly of vitamins A and B. It is quite generally agreed that a pint of milk for each child and a half pint for each adult should be set as a minimum below which no diet should fall. More is safer. A great investigator of the vitamins, Professor Sherman, says: "A quart a day for every boy baby until he is full grown and a quart a day for every girl baby until she has weaned her last child." Since milk has already been shown to be a cheap source of protein and calcium, and since the vitamin content of milk is high, we may almost say we get our vitamins "thrown in" when we buy milk.

Among the green vegetables, economies are effected by choosing those which give rich yields of all three vitamins at the same time. One of these is spinach, which has weight for weight the same vitamin A value as butter. Its season is long and it grows easily, hence its first cost is not high as compared with other leafy vegetables. Buying it primarily for iron, of which it is an economical source, we may regard its vitamins as pure profit on the investment. Another valuable green vegetable is lettuce, now obtainable in cities

all the year round. Where not available in the market, it should be grown in the garden through as much of the year as possible. Like spinach it is a fine source of vitamins and a conserver as well as contributor of iron.

A third economical green vegetable is cabbage, fairly rich in all three vitamins, and contributing at the same time a considerable amount of ash. Its first cost is frequently lower than that of spinach or lettuce and its availability all through the winter when other fresh vegetables are difficult to procure gives it special importance as a source of vitamin C. The habit of eating it shredded raw is an excellent one for adults. For little children it should be steamed only a few minutes and seasoned with a little salt and cream or butter. Tiny babies can take the expressed raw juice when there is no more convenient source of vitamin C procurable. The ease with which vitamin C is destroyed by cooking cabbage and the likelihood of irritating substances being developed by long heating make it imperative that domestic customs be improved in respect to cooking this vegetable in order that it may hold its rightful place in the economical dietary. To be rich in vitamin A its leaves must be really green, not white. The same is true of lettuce.

The carrot, though neither green nor leafy, must also be reckoned one of the valuable sources of vitamins at low cost. It contains a good supply of vitamins A, B, and G at all times, and more or less of vitamin C, depending upon how long it has been stored and how young it was when taken from the garden. All summer young and tender raw carrots grated may add materially to the vitamin C content of little children's diets, and in the winter the older carrots, especially when creamed, are valuable for calories and ash constituents as well as vitamins.

No catalogue of cheap vegetable sources of vitamins would be complete without the white potato. While it does not

contain much vitamin A it is rich in B and C in addition to its calories, protein, and iron. It well deserves its place as a dietary staple. The only danger is, that contributing so much, its shortcomings will not be realized, and it will be used to the exclusion of vegetables which yield vitamin A and those which are laxative.

The tomato lost its place in the culinary dictionary as a fruit just as it lost its name of love-apple, but it became a most valuable vegetable. It is like the orange in being rich in vitamins A, B, and C and like some other fruits in retaining its vitamin C when cooked or canned. This makes it available all the year round at a moderate cost in comparison with fresh vegetables. As a source of vitamin C it is the equivalent of orange juice, and can be given to babies or young children as a substitute with perfect success.

Each season and each locality will produce vegetables whose nutritive properties should be known, so that they may be used to the best advantage. Beet greens, mustard greens, dandelions, turnip tops, and the like are often available at no added cost, and should be regarded as so much clear profit. All summer long lettuce may function in the daily dietary, sometimes by itself, often an accompaniment to more highly flavored fruits or vegetables, but always to be eaten and not left on the plate for "manners," which only reveals one's ignorance of the real rules of eating.

Canned vegetables have to be studied individually. As already stated, the tomato serves its nutritive purpose about as well canned as fresh. But that is not true of all vegetables. The greatest loss is of vitamin C. The A and B vitamins stand processing better, but there is likelihood of some loss. Hence when fresh vegetables are as cheap as canned they should be given preference and reliance should not be placed exclusively on canned ones (except tomatoes) until we know more about the changes which processing brings.

Dried vegetables are the cheapest of all so far as first cost is concerned, but here again we must know what has happened to the vitamins in the drying process. Dried beans and peas are an excellent source of vitamin B but not of the others. Sprouted beans and peas have been used in emergency for vitamin C, which develops in the process of germination.

In the case of leafy vegetables like spinach, the more quickly the food is dried and the lower the temperature, the better vitamin C will be preserved. Commercial preparations are dried at a low temperature in a vacuum and may in this way retain for a time their original properties. But aging is also a factor, so that we should not do well to depend entirely upon dried vegetables for our vitamin C.

Fresh fruits which can be eaten raw or with very little cooking are particularly valuable for their contribution of vitamin C, though generally good sources of B also. They are, with a few exceptions such as the orange, unimportant sources of A, and are generally somewhat more expensive than the vegetables which have already been mentioned.

Apples well deserve their place as a staple fruit almost the year round, and those who can grow them and store them for winter eating, raw or freshly cooked, have a good source of vitamin B and some vitamin C, at very low cost. Even in city markets the apple is generally an economical fruit.

Bananas are practically interchangeable with apples, and for many months of the year can be bought at moderate cost.

Oranges, being very rich in vitamins A, B, and C, are for a considerable part of the year a good investment, though seldom as cheap as canned tomatoes. The practice of serving half an orange is commendable where economy must be practiced. Half an orange a day provides probably sufficient vitamin C for any one, unless it is the very young child with no other source of this vitamin.

Other fresh fruits may be cheap enough to use more or less freely in the height of their season.

Dried fruits are not to be regarded as sources of vitamin C, though they may contribute considerable B.

Our knowledge of the vitamin content of fruits which are commonly canned is still meager, but we should not expect to depend upon them for vitamin C without definite information that it is not destroyed. Canned raspberries and strawberries retain it very well.

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 way toward insuring the continuance of health, and we have in experience abundant evidence that it will do so. As has already been pointed out, hundreds of laboratory experiments continuing through many generations of animals make it very clear that growth to full stature, freedom from susceptibility to infection, postponement of the signs of senility, and maintenance of youthful vigor depend in large measure upon the continuance of a suitable diet throughout the life history of the individual, his parents, and his grandparents. We should not be blinded to the teachings of such experiments by the fact that the human species grows slowly and has a longer life span than common animals. We must continue human studies over long periods before we can begin to see the workings of the laws of nutrition in the human world. Five years in the life of a child is epitomized in two months of the life of a laboratory rat. Hence we can learn 30 times as fast from the rat as from the child.

It is only by patience and foresight that we can attain the highest nutritional state. No housewife will see startling

returns from a good dietary program unless her family has been very distinctly below par at the outset. But every housewife may hope to increase year by year the endurance of her children and see them become vigorous men and women if she can enlist their coöperation in a perpetual "health campaign" in which one objective is always an adequate diet.

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 plans accordingly.

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 towards securing nourishing fare with different sums of money.

Planning a Family Dietary

Since energy is quantitatively the largest of the fundamental requirements in nutrition, we should 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 eleven, 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	11	70	225–338	2250
Woman	90	110	150	1500
Total			1424–2061	14,252

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 12,000 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, or where the children are over twelve years old, 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, and keeping track of body weight will tell whether each is getting his proper share.

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

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

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 — if possible one quart apiece for each child and a pint for each adult
Orange juice for the two youngest children
At least one kind of fruit for the others
Cereal for all the children — preferably for all the family
A mild green vegetable for the three youngest
At least one kind of vegetable besides potatoes for all the others
Eggs for at least the three youngest children and some protein-bearing food (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, potatoes, and some other kind of vegetable.

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

	Calories
Milk (5 quarts for children, 1½ for adults)	4387
Cereal for all	600
Eggs (3 eggs and 1 yolk)	260
Fruit and fruit juice	600
Green vegetable	300
Bread	1500
Butter for bread	1500
Potatoes	600
Another vegetable	600
Meat or meat substitute (not including eggs)	800

Comparing these figures with the total energy requirement of the family, it will be noted that the milk will furnish over one-fourth (nearly thirty per cent) of the total calories, the fruits and vegetables of all kinds taken together about half as many (fifteen per cent) and the eggs and meat together about half as many as the last (eight per cent). In other words these items will make up over half the total calories, leaving the rest to be supplied largely by bread, breakfast

cereals and other grain products, fats including butter, and sugar. Such a diet is not likely to be deficient in protein, ash constituents, or vitamins unless the fruits and vegetables are restricted to kinds notably deficient in some respect (as the exclusive use of dried fruits and vegetables which would be likely to result in deficiency of vitamin C).

Planning the Menu

Keeping in mind the fact that we are going to include the above foods 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 keynote. 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, reserving a portion of the custard part of the apple snow for her dessert. Her bread should be toasted or zwieback may be used. If this dinner be served at night, the younger children will have

a simple supper beforehand; the baby at 5 : 30 and 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 and conversation, — 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 7 o'clock, and the three-year-old will have his breakfast at the same time — orange juice, wheatena with top milk, toast, and milk to drink. After breakfast the baby will have two or three tablespoons of orange juice with a teaspoonful of cod liver oil (9 A.M.) and at ten o'clock a crust of bread to

munch, then thoroughly cooked wheatena with top milk and milk to drink. If the three-year-old is to have his dinner before the family meal at 12 o'clock he will have his extra luncheon of milk and stale bread or cracker in the middle of the afternoon. He may, however, have them now, sleep through the family dinner and get his own dinner at 2 P.M. It is to be hoped that the six-year-old will have a glass of milk and a cracker or other suitable food in the middle of the morning at school.

Assuming that luncheon will be served for all the family except the 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 she should have day-old Graham bread instead of the fresh Boston brown bread.

After the family luncheon the baby will have another meal (2 P.M.), consisting of milk, egg yolk, strained vegetable pulp (which may be made into soup with part of the milk), a teaspoonful of prune pulp and a little stale bread to chew; the three-year-old will either at 12 o'clock or at this time have a soft-cooked egg, some toast, some of the strained green 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, baked potato, and a very little apple sauce; the three-year-old, cereal and milk, bread and butter, a little of the dessert set aside when preparing 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 the children's suppers, since potatoes on the half shell form part of the family dinner, but in this case let us assume that the rice (used also for the three-year-old's pudding) is a left-over from the day before.

Late in the evening (10 P.M.), the grandmother will enjoy a hot, nutritious beverage (such as hot milk, plain or flavored) and a cracker; but this entails 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 hours during the day.

Calculation of the Family Dietary

Having now estimated the fuel needs of our family, 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 and food values in terms of common measures (Table I), we can very quickly estimate fuel values for the day. The dietary is given in detail on pages 274–276.

Comparing our totals with the estimated day's requirements, we find that we have slightly exceeded our quota of fuel, and have 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. We have used a little over six quarts of milk, 600 calories of cereal in

Family Dietary Number I

Fuel Value: 14,673 Calories — Cost: $2\frac{1}{4}$–$2\frac{3}{4}$¢ 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]	2 tbsp.	——	22
Orange juice for 3-year-old [1]	3 tbsp.	——	33
Oranges for 6 [1]	3 large	20	300
Wheatena for 6	$3\frac{7}{8}$ 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	——	——	——
			4038
Lunches:			
10 A.M.			
For baby:			
Wheatena 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] Cod liver oil is not included in the dietary but the two youngest should have 1 teaspoonful in the orange juice, and the 6-year-old 2 teaspoonfuls.

[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	1½ cups	144	900
on toast	6 slices		
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
Sifted pea pulp	1 tsp.	1	4
Baked potato	½ small	3	25
Prune pulp	1 tbsp.	1	20
For 3-year-old:			
Egg	1 egg	25	70
Toast	1 slice	7	50
Baked potato	1 small	6	75
Butter	1 tsp.	——	33
Sifted pea pulp	2 tbsp.	6	25
Rice pudding II [1]	¼ cup	12	100
Milk	¾ cup	26	127
			780
5:30 P.M.			
For baby:			
Wheatena jelly	2 tbsp.	3	16
Milk for cereal	¼ cup	34	170
Milk to drink	¾ cup		
Bread	½ slice	4	25
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
Apple snow	2 tbsp.	——	15
Boiled custard	⅓ cup	13	100
Milk to drink	¾ cup	26	127

[1] See Table II, Appendix, p. 423.

Food	Measure	Protein Calories	Total Calories
Afternoon Meals — *Continued:*			
For 6-year-old:			
Steamed rice	½ cup	6	66
Milk for rice	½ cup	17	85
Bread	2 slices	14	100
Apple snow	3 tbsp.	2	33
Boiled custard	⅓ cup	13	100
Lady fingers	2 fingers	10	100
Milk to drink	¾ cup	26	127
			1236
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	4 medium		
butter	2 tbsp.	62	656
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	18	300
with			
boiled custard	1⅔ cups	65	500
Lady fingers for 4	8 fingers	40	400
			4217
Night Lunch for Grandmother:			
10 P.M.			
Hot milk	¾ cup	26	127
Cracker	1 cracker	3	25
			152
Total for day		2206	14,673

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

the form of wheatena and some rice; five eggs and one yolk in addition to those in the egg sauce, apple snow, custard, and lady fingers; about 500 calories in the form of fruit exclusive of the bananas, which in this dietary may be regarded as a substitute for the root or other vegetable in our original plan; about 275 in green vegetables (string beans, tomatoes, lettuce, pea pulp); about 1700 in bread, over 2000 as butter, and about 900 as halibut and chicken. The potatoes are not up to our estimate, because toast with the creamed chicken took the place of potato in the luncheon and the children had cereal for supper, whereas frequently they might have baked potatoes.

The important sources of vitamins in the diet are shown in the following table.

SOURCES OF VITAMINS IN FAMILY DIET NUMBER I[1]

FOOD MATERIAL	VITAMINS		
	A	B (B + G)	C
Apples	+	++	+
Bananas	+	+	++
Butter	+++	−	−
Eggs	+++	++	−
Lettuce	++[2]	++	+++
Milk	+++	++	?
Oranges	+	++	+++
Pea pulp (fresh peas)	++	++	++
Potatoes	+	++	++
String beans	++	++	++
Tomatoes	++	++	+++

This table is convincing evidence of the abundance of all three vitamins in this diet.

Checking up on the ash constituents, we shall find that our requirement of about 7 grams of calcium per day for the family

[1] The number of plus signs indicates the relative importance of the food as a source of each vitamin.

[2] Valuable for vitamin A only when green.

is met by the milk alone, while the eggs, Boston brown bread, oranges, and string beans furnish a gram and a quarter more.

A phosphorus allowance of 6 grams is also met by the milk, and fully as much more is furnished by the rest of the diet.

There is not so much leeway on the iron, but an allowance adequate for the family, 0.07 gram per day, is covered by the small contributions of many foods, as the following estimate will show.

CHIEF SOURCES OF IRON IN FAMILY DIETARY NUMBER I [1]

FOOD MATERIAL	CALORIES (APPROXIMATE)	IRON GRAMS
Apples	100	0.0005
Bananas	600	0.0037
Boston brown bread	500	0.0065
Chicken (canned)	300	0.0041
Eggs	700	0.0146
Halibut	600	0.0050
Milk	4400	0.0128
Oranges	400	0.0016
Potatoes	400	0.0062
Prunes	75	0.0008
String beans	100	0.0027
Tomatoes	150	0.0026
Wheatena	600	0.0084
		0.0695

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 $3.20 to $4.00 per day, or from two and one-fourth to two and three-

[1] Complete tables for the calculation of the ash constituents may be found in Sherman's *Chemistry of Food and Nutrition* (1926) (used by courtesy of the author in the preparation of tables which simplify calculation in Rose's *Laboratory Handbook for Dietetics* (1929)).

fourths cents per 100 calories, depending upon the locality. If milk costs fifteen cents per quart and eggs four to five cents apiece with other foods in proportion, it can be obtained for $2\frac{3}{4}$ cents only with careful buying. With milk at ten 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 slightly over two cents per 100 calories. 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 $2.85 per day means $1000 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, to give the family 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 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 all 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 about one and three-fourths cents per 100 calories, making a total cost of about $2.50 per day. In our first 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 shall be obliged to 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 some of the fresh. While the milk seems to occupy a large place, its value and economy have already been demonstrated, and as long as the average cost of the dietary is over one and one-half cents 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

[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.

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 general program first proposed for this dietary (see page 269), we may plan a second menu at lower cost.[1]

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
Cole slaw
Chocolate blanc mange 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 calculations on page 282.

[1] Table IV in the Appendix showing groups of foods at different prices will be helpful in this connection.

Family Dietary Number II

Fuel Value: 14,562 Calories Cost: 2–2¼¢ 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	5 tbsp.	4	43
Orange juice for baby	2 tbsp.	—	12
Orange juice for 3-year-old	3 tbsp.	—	18
Oranges for 6	3 medium	14	200
Wheatena for 6	3⅞ cups	63	540
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	——	—	—
			3273
Lunches:			
10 A.M.			
For baby:			
Wheatena jelly	2 tbsp.	3	16
Milk for jelly	¼ cup	34	170
Milk to drink	¾ cup		
For 3-year-old:[1]			
Milk	1 cup	34	170
Bread	1 slice	7	50
For 6-year-old:			
Milk	¾ cup	26	127
Crackers	2 crackers	5	50
			583
Family Luncheon (for 6):			
Creamed dried beef	3⅓ 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[2]	1½ cups	72	600

[1] May be taken at 3 P.M.

[2] See Table II, Appendix, p. 423.

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
Sifted pea pulp	1 tsp.	1	4
Baked potato	½ small	3	30
Prune pulp	1 tbsp.	1	20
For 3-year-old: [1]			
Egg	1 egg	25	70
Toast	1 slice	7	50
Baked potato	1 small	6	75
Butter	1 tsp.	—	33
Sifted pea pulp	2 tbsp.	6	20
Rice pudding II [2]	¼ cup	12	100
Milk	¾ cup	26	127
			780
5:30 P.M.			
For baby:			
Wheatena jelly	2 tbsp.	3	16
Milk for jelly.	¼ cup	34	170
Milk to drink	¾ cup		
Bread	½ slice	4	25
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] May be taken at 12 M. just before family dinner and child sleep through the dinner hour.

[2] See Table II, Appendix, p. 423.

Food	Measure	Protein Calories	Total Calories
Afternoon Meals — *Continued:*			
For 6-year-old:			
Steamed rice	½ cup	6	66
Milk for rice	½ cup	17	85
Bread	2 slices	14	100
Chocolate blanc mange	¼ cup	8	100
Plain cookies	2 cookies	6	100
Milk to drink	¾ cup	26	127
			1188
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 medium	62	656
String beans, buttered, for 5	2¼ cups	23	200
Bread for 5	6 slices	42	300
Butter for 5	3 tbsp.	3	300
Cole slaw for 4	2 cups	12	200
Chocolate blanc mange for 5	2½ cups	80	1000
Top milk for blanc mange	2 cups	68	340
Plain cookies for 4	10 cookies	30	500
			4496
Night Lunch for Grandmother: 10 P.M.			
Hot milk	¾ cup	26	127
Cracker	1 cracker	3	25
			152
Total for day		2098	14,562

Consideration of the calories makes it evident that the changes in the menu have not materially affected the fuel value or protein values of the diet. The vitamin content, too, is little altered, for although the tomatoes, apple, and lettuce are omitted, cabbage has taken their place to some extent, and nearly a quart of milk has been added. We are even better off as regards calcium and phosphorus on account of the extra milk. The iron is slightly lower, and the difference might well be made up by the use of whole wheat bread, as is always desirable in economical dietaries.

It may seem surprising that the protein remains high in

spite of the fact that seven eggs used in the first dietary have been left out of the second. The reason is that a quart more milk has been used and the creamed dried beef yields more protein than the creamed chicken. 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 relatively expensive if one has to buy them in the market. The chocolate blanc mange served with top milk gives nearly twice the fuel value of the apple snow and boiled custard, but costs less than one and one-half cents per 100 calories, while the other dessert will cost at least two 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 over two and one-half 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. Choice cuts of meat 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 less than two cents per 100 calories must be given much thought in order to keep them well balanced. Milk becomes a more important item, taking the place, to some extent, of other protein, vitamin, 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 about One and Three-Fourths Cents per 100 Calories

If now we wish to reduce the cost of food to one and three-fourths cents 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 three-fourths of a cent to one and one-half cents per 100 calories, and very careful selection 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 growth-promoting materials — proteins, ash, and vitamins. When the cost of food is as high as it is in New York City, it is difficult to provide a good dietary especially for children for less than one and three-fourths cents per 100 calories. Milk at fifteen cents per quart can no longer be used freely, but with care one quart a day per child can be provided. 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. Evaporated or condensed milk may also be used in cookery or for the adults, and this is usually cheaper than fresh milk at fifteen cents a quart. When the dietary costs less than one and three-quarters cents 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 and three-fourths cents per 100 calories. Excellent butter substitutes are manufactured, and may even carry as much vitamin A as good butter. Even without added vitamin A these are much better than inferior butter, which lacks the fine texture and flavor which we pay for in high-priced butter and is more variable in its vitamin A content than high grade butter. Still cheaper fats 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 as fuel to olive oil and costs much less. It must always be borne in mind, however, that these fats contain little or no vitamin A, and their use instead of butter is only permissible when this vitamin is supplied in other foods, milk with its full content of butter fat, liver and green vegetables and (as an extra source) cod liver oil.

Dried fruits and vegetables must be to a considerable degree 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. They should be eaten only when all traces of green have disappeared, even at the ends. Baking ripe bananas in the skin, if properly done, produces a more succulent food of fine flavor. They must be quickly baked until 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 and attractiveness. 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. Their vitamin content is similar to that of apples; neither should be used to the exclusion of such a fruit as the orange, which has more of vitamins A, B, and C, or of the tomato, which is a good equivalent. It is upon the dried fruits special emphasis is to be placed in economical dietaries. Dates, raisins, prunes, peaches, and figs may usually be obtained for less than two cents per 100 calories, and their uses are many and varied. Dates, figs, and raisins 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 blanc mange 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. The dried fruits are lacking in vitamin C, but since they add so much to the diet in other ways — fuel, ash constituents, laxative properties, palatability — their use

should be encouraged and their deficiencies made up by other foods, — tomatoes, and various raw vegetables for example.

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 apples in a pie, are all attractive combinations.

Besides the dried legumes the cheapest vegetables are usually potatoes, cabbage, onions, carrots, turnips, and parsnips. While tomatoes are somewhat more expensive, they have great value as a source of vitamins and especially of vitamin C, which is most likely to be deficient when the dried and root vegetables have to be depended on more and more. Aside from requirements for certain dietary essentials we relish a diet of pronounced and varied flavor; bread, cereals, beans, potatoes, and the like are too bland to be wholly satis-

fying. The secret of making a palatable 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 desirable for flavor, but they may satisfy the palate when the diet is wholly inadequate. They are a real menace to good nutrition in children. Wisely used, they may be helpful in the adult dietary.

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 the 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. Stewed Lima beans are delicious with a mock Hollandaise sauce.

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,

[1] *Cheese and its Economical Uses in the Diet.* U. S. Dept. Agric., Farmers' Bulletin 487 (1921).

bread, and hominy in a variety of ways, not fully appreciated by many housewives. It can be successfully combined with 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 and three-fourths cents per 100 calories, we shall find that we cannot afford much more than five quarts of milk if we have to pay ten 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. The best way to get butter fat is in the milk, using a good butter substitute for the table and still cheaper fats in cooking. Even the butter substitute cannot be used freely, consequently some increase in the amount of bread, breakfast cereal, and sugar has been made. A little cod liver oil daily should be given to each child, if possible, certainly to the two youngest. Orange juice has been retained for breakfast for the little children, and bananas substituted 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 as low as one and three-fourths cents per 100 calories. Therefore a rice pudding with milk and raisins but no eggs has been chosen and oatmeal cookies, which are very high in nutritive value, take the place of the expensive lady fingers.

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	Menu III
Breakfast:	**Breakfast:**
Oranges (smaller)	Bananas (orange juice for two youngest)
Wheatena with cream (top milk)	Wheatena with milk
Toast	Toast
Coffee for adults	Coffee for adults
Milk for children	Cereal coffee for older children
	Milk for younger children
Luncheon:	**Luncheon:**
Creamed dried beef on toast	Macaroni and cheese
Baked bananas	Boston brown bread
Boston brown bread	Stewed apricots
Rice pudding II [1]	Oatmeal cookies
Tea for adults	Tea for adults
Milk for children	Milk for youngest child
Dinner:	**Dinner:**
Baked halibut, white sauce	Creamed salt cod
Potatoes on the half shell	Baked potatoes
String beans	Boiled onions
Bread and butter substitute	Bread and butter substitute
Cole slaw	Rice pudding III [1] with milk and sugar
Chocolate blanc mange with top milk and sugar	
Plain cookies	

Worked out in detail for the family, as shown below, this menu fulfills the requirements in most respects quite well. Some changes in the little children's meals will be noted, as well as those for the older children and adults, such as 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 instead of apricots.

[1] See Table II, Appendix, p. 423.

Family Dietary Number III

Fuel Value: 14,332 Calories — Cost: 1¾¢ 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	5 tbsp.	4	43
Orange juice for baby [1]	2 tbsp.	—	12
Orange juice for 3-year-old [1]	3 tbsp.	—	18
Bananas for 6	6 bananas	30	600
Wheatena for 6	4½ 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	1½ cups	51	270
Milk [2] for coffee for adults	3 cups	102	510
Sugar for coffee and cereal for adults, cereal coffee for children	6 tbsp.	—	360
			3653
Lunches:			
10 A.M.			
For baby:			
Wheatena jelly	2 tbsp.	3	16
Milk for jelly	¼ cup	34	170
Milk to drink	¾ cup		
For 3-year-old: [3]			
Milk	¾ cup	26	127
Bread	1 slice	7	50
For 6-year-old:			
Milk	¾ 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 substitute	5 tbsp.	5	500
Stewed apricots	1½ cups	24	600

[1] With 1 or 2 teaspoonfuls of cod liver oil.
[2] See note to Dietary No. I.
[3] May be postponed to 3 P.M.

Food	Material	Protein Calories	Total Calories
Family Luncheon — *Continued:*			
Oatmeal cookies	6 cookies	88	800
Milk for 6-year-old	¾ cup	26	127
Sugar for adults' tea	2 tbsp. (scant)	—	100
Tea for adults	—	—	—
			3827
Afternoon Meals:			
2 P.M.			
For baby:			
Egg yolk	1 yolk	11	56
Bread	½ slice	3	25
Milk	1 cup	34	170
Sifted pea pulp	1 tsp.	1	4
Baked potato	½ small	3	25
Apple sauce	1 tbsp.	—	20
For 3-year-old: [1]			
Split pea soup	⅗ cup	26	100
Bread	1 slice	7	50
Butter substitute	1 tsp.	—	33
Finely chopped creamed macaroni with ½ egg	½ cup	30	160
Apple sauce	⅜ cup	1	100
			743
5:30 P.M.			
For baby:			
Wheatena jelly	2 tbsp.	3	16
Milk for jelly	¼ cup	34	170
Milk to drink	¾ cup		
Bread	½ slice	4	25
For 3-year-old:			
Cream toast	1½ slices toast, 6 tbsp. sauce	20	50
Bread	½ slice	4	25
Rice pudding III [2]	⅖ cup	8	100
Milk for pudding	⅓ cup	11	56
Sugar for pudding	1 tsp.	—	20
Milk to drink	⅝ cup	19	100
For 6-year-old:			
Cream toast	1½ slices toast, ½ cup sauce	33	250

[1] May be taken at 12 M., just before family dinner, the child sleeping through the dinner hour.

[2] See Table II, Appendix, p. 423.

Food	Measure	Protein Calories	Total Calories
Afternoon Meals — *Continued:*			
Bread	1 slice	7	50
Rice pudding III [1]	⅗ cup	12	150
Milk for pudding	½ cup	17	85
Sugar for pudding	2 tsp.	—	40
			1237
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 substitute for 5	5 tbsp.	5	500
Rice pudding III [1] for 5	4 cups	80	1000
Milk for pudding	1½ cups	51	255
Sugar for pudding	3½ tbsp.	—	180
			4182
Night Lunch for Grandmother: 10 P.M.			
Tea with ½ cup hot milk.	1 cup	17	85
Sugar for tea	2 tsp.	—	40
Cracker	1 cracker	3	25
			150
Total for day		1762	14,332

The trend in reducing the cost of the dietary must be towards an increase in the amounts of bread, cereals, dried fruits and vegetables, and sugar, and a reduction in the proportion of meat and fish, milk, eggs, butter, and other expensive fats, green and other fresh vegetables and fresh fruit. This is illustrated by the following figures, taken from the three dietaries which have been given here in detail.

So far we have reduced the cost without sacrificing anything essential to nutrition. The total fuel values for the three dietaries are practically the same, and the protein calories are in each case well within the limits set; and since the protein is derived quite largely from milk, especially for the children, there can be no question of its being ample for

[1] See Table II, Appendix, p. 423.

CHANGES IN THE PROPORTIONS OF CALORIES FROM VARIOUS SOURCES IN FAMILY DIETARIES I, II, AND III

	DIETARY No. I	DIETARY No. II	DIETARY No. III
	Calories	Calories	Calories
Milk	4400	4950	3300
Eggs	670	160	60
Fresh fruit [1]	1055	850	775
Dried fruit	50	50	675
Bread [2]	1685	1900	2390
Butter (or substitute)	2966	2400	1960
Meat and fish	900	800	250
Sugar	720	1150	1320
Cereals	850	1290	1360

all body needs. That the calcium and phosphorus are adequate is also assured by the milk, and by actual calculation the iron in the third dietary is quite as high as in the first one. The sources of vitamins are not so varied in the third dietary, but there is still sufficient milk to guarantee a diet with a fairly good supply of vitamin A. Milk, bananas, potatoes, onions, and in the case of the little children, oranges and apples, protect against any serious deficiency in vitamins B or G. It is our resources for vitamin C that we find most rapidly decreasing when we begin to substitute dried fruits for fresh and root vegetables for green ones, and to increase the proportion of bread, cereals, and sugars. It is important in such dietaries to see to it that each person has in his diet each day some very good source of vitamin C. In Dietary III above, we have potatoes as the chief source, except for the orange juice for the two youngest; but bananas, onions, and apples add their quotas, and in places where safe fresh unheated cow's milk can be had the milk will be a considerable source of this vitamin when the cow has access to pasture or is otherwise given fresh food.

[1] 600 calories from bananas in each dietary.
[2] Including flour and Boston brown bread.

It becomes increasingly difficult to provide variety of diet at low cost. 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 high proportion of the calories from milk (from one-fourth to one-fifth) 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 and ash constituents. Sprouted peas and beans can also become a source of vitamin C as well as B. Soy beans have proteins of excellent quality and are rich in vitamin A as well as B. One should always be on the watch for good sources of vitamin C. Dandelions, water-cress, beet tops, turnip tops, mustard greens, sorrel, and the like are often procurable at little or no cost. Canned tomatoes deserve their popularity because of their vitamin content. The needs of the children cannot be easily met when the dietary falls under one and three-fourths cents per 100 calories, except in districts where milk, 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 one and three-fourths cents 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 apples (orange juice for baby and 3-year-old)
- 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
- Butter substitute
- Oatmeal wafers
- Tea for adults
- Cocoa for children

Dinner:
- Beef stew with vegetables (potatoes, cabbage, tomatoes)
- Bread
- Butter substitute
- Date pudding with liquid sauce

Family Dietary Number IV

Fuel Value: 14,390 Calories — Cost: $1\frac{3}{4}$¢ per 100 Calories

Food	Measure	Protein Calories	Total Calories
Breakfast:			
Milk for baby	1 cup	34	170
Orange juice for baby	2 tbsp.	—	12
Milk for 3-year-old	1 cup	34	170
Oatmeal for 3-year-old	$\frac{1}{2}$ cup	9	75
Orange juice for 3-year-old and 6-year-old	6 tbsp.	—	36
Cornmeal mush for 6	$3\frac{1}{2}$ cups	50	515
Apple sauce for 5	$2\frac{1}{4}$ 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, 11	$1\frac{1}{2}$ 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
			3838

[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	¼ cup	34	170
Milk to drink	¾ cup		
For 3-year-old: [1]			
Milk	¾ cup	26	127
Bread	1 slice	7	50
For 6-year-old:			
Milk	½ cup	17	85
Crackers	4 crackers	10	100
			548
FAMILY LUNCHEON (FOR 6):			
Baked samp with cheese	4½ cups	132	953
Boston brown bread	10 slices	50	500
Butter substitute	5 tbsp.	5	500
Stewed raisins	2 cups	18	600
Oatmeal wafers	8 wafers	88	800
Cocoa I [2] 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	½ slice	3	30
Sifted pea pulp	1 tsp.	1	4
Baked potato	½ small	3	30
Prune pulp	1 tbsp.	—	20
For 3-year-old: [3]			
Split pea soup	⅗ cup	26	110
Bread	2 slices	14	100
Butter substitute	2 tsp.	—	66
Baked potato	1 small	9	80
Baked apple	1 small	1	80
Milk to drink	½ cup	17	85
			775

[1] May be deferred till 3 P.M.

[2] See Table II, Appendix, p. 397.

[3] May be given at 12 M., the child taking a nap during the family dinner.

Food	Measure	Protein Calories	Total Calories
Afternoon Meals — *Continued:*			
5 : 30 P.M.			
For baby:			
Oatmeal jelly	3 tbsp.	4	25
Milk for jelly	½ cup	42	212
Milk to drink	¾ cup		
For 3-year-old:			
Cream toast	1 slice 6 tbsp. sauce	20	150
Bread	1 slice	7	50
Butter substitute	1 tsp.	—	33
Rice pudding III [1]	⅖ cup	8	100
Sugar for pudding	1 tsp.	—	20
Milk for pudding	¼ cup	34	170
Milk to drink	¾ cup		
For 6-year-old:			
Cream toast	1½ slices ½ cup sauce	33	250
Rice pudding III [1]	⅘ cup	16	200
Milk for pudding	½ cup	16	84
Sugar for pudding	2 tsp.	—	40
			1334
Family Dinner (for 5):			
Beef stew with vegetables	4¾ cup	183	1132
Bread	10 slices	70	500
Butter substitute	5 tbsp.	5	500
Date pudding I [2]	5 servings	50	1000
Brown sugar sauce	2½ cups	—	660
			3792
Night Lunch for Grandmother:			
10 P.M.			
Tea with ½ cup hot milk.	1 cup	17	85
Sugar for tea	2 tsp.	—	40
Cracker	1 cracker	3	25
			150
Total for day		1529	14,390

Stewed apples have been substituted for fresh, raw fruit for breakfast, and stewed raisins for stewed apricots, corn-meal for farina, samp for macaroni, a butter substitute for

[1] See Table II, Appendix, p. 423. [2] See Table II, Appendix, p. 402.

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. There has been some lowering of the quantity of protein, but it is still adequate in quality and quantity. The chief source of vitamin A is milk, and there is still enough of this to make us feel reasonably certain that there will be no real shortage of this vitamin even if oleomargarine is substituted for butter. At any rate we probably should have on the whole a less adequate diet if we spent our money for butter when our allowance is so low. Vitamins B and G are probably ample, with milk, potatoes, dried fruit, cereals, and several other foods contributing. Vitamin C is provided for the three youngest in orange juice. The rest have potatoes and other vegetables used in the stew as their main source. The supply of these should be as large as possible. The use of raw carrots, raw turnips, and greens should be frequent.

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 any regular butter substitute 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. 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 noon meal for the sake of economy. An egg yolk should be given a couple of times a week, and liver once or twice in its place if it cannot be afforded every day. Baked potato and more butter substitute 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 increase the iron for these two young children would be advisable.

If the dietary must be kept under a cost of one and one-half cents per 100 calories, not more than three quarts of milk can usually be allowed, and, if possible, one of these should be bought for ten cents a quart, this loose 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
Butter substitute
Coffee for adults
Apple sauce or orange juice for 3-year-old; orange juice for baby

LUNCHEON OR SUPPER:

Pork and beans — bean and tomato soup for young children
Stewed tomatoes
Bread
Butter substitute
Tea with milk and sugar for adults
Milk for youngest children
Cereal coffee or cocoa for older children

DINNER:

Liver
Hashed brown potatoes
Bread
Butter substitute
Tea for adults
Milk for youngest children
Apple and date pie with cheese, for father, mother, and oldest child
Apple sauce for others

The breakfast and lunches for the children will be practically the same in all these menus, following the plan in Dietary IV.[1] The noon meals 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 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.

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 157–166).

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.

[1] Page 298.

II. Breakfast:

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

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
Butter substitute
Sliced raw onions
Steamed cranberry pudding
Everyday sauce,[1] flavored with nutmeg

This menu can be quite easily adapted to the children's needs. Their breakfasts will be like those in Dietary IV,[2] 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 [3] had best be followed.

III. Breakfast:

Farina with milk and sugar
Graham gems baked in a thin sheet
Brown sugar syrup
Cereal coffee (half milk) for all but two youngest children
Milk for two youngest children
Orange juice or tomato juice for the children

[1] Water, cornstarch, sugar, and butter substitute.
[2] Page 298. [3] Page 300.

LUNCHEON OR SUPPER:

Split pea soup
Bread
Oleomargarine
Sliced bananas with sugar (lemon juice if possible)
Gingerbread

DINNER:

Casserole of rice and chopped meat
Tomato sauce
Mashed potatoes
Shredded raw cabbage (seasoned with salt, sugar, and a little vinegar)
Scalloped apples
Cocoa for children
Tea for adults

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 { with corn syrup for adults / with milk for children }
Corned beef hash
Bread
Coffee for adults, milk for children
Tomato juice or orange juice for children

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
Butter substitute
Sliced raw turnip or kohl-rabi
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
Orange or tomato juice for children

LUNCHEON OR SUPPER:

Scalloped potatoes with cheese
German coffee bread
Butter substitute
Apricot tapioca with caramel sauce
Tea for adults
Cereal coffee for children

DINNER:

Braised chuck rib of beef
Stewed cabbage
Browned potatoes
Bread and butter substitute
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
Stewed apricots or tomato juice 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 even 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 of the laws of health, other than those in regard to food, undermine the resistance of the body to disease; fatigue and chill, for instance, often 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 or 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 should 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, far 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 pocketbook; 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.

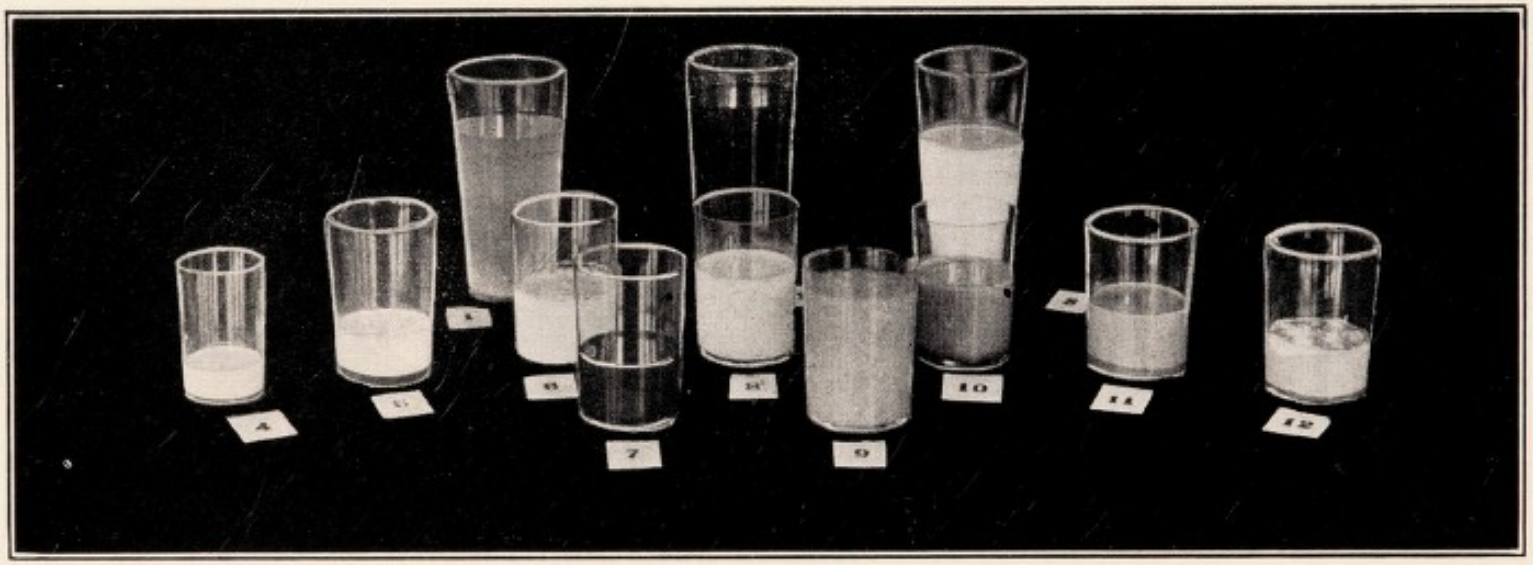
At the outset one must free one's mind from any notion that any particular food is a specific for any disease. As has already been pointed out, there are in health many choices of food, whether for fuel, building, or regulating materials. So in sickness, though the range of choice may be more limited, 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 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

[1] Much practical information about feeding in disease is to be found in *Nutrition and Clinical Dietetics*, Carter, H. S., Howe, P. E., and Mason, H. H., 3rd Ed., Lea and Febiger (1923), or *Nutrition and Diet in Health and Disease*, McLester, J. S., W. B. Saunders Co. (1928).



100-CALORIE PORTIONS OF BEVERAGES [1]

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

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

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 beef 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 nutritive value. 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. Their fuel value is negligible, anywhere from one to several quarts being required to yield 100 calories; but 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 (½ cup) of juice, or about 25 calories. It ranks with eggs and milk as an easily digested protein-bearing 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. Their 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 sick room. It is for most people easy of digestion in its natural state, 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

[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 dextrines and malt sugar.

"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 something which prevents the formation of large or hard curds in the stomach. 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 (koumiss). Coffee, tea, or cocoa may be added for 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 or carbohydrate food, as milk sugar, the volume may be reduced still further with ease.

What are known as "albuminized" beverages are in reality combinations of white of egg (which contains a kind of protein called albumin) with various fluids, such as milk, broth, orange, lemon, pineapple, or grape juice, or even water, making 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 II, 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 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.

[1] Recipes for various foods for invalids with their fuel value stated may be found in Pattee's *Practical Dietetics*, A. F. Pattee, Mount Vernon, N. Y. (1928).

A Sample Menu for a Fluid Diet[1]

7 A.M. 1 cup coffee with ¼ 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 ¼ 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 nutritive value. To keep the food dilute and still 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. 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

[1] Very often the same mixture is used for every meal (see diets in typhoid fever, page 325). When the patient is indifferent to flavor, there is no need for varying the meals.

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; cream of vegetable soups; custards, baked, steamed or "boiled"; whips, soufflés, junkets, blanc mange, gelatin jellies, ice creams, ices, and sherbets. Meats and fish are omitted and green vegetables given with caution, usually in soup. 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

© *H. Armstrong Roberts.*

"It Is the Reflection of Good Physical Health in a Child's Character Which Makes the Effort to Improve His Health Most Worth While."

Chaplin. *Signs of Health in Childhood.*

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 indicate, the main point is to limit the diet strictly to foods that are not likely to disturb digestion, and to see that building and regulating 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; fifteen minutes 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 gay serving dish.

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

General Plan for a 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
	A small portion of purée of green vegetable if none is served in soup
	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 employed. 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, and olive 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, orange juice, 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 such a 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

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

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

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 blanc mange
Milk or tea or coffee half milk, to drink

6 P.M. SUPPER:
Cup of broth
Milk toast or omelet with dry toast
Bread, tapioca, or other cereal pudding

Intestinal Putrefaction

The control of intestinal putrefaction has been a problem interesting many investigators, who have repeatedly observed that changes in the character of the bacteria of the alimentary tract may result from changes in the diet. Milk has been one of the most effective foods, due in part to its lactose or milk sugar. Hence the taking of liberal amounts of milk and some lactose in addition (at least a quart of milk and two or three ounces of lactose per day) has been found more effective than milk alone. This diet favors the growth of organisms which tend to drive out the bacteria of putrefaction. If such organisms can be taken in large numbers in the milk itself, the results are even better. The most effective of these is *Bacillus acidophilus*, but unfortunately acidophilus milk needs to be prepared in the laboratory, and is not easily obtained outside of our larger cities where biological laboratories are maintained. Hence many people will find the use of milk and lactose more practical and much more economical.[1]

In cases of mild putrefaction some less radical treatment of a dietary character is helpful. As indicated in Chapter II, 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 milk beverages, but also cottage and other cheeses as meat

[1] For further information consult Rettger and Cheplin's, *Intestinal Flora*. Yale University Press (1921).

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 need be taken per day by an adult. A liberal use of green vegetables and fruits not only helps to carry off the 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. Further help may be had from lactose, by taking one to three ounces with each meal. Constipation is very likely to be associated with 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 Mild 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 scalloped cauliflower, cabbage, tomatoes, or potatoes; macaroni, rice, or hominy, with cheese; macaroni or rice with tomatoes; or stuffed tomatoes or peppers
	Crisp lettuce or celery
	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 at all can be retained. No food should be given which cannot be

[1] See page 46.

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 and increases with each degree of rise in temperature. Hence the higher the temperature the greater the need for food. To an energy allowance suitable for a healthy man lying in bed there must be added allowances for the rise in temperature, restlessness, and perhaps also a special toxic stimulation of energy expenditure due to the infection. As a result, the total energy requirement in fever may be 30, 40, or 50 per cent higher than normal, so that the bedridden man, instead of requiring from 1800 to 2200 calories per day will need as much as if he were doing fairly active muscular work in health, *i.e.*, 2800 to 3000 calories. In certain instances, notably in typhoid fever, even this liberal number of calories may not be sufficient to keep the body from great loss of nitrogen. Such loss cannot be prevented by increasing the protein of the diet, however, but only by raising the calories to perhaps 4000 or 5000 per day. The protein requirement in fever is little higher than normal and will be met by from two to two and one-half calories per pound of body weight.

The administration of food in fever calls for the exercise 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 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 315, may be used in fever as soon as the digestive tract will tolerate it — usually in a few days.

Diet in Typhoid Fever

The improved control of our water supplies and the discovery of a vaccine conferring immunity have greatly reduced the incidence of typhoid fever, yet it furnishes such a striking example of a disease in which diet is one of the most important factors in treatment and the principles underlying this diet have such wide application in fevers generally that it seems worth while to give it special mention. In this disease 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 may have the responsibility of preparing the food ordered by the doctor, she will be able to coöperate more easily and cheer-

fully if she understands the general principles of the dietetic treatment of the disease.

As in other cases of fever, there is an increase in the energy output, due to the influence of the heightened temperature. There is an additional 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 food 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 injure 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
FOR 2000 CALORIES A DAY:	
Milk, 1500 c.c. (1½ 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. (4½ dr.)	72
FOR 3000 CALORIES A DAY:	
Milk, 1500 c.c. (1½ 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: [2]

[1] Coleman, Warren, The High Calory Diet in Typhoid Fever: A Study of One Hundred and Eleven Cases, *American Journal of Medical Sciences*, January, 1912.

[2] Kinnicutt, F. P., *Diet Lists of the Presbyterian Hospital, New York City*, W. B. Saunders Co. (1926).

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
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, blanc manges, 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, Warren, The High Calory Diet in Typhoid Fever: A Study of One Hundred and Eleven Cases, *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 A.M.	
Same as 9 A.M.	283
4 A.M.	
Same as 9 A.M.	283
Total calories for day	3911

[1] Lactose lemonade may be substituted for the milk mixture at three o'clock.

See Table II, Appendix, page 408.

Diet in Tuberculosis

When the tubercle bacillus gains a foothold in the human body, it not only proceeds to invade 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 known 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 are both of the greatest importance. But in tuberculosis the appetite is apt to be poor and fitful and no guide whatever as to how much the patient should eat. Often he must continue eating when he does not want food at all. This does not mean that he should be indiscriminately "stuffed." In the past this has often been done to the detriment of the patient through upsetting his digestion and otherwise overtaxing his system. Laboratory studies of the energy expenditure in tuberculosis, together with the carefully recorded observations of sanitaria, indicate that energy requirement is not raised greatly above the normal in this disease, and it has been suggested that in pulmonary tuberculosis excessive food intake, bringing about a production of extra heat by its stimulating effect upon the body, may do harm to the lungs by increasing their work, especially in the active stages of the disease. The total energy value of the diet must therefore be adapted to the individual patient, and should be just sufficient to maintain a body weight slightly above normal. In general such diets

range between 2500 and 3500 calories, according to whether the patient is permitted to engage in physical activity or not.

In selecting foods to make a liberal but not excessive diet, the generous use of fat is very desirable, as it is burned with less tax on the lungs than carbohydrate or protein. Laboratory experiments show that from 240 to 360 protein calories per day are sufficient for patients having enough total calories to meet their energy requirements. In other words, the *proportion* of protein in the diet should not be higher than a liberal normal value — from 12 to 15 per cent of the total calories.

In addition to fulfilling protein and energy requirements quantitatively, it is important that the protein be of good quality and that the ash constituents and vitamins be liberally supplied. The demonstrated effect of the vitamins (and especially vitamin A) in enabling the animal body to resist infection, explain the well-known beneficial effects of milk, eggs, butter, cream, and cod liver oil. The tendency of the tuberculous to digestive disorders has limited, perhaps more than necessary, the use of green vegetables. When they cannot be taken in ordinary ways, it is still possible to give purées or to use their juices in soups, and thus to guard against shortage of vitamins B and C. For the same reason a certain amount of fruit is desirable, and juices may be used or mild fruit freshly stewed.

The full amount of a well-balanced diet, arranged with regard to the state of appetite and digestion of the patient, must be taken with as complete regularity as possible. Each day's food should be measured, at least roughly, and by cheerful encouragement, mild diversion, carefully cooked and attractively arranged meals, its consumption secured. Three regular meals a day are sufficient with moderate energy intake, an extra glass of milk or two being sometimes prescribed.

A Day's Food Plan for a Moderate-Priced Diet for Tuberculosis

Fuel Requirement: 2500–3500 Calories Cost: 2½–3¢ per 100 Calories

Breakfast:	Fruit or fruit juice	75–100 Calories
	Cooked cereal	100–200 Calories
	Bacon or Fish or Eggs	75–150 Calories
	Toast or Crisp rolls	100–150 Calories
	Butter	100–150 Calories
	Rich milk (may be flavored with coffee and sugar)	150–200 Calories
	Thin cream for cereal	150–250 Calories
		700–1000 Calories
Dinner:	Meat (roast or broiled) or Fish (baked or broiled) or Cheese dish (fondue, soufflé)	100–200 Calories
	Potatoes (baked or boiled)	100–150 Calories
	Cooked green vegetable	75–150 Calories
	Lettuce or other vegetable salad Cream or oil dressing	150–250 Calories
	Bread or rolls	100–150 Calories
	Butter	150–250 Calories
	Junket or Custard or Cream or Dutch cheese and crackers	100–200 Calories
	Milk to drink (may be flavored with coffee)	150–200 Calories
		1000–1300 Calories
Supper:	Cream soup or Hot cooked cereal with cream or Vegetable cooked with milk	150–250 Calories
	Baked potato or Omelet or Egg, fruit or vegetable salad	100–200 Calories
	Bread	75–150 Calories
	Butter	100–150 Calories
	Very mild cooked fruit	100–150 Calories
	Milk to drink (sweet or buttermilk)	150–200 Calories
		800–1100 Calories

The weight should be watched and if it goes down, the diet should be altered accordingly. Constipation is common, hence a gently laxative diet is desirable. In case of serious gastric disturbance, readjustment of the diet should be made under the physician's guidance.

A Moderate-Priced Dietary for Tuberculosis

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
Orange juice (C, B,[1] A)	¼ cup	2.0	—	25
Farina (B)	¾ cup	6.0	12	100
Cream, thin (A, B)	½ cup	3.6	10	200
Poached egg (A, B)	1 egg	1.6	25	70
Toast	2 slices	1.3	14	100
Butter (A)	1 tbsp.	0.5	1	100
Sugar	2 tbsp.	1.0	—	100
Milk (A, B)	1 cup	8.5	34	170
Coffee	—	—	—	—
				865
Dinner:				
Roast beef	2 slices	3.2	92	200
Gravy	¼ cup	1.7	7	50
Mashed potato (C, B)	¾ cup	4.7	11	150
Creamed peas (A, B, C)	½ cup	2.7	18	100
Bread	1 slice	0.7	7	50
Butter (A)	1 tbsp.	0.5	1	100
Apple tapioca (B, C)	½ cup	7.2	2	200
Cream (A, B)	¼ cup	1.8	5	110
Milk (A, B)	1 cup	8.5	34	170
				1130
Supper:				
Cream of celery soup (B, A)	1 cup	7.2	22	200
Baked sweet potato (A, B)	1 small	4.5	9	150
Bread	1 slice	0.7	7	50
Butter (A)	2 tbsp.	1.0	2	200
Stewed pears (B)	¾ cup	5.5	4	150
Milk to drink (A, B)	1 cup	8.5	34	170
				920
Total for day			351	2915

[1] B includes B and G.

A Low-Priced Tuberculosis Dietary for a Working Man

	Measure	Weight Oz.	Protein Calories	Total Calories
Breakfast:				
Apple sauce (B,[1] C)	⅜ cup	3.5	1	100
Oatmeal (B)	¾ cup	7.9	17	100
Bacon, broiled	5 large pieces	1.0	26	200
Bacon fat	1 tbsp.	0.5	—	100
Bread, whole wheat (B)	4 slices	2.8	32	200
Sugar	2 tbsp. (scant)	0.9	—	100
Milk (A, B)	1 cup	8.5	34	170
Coffee	—	—	—	—
				970
Dinner:				
Beef stew with vegetables (B, C, A)	⅘ cup	6.0	32	200
Boiled potato (C, B)	1 large	5.4	16	150
Bread, whole wheat (B)	2 slices	1.4	16	100
Butter (A)	1 tbsp.	0.5	1	100
Tapioca-cornmeal pudding (A, B)	½ cup	7.2	44	400
Sugar	1 tbsp.	0.5	—	53
Milk (A, B)	1 cup	8.5	34	170
Coffee	—	—	—	—
				1173
Supper:				
Pea soup (A, B)	1 cup	10.0	43	167
Sausages	2 small	2.2	40	200
Bread, whole wheat (B)	2 slices	1.4	16	100
Sausage fat	1 tbsp.	0.5	—	100
Cheese, American (A, B)	⅝ in. cube	0.4	13	50
Stewed figs (B)	4 figs	4.0	10	200
Milk (A, B)	1 cup	8.5	34	170
				987
Night Lunch:				
Bread, whole wheat (B)	2 slices	1.4	16	100
Butter (A)	1 tbsp.	0.5	1	100
Milk (A, B)	1 cup	8.5	34	170
				370
Total for day			460	3500

[1] B includes B and G.

A tempting diet of high fuel value is likely to be expensive. Cream, butter, eggs, choice meats, fruits and vegetables, dainty cookery, and service are beyond the reach of many tuberculous 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 [1] in this country and at those in England under the supervision of the well-known authorities, Bardswell and Chapman.[2]

Diets even less expensive than that on page 332 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.[3] In these milk is the main dependence for vitamins.

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 with potatoes, slice of bread and oleomargarine, dish of well-cooked vegetables, 8 oz. of rice or tapioca pudding made with milk, glass of milk

Diet in Diabetes

Diabetes mellitus is a disease in which the most striking symptom is an impairment of the power of the body to utilize carbohydrates. These ordinarily circulate in the blood as sugar and are burned by the muscles for fuel or stored in muscles and liver as glycogen for future use. In the diabetic

[1] King, H. M., *On the Construction of a Practical and Efficient Diet in Tuberculosis*, Medical Record, Oct. 16, 1909.

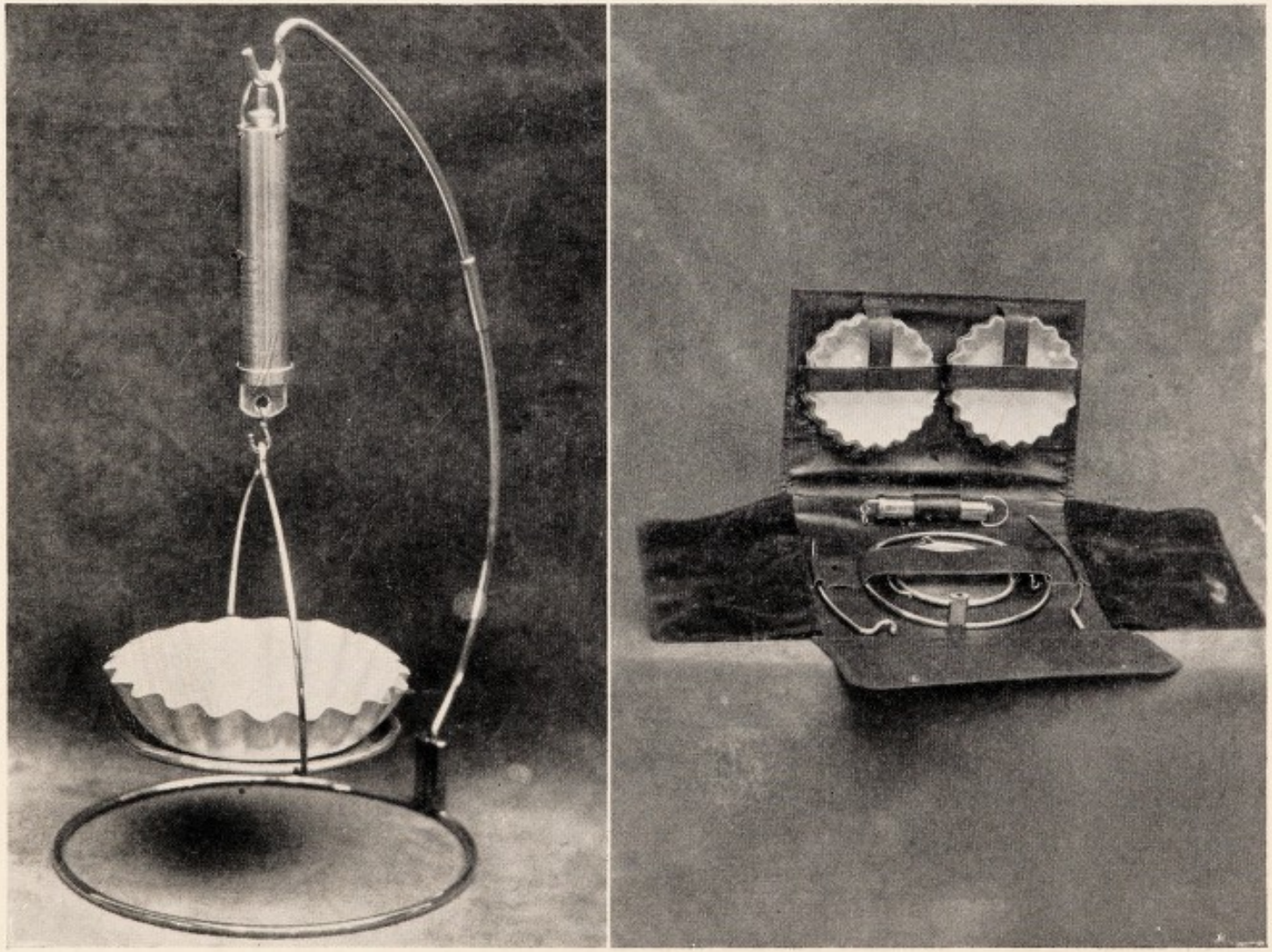
[2] Bardswell, N. D., and Chapman, J. E., *Diet in Tuberculosis*, Oxford University Press (1908).

[3] Gibbs, W. S., *Food for the Invalid and Convalescent*, page 81, The Macmillan Co. (1912).

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.

The fundamental cause of this disease is the failure of the pancreas to produce a sufficient amount of a substance known as insulin, which, circulating in the body, enables it to burn sugar. While it has been known for a long time that the pancreas was at fault, it was not until 1921 that a way was found by Dr. Banting, at the University of Toronto, to make from the pancreas of the dog a preparation of insulin which could be administered to a man and thus supply what his own damaged gland could not furnish. This discovery marks a new era in the history of diabetes mellitus. Where formerly a severe case required the most restricted diet, with the patient forced to live in a state of emaciation and weakness which made him a hopeless invalid, today suitable treatment with insulin makes possible a diet which, though still restricted to a specified régime, may be excellent in quality and sufficient in quantity to enable the person to maintain practically normal weight and to go about his affairs without undue hunger or great weakness.

Insulin cannot be given by mouth because it is destroyed in the alimentary tract, and must be administered subcuta-



A Traveler's Dietary Scale Set Up and in Case

neously with a hypodermic needle. The dosage is in units each one of which will enable the patient to utilize one or two grams more of carbohydrate than he otherwise could. Enough may be administered per day to increase materially the amount of carbohydrate which can be allowed, not only making the diet more palatable, but also enabling the body to burn protein and fat better. Careful treatment and strict adherence to diet does away almost entirely with the dreaded acidosis which menaced the life of the diabetic before insulin was available, and greatly reduces the susceptibility to infection which was also formerly a constant danger. But treatment with insulin must be regulated by a competent physician, for it is a powerful drug, and if not used according to exact directions may go too far toward driving sugar out of the circulation and give the patient an attack of hypoglycemia, which has very uncomfortable and dangerous symptoms. Fortunately these can be relieved by swift administration of carbohydrate, and patients taking insulin are advised to have a small stock of carbohydrate (as a lump of sugar or an orange) by them for such an emergency.

Under proper instruction, the diabetic can learn to administer insulin to himself, and can continue to do so over long periods if he implicitly obeys instructions about dosage and diet. For the discovery of insulin has not done away with the necessity for strict measurement of all food eaten, but has greatly emphasized the importance of it. When insulin is taken there must be also taken, at the right moment by the clock, just the amount of carbohydrate which the insulin can take care of, plus whatever the impaired pancreas is also able to care for. There must also be a definite relationship between the amount of carbohydrate and the amount of protein and fat in the diet, because protein is capable of yielding 58 per cent of its weight in glucose and fat about 10 per cent. In prescribing the carbohydrate allowance of any

patient, these sources of sugar must be taken into account. Furthermore, the amount of fat which can be burned depends quite definitely upon the amount of sugar which can be burned, hence in modern diabetic dietaries all three fuel foodstuffs are very carefully prescribed, and too much protein or fat is just as unsafe as too much carbohydrate.

While certain general principles in regard to dietetic treatment can be stated, each patient presents an individual problem which must be studied not only at the beginning, but throughout the whole life of the individual. The power to burn sugar, once lost, is usually not fully regained, though in the course of time there may be distinct improvement. The diet must always be restricted, although it may be improved from time to time if the patient is coöperative and follows instructions.

In order to find out the exact capacity of any patient to burn sugar, a series of tests are usually made, preferably in a hospital, before insulin treatment is established. By careful supervision of the patient and periodic examinations of blood and urine the physician will determine the amounts of protein, fat, and carbohydrate which may be taken with a given dosage of insulin. Then the patient must learn how to select his diet in harmony with these directions unless he be rich enough to command the services of a trained dietitian. Given a specific prescription for a diet the patient who has not studied food values feels quite at a loss as to how to proceed. But he can soon learn to use tables which give the amount of each of these nutrients in *grams*. We now know that it is quite as important to regulate protein and fat as carbohydrate. Protein is a potential source of sugar and the amount of fat which can be used to advantage is directly related to the amounts of protein and carbohydrate in the diet, so the prescription must be scrupulously followed in every detail.

In order to do this a good scale is necessary, weighing pref-

erably in grams.[1] Standard half-pint measuring cups, one divided into quarters, the other into thirds, and a standard tablespoon and teaspoon are aids to accuracy.

In order that a diet of low fuel value may have sufficient bulk to satisfy the appetite, liberal use is made of the more watery and fibrous vegetables which contain less than ten per cent of carbohydrate and may be eaten in considerable quantities without increasing markedly the total carbohydrate of the ration. Vegetables having the same per cent of carbohydrate may be used interchangeably and thus the patient can make adaptations to his own circumstances. Lists such as the following are helpful in making suitable selections, and can be extended to all sorts of food.

VEGETABLES GROUPED ACCORDING TO CARBOHYDRATE CONTENT

LESS THAN 5 PER CENT	5 PER CENT	10 PER CENT
Lettuce	Tomatoes	String beans (fresh)
Cucumbers	Brussels sprouts	Pumpkin
Spinach	Cauliflower	Squash
Asparagus	Egg plant	Turnip
Rhubarb	Cabbage	Beets
Sauerkraut	String beans (canned)	Carrots
Beet greens		Onions
Celery		

One and one-half cups of any five per cent vegetable and one-half cup of any ten per cent vegetable will yield approximately five grams of carbohydrate. Tables giving the weights of portions of food to yield a certain number of grams of protein or carbohydrate are also useful and can be arranged from a standard handbook of food values[2] with little trouble.[3]

[1] Such scales can be secured from the Chicago Dietetic Supply House, Chicago, Illinois, or John Chatillon Sons, New York City.

[2] Such as Rose's *Laboratory Handbook for Dietetics*, 3rd Ed., The Macmillan Company (1929).

[3] Other small books with many practical suggestions regarding diet are Huddleson's *Food for the Diabetic*, The Macmillan Company (1926), Campbell

Thus one may obtain 10 grams of carbohydrate from any one of the following portions of fresh fruits:

Grapefruit	150 grams
Watermelon	110 grams
Strawberries	135 grams
Peaches	130 grams
Orange juice	80 grams
Malaga grapes	70 grams

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. 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, also of sugar and milk, and special devices are necessary to make acceptable dishes. Although the fat must be calculated, it usually seems liberal, and attention must be given to making it acceptable. Melted butter may be poured over hot vegetables and oil or cream dressing over salads. Cream can be used in place of milk in many dishes. As a rule, the best success in feeding comes from judicious use of the

and Porter's *Guide for Diabetics*, Williams and Wilkins Company (1926), and Joslin's *Diabetic Manual*, Lea and Febiger (1926). For practical suggestions and recipes see also Pattee's *Practical Dietetics*, pp. 397–442, A. F. Pattee, (1929).

[1] Farmer, F. M., *Food for the Sick and Convalescent*, Little, Brown and Company (1913); Huddleson, M. P., *Food for the Diabetic*, The Macmillan Company (1926); Pattee, A. F., *Practical Dietetics*, 17th Ed., A. F. Pattee (1929); Joslin, E. P., *Diabetic Manual*, 4th Ed., Lea and Febiger (1929); and Campbell, W. R., and Porter, M. T., *A Guide for Diabetics*, Williams and Wilkins Company (1926).

ordinary foods in correct amounts, depending chiefly upon vegetables of low carbohydrate content to furnish most of each day's carbohydrate allowance. Special diabetic foods on the market are expensive and often less suitable than natural foods. They should not be used without knowledge of their exact composition.[1] The strict limitation of protein makes the use of gluten and soy bean flour and the like quite impractical. Wafers or biscuits of washed bran or a flour made from cellulose may be regarded as better staples in the diet. Both vegetables and fruits are now canned for the diabetic without sugar, and may be obtained from supply houses making a specialty of diabetic foods. They add materially to the variety possible, especially in the winter.

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 with great moderation 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 if it can possibly be avoided. 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 the home, the problem of following the doctor's orders

[1] The composition of many diabetic foods may be found in a bulletin by L. B. Mendel and J. P. Street, *Diabetic Foods*, Connecticut Agricultural Experiment Station, New Haven, Conn. (1913), and in Bull. 276, by E. M. Bailey, the 30th Report on Food Products and the 18th Report on Drug Products, Connecticut Agricultural Experiment Station, New Haven, Conn. (1925).

is often difficult because of expense. Breadstuffs and other cereal foods constitute so large a part of the very low-priced dietary, that a change to one in which vegetables of very low carbohydrate content are the most important part of at least two meals a day, if not all three, is one which seems at first rather difficult. But from the point of view of general nutrition, the modern diabetic diet is better than most ordinary diets, because of its greater richness in ash constituents and vitamins, its laxative properties and its unfailing regularity of meals.

In planning the menu, it is best to divide the day's allowance of protein, fat, and carbohydrate fairly evenly among the three meals. Unless the carbohydrate allowance is extremely low, a small portion of fruit can usually be allowed for breakfast. When more than 50 grams of carbohydrate are permitted for the day, a small portion of breakfast cereal may also be given. Heavy cream (40%) is very low indeed in protein and carbohydrate, and small weighed portions can be diluted a little with water to take the place of milk.

For the other two meals, there should generally be three or four vegetables; one served raw for a salad, as cabbage or lettuce, having less than 5 per cent of carbohydrate (5 grams in $3\frac{1}{2}$ ounces); two cooked and made the carriers of butter or other fat allotted to the meal, one of these in the "5 per cent" class and the other in the "10 per cent" class. This plan helps to insure variety without violation of regularity in the amount of carbohydrate eaten. In addition a regular small portion of potato is desirable if it can be added without exceeding the allowance.

For breakfast an egg is usually possible, and for each of the other meals a small portion of meat.

Desserts make the menu seem less restricted, but must be made without sugar, using saccharine to sweeten. Gelatin is very useful, as so small a quantity makes a portion of jelly,

and a great variety of flavors is possible, but if the protein is greatly restricted, "vegetable gelatin" or agar-agar, which has practically no protein, should be substituted. Heavy cream is also very useful in making various whipped cream desserts, to which small amounts of fruit or fruit juice can by careful figuring be added. When the carbohydrate allowance is 60 grams or more, a daily portion of bread at one meal will be greatly appreciated by most people. Some examples of diabetic dietaries at moderate cost are included here, to show what may be done, in spite of restrictions, to make wholesome and palatable meals. To correspond with the tables in the Appendix and with other dietaries in this book, food values have been worked out in calories instead of grams, but to convert them into grams it is, of course, only necessary to divide protein and carbohydrate calories by 4 and fat calories by 9. Weights have been given in ounces for the same reason, but it is more accurate, and therefore preferable, to weigh foods in grams for all diabetics. Measures are not sufficiently accurate where so much is at stake. Upon the care with which the diet is controlled, not only the present, but also the future welfare of the diabetic very largely depends. With the help of insulin, such good diets are now possible that the diabetic can truly be a well-nourished person so long as he adheres strictly to his prescribed routine.

A Moderate-Priced Dietary for a Diabetic, I

Daily allowance: Protein, 40 grams or 160 calories
Fat, 130 grams or 1170 calories
Carbohydrate, 50 grams or 200 calories
Total calories, 1530

	Measure	Weight Oz.	Protein Calories	Fat Calories	Carbohydrate Calories	Total Calories
BREAKFAST:						
Orange	1 small	4.0	3	1	40	44
Egg	1 egg	1.9	25	45	—	70
Bacon	3 small pieces	0.4	10	65	—	75
String beans	½ cup	1.7	5	—	15	20
Bran biscuits	ad libitum [1]					
Butter	1 tbsp.	0.5	1	99	—	100
Cream, 40%	1⅔ tbsp.	0.9	2	95	3	100
Coffee [2]	1 cup	—	—	—	—	—
			46	305	58	409
DINNER:						
Hamburg steak	1 small cake	1.8	50	40	—	90
Carrots, diced	¾ cup	2.3	4	3	38	45
Tomatoes, stewed	⅔ cup	3.3	4	1	14	19
Butter for vegetables	2¼ tbsp.	1.1	2	222	—	224
Cabbage for salad	1 cup shredded	2.0	4	1	15	20
Cream for salad and coffee, 40%	⅓ cup	1.8	4	190	6	200
			68	457	73	598
SUPPER:						
Boiled ham, fat	1 slice	1.3	20	80	—	100
Potato, baked	½ medium	1.5	5	—	45	50
Spinach, cooked	½ cup	3.3	2	1	13	16
Butter for vegetables	1 tbsp.	0.5	1	99	—	100
Lettuce for salad	3 large leaves	2.0	1	—	9	10
Mayonnaise dressing	1 tbsp.	0.5	1	97	2	100
Raspberry jelly [3]	½ cup	3.8	9	—	—	9
Whipped cream [2]	2 tbsp.	0.9	2	95	3	100
Brazil nut	1 nut	0.3	5	43	2	50
			46	415	74	535
Totals for day: calories			160	1177	205	1542
grams			40	130	51	

[1] Made from washed bran; no food value.
[2] Saccharine may be used for sweetening.
[3] Made from a sugar-free commercial preparation by dissolving in hot water.

A Moderate-Priced Dietary for a Diabetic, II

Daily allowance: Protein, 50 grams or 200 calories
Fat, 170 grams or 1530 calories
Carbohydrate, 70 grams or 280 calories
Total calories, 2010

	Measure	Weight Oz.	Protein Calories	Fat Calories	Carbohydrate Calories	Total Calories
BREAKFAST:						
Grapefruit	½ grapefruit 4-inch diam.	5.0	3	2	45	50
Rolled oats, cooked	⅜ cup	2.4	8	8	34	50
Egg	1 egg	1.9	25	45	—	70
Bacon	3 small pieces	0.4	10	65	—	75
Bran biscuit	ad libitum [1]					
Butter	1 tbsp.	0.5	1	99	—	100
Cream, 40%, for cereal and coffee	⅓ cup	1.8	4	190	6	200
Coffee	1 cup		—	—	—	—
			51	409	85	545
DINNER:						
Pot roast of beef	1 slice	1.6	62	38	—	100
Kale, steamed	1 cup	4.0	13	5	32	50
Bacon fat for kale	2 tbsp.	0.8	—	200	—	200
Onions, boiled	2 small	3.5	6	3	41	50
Butter for onions	1 tbsp.	0.5	1	99	—	100
Celery and lettuce for salad	⅛ cup celery, 2 large lettuce leaves	3.4	3	—	12	15
French dressing	1½ tbsp.	0.6	—	100	—	100
Coffee Bavarian cream [2]	½ cup	3.5	4	100	16	120
			89	545	101	735
SUPPER:						
Pork chop	1 chop	2.5	48	144	—	192
Parsnips, fried	½ medium	3.0	5	3	42	50
Tomatoes, stewed	½ cup	4.0	5	2	18	25
Butter for vegetables	2 tbsp.	1.5	3	297	—	300
Lettuce for salad	2 large leaves	1.2	1	—	5	6
Mayonnaise dressing	1⅓ tbsp.	0.7	1	132	—	133
Blueberries, canned [3]	½ cup	2.3	1	2	30	33
			64	580	95	739
Totals for day: calories			204	1534	281	2019
grams			51	170	70	

[1] Made from washed bran; no food value.

[2] Three-fourths tsp. agar-agar, 2 tbsp. coffee infusion, ¼ cup water, 2 tbsp. milk, 2 tbsp. 40% cream. [3] Canned without sugar and sweetened with saccharine.

A Moderate-Priced Dietary for a Diabetic, III

Food allowance: Protein, 65 grams or 260 calories
Fat, 200 grams or 1800 calories
Carbohydrate, 80 grams or 320 calories
Total calories, 2380

	Measure	Weight Oz.	Protein Calories	Fat Calories	Carbohydrate Calories	Total Calories
BREAKFAST:						
Cantaloupe	½ small	7.0	2	—	38	40
Cornflakes	⅜ cup	0.5	3	2	45	50
Broiled ham, lean	1 slice	2.6	58	150	—	208
Cream for cereal and coffee 40%	6 tbsp.	3.0	7	342	11	360
			70	494	94	658
DINNER:						
Beef loaf	1 slice	1.4	40	60	—	100
Potato, boiled	½ medium	1.8	5	—	45	50
Cauliflower, steamed	¼ head, 4-inch diam.	2.8	5	3	17	25
String beans, steamed	¾ cup	2.5	7	—	23	30
Butter for vegetables	3 tbsp.	1.5	3	297	—	300
Raw grated carrot for salad	1 tbsp.	0.4	1	—	4	5
Green pepper for salad	½ pepper	0.7	1	—	4	5
Lettuce for salad	2 large leaves	1.2	1	—	5	6
French dressing	1½ tbsp.	0.6	—	100	—	100
Spanish cream	½ cup	1.3	16	48	8	72
Whipped cream	2 tbsp.	0.9	2	95	3	100
			81	603	109	793
SUPPER:						
Roast veal	1 slice	2.0	65	25	—	90
Carrots, steamed	½ cup	2.0	2	2	21	25
Celery, stewed	1 cup	4.5	6	1	17	24
Bread, whole wheat	¼-inch slice	0.7	8	1	41	50
Butter for vegetables and bread	3½ tbsp.	1.7	3	347	—	350
Lettuce	2 large leaves	1.0	1	—	4	5
French dressing	1½ tbsp.	0.6	—	100	—	100
Custard pie, crust	⅙ of 9-inch pie [1]	0.5	5	50	28	83
filling [2]	½ cup	4.0	18	175	10	203
			108	701	121	930
Totals for day: calories			259	1798	324	2381
grams			65	200	81	

[1] Rolled as thin as paper.

[2] Two tbsp. each of milk, 40% cream, and water; ⅓ of one egg; saccharine to sweeten; nutmeg to flavor.

APPENDIX

APPENDIX

TABLE I. 100-Calorie portions and calories in common measures
TABLE II. Dietary recipes
TABLE III. Vitamin values of foods
TABLE IV. Fuel values in relation to cost
TABLE V. Height and weight of men at different ages
TABLE VI. Height and weight of women at different ages
TABLE VII. Height and weight of boys of school age
TABLE VIII. Height and weight of girls of school age
TABLE IX. Height and weight of boys from birth to school age
TABLE X. Height and weight of girls from birth to school age

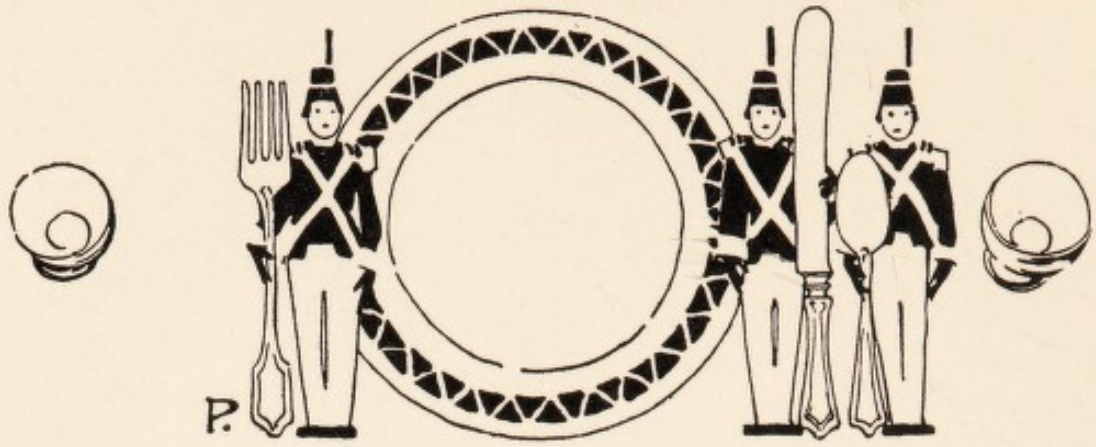


TABLE I

100-Calorie Portions and Calories in Common Measures

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. Many of the data have been taken from the author's *Laboratory Handbook for Dietetics*, based chiefly 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. Weights and measures are for foods as we eat them unless otherwise stated. Recipes for many of the made dishes will be found in Table II of this Appendix.

TABLE I. 100-CALORIE PORTIONS AND CALORIES IN COMMON MEASURES

MATERIAL	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
Almonds, chocolate	5 almonds	0.5	100	?	?	?
Almonds, chopped	1 cup	3.0	550	71	420	59
Almonds, salted	10–12 nuts	0.5	100	12	78	10
Almonds, shelled	12–15 nuts	0.5	100	13	76	11
Almonds, shelled	1 cup	4.0	734	95	560	79
Almonds, sugar	2½ almonds	0.8	100	?	?	?
Almonds, sugar	1 almond	0.3	40	?	?	?
Angel cake	Piece 1¼″ × 2″ × 2½″	1.3	100	12	1	87
Apple, baked with 2 tbsp. sugar	1 large apple	4.6	200	2	6	192
Apple, baked, with whipped cream	1 apple	4.8	200	3	61	136
Apple, fresh, whole	1 large	7.5	100	3	5	92
Apple, fresh, whole	1 medium	6.0	80	2	4	74
Apple pie	Piece 1½″ at circumference [1]	1.6	100	3	41	56
Apple pie	Piece 4½″ at circumference [1]	4.8	300	9	123	168
Apple sauce	⅜ cup	3.5	100	1	3	96
Apple sauce cake	Piece 1½″ × ½″ × 3¾″	0.8	100	5	11	84
Apple snow	⅘ cup	2.0	100	6	2	92
Apple snow	1 cup	2.7	132	8	3	121
Apple tapioca	¼ cup	3.6	100	1	1	98
Apple tapioca	1 cup	14.8	407	3	5	399

[1] All pies are 9 inches in diameter.

TABLE I — 100-CALORIE PORTIONS AND CALORIES IN COMMON MEASURES — *Continued*

MATERIAL	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
Apricots, canned	3 large halves and 2 tbsp. juice	4.8	100	5	—	95
Apricots, dried	9 halves	1.3	100	7	3	90
Apricots, dried, stewed, sweetened	¼ cup	2.7	100	4	2	94
Apricots, fresh, whole	5 apricots	6.5	100	8	—	92
Asparagus au gratin	½ cup	3.0	100	20	57	23
Asparagus, canned, drained	15 large stalks 5½″ long	12.0	100	37	14	49
Asparagus, canned tips, drained	1 cup	6.0	50	18	7	25
Asparagus, creamed	¼ cup	2.5	100	14	57	29
Asparagus, fresh	20 large stalks 8″ long	15.9	100	32	8	60
Asparagus on toast	⅔ serving [1]	4.6	100	13	46	41
Asparagus on toast	1 serving [1]	7.7	169	23	77	69
Asparagus soup, cream of	½ cup scant	4.0	100	17	56	27
Avocado (alligator pear)	1 medium	8.2	205	10	153	42
Avocado dessert	⅓ small pear	1.6	100	3	72	25
Avocado on the half shell	¼ medium pear	1.1	100	3	88	9
Avocado salad	⅕ cup	1.8	100	3	87	10
Bacon, cooked	4–5 small slices	0.5	100	13	87	—
Bacon fat	1 tbsp.	0.4	100	—	100	—

[1] For servings consult Table II, Dietary Recipes.

TABLE I — 100-CALORIE PORTIONS AND CALORIES IN COMMON MEASURES — *Continued*

MATERIAL	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
Baking powder biscuit	2 small biscuits	1.3	100	11	27	62
Banana jelly	Piece 3″ × 2″ × 1″	3.8	100	9	1	90
Banana nut salad	⅓ serving [1]	1.7	100	6	67	27
Banana salad	1 small serving [1]	2.6	100	12	36	52
Bananas in skins	1 medium	5.5	100	5	6	89
Barley flour	4 tbsp.	1.0	100	13	5	82
Barley flour	1 cup	8.0	796	76	23	697
Barley, pearl	1 tbsp.	0.5	50	5	1	44
Barley, pearl	1 cup	7.5	755	72	21	662
Beans, baked, canned	⅓ cup	2.7	100	21	18	61
Beans, baked, cream soup	½ cup	2.6	100	15	45	40
Beans, kidney, stew	½ cup	4.9	100	26	18	56
Beans, Lima, dried	⅙ cup	1.0	100	21	4	75
Beans, Lima, dried	1 cup	5.5	546	115	22	409
Beans, Lima, dried, baked	⅓ cup	2.4	100	12	40	48
Beans, Lima, dried, stewed	⅓ cup	2.6	100	21	4	75
Beans, Lima, fresh or canned	½ cup	3.0	100	23	5	72
Beans, Lima, fresh, buttered	¼ cup	1.7	100	16	36	48
Beans, navy, dried	⅛ cup (scant)	1.0	100	26	5	69
Beans, navy, dried	1 cup	7.0	684	179	32	473

[1] For servings consult Table II, Dietary Recipes.

TABLE I — 100-CALORIE PORTIONS AND CALORIES IN COMMON MEASURES — *Continued*

MATERIAL	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
Beans, soy, see *Soy beans*						
Beans, string	2⅓ cups of 1″ pieces	8.5	100	22	7	71
Beans, string, buttered	1⅙ cups	5.0	100	11	53	36
Beans, string, buttered	1 cup	4.3	86	10	46	30
Beans, string, creamed	⅓ cup	3.5	100	13	54	33
Beef broth	4 cups	32.0	150	66	84	—
Beef, corned, boiled (less ¾ fat content)	Slice 4″ × 1½″ × ⅝″	3.0	100	53	47	—
Beef, corned, boiled (with fat)	Slice 4½″ × 1½″ × ¼″	1.0	100	21	79	—
Beef, dried	4 thin slices 4″ × 5″	2.0	100	67	33	—
Beef, dried, creamed I	⅓ cup (scant)	2.4	100	16	65	19
Beef, dried, creamed II	⅓ cup	2.3	100	20	62	18
Beef, drippings	1 tbsp.	0.4	100	—	100	—
Beef, Hamburg steak, broiled	Cake 2½″ diam., ⅞″ thick	2.0	100	55	45	—
Beef, Hamburg steak with gravy	1 cake 2″ diam., ¾″ thick, 1⅔ tbsp. gravy	2.3	100	38	52	10
Beef, heart, stuffed	Slice 2½″ × 2¼″ × ¼″	1.0	100	21	68	11
Beef, lean meat, uncooked	Slice 2¾″ × 1½″ × 1¾″	2.3	100	55	45	—
Beef liver, broiled, ground	½ cup	2.1	100	63	32	5

TABLE I — 100-CALORIE PORTIONS AND CALORIES IN COMMON MEASURES — *Continued*

MATERIAL	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
Beef liver, raw	Slice 4″ × 3″ × ½″	2.7	100	63	32	5
Beef loaf	Slice 4″ × 6″ × ⅛″	1.4	100	40	60	—
Beef marrow	1 tbsp.	0.5	119	1	118	—
Beef pie	¼ serving [1]	1.7	100	10	43	47
Beef rib, lean, roasted	Slice 5″ × 2½″ × ¼″	1.6	100	46	54	—
Beef, round, lean	Slice 2¾″ × 1½″ × ¾″	2.3	100	55	45	—
Beef, round, lean, pot roast	Slice 4¾″ × 3½″ × ⅛″	1.6	100	62	38	—
Beef, round steak, pan-broiled	Slice 2″ × 3″ × ½″	2.0	100	48	52	—
Beef, round steak, stuffed	Slice 3″ diam., ⅓″ thick	1.7	100	39	49	12
Beef, round steak, Swiss style	Slice 4″ × 1″ × ⅝″	1.2	100	35	48	17
Beef, sirloin steak, lean, broiled	Slice 2″ × 1½″ × ¾″	2.0	100	47	53	—
Beef, sirloin steak, medium fat, broiled	Slice 1¾″ × 1½″ × ¾″	1.3	100	31	69	—
Beef stew with vegetables	⅔ cup	3.0	100	16	45	39
Beef stew with vegetables	1 cup	7.2	238	39	107	92
Beet greens, cooked	2¼ cups	6.8	100	17	58	25
Beets, fresh	4 beets 2″ diam. (1⅓ cups sliced)	7.7	100	14	2	84

[1] For servings consult Table II, Dietary Recipes.

TABLE I — 100-CALORIE PORTIONS AND CALORIES IN COMMON MEASURES — *Continued*

MATERIAL	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
Blackberries, fresh	½ cup (50 berries)	6.1	100	9	16	75
Blackberries, stewed, sweetened	¼ cup	2.2	100	2	4	94
Bluefish, broiled	Piece 3″ × 2½″ × 1″	3.3	100	72	28	—
Bologna sausage	Slice 2⅛″ diam., ½″ thick	1.5	100	32	67	1
Bouillon	4 cups	33.6	100	84	8	8
Bran, unwashed	1 cup	1.0	100	18	22	60
Brazil nuts, shelled	2 nuts	0.5	100	10	86	4
Bread, Boston brown	Slice 3″ diam., ¾″ thick	1.8	100	10	10	80
Bread crumbs, oven dried	1 cup	3.5	373	52	17	304
Bread crumbs, soft	1 cup	2.0	147	21	6	120
Bread crumbs, stale	1 cup	3.0	236	34	11	191
Bread, Graham or whole wheat	2½ slices 3¾″ × 3¼″ × ¼″	1.4	100	14	6	80
Bread, Graham or whole wheat	Slice 3¾″ × 3¼″ × ¼″	0.6	40	6	2	32
Bread, Old New England corn	Piece 2½″ × 1″ × 1″	1.0	100	8	30	62
Bread, rye	2⅔ slices 3½″ × 4″ × ¼″	1.4	100	13	2	85
Bread, rye	Slice 3½″ × 4″ × ¼″	0.6	38	5	1	32
Bread, white	4 slices 3″ × 3½″ × ¼″	1.4	100	14	6	80
Bread, white, raisin	Slice 3¾″ × 3½″ × ½″	1.2	100	9	21	70
Bread, whole wheat raisin	Slice 3¾″ × 3⅛″ × ½″	1.3	100	11	10	79

TABLE I — 100-CALORIE PORTIONS AND CALORIES IN COMMON MEASURES — *Continued*

MATERIAL	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
Brussels sprouts	1 quart box	16.7	100	29	6	65
Butter	1 tbsp.	0.5	100	—	100	—
Butter	1 square $1\frac{1}{4}'' \times 1\frac{1}{4}'' \times \frac{1}{4}''$	0.3	50	—	50	—
Butter	1 cup	8.0	1744	8	1736	—
Brown Betty	$\frac{1}{5}$ cup	2.1	100	3	35	62
Brown Betty	1 cup	10.2	500	18	175	307
Brown sauce	$\frac{1}{2}$ cup	3.4	100	14	49	37
Brown sugar sauce	$\frac{1}{3}$ cup	3.0	100	—	—	100
Buttermilk	1 cup	8.5	88	29	12	47
Buttermilk	$1\frac{1}{8}$ cups	9.9	100	33	13	54
Butternuts	4–5 nuts	0.5	100	17	81	2
Cabbage, buttered	$\frac{3}{4}$ cup	5.8	100	10	54	36
Cabbage, shredded	$3\frac{1}{2}$ cups chopped, 4–5 cups shredded	11.2	100	20	9	71
Cake, one-egg [1]	$1\frac{3}{4}''$ cube	1.0	100	8	32	60
Cantaloupe	1 melon $4\frac{1}{2}''$ diam.	18.0	100	6	—	94
Capon, roast	Slice $4'' \times 2\frac{1}{2}'' \times \frac{1}{4}''$	1.7	100	51	49	—
Carrots, buttered	$\frac{1}{2}$ cup	3.0	100	4	67	29
Carrots, creamed	$\frac{3}{4}$ cup	4.5	100	11	44	45
Carrots, fresh	$1\frac{2}{3}$ cups of $\frac{1}{2}''$ cubes (4–5 young carrots 3–4'' long)	7.8	100	10	8	82
Carrots, fresh	1 tbsp. grated	0.4	5	1	—	4
Cauliflower	1 small head $4\frac{1}{2}''$ diam.	11.5	100	23	15	62
Celery	4 cups of $\frac{1}{4}''$ pieces	19.1	100	24	5	71

[1] For other cakes see *Angel, Chocolate, Fruit,* etc.

TABLE I — 100-CALORIE PORTIONS AND CALORIES IN COMMON MEASURES — *Continued*

MATERIAL	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
Celery soup, cream of	½ cup	3.6	100	11	61	28
Charlotte Russe, cream filling	⅕ cup	1.5	100	4	74	22
Cheese, American	1⅛″ cube	0.8	100	26	74	—
Cheese, American	1 tbsp. grated	0.3	33	9	24	—
Cheese, American	1 cup grated	4.0	498	130	366	2
Cheese and pineapple salad	½ serving	1.7	100	9	58	33
Cheese, Brie	Piece 1½″ × 1¼″ × 1″	1.4	100	25	73	2
Cheese, Camembert	2¼″ sector 1″ thick, radius 2¼″	1.6	126	38	88	—
Cheese, cottage	5 tbsp.	3.2	100	76	9	15
Cheese fondue	Piece 1″ × 2″ × 2½″	1.5	100	23	65	12
Cheese, full cream	Piece 2″ × 1″ × ⅜″	0.9	100	25	72	3
Cheese, pineapple	Circle 2¼″ diam., ⅜″ thick	0.7	100	25	73	2
Cheese, Roquefort	Piece 1½″ × 1¼″ × ⅞″	1.0	100	25	73	2
Cheese sauce	¼ cup	2.2	100	15	69	16
Cheese, soft cream	Piece 2¾″ × 2⅛″ × ¾″	3.0	328	38	287	3
Cheese, soft cream	2 tbsp.	0.9	100	12	87	1
Cheese soufflé	½ cup	1.7	100	18	70	12
Cheese straws	3 straws 5″ × ⅜″ × ⅜″	0.8	100	17	52	31
Cheese, Swiss	Slice 4½″ × 3½″ × ⅛″	0.8	100	25	73	2

TABLE I — 100-CALORIE PORTIONS AND CALORIES IN COMMON MEASURES — *Continued*

MATERIAL	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
Cheese, toasted, on saltines	4 tsp. cheese, 4 crackers	0.8	100	16	46	38
Cherries, candied	10 medium cherries	1.0	100	1	—	99
Cherries, stoned, fresh	1 cup	4.5	100	5	9	86
Cherries, sweet, fresh	20 cherries $\frac{7}{8}$″ diam.	4.7	100	5	9	86
Chestnuts, Italian, shelled	7 nuts	1.5	100	10	20	70
Chicken, canned, boned	$\frac{1}{4}$ cup	1.5	100	49	51	—
Chicken, canned, boned	1 cup or 1 small can	6.0	384	188	196	—
Chicken, creamed	$\frac{1}{4}$ cup (scant)	1.6	100	16	73	11
Chicken, lean meat, cooked	3 slices $3\frac{1}{2}$″ × $2\frac{1}{2}$″ × $\frac{1}{4}$″	3.2	100	80	20	—
Chicken salad	$\frac{1}{4}$ cup	1.6	100	12	86	2
Chocolate, beverage, milk and water, half and half	$\frac{1}{2}$ cup (scant)	4.1	100	10	48	42
Chocolate, beverage, made with milk	$\frac{1}{3}$ cup	3.1	100	13	49	38
Chocolate blanc mange	$\frac{1}{4}$ cup (scant)	1.9	100	8	33	59
Chocolate cream mints	1 mint 3″ diam.	1.7	187	?	?	?
Chocolate drop cookies	$1\frac{1}{2}$ cookies $2\frac{1}{4}$″ diam.	0.8	100	8	52	40
Chocolate fudge	Piece $1\frac{1}{2}$″ × $\frac{3}{4}$″ × 1″	0.9	100	2	20	78

TABLE I — 100-CALORIE PORTIONS AND CALORIES IN COMMON MEASURES — *Continued*

MATERIAL	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
Chocolate loaf cake	Piece $2\frac{1}{2}'' \times 2\frac{1}{2}'' \times \frac{7}{8}''$	0.9	100	5	41	54
Chocolate nut caramels	2 caramels, $\frac{3}{4}''$ cubes	0.7	100	4	32	64
Chocolate nut fudge	Piece $1\frac{1}{4}'' \times 1'' \times \frac{3}{4}''$	0.9	100	4	36	60
Chocolate peppermints	3 mints 1″ diam.	1.0	100	?	?	?
Chocolate, sweet milk	Piece $2\frac{1}{4}'' \times 1'' \times \frac{1}{8}''$	0.7	100	7	58	35
Chocolate, unsweetened	1 tbsp. grated	0.2	29	2	21	6
Chocolate, unsweetened	1 square	1.0	173	15	124	34
Citron, dried	Piece $1\frac{1}{4}'' \times 1'' \times 1''$	1.1	100	—	—	100
Citron, dried chopped	1 cup	2.8	246	2	2	242
Clams	12 clams or $\frac{2}{3}$ cup	7.6	100	56	8	36
Cocoa, beverage, with dried milk	$\frac{1}{2}$ cup	3.0	100	16	43	41
Cocoa, beverage, with evaporated milk	$\frac{1}{3}$ cup	3.1	100	19	42	39
Cocoa, beverage, with milk and lactose	$\frac{1}{3}$ cup	2.9	100	12	34	54
Cocoa, beverage, with milk	$\frac{1}{2}$ cup (scant)	3.8	100	16	44	40
Cocoa, beverage, with milk and water, half and half	$\frac{2}{3}$ cup	5.5	100	14	39	47

TABLE I — 100-CALORIE PORTIONS AND CALORIES IN COMMON MEASURES — *Continued*

MATERIAL	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
Cocoa, powder	2½ tbsp.	0.7	100	18	52	30
Cocoa, powder	1 tbsp.	0.3	40	7	21	12
Cocoa tapioca	¼ cup	2.6	100	9	24	67
Coconut caramels	2 caramels, ¾″ cubes	0.7	100	3	24	73
Coconut, prepared	3 tbsp.	0.6	100	4	77	19
Codfish balls	1 ball 2″ diam.	1.7	100	14	65	21
Codfish, creamed	½ cup	2.5	100	32	46	22
Cod liver oil	1 tbsp.	0.4	100	—	100	—
Cod steak, steamed	Piece 3¾″ × 2½″ × ¾″	4.0	100	94	6	—
Cod steak, uncooked	Piece 3¾″ × 2½″ × 1″	4.9	100	94	6	—
Coffee jelly	1¼ cups	9.9	100	11	—	89
Cole slaw	1 cup	2.8	100	6	78	16
Consommé	4 cups	32.0	100	90	10	—
Corn, à la Southern	⅓ cup	3.4	100	16	41	43
Corn bread	Slice 2″ × 2″ × 1″	1.2	100	10	24	66
Corn, canned	⅓ cup	3.6	100	11	11	78
Corn chowder	⅓ cup	3.3	100	12	43	45
Cornflakes	¾ cup	1.0	100	6	4	90
Corn, fresh, cut from cob	½ cup	3.5	100	12	10	78
Corn, fresh, on cob	2 ears 6″ long	9.0	100	12	9	79
Cornmeal, cooked	⅔ cup	6.0	100	10	5	85
Cornmeal, uncooked	1 tbsp.	0.3	33	3	1	29
Cornmeal, uncooked	1 cup	5.0	504	52	24	428
Corn, puffed	1¼ cups	1.0	100	6	4	90

Cookies, see *Chocolate, Hermits, Marguerites, Molasses, Oatmeal, Peanut, Plain.*

TABLE I — 100-CALORIE PORTIONS AND CALORIES IN COMMON MEASURES — *Continued*

MATERIAL	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
Corn soup, cream of	½ cup	3.9	100	12	38	50
Cornstarch	1 tbsp.	0.3	34	—	—	34
Cornstarch	1 cup	4.5	459	—	—	459
Cornstarch blanc mange	¼ cup	2.7	100	9	24	67
Corn syrup	1¾ tbsp.	1.0	100	—	—	100
Corn syrup	1 tbsp.	0.6	56	—	—	56
Cottage pudding	Slice 1¾″ × 2″ × 2½″	1.1	100	7	26	67
Cottolene	1 tbsp.	0.4	100	—	100	—
Cottolene	1 cup	6.3	1575	—	1575	—
Cottonseed oil	1 tbsp.	0.4	100	—	100	—
Crab meat, canned	¾ cup	4.4	100	79	17	4
Cracker crumbs	1 tbsp.	0.3	29	3	4	22
Cracker meal	1 cup	4.2	467	52	65	350
Crackers, Graham	2½ crackers 2½″ × 2¾″ × ¼″	0.8	100	9	20	71
Crackers, Graham	1 cracker 2½″ × 2¾″ × ¼″	0.3	40	4	8	28
Crackers, oyster	24 crackers, 1″ diam.	0.8	100	10	22	68
Crackers, oyster	1 cracker, 1″ diam.	0.04	5	1	1	3
Crackers, pilot	1 cracker, 5″ diam.	1.2	130	15	15	100
Crackers, saltines	6 crackers, 2″ square	0.8	100	10	26	64
Crackers, soda	4 crackers, 2¾″ × 2½″	0.9	100	10	20	70
Crackers, water	3 crackers, ⅛″ thick, 2¼″ diam.	0.9	100	12	11	77
Crackers, water	1 cracker, ⅛″ thick, 2¼″ diam.	0.3	33	4	4	25
Crackers, whole wheat	4½ crackers, 2½″ × 1¾″	1.0	100	10	15	75

TABLE I — 100-CALORIE PORTIONS AND CALORIES IN COMMON MEASURES — *Continued*

MATERIAL	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
Crackers, whole wheat	1 cracker, $2\frac{1}{2}''$ × $1\frac{3}{4}''$	0.2	22	2	3	17
Cranberries, fresh	2 cups	7.6	100	3	12	85
Cranberry jelly	2 tbsp.	1.5	100	—	1	99
Cranberry jelly	1 cup	8.6	566	3	12	551
Cranberry pie	Piece $1\frac{1}{2}''$ at circumference	1.4	100	2	18	80
Cranberry pie	Piece $4\frac{1}{2}''$ at circumference	4.2	310	6	64	240
Cranberry pudding, steamed	$\frac{1}{6}$ cup	1.1	100	10	33	57
Cranberry sauce	$\frac{1}{4}$ cup (scant)	1.5	100	—	1	99
Cream, thick (40% fat)	1 tbsp. plain or $1\frac{3}{4}$ tbsp. whipped	0.6	60	1	57	2
Cream, thick (40% fat)	$1\frac{2}{3}$ tbsp.	0.9	100	2	95	3
Cream, thick (40% fat)	1 cup	7.8	842	19	796	27
Cream, thin (18.5% fat)	1 tbsp.	0.6	30	1	26	3
Cream, thin (18.5% fat)	$\frac{1}{4}$ cup (scant)	1.8	100	5	86	9
Cream, thin (18.5% fat)	1 cup	8.0	440	23	377	40
Cream filling (custard)	$3\frac{1}{3}$ tbsp.	1.8	100	10	24	66
Cream filling (custard)	1 cup	9.1	494	52	117	325
Cream filling (thick cream)	$\frac{1}{4}$ cup	1.2	100	5	77	18
Cream puff shells	$1\frac{1}{2}$ puffs	0.8	100	10	68	22

TABLE I — 100-CALORIE PORTIONS AND CALORIES IN COMMON MEASURES — *Continued*

MATERIAL	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
Cream pie with meringue	Piece 2″ at circumference	1.6	100	10	37	53
Cream pie with meringue	Piece $4\frac{1}{2}$″ at circumference	3.5	225	23	83	119
Cream sauce	$\frac{1}{6}$ cup	1.1	100	3	68	29
Cream sauce	1 cup	6.6	582	15	396	171
Crisco	1 tbsp.	0.4	100	—	100	—
Crisco	1 cup	6.3	1602	—	1602	—
Croutons (fried)	15 croutons, $\frac{1}{2}$″ cubes	0.8	100	7	49	44
Croutons (toasted)	27 croutons, $\frac{1}{2}$″ cubes	1.4	100	14	4	82
Cucumbers	2 cucumbers 9″ long	20.3	100	19	12	69
Cup cakes, plain	$\frac{1}{2}$ cake 2″ diam., 2″ thick	0.9	100	8	32	60
Currants, dried	1 cup	5.5	502	15	24	463
Currants, dried	$\frac{1}{5}$ cup	1.1	100	3	5	92
Currants, fresh	$1\frac{1}{2}$ cups	6.2	100	11	—	89
Currants, fresh	1 cup	4.0	66	7	—	59
Custard, boiled	$\frac{1}{3}$ cup (scant)	2.2	100	13	44	43
Custard, cup	$\frac{1}{3}$ cup	3.3	100	17	39	44
Custard pie	Piece $1\frac{9}{16}$″ at circumference	1.9	100	9	32	59
Custard pie	Piece $4\frac{1}{2}$″ at circumference	4.2	225	20	72	133
Dandelion greens	$2\frac{1}{3}$ cups cooked	5.8	100	15	15	70
Date pudding I	Slice 1″ × 1″ × $1\frac{1}{2}$″	0.8	100	5	30	65
Date pudding II	Slice 3″ diam., $\frac{1}{2}$″ thick	1.1	100	7	27	66
Dates, stoned	1 cup	6.2	608	15	44	549

TABLE I — 100-CALORIE PORTIONS AND CALORIES IN COMMON MEASURES — *Continued*

MATERIAL	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
Dates, unstoned	3–4 dates	1.1	100	2	7	91
Doughnuts	½ doughnut	0.8	100	6	45	49
Egg and tomato salad	1 serving [1]	4.4	100	15	73	12
Egg lemonade	½ cup	4.8	100	13	24	63
Eggnog	½ cup (scant)	3.7	100	21	48	31
Egg plant	6 slices 4″ diam., ½″ thick	12.6	100	17	10	73
Egg salad	⅔ serving [1]	1.4	100	14	85	1
Egg salad	1 serving [1]	3.3	232	33	197	2
Egg timbale	⅜ cup	4.2	100	26	55	19
Eggs, à la goldenrod	⅓ serving [1]	2.0	100	18	42	40
Eggs, à la goldenrod	1 serving [1]	5.7	286	51	119	116
Eggs, deviled	1 egg	1.9	100	27	72	1
Eggs, in shell	1⅓ eggs	2.7	100	36	64	—
Eggs, in shell	1 egg	1.9	70	25	45	—
Eggs, poached on spinach	⅔ egg, ⅓ cup spinach	4.4	100	24	68	8
Eggs, scrambled	¼ cup	2.1	100	20	76	4
Eggs, whites	1 white	1.0	14	13	1	—
Eggs, whites	7 whites	6.9	100	97	3	—
Eggs, yolks	1 yolk	0.6	56	11	45	—
Eggs, yolks	2 yolks	1.0	100	17	83	—
Endive	14 stalks 5¾″ long	25.1	100	28	—	72
Endive	1 stalk 5¾″ long	1.8	7	2	—	5
Farina, cooked	¾ cup	6.0	100	12	4	84
Farina, uncooked	1 tbsp.	0.3	34	4	1	29
Farina, uncooked	1 cup	6.0	615	75	21	519
Figs, dried	1½ large	1.1	100	5	1	94
Figs, dried, chopped	1 cup	5.6	504	27	4	473

[1] For servings consult Table II, Dietary Recipes.

TABLE I — 100-CALORIE PORTIONS AND CALORIES IN COMMON MEASURES — *Continued*

MATERIAL	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
Figs, fresh, A. P.	3 small, 1½″ diam.	4.3	100	5	1	94
Filberts	8–10 nuts	0.5	100	9	84	7
Flounder, fresh, entrails removed	1 fish 8″ long without head and tail	12.5	100	91	9	—
Flour, buckwheat	1 tbsp.	0.4	40	3	1	36
Flour, Graham	1 tbsp.	0.3	34	5	2	27
Flour, Graham	1 cup	5.0	508	75	28	405
Flour, rice	1 tbsp.	0.5	50	5	6	39
Flour, rice	1 cup	8.5	867	85	127	655
Flour, rye	1 tbsp.	0.3	33	2	1	30
Flour, rye	1 cup	5.0	496	38	12	446
Flour, wheat, white, sifted	1 tbsp.	0.3	25	3	1	21
Flour, wheat, white, sifted	4 tbsp.	1.0	100	12	3	85
Flour, wheat, white, sifted	1 cup	3.9	395	50	10	335
Flour, wheat, white, unsifted	1 tbsp.	0.3	33	4	1	28
Flour, wheat, white, unsifted	1 cup	4.5	451	57	11	383
Flour, whole wheat, sifted	4½ tbsp.	1.0	100	15	5	80
Flour, whole wheat, sifted	1 cup	3.9	400	60	20	320
Frankfurters	1 sausage	1.4	100	31	67	2
French salad dressing	1½ tbsp.	0.6	100	—	100	—
Fruit balls	1 ball 1⅛″ diam.	1.0	100	5	30	65
Fruit cake	Piece 1⅞″ × 1⅞″ × ⅜″	0.9	100	6	26	68
Fruit cocktail	⅜ cup	3.4	100	3	3	94
Fruit cocktail	1 cup	7.1	206	6	5	195
Fruit punch	½ cup (scant)	1.8	100	1	1	98

TABLE I — 100-CALORIE PORTIONS AND CALORIES IN COMMON MEASURES — *Continued*

MATERIAL	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
Fruit salad	¼ cup fruit, ½ tbsp. dressing	1.5	100	3	75	22
Gelatin, granulated	1 tbsp.	0.3	29	29	—	—
Ginger ale	1½ cups	12.0	100	—	—	100
Gingerbread, hot water	Piece 1″ × 1⅔″ × 2″	1.1	100	7	21	72
Gingerbread, sour milk	Piece 1″ × 2″ × 2″	1.1	100	8	22	70
Ginger, crystallized	6 pieces 1½″ × ¾″ × ¼″	1.0	100	1	—	99
Ginger snaps	6 snaps	0.6	100	6	20	74
Ginger snaps	1 snap 1¾″ diam.	0.1	16	1	3	12
Grapefruit, in skin	½ large	10.0	100	7	4	89
Grapefruit, without skin	½ large	7.5	100	7	4	89
Grape juice	½ cup	3.5	100	—	—	100
Grapenuts	¼ cup	1.0	100	12	2	86
Grapes, Concord	1 large bunch	4.9	100	5	15	80
Grapes, Malaga	20–25 grapes	3.7	100	5	15	80
Griddle cakes	1 cake 4½″ diam.	1.8	100	14	25	61
Gumdrops	3 large gumdrops ⅞″ diam. or 25 very small	1.0	100	—	—	100
Halibut steak, cooked	Piece 3″ × 1¼″ × 1″	3.0	100	61	39	—
Ham, boiled	Slice 4¾″ × 4″ × ⅛″	1.3	100	29	71	—
Hamburg steak, see *Beef*						
Hard sauce	1 tbsp.	0.7	100	—	50	50
Hash, beef	¼ cup	1.7	100	35	39	26
Hermits	2½ cookies 2″ diam.	0.9	100	6	29	65

TABLE I — 100-CALORIE PORTIONS AND CALORIES IN COMMON MEASURES — *Continued*

MATERIAL	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbo-hydrate*
Hermits	1 cooky 2″ diam.	0.4	40	2	12	26
Hickory nuts, in shell	12–15 nuts	0.5	100	9	85	6
Hickory nuts, chopped	1 cup	6.0	1214	105	1032	77
Hominy grits, cooked	⅘ cup	6.8	100	9	1	90
Hominy grits, cooked	1 cup	9.0	141	13	2	126
Hominy grits, uncooked	1 cup	5.5	553	52	8	493
Honey	1 tbsp	1.1	100	1	—	99
Huckleberries, fresh	1 cup	4.7	100	3	7	90
Ice cream, commercial	¼ cup	1.6	100	4	63	33
Ice cream, French	¼ cup	2.0	100	6	55	39
Ice cream, Philadelphia	3 tbsp.	1.4	100	4	67	29
Ice cream, peach, see *Peach ice cream*						
Irish stew with dumplings	¼ cup stew, ⅙ dumpling	1.9	100	12	56	32
Irish stew with dumplings	1 cup stew, 1 dumpling	8.4	440	50	246	144
Jello	1 box	3.3	362	40	—	322
Jelly beans	15 beans	1.5	100	—	—	100
Junket, plain	⅜ cup	4.0	100	14	39	47
Junket, plain	1 cup	10.7	267	37	105	125
Kale, cooked	2⅓ cups	8.0	100	27	10	63
Kale, cooked	1 cup	3.0	37	10	4	23
Kohl-rabi, buttered	⅝ cup	3.8	100	8	70	22
Kohl-rabi, buttered	1 cup	6.1	163	14	114	35
Kohl-rabi, creamed	½ cup	4.8	100	15	46	39

TABLE I — 100-CALORIE PORTIONS AND CALORIES IN COMMON MEASURES — *Continued*

MATERIAL	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
Koumiss	1 quart	34.4	504	109	184	211
Lactose	3½ tbsp.	0.9	100	—	—	100
Lady fingers	2–4 fingers	1.0	100	10	13	77
Lamb chops, broiled	Lean meat of one chop, 2″ × 1½″ × ¾″	1.6	100	40	60	—
Lamb, leg, roast	Slice 3½″ × 4½″ × ⅛″	1.8	100	41	59	—
Lard	1 tbsp. (scant)	0.4	100	—	100	—
Lard	1 cup	8.0	2042	—	2042	—
Leeks	9 leeks 5″ long	10.8	100	15	13	72
Lemons, whole	3 large	11.4	100	9	15	76
Lemons, whole	1 medium	3.4	30	3	4	23
Lemonade	1 cup	8.0	72	—	—	72
Lemonade, egg	1 cup	9.0	190	25	45	120
Lemonade, lactose	1 cup	8.6	356	—	—	356
Lemon ice	½ cup (scant)	3.1	100	—	—	100
Lemon jelly	½ cup	3.8	100	9	—	91
Lemon juice	1 tbsp.	0.5	5	—	—	5
Lemon juice	1⅛ cups	9.0	100	—	—	100
Lemon meringue pie	Piece 1″ at circumference	1.0	100	5	27	68
Lemon meringue pie	Piece 4½″ at circumference	4.5	450	23	121	306
Lemon milk sherbet	¼ cup	1.9	100	4	12	84
Lemon sauce	⅛ cup	1.5	100	—	30	70
Lentil and tomato soup	⅚ cup	6.7	100	28	3	69
Lentils, dried	2½ tbsp.	1.0	100	29	3	68
Lettuce	2 large heads	18.5	100	25	14	61
Lettuce	2 large leaves	1.2	6	1	—	5
Lettuce salad with oil dressing	1 small serving [1]	1.2	100	1	95	4
Liver, see *Beef*						
Liver and noodle loaf	Piece 2″ × 2″ × 1½″	2.1	100	32	49	19

[1] For servings consult Table II, Dietary Recipes.

TABLE I — 100-CALORIE PORTIONS AND CALORIES IN COMMON MEASURES — *Continued*

MATERIAL	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
Lobster, canned	¾ cup	4.2	100	86	12	2
Loganberry juice	⅓ cup	2.3	100	—	—	100
Lollipops	2 lollipops 2″ diam.	1.0	100	—	—	100
Macaroni and cheese	½ cup	2.1	100	17	39	44
Macaroni, cooked	¾ cup	5.8	100	15	2	83
Macaroni croquettes	1 croquette	1.2	100	10	45	45
Macaroni, uncooked	¼ cup of 1″ pieces	1.0	100	15	2	83
Macaroni, uncooked	1 cup or 10 sticks 9″ long	3.5	355	53	8	294
Macaroni, with tomato sauce	5 tbsp.	3.6	100	10	36	54
Macaroons	2 macaroons	0.8	100	6	33	61
Mackerel, Spanish, fresh, entrails removed	1 fish 11″ long without head or tail	18.7	413	246	167	—
Mackerel, Spanish, fresh, entrails removed	Cross-section 2½″ on back	4.5	100	60	40	—
Mackerel, Spanish, broiled	Cross-section 2½″ on back	2.6	100	60	40	—
Maple sugar	Piece 1¾″ × 1¼″ × ½″	1.1	100	—	—	100
Maple syrup	1½ tbsp.	1.2	100	—	—	100
Marguerites	2 crackers	0.9	100	10	41	49
Marshmallows	5 marshmallows 1¼″ diam.	1.0	100	?	?	?
Mayonnaise dressing	1 tbsp.	0.5	100	1	97	2

TABLE I — 100-CALORIE PORTIONS AND CALORIES IN COMMON MEASURES — *Continued*

MATERIAL	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
Milk, condensed, sweetened	1½ tbsp.	1.1	100	11	23	66
Milk, condensed, sweetened	1 cup	10.0	915	99	209	607
Milk, condensed, unsweetened or evaporated	3¾ tbsp.	2.1	100	23	51	26
Milk, condensed, unsweetened or evaporated	1 cup	9.4	444	103	223	118
Milk, dried, whole	3 tbsp. (scant)	0.7	100	20	50	30
Milk, malted	3 tbsp.	0.9	100	14	7	79
Milk, skim	1⅛ cups	9.6	100	37	7	56
Milk, skim	1 cup	8.5	88	32	7	49
Milk, skim	1 quart	34.4	358	132	27	199
Milk, top 10 oz.	¼ cup	2.7	100	9	78	13
Milk, top 12 oz.	⅜ cup	3.0	100	10	75	15
Milk, whole	⅝ cup	5.1	100	19	52	29
Milk, whole	1 cup	8.5	170	34	88	48
Milk, whole	1 quart	34.4	676	130	351	195
Mince pie	Piece 1″ at circumference	1.2	100	8	39	53
Mince pie	Piece 4½″ at circumference	5.4	450	36	176	238
Mineral oil salad dressing, see *Salad dressing*						
Mints, chocolate cream	1 mint 3″ diam.	1.6	175	?	?	?
Mock Hollandaise sauce	1¼ tbsp.	0.8	100	4	90	6
Mock Hollandaise sauce	1 cup	8.3	1045	43	942	60

TABLE I — 100-CALORIE PORTIONS AND CALORIES IN COMMON MEASURES — *Continued*

MATERIAL	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
Molasses	1½ tbsp.	1.2	100	3	—	97
Molasses	1 tbsp.	0.8	65	2	—	63
Molasses	1 cup	10.0	815	27	—	788
Molasses cookies I	3 cookies, 2″ diam.	0.7	100	6	34	60
Molasses cookies II	2½ cookies, 2″ diam.	0.9	100	6	32	62
Molasses kisses	3 kisses	0.9	100	—	—	100
Muffins, bran	1 muffin, 2¾″ diam.	2.0	57	12	9	36
Muffins, corn-meal	1 muffin, 2¾″ diam.	1.6	133	17	33	83
Muffins, Graham	1 muffin, 2¾″ diam.	1.9	133	17	21	95
Muffins, one egg	1 muffin, 2¾″ diam.	1.5	125	15	30	80
Muffins, twin mountain	1 muffin, 2¾″ diam.	1.5	150	14	54	82
Muffins, whole wheat	1 muffin, 2¾″ diam.	1.7	133	16	25	92
Muffins, whole wheat with molasses	1 muffin, 2¾″ diam.	1.9	133	16	12	105
Mushrooms, fresh	20–25 mush-rooms, 1″ diam.	7.9	100	31	8	61
Mushrooms, stewed	⅝ cup	2.3	100	8	15	77
Mutton, leg, roast	Slice 3″ × 3¾″ × ⅛″	1.2	100	33	67	—
Nabisco almonds	10 almonds	0.7	100	?	?	?
Nabisco wafers	5 nabiscoes 2½″ × 1″ × ¼″	0.7	100	?	?	?
Nut and cheese roast	Slice 1¼″ × 1¼″ × ¾″	0.9	100	15	68	17
Nut loaf	¼ cup	1.4	100	16	62	22
Oatmeal cookies, with raisins and nuts	1 cooky 3″ diam.	0.9	133	15	28	90

TABLE I — 100-CALORIE PORTIONS AND CALORIES IN COMMON MEASURES — *Continued*

MATERIAL	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
Oatmeal cookies (Scottish Fancies)	1 cooky 2½″ diam.	0.8	100	9	17	74
Oatmeal wafers	1 wafer, 2¾″ diam.	0.5	100	11	23	66
Oats, rolled, uncooked	¼ cup	0.9	100	17	16	67
Oats, rolled, cooked	½ to ¾ cup	4.8	100	17	16	67
Okra	5–6 pods	2.0	20	3	1	16
Oleomargarine	1 tbsp.	0.5	100	1	99	—
Oleomargarine	1 cup	7.0	1492	10	1482	—
Olive oil	1 tbsp.	0.4	100	—	100	—
Olive oil	1 cup	7.3	1881	—	1881	—
Olives, green, unstoned	6–8 olives	1.6	100	1	83	16
Olives, green, stuffed	25 olives, ⅝″ long	2.5	100	?	?	?
Olives, ripe, unstoned	6–8 olives	1.7	100	3	90	7
Onions	3–4 medium	7.2	100	13	6	81
Onions, scalloped	⅓ cup	2.5	100	8	59	33
Orange ice	⅜ cup	3.2	100	—	—	100
Orange jelly with cream	5 tbsp. jelly, 2½ tbsp. whipped cream	2.7	100	6	28	66
Orange juice	1 tbsp.	0.5	6	—	—	6
Orange juice	1 cup	8.2	100	—	—	100
Orange milk sherbet	½ cup	3.8	100	9	26	65
Oranges, whole	1 large	9.5	100	7	2	91
Oranges, whole	1 medium	7.6	80	6	1	73
Oyster stew I	⅓ cup	3.5	100	18	58	24
Oyster stew II	½ cup	4.7	100	16	63	21
Oysters	⅔ cup solids or 6–15 oysters	7.2	100	49	24	27
Parsnips, whole	1 parsnip 7″ long, 2″ diam. at top	6.8	100	10	7	83

TABLE I — 100-CALORIE PORTIONS AND CALORIES IN COMMON MEASURES — *Continued*

MATERIAL	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
Parsnips, stewed	7 pieces $3\frac{1}{2}'' \times 1\frac{1}{2}'' \times \frac{1}{3}''$	5.8	100	10	7	83
Pea soup, green, cream of	$\frac{2}{3}$ cup	5.2	100	16	46	38
Pea soup, green, cream of	1 cup	7.8	150	24	69	57
Pea soup, split	$\frac{3}{5}$ cup	6.0	100	26	2	72
Pea soup, split	1 cup	10.0	166	43	3	120
Peach ice cream	$\frac{1}{4}$ cup	1.8	100	4	51	45
Peaches, canned	2 large halves and 3 tbsp. juice	7.5	100	6	2	92
Peaches, fresh, whole	3 medium	10.5	100	6	3	91
Peaches, stewed	$\frac{1}{2}$ cup	3.5	100	2	—	98
Peanut brittle	2 squares, $1\frac{1}{4}'' \times 1\frac{1}{4}'' \times \frac{3}{8}''$	0.8	100	6	20	74
Peanut butter	1 tbsp. (scant)	0.6	100	19	69	12
Peanut butter soup, cream of	$\frac{1}{3}$ cup (scant)	2.6	100	18	54	28
Peanut cookies	$1\frac{3}{4}$ cookies 2″ in diam.	0.8	100	11	43	46
Peanuts, chopped	1 tbsp.	0.3	50	9	32	9
Peanuts, chopped	1 cup	3.7	575	108	365	102
Peanuts, shelled	20–24 single nuts	0.6	100	19	63	18
Peanuts, shelled	1 cup	4.3	663	125	420	118
Pears, canned	3 halves and 3 tbsp. juice	4.7	100	2	4	94
Pears, fresh, whole	2 medium	6.3	100	4	6	90
Peas, canned, drained	$\frac{3}{4}$ cup	7.5	100	26	3	71

TABLE I — 100-CALORIE PORTIONS AND CALORIES IN COMMON MEASURES — *Continued*

MATERIAL	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
Peas, creamed	½ cup	2.7	100	18	37	45
Peas, dried, split	1 tbsp.	0.5	46	13	1	32
Peas, dried, split	1 cup	7.5	675	187	17	471
Peas, green, shelled	¾ cup	3.5	100	28	4	68
Pecans, shelled	12 meats	0.5	100	5	87	8
Pecans, shelled	1 cup	5.5	1145	60	990	95
Penuchi	Piece 1″ × 1″ × 1⅓″	0.9	100	2	18	80
Peppers, green	5 peppers 3½″ long	13.6	100	25	5	70
Peppers, green, stuffed I	1 large pepper	4.7	100	17	16	67
Peppers, green, stuffed II	1 large pepper	7.0	100	11	21	68
Peppers, green, stuffed III	⅖ large pepper	2.5	100	16	55	29
	1 pepper	5.7	226	37	123	66
Perfection salad	1½ cups	7.0	100	15	—	85
Pie crust, plain, baked	Single crust of pie 9″ diam.	2.8	400	24	232	144
Pie crust, plain, baked	¼ of one crust, 9″ diam.	0.7	100	6	58	36
Pineapple and carrot salad	½ serving [1]	2.8	100	3	35	62
Pineapple, canned	1 slice and 3 tbsp. juice or ¼ cup shredded	2.3	100	1	4	95
Pineapple, canned, shredded	1 cup	8.5	369	4	15	350
Pineapple, fresh	2 slices 1″ thick	8.2	100	4	6	90
Pineapple marshmallow cup	⅖ cup	2.9	100	1	1	98

[1] For servings consult Table II, Dietary Recipes.

TABLE I — 100-CALORIE PORTIONS AND CALORIES IN COMMON MEASURES — *Continued*

MATERIAL	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
Pineapple marshmallow cup	1 cup	7.1	244	2	—	242
Pineapple salad	¼ serving [1]	1.4	100	8	60	32
Pine nuts	¼ cup	0.6	100	22	73	5
Plain cookies	2 cookies, 2¼″ diam.	0.9	100	6	33	61
Plums, fresh, whole	3–4 large	4.4	100	5	—	95
Popcorn, popped	1½ cups	0.9	100	11	11	78
Popcorn, unpopped	⅛ cup	0.9	100	11	11	78
Popovers	1 popover	2.0	100	18	27	55
Pork chops, broiled	1 chop (lean meat only)	2.4	200	64	136	—
Pork sausage, cooked	1⅔ sausages 3″ long, ¾″ diam.	1.1	100	20	78	2
Potato salad	¼ cup	1.7	100	3	68	29
Potato salad	1 cup	7.3	420	14	282	124
Potato soup	½ cup (scant)	4.2	100	15	38	47
Potatoes, sweet, in skins	½ medium	3.6	100	6	5	89
Potatoes, sweet, baked	½ medium	3.0	100	6	5	89
Potatoes, sweet, glazed	½ small	2.1	100	4	7	89
Potatoes, white, whole	1 medium	5.3	100	11	1	88
Potatoes, white	¾ cup of ½″ cubes	4.2	100	11	1	88
Potatoes, white, baked	1 medium	3.0	100	11	1	88
Potatoes, white, boiled	1 medium	3.6	100	11	1	88
Potatoes, white, chips	8–10 large pieces	0.6	100	5	63	32

[1] For servings consult Table II, Dietary Recipes.

TABLE I — 100-CALORIE PORTIONS AND CALORIES IN COMMON MEASURES — *Continued*

MATERIAL	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
Potatoes, white, creamed	⅔ cup	2.7	100	9	50	41
Potatoes, white, creamed	1 cup	6.4	235	21	116	98
Potatoes, white, mashed	½ cup (scant)	3.1	100	7	48	45
Potatoes, white, riced	⅞ cup	4.2	100	11	1	88
Potatoes, white, scalloped	⅝ cup	3.5	100	9	30	61
Potatoes, white, scalloped	1 cup	5.7	163	15	49	99
Pretzels	5 pretzels	1.0	100	14	6	80
Prune and cottage salad	⅙ serving [1]	2.4	100	11	41	48
Prune pudding, Norwegian	3 tbsp.	2.0	100	2	—	98
Prune pudding, Norwegian	1 cup	8.7	433	5	—	428
Prune pulp	1 tbsp.	0.5	20	1	—	19
Prune pulp	4¾ tbsp.	2.8	100	3	—	97
Prune soufflé	⅖ cup	1.8	100	10	—	90
Prune soufflé	1 cup	4.8	258	25	1	232
Prunes, dried	4 medium	1.4	100	3	—	97
Prunes, stewed, sweetened	2 prunes and 2 tbsp. juice	2.8	100	2	—	98
Pumpkin, cooked	1 cup	6.5	70	7	4	59
Pumpkin, cooked	1½ cups	9.3	100	10	6	84

[1] For servings consult Table II, Dietary Recipes.

TABLE I — 100-CALORIE PORTIONS AND CALORIES IN COMMON MEASURES — *Continued*

MATERIAL	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
Radishes	3 doz. red button	12.0	100	18	3	79
Raisin pie	Piece 1″ at circumference	1.2	100	3	29	68
Raisin pie	Piece 4½″ at circumference	5.4	450	13	120	317
Raisin and cranberry pie	Piece 1⅛″ at circumference	1.0	100	3	27	70
Raisin and cranberry pie	Piece 4½″ at circumference	4.0	400	12	108	280
Raisins	¼ cup seeded or 2 tbsp. seedless	1.0	100	3	9	88
Raisins, seeded	1 cup	5.0	489	15	42	432
Raspberries, fresh	1⅛ cups	5.3	100	10	14	76
Raspberry sherbet	¼ cup	2.1	100	1	—	99
Rhubarb, fresh	4 cups of 1″ pieces	15.3	100	10	27	63
Rhubarb, stewed, sweetened	½ cup	3.9	100	1	2	97
Rhubarb pie	Piece 1⅔″ at circumference	1.7	100	5	18	77
Rhubarb pie	Piece 4½″ at circumference	4.8	280	14	50	216
Rice dainty	¼ cup	1.9	100	4	37	59
Rice fondue on saltines	2½ tbsp. fondue, 1¼ saltines	1.4	100	22	48	30
Rice fondue on saltines	2 tbsp. fondue, 1 saltine	1.1	80	18	38	24
Rice pudding (with egg)	½ cup (scant)	3.1	100	18	32	50
Rice pudding, (creamy)	¼ cup	2.2	100	12	27	61
Rice pudding (with raisins)	½ cup (scant)	1.5	100	8	7	85
Rice, puffed	1⅓ cups	1.0	100	9	1	90

TABLE I — 100-CALORIE PORTIONS AND CALORIES IN COMMON MEASURES — *Continued*

MATERIAL	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
Rice, steamed	¾ cup	4.0	100	9	1	90
Rice, uncooked	2 tbsp.	1.0	10	9	1	90
Rice, uncooked	1 cup	7.0	696	63	6	627
Rice with cheese	¼ cup	1.6	100	17	34	49
Rice with cheese and tomatoes	¼ cup	2.1	100	19	42	39
Rolls, French	1 roll	1.3	100	12	8	80
Rutabagas, buttered	½ cup	3.7	100	5	63	32
Rutabagas, creamed	½ cup	4.5	100	11	45	44
Rutabagas, uncooked	1⅔ cups of ½″ cubes	8.5	100	13	4	83
Rutabagas, whole	1 large, 7½″ long, 4½″ diam.	34.8	288	36	9	243
Salad dressing, boiled	¼ cup	2.8	100	10	64	26
Salad dressing, French — see *French salad dressing*						
Salad dressing, mayonnaise — see *Mayonnaise dressing*						
Salad dressing, mineral oil	2 cups	16.0	100	13	62	25
Salmon, canned	½ cup (scant)	1.8	100	45	55	—
Salmon, creamed on toast	¼ cup salmon, ½ slice toast	2.4	100	22	42	36
Salmon loaf	¼ cup	2.1	100	37	52	11
Samp, baked with cheese	½ cup	4.0	100	14	20	66
Sardines, canned	4 sardines 3″ long	1.3	100	34	66	—

TABLE I — 100-CALORIE PORTIONS AND CALORIES IN COMMON MEASURES — *Continued*

MATERIAL	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
Sardine salad	⅓ serving [1]	1.1	100	27	63	10
Sauerkraut	2½ cups packed	13.0	100	25	17	58
Scallops	¾ cup	4.8	100	80	1	19
Shrimp, canned without oil	20 shrimps or ⅔ cup	3.2	100	91	8	1
Smelts, whole	2 fish 6″ long	7.1	100	82	18	—
Snow pudding	⅔ cup	2.2	100	10	—	90
Soda water, plain	1 large glass	—	200	—	—	200
Soda water with chocolate ice cream	1 large glass	—	375	?	?	?
Soda water with vanilla ice cream	1 large glass	—	325	?	?	?
Soy bean loaf	2½ tbsp.	1.2	100	23	54	23
Soy bean loaf	1 cup	7.1	591	137	320	134
Soy bean soup	⅜ cup	3.5	100	20	58	22
Soy bean soup	1 cup	7.5	216	44	124	48
Soy beans, dried	1¾ tbsp.	0.8	100	32	35	33
Spanish cream	1 cup	2.5	100	18	28	54
Spinach à la crême	⅗ cup	4.1	100	10	70	20
Spinach à la crême	1 cup	6.8	165	17	116	32
Spinach, cooked and chopped	2½ cups	18.7	100	12	8	80
Spinach, cooked and chopped	1 cup	8.5	43	15	5	23
Spinach soup, cream of	⅔ cup	4.2	100	16	56	28
Spinach soup, cream of	1 cup	7.6	179	28	101	50
Spinach with egg	⅘ cup	7.6	100	22	60	18

[1] For servings consult Table II, Dietary Recipes.

TABLE I — 100-CALORIE PORTIONS AND CALORIES IN COMMON MEASURES — *Continued*

MATERIAL	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
Sponge cake, 6-egg	Piece $1\frac{1}{2}'' \times 1\frac{1}{2}'' \times 2''$	0.9	100	11	19	70
Sponge cake, hot water	Piece $2'' \times 2\frac{3}{4}'' \times \frac{7}{8}''$	0.9	100	7	7	86
Squash, Hubbard, cooked	1 cup (scant)	7.7	100	12	10	78
Squash pie	Piece 2″ at circumference	1.8	100	10	25	65
Squash pie	Piece $4\frac{1}{2}''$ at circumference	4.1	225	23	56	146
Squash, summer	$\frac{1}{2}$ squash 5″ diam.	15.6	100	12	8	80
Strawberries, fresh	$1\frac{1}{3}$ cups	9.0	100	10	14	76
Succotash, canned	$\frac{1}{3}$ cup	3.6	100	15	9	76
Suet	1 cup	3.5	749	19	730	—
Sugar, brown	3 tbsp.	0.9	100	—	—	100
Sugar, brown	1 cup	5.8	625	—	—	625
Sugar cookies	2 cookies, $2\frac{1}{4}''$ diam.	0.9	100	6	33	61
Sugar, granulated	2 tbsp. (scant)	0.9	100	—	—	100
Sugar, granulated	1 cup	7.4	840	—	—	840
Sugar, loaf	4 pieces $1\frac{1}{8}'' \times \frac{3}{4}'' \times \frac{3}{8}''$	0.9	100	—	—	100
Sugar, powdered	$2\frac{3}{4}$ tbsp.	0.9	100	—	—	100
Sugar, powdered	1 cup	6.0	680	—	—	680
Sundae, chocolate, chocolate and walnut sauce	1 sundae	—	425	24	?	?
Sundae, chocolate ice cream with maple walnut sauce	1 sundae	—	419	16	?	?

TABLE I — 100-CALORIE PORTIONS AND CALORIES IN COMMON MEASURES — *Continued*

MATERIAL	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
Sundae, fruit ice cream with fruit sauce	1 sundae	—	250	?	?	?
Sundae, vanilla ice cream with chocolate sauce	1 sundae	—	396	36	?	?
Sundae, vanilla ice cream, walnut marshmallow sauce	1 sundae	—	350	16	?	?
Sweetbreads	1 pair, medium size	8.0	400	152	248	—
Swiss chard with mayonnaise	1 serving [1]	3.5	100	12	70	18
Swiss steak, see *Beef*						
Tapioca	2 tbsp.	1.0	100	—	—	100
Tapioca	1 cup	6.5	653	3	2	648
Tapioca cornmeal pudding	2 tbsp.	1.8	100	11	20	69
Tapioca cornmeal pudding	1 cup	11.8	674	77	135	462
Tapioca cream	$\frac{2}{5}$ cup	2.8	100	12	28	60
Tapioca cream	1 cup	7.3	255	30	73	152
Toast, cream	$\frac{2}{5}$ slice toast, $\frac{1}{5}$ cup sauce	2.2	100	13	43	44
Toast, cream	1 slice toast and $\frac{1}{3}$ cup sauce	3.5	160	21	69	70
Toast, French	Slice $3'' \times 3'' \times \frac{1}{2}''$	1.4	100	10	48	42
Tomato and cucumber salad	$\frac{5}{8}$ serving [1]	2.0	100	4	81	15

[1] For servings consult Table II, Dietary Recipes.

TABLE I — 100-CALORIE PORTIONS AND CALORIES IN COMMON MEASURES — *Continued*

MATERIAL	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
Tomato and lettuce salad	½ serving [1]	2.7	100	3	86	11
Tomato jelly salad	1¼ cups	12.7	100	37	5	58
Tomato sauce	⅓ cup	2.5	100	5	70	25
Tomato soup, canned	¾ cup	7.0	100	12	12	76
Tomato soup, clear	1 cup (scant)	7.4	100	8	48	44
Tomato soup, cream of	⅜ cup	3.2	100	11	63	26
Tomato soup, cream of	1 cup	8.7	269	30	169	70
Tomatoes, canned	2 cups (scant)	15.6	100	21	8	71
Tomatoes, fresh, whole	2–3 medium	15.5	100	16	16	68
Tomatoes, scalloped	½ cup	4.8	100	11	40	49
Tomatoes, stuffed with liver	½ tomato	3.5	100	41	43	16
Tomatoes, stuffed	1 tomato	4.0	100	13	45	42
Triscuit	6 triscuits, 2″ square	1.0	100	13	5	82
Tuna fish à la Newburg	¼ cup (scant)	1.8	100	36	60	4
Tuna fish, canned	½ cup	2.8	100	70	30	—
Turkey, dark meat, cooked	1 slice 4″ × 2½″ × ¼″	1.8	100	80	20	—
Turkey, light meat, cooked	1 slice 4″ × 2¼″ × ¼″	1.9	100	75	25	—
Turkey, roast, with stuffing	⅙ cup	0.8	100	9	48	43
Turkish pilaf	1 cup	7.5	100	9	22	69

[1] For servings consult Table II, Dietary Recipes.

TABLE I — 100-CALORIE PORTIONS AND CALORIES IN COMMON MEASURES — *Continued*

MATERIAL	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
Turnip greens, boiled	2½ cups, cooked	15.4	100	36	7	57
Turnip greens, boiled	1 cup	6.1	40	14	3	23
Turnip greens, creamed	⅗ cup	4.5	100	15	56	29
Turnip greens, creamed	1 cup	7.7	173	25	99	49
Turnip greens with oil dressing	⅗ cup	2.9	100	7	80	13
Turnip greens with oil dressing	1 cup	4.9	169	12	136	21
Turnips	2 cups of ½″ cubes	9.0	100	13	5	82
Turnips, creamed	½ cup	1.4	100	10	50	40
Veal cutlets, breaded	⅖ serving [1]	2.0	100	30	52	18
Veal kidney	1 kidney, 4¾″ long	7.0	250	133	117	—
Veal kidney	⅖ of kidney 4¾″ long	2.8	100	54	46	—
Veal leg, roast	Slice 2″ × 2¾″ × ⅛″	2.3	100	71	29	—
Veal liver, uncooked	Slice 3½″ × 2½″ × ½″	2.9	100	62	38	—
Veal liver, pan broiled	Slice 3½″ × 2½″ × ⅜″	2.1	100	62	38	—
Waffles	1 waffle 6″ diam.	2.3	250	35	88	127
Waffles	⅖ of waffle, 6″ diam.	0.9	100	14	35	51
Waldorf salad	⅖ serving [1]	1.2	100	4	76	20
Waldorf salad	1 serving [1]	3.0	250	10	190	50
Walnuts, English	8–16 meats or 1¼ tbsp. chopped	0.5	100	11	82	7

[1] For servings consult Table II, Dietary Recipes.

TABLE I — 100-CALORIE PORTIONS AND CALORIES IN COMMON MEASURES — *Continued*

MATERIAL	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
Walnuts, English	1 cup chopped	3.0	600	63	493	44
Watercress	5 bunches, 3″ long, 3″diam.	15.9	100	13	20	67
Watermelon	¾″ slice, 6″ diam.	11.7	100	5	6	89
Welsh rarebit	1½ tbsp. sauce, ½ slice toast	1.3	100	22	57	21
Welsh rarebit	¼ cup sauce, 1 slice toast	2.7	210	46	120	44
Wheat, flaked, cooked	⅔ cup	6.0	100	13	5	82
Wheat, flaked, uncooked	⅓ cup	1.0	100	13	5	82
Wheat, flaked, uncooked	1 cup	3.0	309	46	10	253
Wheat, puffed	2 cups	1.0	100	13	5	82
Wheat, shredded	1 biscuit	1.0	100	13	5	82
Whey	1 cup	8.0	60	9	6	45
Whey	1⅔ cups	13.0	100	15	10	75
White mountain icing	2½ tbsp.	1.0	100	1	—	99
White sauce, medium thick	¼ cup	2.4	100	8	70	22
Yeast, compressed	1 cake	0.5	18	6	—	12
Yeast, compressed	6 cakes	3.0	100	32	—	68
Zwieback	3 pieces 3¼″ × 1¼″ × ½″	0.8	100	9	21	70

TABLE II

Dietary Recipes

Introductory Note

Since a great deal of variation in fuel 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 or other measures 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 and, also, 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 any one intent on learning to estimate food values for practical household purposes, these discrepancies are of no moment. A variation of a few calories in a day's dietary has no particular significance. What one needs to know is the *approximate* food value of any dish which is prepared. One can then estimate the food value of each individual serving without difficulty. The food values for the whole recipe have been stated first, followed usually by those for some convenient smaller unit of measure. If anyone will take the trouble to measure a 100-calorie portion, it will be found possible to remember this well enough to judge of the approximate calorie 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.

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.

TABLE II — DIETARY RECIPES

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
ANGEL CAKE						
1 cup sugar						
¾ cup flour						
Whites 8 eggs	Loaf 2½″ × 5½″					
1 tsp. vanilla	× 5½″	14.0	1260	156	12	1092
1 tsp. cream of	Piece 1¼″ × 2″					
tartar	× 2½″	1.3	100	12	1	87
APPLE, BAKED						
1 large apple						
2 tbsp. sugar						
1 tbsp. water	1 serving	4.5	200	3	5	192
APPLE, BAKED, WITH WHIPPED CREAM						
1 large apple						
1 tbsp. sugar						
1 tbsp. water						
1 tbsp. cream	1 apple	4.8	200	3	61	136
APPLE PIE						
4 apples						
½ cup sugar						
Water	Pie 9″ diam.	28.0	1830	64	744	1022
Plain pastry	Piece 4½″ at					
for 2 crusts	circumference	4.8	300	9	123	168
APPLE SAUCE						
4 large apples						
6½ tbsp. sugar	2½ cups	23.0	671	9	26	636
Water	1 cup	9.2	268	4	10	254
APPLE SAUCE CAKE						
1 cup sugar						
2 tbsp. butter						
1 cup apple sauce						
2 cups flour	Loaf 5¾″ × 8″					
1 tsp. soda	× 1½″	21.2	2474	116	281	2077
⅔ cup raisins	Piece 1½″ × ½″					
Spices	× 3¾″	0.8	100	5	11	84
APPLE SNOW						
3 egg whites						
¾ cup steamed						
apple pulp						
½ cup sugar	5¾ cups	15.7	762	48	18	696

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
APPLE TAPIOCA						
½ cup tapioca						
4 apples						
½ cup sugar						
3 cups water						
Few grains salt	2⅓ cups	34.5	950	6	12	932
APRICOTS, STEWED, DRIED						
1 lb. apricots						
1 cup sugar	5¼ cups	56.4	2100	85	41	1974
Water	1 cup	10.7	400	16	8	376
ASPARAGUS, AU GRATIN						
20 canned asparagus tips 3″ long						
1½ tbsp. cheese						
½ slice bread						
½ tbsp. butter						
Seasoning	1 cup	5.9	200	40	115	45
ASPARAGUS, CREAMED						
20 asparagus tips						
1 tbsp. butter						
1 tbsp. flour						
½ cup milk	½ cup	5.0	268	39	152	77
ASPARAGUS, ON TOAST						
1 can (20 stalks) asparagus						
4 slices toast	4 servings	30.8	678	92	309	277
1 cup white sauce	1 serving	7.7	169	23	77	69
ASPARAGUS SOUP, CREAM OF						
1 can asparagus						
1 bouillon cube						
4 cups milk						
4 tbsp. butter						
5 tbsp. flour						
2 eggs	2 qts.	60.0	1510	250	845	415
Seasonings	1 cup	7.5	189	31	106	52

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
AVOCADO DESSERT						
½ small avocado						
½ tbsp. powdered sugar						
½ tsp. lemon juice	1 serving	2.4	149	5	108	36
AVOCADO ON THE HALF SHELL						
½ large avocado pear						
1 tsp. olive oil						
1 tbsp. lemon juice	1 serving	6.4	456	12	394	50
AVOCADO SALAD						
⅓ cup avocado cubes						
2 lettuce leaves						
1½ tsp. olive oil						
½ tsp. lemon juice	1 serving	3.0	170	5	148	17
BAKING POWDER BISCUIT						
2 cups flour						
4 tsp. baking powder						
1 tsp. salt						
1 tsp. lard						
1 tbsp. butter	24 small biscuits	14.8	1182	128	319	735
¾ cup milk	1 biscuit	0.7	50	5	14	31
BANANA JELLY						
1 tbsp. gelatin						
⅜ cup sugar	Piece 6″ × 4″					
¾ cup banana	× 1¼″	16.0	418	37	6	375
1 tbsp. lemon juice	Piece 3″ × 2″					
2 cups water	× 1″	3.8	100	9	1	90
BANANA NUT SALAD						
1 tbsp. walnuts						
½ banana						
1 lettuce leaf						
1 tbsp. mayonnaise	1 serving	4.4	261	15	175	71
BANANA SALAD						
4 bananas						
1 tbsp. lemon juice						
8 lettuce leaves						

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
BANANA SALAD—*Continued*						
½ cup chopped peanuts	8 servings	23.2	881	105	317	459
¼ cup boiled dressing	1 serving	2.9	110	13	40	57
BAKED BEAN SOUP, CREAM OF						
2 tbsp. butter						
4 tbsp. flour						
1⅓ cups milk						
1 cup bean pulp						
1⅓ cups water	4½ cups	21.5	824	120	372	332
Seasonings	1 cup	4.8	183	27	82	74
BEAN STEW, KIDNEY						
½ cup kidney beans						
½ onion						
1 tbsp. rice						
2 small potatoes						
2 cups canned tomatoes						
1 tbsp. butter	3¾ cups	36.0	730	189	130	411
Seasonings	1 cup	9.6	195	50	35	110
BEANS, LIMA, BAKED						
2 cups dried lima beans						
2″ cube fat salt pork						
1 small onion, cut fine	6 cups (round pan 8″ diam., 4″ deep)	42.0	1760	233	693	834
½ cup carrot cubes						
2 tbsp. butter	1 cup	7.0	293	39	115	139
BEANS, LIMA, BUTTERED						
1 cup beans						
1 tbsp. butter	1 cup	6.9	396	61	146	189
BEANS, STRING, BUTTERED						
2¼ cups string beans 1″ pieces						
1 tbsp. butter	2⅓ cups	10.0	200	23	106	71
½ tsp. salt	1 cup	4.3	86	10	46	30

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
BEANS, STRING, CREAMED						
1 cup string beans 1″ pieces						
⅜ cup milk						
2 tsp. butter						
2 tsp. flour	⅔ cup	6.8	193	25	104	64
¼ tsp. salt	1 cup	10.2	290	38	156	96
BEEF, DRIED, CREAMED I						
½ oz. dried beef (slice 4″×5″)						
1 tbsp. beef drippings						
1 tbsp. flour						
⅝ cup milk	¾ cup	6.0	250	40	162	48
Seasonings	1 cup	8.0	333	53	216	64
BEEF, DRIED, CREAMED II						
½ cup (2 oz.) dried beef						
1 cup milk						
2 tbsp. butter						
2 tbsp. flour	1½ cups	12.0	520	106	322	92
Seasonings	1 cup	8.0	347	71	215	61
BEEF, HAMBURG STEAK WITH GRAVY						
½ cup chopped beef						
1 tbsp. flour						
½ tbsp. butter	2 balls 2″ diam., ¾″ thick	6.8	482	154	30	298
Onion						
Salt and pepper	4 tbsp. gravy					
BEEF, HEART, STUFFED						
1 beef heart (3 lb.)	1 heart and gravy	48.0	4218	940	2810	468
9 oz. salt pork						
6 oz. bread crumbs	Piece 2½″ × 2½″ × ¼″ and 1 tbsp. gravy	1.1	100	21	68	11
¼ cup flour						
Seasonings						

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
BEEF LOAF						
2 lb. lean beef						
1 egg	Loaf 4″ × 6″ × 2½″	26.0	1811	719	1092	—
2 tbsp. melted butter	Piece 4″ × 6″ × ⅛″	1.4	100	40	60	—
Seasonings						
BEEF, ROUND STEAK, STUFFED						
2 lb. lean steak	Roll 6″ or 7″ long, 3″ diam.	36.0	2107	800	1051	256
2 oz. suet						
4 oz. bread crumbs	Piece 3″ diam., ½″ thick	1.7	100	39	49	12
Seasonings						
BEEF, SIRLOIN STEAK						
Piece of steak 4″ × 2″ × ¾″	1 serving	5.6	398	108	290	—
½ tbsp. butter						
BEEF STEW WITH VEGETABLES						
½ lb. beef plate						
½ cup carrot cubes						
1 onion						
3 potatoes						
½ cup turnip cubes						
¼ cup flour						
Water and seasonings	4¾ cups	34.0	1132	183	510	439
	1 cup	7.2	238	39	107	92
BEEF, SWISS STEAK						
1 lb. lean beef round						
½ cup flour						
2 tbsp. drippings	Piece 4½″ × 7″ × 1″	15.0	1215	418	585	212
1 slice onion						
1 tbsp. vinegar	Piece 4″ × 1″ × ⅝″	1.2	100	35	48	17
Seasonings						
BOSTON BROWN BREAD						
1 cup rye meal						
1 cup corn meal						
1 cup graham flour	4 loaves 3″ diam., 4½″ high	40.9	2260	219	227	1814
¾ tbsp. soda						
1 tsp. salt						
¾ cup molasses	Slice 3″ diam., ¾″ thick	1.8	100	10	10	80
2 cups sour milk						

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbo-hydrate*
BRAN MUFFINS						
1 cup flour						
1 tsp. soda						
2 cups bran						
1 tsp. salt						
1¼ cups milk	12 muffins, 2¾″					
½ cup molasses	diam.	24.0	1382	271	236	875
1 egg	1 muffin	2.0	115	23	20	72
BROWN BETTY						
2 cups bread crumbs						
4 tbsp. butter						
3 large apples						
½ cup sugar	2½ cups	25.5	1240	44	434	762
1 cup water	1 cup	10.2	500	18	175	307
BROWN SAUCE						
2 tbsp. butter						
½ slice onion						
3 tbsp. flour						
1 cup brown stock	1⅛ cups	7.8	228	32	112	84
Seasonings	1 cup	6.7	195	27	96	72
BROWN SUGAR SAUCE						
½ cup brown sugar						
½ tbsp. cornstarch						
1 cup water						
1 tsp. vinegar	1 cup (very full)	9.9	330	—	—	330
CABBAGE, BUTTERED						
1¾ cups cabbage	¾ cup	5.8	100	10	54	36
½ tbsp. butter	1 cup	7.7	133	13	72	48
CAKE, ONE-EGG						
¼ cup butter						
½ cup sugar						
1 egg						
½ cup milk	Loaf 1¾″ × 3½″					
1½ cups flour	× 4¾″	16.0	1584	123	502	959
2½ tsp. baking	Piece 1¾″ × 1¾″					
powder	× 1¾″	1.0	100	8	32	60
CARROTS, BUTTERED						
2 cups carrots	1¾ cups	10.6	351	13	235	103
2 tbsp. butter	1 cup	6.1	200	7	134	59

For other cakes see *Angel*, *Chocolate*, *Fruit*, etc.

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
CARROTS, CREAMED						
2 cups carrots						
¾ tbsp. butter						
¾ tbsp. flour	2½ cups	14.8	330	36	144	150
⅔ cup milk	1 cup	5.9	131	14	57	60
CARROT SANDWICH						
2 slices whole wheat bread 3¾″ × 3″ × ¼″						
1 tsp. butter						
3 tbsp. raw grated carrot						
1 tbsp. orange juice	1 sandwich	3.4	127	13	40	74
CELERY SOUP, CREAM OF						
2 bunches celery						
4 tbsp. butter						
6 tbsp. flour						
3 cups milk	5¼ cups	40.0	1097	128	666	303
Seasonings	1 cup	8.4	230	26	140	64
CHARLOTTE RUSSE FILLING						
1 cup thick cream						
½ cup skim milk						
½ tsp. gelatin						
¼ cup sugar	2½ cups	17.2	1177	44	879	254
4 tbsp. water	1 cup	6.9	471	18	351	102
CHEESE AND OLIVE SANDWICH						
1 tbsp. mayonnaise						
2 tbsp. cheese						
2 olives, chopped						
2 slices white bread 3½″ × 3″ × ½″	1 sandwich	3.8	426	54	260	112
CHEESE AND PINEAPPLE SALAD						
½ head lettuce						
6 slices canned pineapple						
1 cream cheese						
6 tbsp. French dressing	6 servings	22.4	1315	121	754	440
	1 serving	3.7	219	20	126	73

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
CHEESE FONDUE						
1¼ cups grated cheese						
1 cup milk						
1 tbsp. butter	Round pan 1″					
1 cup soft bread crumbs	deep, 7″ diam.	15.8	1053	247	681	125
3 eggs	Piece 1″ × 2¼″ × 3¼″	3.0	200	46	130	24
CHEESE SAUCE						
1½ tbsp. butter						
1½ tbsp. flour						
1 cup milk	1¼ cups	10.5	492	73	338	81
¼ cup grated cheese	1 cup	8.4	393	58	270	65
CHEESE SOUFFLÉ						
2 tbsp. butter						
3 tbsp. flour						
½ cup milk						
¼ cup cheese						
3 eggs	3 cups	11.5	661	119	467	75
Seasonings	1 cup	3.8	220	40	155	25
CHEESE STRAWS						
1 tbsp. butter						
⅔ cup flour						
1 cup bread crumbs						
2 tbsp. milk	28 straws					
1 cup grated cheese	5″ × ⅜″ × ⅜″	8.0	1050	182	542	326
Seasonings	1 straw	0.3	38	7	19	12
CHEESE, TOASTED SALTINES						
6 saltines						
2 tbsp. cheese	6 crackers	1.1	172	28	79	65
CHICKEN, CREAMED						
½ cup canned chicken						
1 tbsp. butter						
1 tbsp. flour						
½ cup milk	1 cup	7.2	435	72	315	48
CHICKEN SALAD						
1 cup cooked chicken						
1 cup celery						

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
CHICKEN SALAD — *Continued*						
8 lettuce leaves						
4 tbsp. French dressing						
4 tbsp. mayonnaise dressing	8 servings	14.1	915	112	783	20
	1 serving	1.8	114	14	98	2
CHOCOLATE I						
½ cup milk						
½ cup water						
½ sq. chocolate						
1 tbsp. sugar	1 cup	9.0	223	23	106	94
CHOCOLATE II						
1 cup milk						
½ sq. chocolate						
1 tbsp. sugar	1 cup	9.3	306	39	150	117
CHOCOLATE BLANC MANGE						
3 tbsp. cornstarch						
2 cups milk						
½ cup sugar						
1½ sq. chocolate	2½ cups	21.2	1077	88	362	627
½ tsp. vanilla	1 cup	8.5	431	35	145	251
CHOCOLATE DROP COOKIES						
½ cup butter						
1 cup brown sugar						
½ cup milk						
2 cups flour						
2 eggs						
3 sq. chocolate						
1 cup nut meats	56 cookies 2¼″ diam.	32.0	3760	292	1980	1488
2 tsp. soda						
2 tsp. vanilla	1 cooky	0.6	63	5	35	23
CHOCOLATE FUDGE						
2 cups sugar						
⅔ cup milk	Sheet 6″ × 4″ × 1″	20.6	2244	56	444	1744
1 tbsp. butter						
2 sq. chocolate	Piece 1½″ × 1″ × ¾″	0.9	100	2	20	78
1 tsp. vanilla						

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
CHOCOLATE LOAF CAKE						
½ cup butter						
1 cup sugar						
2 eggs						
½ cup milk						
1½ cups flour	Loaf 5½″ × 10½″ × 2½″	28.0	3070	165	1252	1653
2½ tsp. baking powder						
2 sq. chocolate	Piece 2½″ × 2½″ × ⅞″	0.9	100	5	41	54
CHOCOLATE NUT CARAMELS						
¾ cup condensed milk						
¾ cup cream						
2 cups sugar						
¾ cup glucose						
2 sq. chocolate	Sheet 8″ × 4″ × 1″	26.0	3892	173	1260	2459
½ cup English walnuts						
½ cup almonds	Piece 1″ × 1″ × ⅝″	0.7	100	4	32	64
CHOCOLATE NUT FUDGE						
2 cups sugar						
¾ cup milk						
2 tbsp. butter						
2 sq. chocolate						
½ tsp. vanilla						
¾ cup chopped walnuts						
⅛ tsp. salt	Square 5″ × 6″ × 1″	28.4	3133	122	1060	1951
CLUB SANDWICH						
2 slices toast						
2 slices cooked bacon						
2 large leaves lettuce						
3 tbsp. chopped chicken						
3 tbsp. mayonnaise dressing						

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
CLUB SANDWICH — *Continued*						
4 olives						
2 slices tomato						
½ egg	1 sandwich	9.0	609	91	417	101
COCOA I						
½ cup milk						
½ cup water						
2 tsp. cocoa						
2 tsp. sugar	1 cup	9.0	161	22	63	76
COCOA II						
1 cup milk						
2 tsp. cocoa						
2 tsp. sugar	1 cup	9.0	240	38	107	95
COCOA III						
1 cup milk						
2 tsp. cocoa						
3 tbsp. lactose	1 cup	9.2	320	39	107	174
COCOA IV						
4 tbsp. dried whole milk						
2 tsp. cocoa						
2 tsp. sugar						
1 cup water	1 cup	6.5	217	36	93	88
COCOA V						
½ cup evaporated milk						
½ cup water						
2 tsp. cocoa						
2 tsp. sugar	1 cup	8.5	275	51	116	108
COCOA TAPIOCA						
⅔ cup milk						
2 tbsp. tapioca						
2 tsp. cocoa	¾ cup	7.0	324	28	78	218
4 tsp. sugar	1 cup	9.3	432	37	104	291
COCONUT CARAMELS						
1 cup condensed milk						
½ cup cream						
½ cup maple syrup						

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
COCONUT CARAMELS — *Continued*						
2 cups sugar	Sheet 8″ × 4″					
⅔ cup glucose	× 1″	26.0	3735	118	881	2736
1 cup coconut	1 caramel, ¾″					
	cube	0.4	50	1	12	37
CODFISH BALLS						
1 cup codfish						
2 cups potato						
2 tbsp. butter	10 balls 2″					
1 egg	diam.	16.6	980	138	632	210
Fat for frying	1 ball	1.7	100	14	65	21
CODFISH, CREAMED						
2 cups salt cod (shredded)						
1 cup skim milk						
1 cup water						
3 tbsp. butter	4 cups	18.4	747	243	343	161
4 tbsp. flour	1 cup	4.6	187	61	86	40
COFFEE JELLY						
2 tbsp. gelatin						
½ cup cold water						
1 cup boiling water						
2 cups boiled coffee	4 cups	31.0	352	72	—	280
⅓ cup sugar	1 cup	8.0	88	18	—	70
COLE SLAW						
2 cups shredded cabbage						
¼ cup thick cream						
1½ tbsp. vinegar	2½ cups	7.2	259	15	202	42
Seasonings	1 cup	2.8	100	6	78	16
COOKIES, PLAIN						
½ cup butter						
1 cup sugar						
1 egg						
¼ cup milk						
2 tsp. baking powder	60 cookies 2¼″					
	diam.	26.0	2911	166	957	1788
2½ cups flour	1 cooky	0.5	50	3	17	30

For other cookies see *Chocolate, Hermits, Molasses, Oatmeal, Peanut*

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
CORN À LA SOUTHERN						
1 cup canned corn						
1 egg						
¾ tbsp. butter						
1 cup milk	2 cups	20.8	590	95	243	252
Seasonings	1 cup	10.4	295	47	122	126
CORN BREAD, OLD NEW ENGLAND						
2 cups cornmeal	Loaf 1″ × 6″					
1 cup flour	× 8½″	20.0	2000	160	590	1250
⅔ cup suet	Piece 2½″ × 1″					
⅓ cup molasses	× 1″	1.0	100	8	30	62
CORN CAKE (*Johnny cake*)						
¾ cup cornmeal						
1¼ cups flour						
¼ cup sugar						
5 tsp. baking powder						
½ tsp. salt	Loaf 6″ × 10″					
1 cup milk	× 1″	18.0	1538	162	364	1012
1 egg	Piece 2″ × 2″					
2 tbsp. butter	× 1″	1.2	100	10	24	66
CORN CHOWDER						
1 cup canned corn						
2 cups potatoes						
8 soda crackers						
2 cups milk						
1½ tbsp. butter						
1½ oz. salt pork	5 cups	41.7	1244	144	540	560
Seasonings	1 cup	8.3	250	29	109	112
CORN MUFFINS						
½ cup cornmeal						
1 cup flour						
3 tsp. baking powder						
1 tbsp. sugar						
1 tbsp. melted butter						
½ tsp. salt						
¾ cup milk	8 muffins	13.0	1100	143	271	686
1 egg	1 muffin	1.6	133	17	33	83

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
CORN SOUP, CREAM OF						
2 cups canned corn						
2 cups milk						
2 tbsp. butter						
2 tbsp. flour						
2 cups water	5⅓ cups	44.7	1163	137	439	587
Seasonings	1 cup	7.8	200	24	76	100
CORNSTARCH BLANC MANGE						
4 tbsp. cornstarch						
⅓ cup sugar						
2 cups milk	2 cups	19.5	733	64	176	493
½ tsp. vanilla	1 cup	9.8	367	32	88	247
COTTAGE PUDDING						
¼ cup butter						
⅔ cup sugar						
1 egg						
1 cup milk						
2¼ cups flour	2 loaves 6″ × 4″ × 1¾″	24.3	2100	179	549	1372
4 tsp. baking powder	Piece 1¾″ × 2″ × 2½″	1.1	100	7	26	67
½ tsp. salt						
CRANBERRY JELLY						
4 cups cranberries						
1 cup water	3½ cups	30.0	1982	12	41	1929
2 cups sugar	1 cup	8.6	566	3	12	551
CRANBERRY PIE						
2 cups cranberries						
1 cup sugar						
⅓ cup water						
Plain pastry for undercrust and strips over top	Pie 8″ diam. Piece 5¼″ at circumference	21.2 4.2	1462 310	28 6	266 64	1168 240
CRANBERRY PUDDING, STEAMED						
½ cup butter						
1 cup sugar						
3 eggs						
3½ cups flour	6 cups (1½ quart mold)	41.0	3600	347	1178	2075
½ cup milk						
1½ cups cranberries	1 cup	7.0	600	58	196	346

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
CRANBERRY SAUCE						
1 cup cranberries						
½ cup sugar	1⅛ cups	8.0	520	2	6	512
½ cup water	1 cup	7.1	462	2	5	455
CREAM FILLING I						
¾ cup sugar						
¼ cup flour						
2 eggs						
2 cups milk	2½ cups	22.7	1235	130	293	812
1 tsp. vanilla	1 cup	9.1	494	52	117	325
CREAM FILLING II						
1 cup thick cream						
⅓ cup milk						
1 egg white						
⅓ cup sugar	3 cups	14.6	1170	56	909	205
1 tsp. vanilla	1 cup	4.8	390	19	303	68
CREAM PIE WITH MERINGUE						
2 cups milk						
5 tbsp. flour						
½ cup sugar						
2 eggs						
Flavoring	Pie 10″ diam.	25.8	1597	163	594	840
Plain pastry for undercrust	Piece 4¼″ at circumference	3.5	225	23	83	119
CREAM PUFF SHELLS						
1 cup flour						
½ cup butter						
4 eggs	20 puffs	11.6	1510	158	1017	335
1 cup water	1 puff	0.6	76	8	51	17
CREAM SAUCE						
¾ cup thick cream						
¼ cup skim milk						
⅓ cup powdered sugar	1½ cups	10.0	873	22	595	256
1 tsp. vanilla	1 cup	6.6	582	15	396	171
CROUTONS (FRIED)						
4 oz. bread	80 croutons ½″ cubes	4.2	543	40	264	239
1 oz. fat	10 croutons	0.5	68	5	33	30

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
CROUTONS (TOASTED)						
5½ oz. bread	112 croutons ½" cubes	4.4	404	58	16	330
	10 croutons	0.4	37	5	2	30
CUP CAKES, PLAIN						
⅔ cup butter						
2 cups sugar						
4 eggs						
1 cup milk						
3¼ cups flour	24 cakes					
4 tsp. baking powder	2" diam. 2" thick	44.0	4740	385	1560	2795
¼ tsp. mace	1 cake	1.8	200	16	65	119
CUSTARD, BOILED						
2 cups milk						
3 egg yolks						
¼ cup sugar	2 cups	15.0	692	91	303	298
½ tsp. vanilla	1 cup	7.5	346	45	152	149
CUSTARD, CUP						
3 cups milk						
3 eggs	3½ cups	33.8	1030	172	400	458
6 tbsp. sugar	1 cup	9.7	294	49	114	131
DATE AND CREAM CHEESE SANDWICHES						
3 slices bread						
2 tsp. butter	3 triangles 3" × 3½" × 4⅗"	3.0	290	27	114	149
3 dates						
1 tbsp. cheese	1 triangle	1.0	97	9	38	50
DATE PUDDING I						
1½ cups dates						
1¼ cups flour	Loaf 4" diam., 6" high	20.0	2486	123	743	1620
⅓ cup sugar						
⅜ cup drippings	Piece 1" × 1" × 1½"	0.8	100	5	30	65
½ tsp. cinnamon						
DATE PUDDING II						
¼ cup butter						
½ cup molasses						
½ cup milk						
1 egg	2 loaves 3" diam., 4½" high	24.3	2111	157	565	1390
1½ cups graham flour						

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
DATE PUDDING II — *Continued*						
1 cup dates						
½ tsp. soda	Piece 3″ diam.,					
½ tsp. salt	½″ thick	1.1	100	7	27	66
DATE SANDWICHES						
3 thin slices bread	3 triangles 3″ ×					
2 tsp. butter	3½″ × 4⅗″	3.4	300	17	81	202
6 dates	1 triangle	1.1	100	6	27	67
EGG AND TOMATO SALAD						
½ egg						
3 lettuce leaves						
½ tomato						
½ tbsp. mayonnaise	1 serving	4.4	100	15	73	12
EGGNOG						
¾ cup milk						
1 egg						
2 tsp. sugar						
Flavorings	1 cup	8.5	230	48	110	72
EGG, POACHED ON SPINACH						
½ cup spinach						
1 egg						
1 tsp. butter	1 serving	6.4	144	34	98	12
EGG SALAD						
2 eggs						
4 leaves lettuce						
2¾ tbsp. mayonnaise	2 servings	6.6	464	65	395	4
EGG TIMBALE						
1 egg						
¾ cup milk						
Seasonings	¾ cup	7.8	190	49	105	36
EGGS À LA GOLDENROD						
2 cups milk						
4 tbsp. flour						
4 tbsp. butter						
8 eggs						
8 slices bread	8 servings	45.3	2287	404	955	928
Seasonings	1 serving	5.7	286	51	119	116

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
EGGS, DEVILLED						
1 egg						
1⅛ tsp. 40% cream						
Salt						
Pepper						
Mustard	1 egg	1.9	100	27	73	—
EGGS, SCRAMBLED						
5 eggs						
½ cup milk						
2 tbsp. butter	1½ cups	12.7	584	119	440	25
Seasonings	1 cup	8.5	389	79	293	17
FRENCH SALAD DRESSING						
4 tbsp. olive oil						
2 tbsp. vinegar	6 tbsp.	2.5	400	—	400	—
Seasonings	1 tbsp.	0.4	67	—	67	—
FRUIT BALLS						
1 lb. prunes						
1 lb. raisins						
1 lb. figs						
1¼ lbs. dates						
½ lb. almonds	94 balls	84.0	9470	489	2850	6131
½ lb. pecans	1 ball	0.9	100	5	30	65
FRUIT CAKE						
2 cups shortening						
2⅔ cups brown sugar						
1 cup molasses						
4 sq. chocolate						
12 eggs						
4 cups flour						
1 cup cider						
1 lb. almonds						
2 lbs. seeded raisins						
2 lbs. Sultana raisins	6 loaves					
1½ lbs. citron	2″ deep,					
1 lb. currants	6¾″ diam.,					
½ lemon rind	1½″ hole in	14.5				
½ orange rind	center	lbs.	24265	1254	8137	14874
1 lb. candied cherries	Piece 1⅞″ × 1⅞″ × ⅜″	0.9	100	6	26	68

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
FRUIT COCKTAIL						
1 cup grapefruit sections						
½ cup banana cubes						
½ cup pineapple cubes						
¼ cup sugar						
¼ cup water	2 cups	14.1	412	11	10	391
FRUIT PUNCH						
1 cup raspberry juice						
1⅛ cups currant juice						
⅝ cup orange juice						
½ cup lemon juice						
2⅓ cups sugar	3 qts.	50.2	2727	36	27	2664
6 cups water	1 cup	4.2	227	3	2	222
FRUIT SALAD I						
¾ lb. grapes						
3 small oranges						
1 small banana						
24 walnuts	6 cups	36.8	2375	80	1780	515
9 leaves lettuce	1 cup and					
1 cup mayonnaise dressing	2 tbsp. dressing	6.1	396	13	297	86
FRUIT SALAD II						
3 lettuce leaves						
3 sections grapefruit						
3 sections orange						
1 tbsp. oil						
⅓ tbsp. lemon juice						
Seasonings	1 serving	7.0	200	6	123	71
GINGERBREAD I						
1 cup molasses						
½ cup water						
2¼ cups flour						
1 tsp. soda	Loaf $8\frac{1}{2}'' \times 9''$					
1½ tsp. ginger	$\times 1''$	25.5	2189	143	456	1590
4 tbsp. melted butter	Piece $1'' \times 1\frac{2}{3}''$					
½ tsp. salt	$\times 2''$	1.1	100	7	21	72

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
GINGERBREAD II						
1 cup molasses						
1 cup sour milk						
2⅓ cups flour						
1¾ tsp. soda	Loaf 9½″ × 10″					
2 tsp. ginger	× 1″	30.0	2407	181	508	1718
½ tsp. salt	Piece 1″ × 2″					
¼ cup melted butter	× 2″	1.2	100	8	22	70
GRAHAM MUFFINS						
1 cup Graham flour						
1 cup white flour						
¼ cup sugar						
1 tsp. salt						
1 cup milk						
1 egg						
2 tbsp. melted butter	11 muffins 2¾″					
4 tsp. baking	diam.	20.0	1460	186	234	1040
powder	1 muffin	1.8	133	17	21	95
GRIDDLE CAKES						
2 cups flour						
1 tbsp. melted butter						
2 cups sour milk						
1 tbsp. sugar						
1 egg	14 cakes 4½″					
1 tsp. soda	diam.	25.0	1358	191	341	826
½ tsp. salt	1 cake	1.8	100	14	25	61
HARD SAUCE						
⅓ cup butter						
⅔ cup powdered sugar						
⅓ tsp. lemon extract	¾ cup	7.4	1103	3	545	555
⅔ tsp. vanilla	1 tbsp.	0.7	100	—	50	50
HASH						
½ cup chopped beef						
⅜ cup chopped potato						
¼ tbsp. butter	¾ cup	6.0	346	120	137	89
Onion	1 cup	8.0	461	160	182	119

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbo-hydrate*
HERMITS						
⅓ cup butter						
⅔ cup sugar						
1 egg						
2 tbsp. milk						
1¾ cups flour						
2 tsp. baking powder	50 cookies 2″ diam.	18.5	2116	127	617	1372
⅓ cup raisins	1 cooky	0.4	40	2	12	26
ICE CREAM, FRENCH						
2 cups skim milk						
1 tbsp. flour						
1 cup sugar						
1 egg						
1 qt. thin cream	2 qts.	57.7	2874	184	1568	1122
2 tbsp. vanilla	1 cup	7.2	359	23	196	140
ICE CREAM, PHILADELPHIA						
1 qt. thin cream						
¾ cup sugar	1½ qts.	37.2	2390	92	1508	790
1½ tbsp. vanilla	1 cup	6.2	398	15	251	132
IRISH STEW WITH DUMPLINGS						
Stew:						
2 lbs. mutton						
2 lbs. 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 qts. and 12 dumplings	135.0	7057	804	3943	2310
4 tsp. baking powder	1 cup and					
½ tsp. salt	1 dumpling	8.4	440	50	246	144

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
JUNKET						
1 cup milk						
1 tbsp. sugar						
½ junket tablet						
¼ tsp. vanilla	1 cup	9.4	232	34	91	107
KOHLRABI, BUTTERED						
2¼ cups kohlrabi	2 cups	12.1	325	27	227	71
2¼ tbsp. butter	1 cup	6.1	163	14	114	35
KOHLRABI, CREAMED						
2¼ cups kohlrabi cubes						
1 cup milk						
1 tbsp. butter						
2 tbsp. flour	2¼ cups	19.9	418	65	191	162
Seasoning	1 cup	8.8	186	29	85	72
LEMONADE						
1 cup water						
1½ tbsp. sugar	1¼ cups	10.0	90	—	—	90
2 tbsp. lemon juice	1 cup	8.0	72	—	—	72
LEMONADE, EGG						
1 egg						
2 tbsp. lemon juice						
2 tbsp. sugar						
⅔ cup water	1 cup	9.0	190	25	45	120
LEMONADE, LACTOSE						
1 tbsp. cane sugar						
2 tbsp. lemon juice						
6 tbsp. lactose						
⅔ cup water	1 cup	8.6	356	—	—	356
LEMON ICE						
1 cup water						
8 tbsp. sugar	1¾ cups	13.5	427	—	—	427
4 tbsp. lemon juice	1 cup	7.7	244	—	—	244
LEMON JELLY						
½ cup sugar						
1 tbsp. gelatin						
¼ cup lemon juice	2 cups	16.8	435	38	—	397
1¾ cups water	1 cup	8.4	218	19	—	199

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
LEMON MERINGUE PIE						
3 eggs						
1½ cups sugar						
2 tbsp. flour						
3 tbsp. powdered sugar						
2 cups water						
Juice 2 lemons	Pie 9″ diam.	27.0	2700	140	729	1831
Plain pastry for undercrust	Piece 4½″ at circumference	4.5	450	23	121	306
LEMON MILK SHERBET						
2⅔ cups milk						
1⅓ cups sugar	4⅓ cups	30.8	1574	66	179	1329
⅓ cup lemon juice	1 cup	7.1	363	15	41	307
LEMON SAUCE						
½ cup sugar						
1 cup water						
2 tbsp. cornstarch						
2 tbsp. butter	⅝ cup	10.7	684	1	205	478
1½ tbsp. lemon juice	1 cup	12.8	821	1	246	574
LENTILS, BAKED						
½ cup dry lentils						
1 tbsp. bread crumbs						
2 tsp. butter						
¼ small onion						
Water						
Seasonings	1 cup	7.0	445	107	86	252
LENTIL MEAT LOAF						
½ lb. round steak						
1 cup cooked lentils						
1 egg						
¼ cup milk						
4 tbsp. butter						
¼ cup chopped walnuts	Loaf 2″ × 3″ × 5″	18.8	1640	460	672	508
¼ cup bread crumbs	Piece 1¾″ ×					
½ small onion	2½″ × ¾″	1.1	100	28	41	31

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
LENTIL SOUP						
2 tbsp. lentils (uncooked)						
1½ tbsp. flour						
½ tbsp. butter						
1 tsp. sugar						
½ tsp. salt						
2 cups water	2⅛ cups	18.0	200	34	54	112
Seasonings	1 cup	8.5	95	16	26	53
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	3 cups	24.2	372	104	12	256
Seasonings	1 cup	8.1	124	35	4	85
LETTUCE SALAD WITH FRENCH DRESSING						
1 head lettuce						
6 tbsp. French dressing	9 servings	11.0	950	13	907	30
	1 serving	1.2	105	1	101	3
LIVER AND NOODLE LOAF						
¼ lb. liver						
¼ cup uncooked vermicelli						
1 egg	Loaf 6″ diam.,					
¼ cup 20% cream	1½″ thick	11.3	525	168	256	101
½ tbsp. butter	Piece 2″ × 2″					
¾ tsp. salt	× 1½″	2.1	100	32	49	19
LIVER SANDWICH I						
2 slices whole wheat bread 3¾″ × 3″ × ⅜″						
1 tsp. butter						
2 tsp. cooked liver						
2 tsp. celery	1 sandwich	2.2	149	24	43	82

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
LIVER SANDWICH II						
2 slices white bread $3\frac{3}{4}'' \times 3'' \times \frac{3}{8}''$						
$1\frac{1}{2}$ tbsp. chopped liver						
$\frac{3}{4}$ tbsp. chopped green olives						
Salt and pepper						
1 tsp. mayonnaise						
Dash onion juice	1 sandwich	1.8	146	22	60	64
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	1004	170	390	444
	1 cup	4.2	200	34	78	88
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	2010	208	898	904
	1 croquette	1.6	126	13	56	57
MACARONI WITH TOMATO SAUCE						
1 cup macaroni (uncooked)						
$1\frac{3}{4}$ cups tomatoes						
3 tbsp. butter						
3 tbsp. flour	4 cups	33.0	905	97	318	490
Seasonings	1 cup	8.3	226	24	79	123

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
MARGUERITES						
1 egg white						
2 tbsp. powdered sugar						
12 nuts	8 crackers	3.7	400	43	164	193
8 saltines	1 cracker	0.5	50	5	20	25
MAYONNAISE DRESSING						
1 egg yolk						
1 tsp. sugar						
1 tbsp. lemon juice						
1 tbsp. vinegar						
¾ cup olive oil	1⅛ cups	8.8	1793	12	1740	41
Seasonings	1 cup	7.8	1594	11	1547	36
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	Pie 9″ diam., 3½″ deep or 8 large servings					
3 tbsp. cornstarch						
1 tbsp. butter		52.0	3050	320	1314	1416
Seasonings	1 serving	6.5	381	40	164	177
MOCK HOLLANDAISE SAUCE						
2 tbsp. butter						
2 tbsp. flour						
¾ cup milk						
2 egg yolks						
½ cup butter	1⅓ cups	11.0	1393	57	1255	81
1 tbsp. lemon juice	1 cup	8.3	1045	43	942	60

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
MOLASSES COOKIES I						
1 cup molasses						
¼ cup lard						
¼ cup oleomargarine						
1 tbsp. ginger						
1 tbsp. soda	73 cookies 2″					
2 tbsp. milk	diam.	17.4	2460	136	820	1504
2 cups bread flour	1 cooky	0.2	33	2	11	20
MOLASSES COOKIES II						
1 cup molasses						
¼ cup butter						
¼ cup lard						
2½ cups flour						
2 tbsp. milk						
1 tbsp. ginger	68 cookies 2¼″					
1 tbsp. soda	diam.	27.0	2949	170	949	1830
1 tsp. salt	1 cooky	0.4	43	3	14	26
MUFFINS, see *Bran, Cornmeal, Graham, One-Egg, Twin Mountain, Whole Wheat*						
MUSHROOMS, BROILED, ON TOAST						
1 slice bread 3″ × 3½″ × ½″						
10 medium mushrooms 1½″ diam.						
1½ tbsp. butter	1 serving	3.7	304	28	167	109
MUSHROOM SOUP, CREAM OF						
2 cups milk						
2 tbsp. butter						
1 tbsp. flour						
¼ cup mushrooms	2½ cups	19.2	587	75	380	132
Seasonings	1 cup	7.7	235	30	152	53
MUSHROOMS, STEWED						
½ lb. mushrooms						
3 tbsp. butter						
1 tbsp. flour	2½ cups	10.0	440	32	333	75
1½ cups water	1 cup	4.0	176	13	133	30
NUT AND CHEESE ROAST						
1 cup grated cheese						
1 cup chopped walnuts						

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbo-hydrate*
NUT AND CHEESE ROAST — *Cont'd*						
1 cup dry bread crumbs						
2 tbsp. chopped onion						
1 tbsp. butter	Loaf 3″ × 4″ × 1¼″	14.8	1558	232	1060	266
2 tbsp. lemon juice	Piece 1¼″ × 1¼″ × ¾″	0.9	100	15	68	17
Salt and pepper						
NUT LOAF						
1 cup chopped walnuts						
2 eggs						
1 cup bread crumbs						
⅔ cup milk	2¾ cups	14.8	1020	164	632	224
Seasonings	1 cup	5.4	371	60	230	81
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						
2 tsp. baking powder	20 cookies 3″ diam.	18.7	2621	290	551	1780
1 tsp. salt	1 cooky	0.9	133	15	28	90
OATMEAL WAFERS						
1 cup oatmeal						
1 cup rolled oats						
2 cups flour						
¼ cup sugar						
1 tsp. salt						
⅛ tsp. soda	30 wafers 2¾″ diam.	15.0	2801	327	616	1858
¼ cup crisco						
½ cup hot water	1 wafer	0.5	100	11	23	66
ONE EGG MUFFINS						
2 cups flour						
4 tsp. baking powder						

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbo-hydrate*
ONE EGG MUFFINS — *Continued*						
½ tsp. salt						
2 tbsp. sugar						
1 cup milk						
2 tbsp. melted butter	10 muffins	16.6	1316	160	310	846
1 egg	1 muffin	1.5	125	15	30	80
ONIONS, SCALLOPED						
4 onions (10 oz.)						
1 cup milk						
2 tbsp. flour						
3 tbsp. butter	2¾ cups	22.4	880	72	522	286
¼ cup bread crumbs	1 cup	8.1	320	26	190	104
ORANGE ICE						
¼ cup sugar						
⅓ cup orange juice						
½ tbsp. lemon juice	⅞ cup	7.8	244	—	—	244
½ cup water	1 cup	8.9	279	—	—	279
ORANGE JELLY WITH WHIPPED CREAM						
2 tsp. gelatin						
2 tbsp. cold water						
6 tbsp. boiling water						
6 tbsp. orange juice						
4 tbsp. lemon juice	1¼ cups jelly with 2 tbsp. cream	10.9	400	25	111	264
4 tbsp. sugar	¼ cup jelly, 1					
2 tbsp. 40% cream	tsp. cream	2.2	80	5	22	53
ORANGE MILK SHERBET						
½ cup milk						
4 tbsp. orange juice						
1 tsp. lemon juice	⅞ cup	5.9	156	15	40	101
1 tbsp. sugar	1 cup	6.7	178	17	46	115
OYSTER STEW I						
1 cup (12) oysters						
2 soda crackers						

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
OYSTER STEW I — *Continued*						
1½ tbsp. butter						
1 cup milk	2 cups	16.5	464	85	270	109
Seasonings	1 cup	8.3	232	43	135	54
OYSTER STEW II						
18 oysters						
1⅓ cups oyster liquor						
5 cups milk						
4 tbsp. butter	8 cups	64.0	1360	224	862	274
Seasonings	1 cup	8.0	170	28	108	34
PASTRY, PLAIN						
1¼ cups flour		10.2				
3 tbsp. lard	3 crusts 9″	un-				
3 tbsp. butter	diam.	cooked	1137	64	653	420
½ tsp. salt		8.5				
Water		cooked				
		2.8				
	1 crust	cooked	400	24	232	144
PEACHES, STEWED						
2 peaches						
2 tbsp. sugar	¾ cup	5.5	158	4	1	153
¼ cup water	1 cup	7.3	210	5	1	204
PEACH ICE CREAM						
6 peaches						
½ cup sugar						
1 cup thick cream	4 cups	30.2	1655	66	842	747
1 cup milk	1 cup	7.6	414	16	211	187
PEANUT BUTTER SANDWICH I						
2 ¼″ slices whole wheat bread						
½ tbsp. peanut butter						
½ tbsp. raisins, chopped	1 sandwich 3″ × 3″	1.7	152	20	36	96
PEANUT BUTTER SANDWICH II						
2¼″ slices whole wheat bread						

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
PEANUT BUTTER SANDWICH II — *Cont'd*						
½ tsp. butter						
½ tbsp. thick cream						
½ tbsp. peanut butter	1 sandwich 3″					
½ tbsp. raisins	× 3″	2.5	250	20	135	95
PEANUT BUTTER SANDWICH III						
2 slices whole wheat bread 2½″ × 2½″ × ¼″						
1 tsp. butter						
1 tsp. peanut butter						
⅙ lettuce leaf	1 sandwich	1.3	131	15	66	50
PEANUT BUTTER SOUP						
1 cup milk						
1½ tbsp. peanut butter						
1½ tbsp. flour	1⅛ cups	9.8	370	68	200	102
Seasonings	1 cup	8.7	329	60	178	91
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	18 cookies 2″					
1 tsp. baking powder	diam.	9.3	1154	132	493	529
⅛ tsp. salt	1 cooky	0.5	57	6	25	26
PEAS, CREAMED						
¾ cup peas						
5 tbsp. white sauce	1 cup	6.2	222	39	83	100
PEA SOUP, CREAM OF						
1½ cups peas						
1 cup milk						
1 cup water						
1 tbsp. flour						
1 tbsp. butter	3 cups	24.0	455	72	207	176
Seasonings	1 cup	8.0	152	24	69	59

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbo-hydrate*
PEA SOUP, SPLIT						
½ cup split peas						
1 tsp. flour						
2 cups water	2½ cups	23.0	381	100	9	272
Seasonings	1 cup	8.1	152	40	3	109
PENUCHI						
1 cup brown sugar						
¼ cup milk	Sheet 3″ × 4¼″					
6 English walnuts	× 1″	8.2	942	22	171	749
1 tsp. butter	Piece 1″ × 1″					
½ tsp. vanilla	× 1⅔″	0.9	100	2	18	80
PEPPERS, STUFFED I						
6 large peppers						
1 cup stale bread crumbs						
⅔ cup brown sauce						
¼ cup chopped mushrooms	6 peppers	25.4	540	95	85	360
	1 pepper	4.7	100	17	16	67
PEPPERS, STUFFED II						
6 large peppers						
2 cups boiled rice						
¾ cup tomato						
1 tbsp. butter						
1 onion	6 peppers	36.5	521	57	110	354
1 tsp. salt	1 pepper	7.0	100	11	21	68
PEPPERS, STUFFED III						
6 large peppers						
1½ cups bread crumbs						
1½ cups chopped boiled ham	6 peppers	33.9	1354	220	738	396
Seasonings	1 pepper	5.7	226	37	123	66
PERFECTION SALAD						
2 tbsp. gelatin						
½ cup cold water						
½ cup mild vinegar						
2 tbsp. lemon juice						
2 cups boiling water						
½ cup sugar						
1 tsp. salt						

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbo-hydrate*
PERFECTION SALAD — *Continued*						
1 cup finely shredded cabbage						
2 cups celery (cut in small pieces)						
2 pimentoes (cut	8 cups	40.0	564	84	—	480
in small pieces)	1 cup	5.0	70	10	—	60
PIES, see *Apple, Cranberry, Cream,* etc.						
PINEAPPLE AND CARROT SALAD						
3 lettuce leaves						
1 slice canned pineapple						
2 tbsp. grated raw carrot						
½ tbsp. mayonnaise						
½ tbsp. 40% cream						
1 tbsp. pineapple juice	1 serving	5.6	200	5	71	124
PINEAPPLE MARSHMALLOW CUP						
2 cups pineapple cubes						
1 cup cut marshmallows						
¼ cup sugar						
¼ tbsp. cornstarch						
1⅞ tbsp. lemon juice	2½ cups	17.7	609	5	—	604
½ cup water	1 cup	7.1	244	2	—	242
PINEAPPLE SALAD						
1 slice canned pineapple						
1 tbsp. cheese						
2 lettuce leaves						
1 tbsp. mayonnaise						
1 tbsp. chopped nuts	1 serving	5.5	395	29	240	126

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
POPOVERS						
1 cup flour						
¼ tsp. salt						
⅞ cup milk						
2 eggs	7 popovers	15.0	706	128	188	390
½ tsp. melted butter	1 popover	2.0	100	18	27	55
POTATO SALAD						
1 large potato						
6 small lettuce leaves						
2½ tbsp. mayonnaise	2 servings	7.3	420	14	282	124
POTATO SOUP						
3 cups milk						
3 medium potatoes						
1 slice onion						
½ tbsp. butter						
1 tbsp. flour	4½ cups	36.0	852	126	324	402
Seasonings	1 cup	8.0	198	30	78	90
POTATOES, CREAMED						
2 cups potato cubes						
2 tbsp. butter						
2 tbsp. flour						
1 cup milk	3⅛ cups	20.2	743	67	366	310
¼ tsp. salt	1 cup	6.4	235	21	116	98
POTATOES, MASHED						
5 medium potatoes						
3 tbsp. butter	3⅓ cups	21.8	690	50	330	310
⅓ cup milk	1 cup	6.5	207	15	99	93
POTATOES, SCALLOPED						
4 medium potatoes						
1 tbsp. flour						
½ tbsp. butter						
1 cup milk						
1 tsp. salt	4 cups	22.8	652	60	196	396
⅛ tsp. pepper	1 cup	5.7	163	15	49	99
POTATOES, SWEET, GLAZED						
6 sweet potatoes	12 medium halves	34.3	1665	70	107	1488
¼ cup sugar						
½ tbsp. butter	1 medium potato	5.8	278	12	18	248

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbo-hydrate*
POULTRY STUFFING						
2 cups soft bread crumbs						
2 tbsp. melted butter						
¼ cup milk						
Seasonings	1 cup	5.0	624	58	300	266
PRUNE AND COTTAGE CHEESE SALAD						
5 tsp. cottage cheese						
4 prunes						
⅓ tbsp. 40% cream						
3 lettuce leaves						
½ tbsp. mayonnaise	1 serving	4.7	200	21	83	96
PRUNE AND NUT SANDWICH						
2 slices Graham bread $3\frac{3}{4}'' \times 3'' \times \frac{1}{4}''$						
1 tsp. butter						
1 tsp. chopped walnuts						
1 tbsp. prune pulp	1 sandwich	1.9	177	15	74	88
PRUNE PUDDING, NORWEGIAN						
½ lb. prunes						
1 cup sugar						
⅓ cup cornstarch	4 cups	35.0	1733	20	—	1713
1 tbsp. lemon juice	1 cup	8.7	433	5	—	428
PRUNE SOUFFLÉ						
⅓ lb. prunes (uncooked)						
5 egg whites	$3\frac{1}{3}$ cups	16.0	860	85	3	772
½ cup sugar	1 cup	4.8	258	25	1	232
PRUNES, STEWED						
1 lb. prunes	48 prunes and 4					
1 cup sugar	cups juice	56.0	2068	32	—	2036
Water	4 prunes and					
	4 tbsp. juice	5.6	200	4	—	196

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
RAISIN BREAD						
1⅔ lbs. flour						
1 cake yeast						
¼ cup sugar	3 loaves 1 lb.					
⅓ cup crisco	each	48.0	4160	369	876	2915
1⅔ cups milk	1 slice 3¾″ ×					
½ lb. raisins	3½″ × ½″	1.2	100	9	21	70
RAISIN AND CRANBERRY PIE						
1 cup cranberries						
1 cup raisins						
1 cup sugar						
1 tbsp. flour						
1 cup water	Pie 9″ diam.	25.0	2522	84	702	1736
Plain pastry for 2 crusts	Piece 4½″ at circumference	4.0	400	12	108	280
RAISIN PIE						
2 cups raisins						
2 tbsp. lemon juice						
½ cup sugar						
2 tbsp. cornstarch	Pie 9″ diam.	31.6	2738	96	791	1851
Plain pastry for 2 crusts	Piece 4½″ at circumference	5.4	450	13	120	317
RASPBERRY SHERBET						
1 qt. raspberries						
1¼ cups sugar						
1 cup water						
2 tbsp. lemon juice	3¼ cups	26.5	1256	14	1	1241
1 egg white	1 cup	8.2	386	4	—	382
RHUBARB PIE						
2¼ cups rhubarb						
1⅙ cups sugar						
1 egg						
2¼ tbsp. flour	Pie 9″ diam.	31.2	1802	92	326	1384
Plain pastry for 2 crusts	Piece 4½″ at circumference	4.8	280	14	50	216
RHUBARB, STEWED						
1 cup rhubarb (¾″ pieces)	2¼ cups	17.6	458	3	7	448
8½ tbsp. sugar	1 cup	7.8	203	1	3	199

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
RICE DAINTY						
½ cup rice						
½ cup heavy cream						
4 slices pineapple and	2½ cups	20.5	1096	44	396	656
4 tbsp. juice	1 cup	8.2	438	18	158	262
RICE FONDUE ON CRACKERS						
1 tbsp. raw rice						
4 tbsp. grated cheese						
½ tbsp. milk	4 crackers and					
1 egg	8 tbsp. sauce	4.4	321	72	153	96
4 saltines	1 cracker and					
Seasonings	2 tbsp. sauce	1.1	80	18	38	24
RICE PUDDING I						
½ cup boiled rice						
½ cup milk						
1 egg						
1 tbsp. sugar	1⅓ cups	8.2	260	45	85	130
¼ tsp. lemon extract	1 cup	6.2	195	34	64	97
RICE PUDDING II (CREAMY)						
2 cups milk						
¼ cup rice						
⅙ cup sugar	1⅔ cups	14.1	646	79	175	392
⅛ tsp. salt	1 cup	8.5	387	47	105	235
RICE PUDDING III						
¾ cup rice						
30 raisins						
6 tbsp. sugar						
1 cup milk						
2 cups water	4¾ cups	18.0	1168	89	87	992
⅛ tsp. salt	1 cup	3.8	246	19	18	209
RICE WITH CHEESE						
¼ cup uncooked rice						
¼ cup cheese						
¾ cup milk	1¼ cups	8.1	496	82	170	244
⅛ tsp. salt	1 cup	6.5	397	66	136	195

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbo-hydrate*
RICE WITH CHEESE AND TOMATOES						
1 cup uncooked rice						
8 oz. American cheese						
1 pt. canned tomatoes	4¾ cups	37.5	1800	347	746	707
	1 cup	7.9	379	73	157	149
RUTABAGAS, BUTTERED						
1 cup rutabaga cubes						
1 tbsp. butter	1 cup	6.0	162	9	102	51
RUTABAGAS, CREAMED						
1 cup rutabaga cubes						
½ tbsp. butter						
½ tbsp. flour						
¼ cup milk						
Seasonings	1 cup	7.6	168	18	76	74
SALAD DRESSING, BOILED						
2 egg yolks						
½ tbsp. flour						
1½ tbsp. sugar						
1½ tbsp. melted butter						
¾ cup milk						
¼ cup vinegar	1⅛ cups	13.0	462	47	292	123
Seasonings	1 tbsp.	0.8	30	3	19	8
SALAD DRESSING, FRENCH, see *French Salad Dressing*						
SALAD DRESSING, MAYONNAISE, see *Mayonnaise Dressing*						
SALAD DRESSING, MINERAL OIL						
1 egg yolk						
1 tsp. sugar						
1 tbsp. lemon juice						
1 tbsp. vinegar						
¾ cup mineral oil	1⅛ cups	8.8	66	9	41	16
Seasonings	1 cup	8.2	58	8	36	14

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
SALMON, CREAMED ON TOAST						
¼ cup salmon						
¾ cup skim milk						
1 tbsp. oleomargarine						
1½ tbsp. flour	1 cup salmon					
2 slices toast	and toast	10.0	424	92	178	154
SALMON LOAF						
1 cup salmon						
½ cup bread crumbs						
1 egg						
1 tsp. butter	1½ cups	11.2	550	205	288	57
Seasonings	1 cup	7.5	367	137	192	38
SAMP BAKED WITH CHEESE						
1 cup samp (uncooked)						
2 oz. cheese	4½ cups	38.0	953	132	194	627
Salt	1 cup	8.4	211	29	43	139
SARDINE SALAD						
5 sardines						
2 egg yolks						
1 egg white						
2 leaves lettuce						
1 tsp. mayonnaise	1 large serving	3.5	310	85	195	30
SNOW PUDDING						
1 tbsp. gelatin						
1 cup sugar						
3 egg whites						
¼ cup lemon juice	6 cups	20.0	925	88	1	836
1¼ cups water	1 cup	3.3	154	15	—	139
SOY BEAN LOAF						
½ cup soy beans						
½ cup cheese						
1 pimento						
½ cup bread crumbs						
1½ tbsp. butter						
½ egg	1⅝ cups	11.5	960	223	520	217
½ tsp. salt	1 cup	7.1	591	137	320	134

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
SOY BEAN SOUP						
2½ cups milk						
¼ cup dried soy beans						
2 slices onion						
1 tbsp. butter	3¼ cups	24.4	703	142	405	156
½ tbsp. salt	1 cup	8.0	234	47	135	52
SPANISH CREAM						
1 tbsp. gelatin						
2 cups milk						
2 eggs						
½ cup sugar	4½ cups	11.5	465	82	132	251
½ tsp. vanilla	1 cup	2.5	100	18	28	54
SPINACH À LA CRÊME						
2 lbs. spinach						
2 tbsp. butter						
½ cup thick cream						
1 tsp. sugar	5½ cups	37.2	908	91	639	178
Seasonings	1 cup	6.8	165	17	116	32
SPINACH SOUP, CREAM OF						
4 cups milk						
2 tbsp. butter						
2½ tbsp. flour						
1 cup cooked spinach	5½ cups	42.0	985	153	554	278
Seasonings	1 cup	7.6	179	28	101	50
SPINACH WITH EGG						
2 cups finely chopped spinach						
1 hard-boiled egg						
1 tbsp. butter	2 cups	19.4	255	56	153	46
Seasonings	1 cup	9.7	128	28	77	23
SPONGE CAKE						
6 eggs						
1 cup sugar						
1 cup flour	Loaf 10″ × 4¾″					
1 tbsp. lemon juice	× 1½″	16.0	1692	192	323	1177
½ rind one lemon	Piece 1½″ ×					
¼ tsp. salt	1½″ × 2″	0.9	100	11	19	70

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
SPONGE CAKE, HOT WATER						
2 eggs						
1 cup sugar						
1 cup flour						
1½ tsp. baking powder	Sheet 8½″ × 8½″ × ⅞″	12.7	1355	98	95	1162
2 tsp. lemon juice	Piece 2″ × 2¾″					
⅜ cup hot water	× ⅞″	0.9	100	7	7	86
SQUASH PIE						
1½ cups cooked squash						
2 eggs						
⅔ cup brown sugar						
2 tbsp. molasses						
1½ cups skim milk	Pie 9″ diam.	25.0	1396	132	357	907
Plain pastry for undercrust	Piece 4½″ at circumference	4.1	225	23	56	146
SWISS CHARD SALAD						
¾ cup shredded Swiss chard						
½ tbsp. mayonnaise	1 serving	3.5	100	12	70	18
TAPIOCA-CORNMEAL PUDDING						
5 tbsp. tapioca						
4 tbsp. cornmeal						
5 cups skim milk						
⅓ cup molasses						
⅓ cup sugar						
3 tbsp. butter	2½ cups	29.6	1684	192	338	1154
½ tsp. salt	1 cup	11.8	674	77	135	462
TAPIOCA CREAM						
2 cups milk						
¼ cup sugar						
3 tbsp. tapioca						
1 egg	3 cups	22.0	766	91	219	456
½ tsp. vanilla	1 cup	7.3	255	30	73	152
TOAST, CREAM						
6 slices bread	6 slices toast and					
2 cups milk	2 cups sauce	21.0	958	124	413	421
3 tbsp. flour	1 slice toast and					
2 tbsp. butter	⅓ cup sauce	3.5	160	21	69	70

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
TOAST, FRENCH						
12 slices bread						
4 tbsp. butter	12 slices 3″ × 3″ × ½″	18.0	1248	132	588	528
1 egg	1 slice	1.4	100	10	48	42
1 cup milk						
TOMATO AND CUCUMBER SALAD						
6 slices cucumber						
3 slices tomato						
3 leaves lettuce						
1½ tbsp. mayonnaise	1 serving	3.7	185	8	149	28
TOMATO AND LETTUCE SALAD						
4 medium tomatoes						
1 head lettuce	6 servings	32.0	1162	38	999	125
⅔ cup mayonnaise	1 serving	5.3	194	6	167	21
TOMATOES, SCALLOPED						
1 cup tomatoes						
½ slice bread						
½ tsp. sugar						
½ tbsp. butter	1 cup	8.6	168	18	68	82
TOMATO JELLY SALAD						
1 can tomatoes (2 cups strained)						
1 tsp. salt						
1 tsp. sugar						
1 tbsp. gelatin						
½ cup cold water	2 cups	20.0	158	58	8	92
Dash cayenne	⅓ cup	3.3	25	9	1	15
TOMATO SAUCE						
1 cup tomato juice						
2 tbsp. flour						
2 tbsp. butter						
½ onion						
1 pepper corn						
Salt	1 cup	8.3	332	18	230	84
TOMATO SOUP, CLEAR						
2 cups tomato juice						
2 cups water						
2 tsp. sugar						

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
TOMATO SOUP, CLEAR — *Continued*						
2 tbsp. butter						
3 tbsp. flour	4 cups	32.0	435	33	210	192
Soda and seasonings	1 cup	8.0	109	8	53	48
TOMATO SOUP, CREAM OF						
2 cups canned tomatoes						
2 tsp. sugar						
1 qt. milk						
4 tbsp. flour						
⅓ cup butter						
⅙ medium onion	5½ cups	47.6	1480	165	927	388
Soda and seasonings	1 cup	8.7	269	30	169	70
TOMATO, STUFFED						
1 tomato						
1 tsp. butter						
¼ tsp. chopped onion						
2 tbsp. bread crumbs						
1 tsp. chopped ham	1 tomato holding ¼ cup	4.0	100	13	45	42
TOMATO STUFFED WITH LIVER						
1 tomato						
½ cup cooked liver						
1 tbsp. chopped onion						
1 tsp. butter						
Salt	1 stuffed tomato	5.9	167	68	73	26
TUNA FISH À LA NEWBURG						
2 cups tuna fish						
3 tbsp. butter						
1½ tbsp. flour						
1 tsp. lemon juice						
2 egg yolks						
½ cup skim milk	2 cups	16.0	893	318	538	37
Seasonings	1 cup	8.0	447	159	269	19

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
TURKISH PILAF						
½ cup raw rice						
1 tbsp. butter						
1 cup water						
1¾ cups canned tomato	5¼ cups	41.8	557	52	121	384
Seasonings	1 cup	7.5	100	9	22	69
TURNIP GREENS, CREAMED						
¾ cup cooked turnip greens						
½ tbsp. butter						
¼ cup milk						
½ tbsp. flour	¾ cup	5.8	130	19	74	37
Seasonings	1 cup	7.7	173	25	99	49
TURNIP GREENS WITH OIL						
¾ cup turnip greens						
1 tbsp. olive oil						
1 tbsp. lemon juice	¾ cup	3.7	127	9	102	16
Seasonings	1 cup	4.9	169	12	136	21
TURNIPS, CREAMED						
3 medium turnips						
½ cup milk						
1 tbsp. butter						
1 tbsp. flour	1½ cups	4.3	292	29	147	116
Seasonings	1 cup	2.9	194	19	98	77
TWIN MOUNTAIN MUFFINS						
¼ cup butter						
¼ cup sugar						
1 egg						
¾ cup milk						
2 cups flour						
4 tsp. baking powder	10 muffins	14.8	1494	138	546	810
	1 muffin	1.5	150	14	54	82

TABLE II — DIETARY RECIPES — *Continued*

INGREDIENTS	MEASURE	WEIGHT *Ounces*	TOTAL CALORIES	DISTRIBUTION OF CALORIES		
				Protein	*Fat*	*Carbohydrate*
VEAL CUTLETS						
1⅓ lbs. veal (trimmed)						
2 eggs						
4 tbsp. butter						
6 tbsp. flour						
1 cup bread crumbs						
3 cups water	6 servings	33.8	1697	512	875	310
Seasonings	1 serving	5.6	283	85	146	52
WAFFLES						
2 cups flour						
2 tbsp. butter						
3 eggs						
1 tbsp. sugar						
1 cup milk	6 waffles 6″					
3 tsp. baking	diam.	13.6	1416	201	498	717
powder	1 waffle	2.3	250	35	88	127
WALDORF SALAD						
6 walnut halves						
½ medium apple						
¼ cup cut celery						
1 large leaf lettuce						
1½ tbsp. mayonnaise	1 large serving	3.3	258	11	195	52
WELSH RAREBIT						
¼ cup milk						
1 cup grated cheese						
1 egg						
2 tsp. butter						
4 slices toast	1 cup rarebit					
Seasonings	and toast	10.7	840	185	478	177
WHITE MOUNTAIN ICING						
1 cup sugar						
1 egg white						
½ cup water	1½ cups	8.7	853	12	1	840
WHITE SAUCE						
1 cup milk						
2 tbsp. flour						
2 tbsp. butter						
¼ tsp. salt	1 cup	10.0	416	38	286	92

TABLE III

Vitamin Values of Foods

How to Interpret the Table

If the vitamin is known to be present in amounts significant for nutrition, this is indicated by a single plus sign (+). If it occurs in considerable quantity, two plus signs are used (++); and if present in large enough quantity to be an especially rich source, three plus signs designate this. When little or none of the vitamin is present the minus sign is used, and when there is uncertainty as to its presence the question mark shows the need of further investigation before any statement can be made.

Vitamins B and G are so intimately associated in our common foods that they have hitherto been investigated together and, as in the other parts of this book, no attempt has here been made to separate them because of inadequate knowledge of their individual properties.

Vitamin C in milk, in many vegetables, and in some fruits is appreciably decreased by cooking. The length of time and the conditions under which the cooking is done influence the amount of this loss. In general, it is well to expect only about one-tenth as much vitamin C in a cooked green vegetable as in a raw one. In many other vegetables, in most fruits, and in milk, the loss is much less. In the table the signs indicate the vitamin content of the raw food, unless otherwise stated.

TABLE III

Source	A	B + G	C
Almonds	+	++	?
Apples	+	++	+
Asparagus	++	+++	?
Bananas	+	+	++
Barley, white	+	++	−
Beans, dried (kidney, Lima, navy, soy)	+	+++	−
Beans, fresh, string	++	++	++
Beef, lean	−	+	−
Beets, fresh	+	+	+
Blackberries	−	+	+
Brazil nuts	?	++	?
Bread, white (yeast)	−	+	−
Bread, whole wheat (yeast)	−	++	−
Bread, rye	−	++	−
Brussels sprouts	+	+++	+
Butter	+++	−	−
Buttermilk	+	++	?
Cabbage	++	+++	+++
Cantaloupe	++	++	?
Carrots, fresh	+++	++	++
Cauliflower	+	++	+
Celery	−	++	?
Chard	++	+	+
Cheese, whole milk	+++	++	−
Chestnuts	−	+	−
Clams	++	−	?
Coconut	+	++	?
Collards	+++	++	−
Corn, fresh	+	++	+
Corn (dried) white	+	++	−
Corn (dried) yellow	++	++	+
Cranberries	?	?	+
Cream	+++	++	?
Cod liver oil	+++	−	−
Corn oil	+	−	−
Cottonseed oil	?	−	−
Cucumbers	−	+	+
Dandelion greens	++	++	+
Dasheens	−	+	+
Egg plant	+	+	−
Eggs (in yolk only)	+++	++	−
Endive	+	?	+

TABLE III — *Continued*

SOURCE	A	B + G	C
Filberts	?	++	?
Fish, fat	+	+	?
Grapefruit	+	++	+++
Grapes	+	+	+
Heart	+	+	?
Honey	−	−	−
Kale	++	+	?
Kidney	++	++	?
Kohlrabi	?	?	+
Lard	−	−	−
Lemons	+	++	+++
Lentils, dried	+	++	−
Lettuce	++	++	+++
Liver	+++	++	+
Milk, skimmed	+	++	?
Milk (whole, fresh, dried, pasteurized, evaporated)	+++	++	?
Molasses	−	+	?
Mushrooms	−	++	−
Mutton	−	++	?
Oats, rolled	−	−	−
Olive oil	−	−	−
Onions	−	+	++
Oranges	+	++	+++
Oysters	+	?	+
Parsnips	−	++	?
Peaches, fresh	+	+	++
Peanut oil	?	−	−
Peanuts	+	++	?
Pears, fresh	?	+	?
Peas, dried	+	++	−
Peas, fresh or canned	++	++	++
Pecans	+	+	?
Peppers, green	++	++	++
Pineapple, fresh	++	++	++
Pine nuts	−	+	−
Potatoes, sweet	++	++	++
Potatoes, white, cooked	+	++	++
Prunes	++	++	−
Pumpkins	+	+	?
Radishes	−	+	+
Raisins	−	+	−
Raspberries, fresh or canned	?	?	++

TABLE III — *Continued*

SOURCE	A	B + G	C
Rhubarb, fresh	?	?	+
Rice, brown	+	++	−
Rice, white (polished)	−	−	−
Roe, fish	+	++	?
Rutabagas	+	++	+++
Salmon, canned	+	?	?
Sauerkraut	+	+	−
Spinach, cooked or canned	+++	+++	+
Squash, yellow	++	?	?
Strawberries, fresh or canned	?	+	++
Sugar	−	−	−
Sweetbreads (thymus gland)	−	−	−
Tomatoes, fresh or canned	++	++	+++
Turnip greens, cooked	++	++	+
Turnips, white	−	++	++
Veal	−	+	?
Walnuts	+	++	?
Yeast	−	+++	−

TABLE IV

Fuel Values in Relation to Cost

A. Some Foods Costing ¾ Cent or Less per 100 Calories

Butter (24 cents per pound)
Corn oil
Cottonseed oil
Cornmeal
Cornstarch
Corn syrup
Flour, graham
rye
white
Lard
Molasses
Oatmeal
Oats, rolled
Oleomargarine (24 cents per pound)
Peas, dried split
Rice (8 cents per pound)
Samp
Suet
Sugar

B. Some Foods Costing ¾ to 1 Cent per 100 Calories

Apple sauce cake
Bacon (all fat eaten)
Baking powder biscuit
Beans, dried
Bread, Boston brown
corn (old New England)
white
Chocolate caramels
Coconut caramels
Cookies, plain
Corn flakes
Cornmeal muffins
Farina
Fudge, chocolate
Gingerbread
Griddle cakes
Hermits
Hominy grits
Lentils
Lemon sauce
Molasses cookies
Oatmeal cookies
Oleomargarine (25 to 35 cents per pound)
One egg cake
One egg muffins
Peanut butter
Popovers
Pork, salt
Raisins
Shredded wheat
Split pea soup
Sponge cake (hot water)
Tapioca, pearl
Wheat, flaked

C. Some Foods Costing 1 to 1½ Cents per 100 Calories

Apple pie
Apple sauce
Apple snow
Blanc mange, chocolate
cornstarch
Butter (35 to 50 cents per pound)
Cake, angel
chocolate
sponge
Cheese straws
Chocolate (unsweetened)
Cocoa (powder)
Cookies, chocolate drop
Crackers, graham
oyster
soda
Cranberry pie
Cream puffs (shells)
Date pudding, steamed
Figs (unpressed)
French toast
Force
Grapenuts
Irish stew with dumplings

C. Some Foods Costing 1 to 1½ Cents per 100 Calories — *Continued*

Lemon milk sherbet
Lemon meringue pie
Meat pie
Macaroni
Macaroni and cheese
Milk (7 to 13 cents per quart)
Milk, evaporated
Milk, condensed, sweetened
Muffins, graham
Peanuts
Penuchi
Potatoes, creamed
Prunes, stewed
Rice pudding, creamy
Rhubarb, stewed
Salmon, creamed, on toast
Tapioca (granulated)
Waffles
Zwieback

D. Some Foods Costing 1½ to 2 Cents per 100 Calories

Apples, dried
Beef heart, stuffed
Butter (52 to 70 cents per pound)
Brown betty
Cheese, American
cottage
Chocolate (sweet)
Cup custard
Eggs à la goldenrod
Filberts
Lemon ice
Lemon jelly
Lentil soup
Macaroni croquettes
Macaroni with tomato sauce
Marguerites
Mayonnaise dressing
Milk (10 to 13 cents per quart)
Olive oil
Peaches, dried
Pecans
Peanut butter soup
Potatoes, Irish
Potatoes, sweet
Prunes
Prune soufflé
Rice with cheese and tomatoes
Scalloped potatoes
Snow pudding
Squash pie
Tapioca cream
Turkish pilaf

E. Some Foods Costing 2 to 2½ Cents per 100 Calories

Almonds
Baked bean soup
Boiled custard
Boiled salad dressing
Brown sauce
Corn chowder
Cranberry jelly
Eggs (27 to 33 cents per dozen)
Lamb, shoulder
Lentil meat loaf
Lemonade
Milk (14 to 17 cents per quart)
Pineapple, canned
Potato soup
Saltines
Scalloped onions
String beans, canned
Stuffed steak
Swiss steak
Tomato soup (cream of)
Vanilla wafers

F. Some Foods Costing 2½ to 3 Cents per 100 Calories

Baked apples
Buttermilk
Corn, canned
Corn soup (cream of)
Dates
Dried beef, creamed
Egg lemonade
Flank steak
French dressing
Kidney bean stew

F. Some Foods Costing 2½ to 3 Cents per 100 Calories — *Continued*

Milk (18 to 20 cents per quart)
Milk, powdered, skim
Milk, powdered, whole
Nut loaf
Nut and cheese roast
Onions
Rice pudding (with egg)
Spinach soup (cream of)
Tuna fish à la Newburg

G. Some Foods Costing 3 to 5 Cents per 100 Calories

Apples
Apple sauce
Apricots, canned
dried
Asparagus soup (cream of)
Bananas
Banana salad
Beef, chuck (all fat eaten)
liver
round (all fat eaten)
Beef loaf
Beets
Cabbage
Cauliflower
Celery soup (cream of)
Cheese, cream
Cheese, Neufchâtel
Cheese soufflé
Cheese and pineapple salad
Club sandwich
Corn à la Southern
Cole slaw
Cream
Eggs (40 to 67 cents per dozen)
Egg timbale
Egg salad
Figs, pressed
Fruit salad
Grapefruit
Honey, strained
Lady fingers
Olives, green
Potato salad
Peas, canned
Pears, canned
Pork chops
Puffed corn
Puffed rice
Puffed wheat
Salmon (canned)
Salmon loaf
Sardines (canned)
Scrambled eggs
Tomato sauce
Walnuts

H. Some Foods Costing over 5 Cents per 100 Calories

Asparagus
Beef, most cuts
Blackberries
Blue fish
Cantaloupe
Chicken, canned
creamed
Carrots (young)
Celery
Cod, fresh
Dried beef
Grape juice
Halibut
Ham, boiled
Lamb chops
Lemons
Lettuce
Olives, ripe
Oranges
Peaches, canned
fresh
Pears, fresh
Peppers, green
green, stuffed
Raspberries
Spinach
Tomatoes, canned
Tuna fish
Turnips, fresh

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

Weight-Height-Age Table for Boys of School Age [1]

Height (in.)	Av. Wt. for Ht. (lbs.)	5 Yrs.	6 Yrs.	7 Yrs.	8 Yrs.	9 Yrs.	10 Yrs.	11 Yrs.	12 Yrs.	13 Yrs.	14 Yrs.	15 Yrs.	16 Yrs.	17 Yrs.	18 Yrs.	19 Yrs.
38	34	34	34*													
39	35	35	35													
40	36	36	36*													
41	38	38	38	38*												
42	39	39	39	39*	39*											
43	41	41	41	41*	41*											
44	44	44	44	44	44*											
45	46	46	46	46	46*	46*										
46	48	47*	48	48	48	48*										
47	50	49*	50	50	50	50*	50*									
48	53		52	53	53	53	53*									
49	55		55	55	55	55	55	55*								
50	58		57*	58	58	58	58	58*	58*							
51	61			61	61	61	61	61	61*							
52	64			63	64	64	64	64	64	64*						
53	68			66*	67	67	67	67	68	68*						
54	71				70	70	70	70	71	71	72*					
55	74				72*	72	73	73	74	74	74*					
56	78				75*	76	77	77	77	78	78	80*				
57	82					79*	80	81	81	82	83	83*				
58	85					83*	84	84	85	85	86	87				
59	89						87	88	89	89	90	90	90			
60	94						91*	92	92	93	94	95	96			
61	99							95	96	97	99	100	103	106*		
62	104							100*	101	102	103	104	107	111	116*	
63	111							105*	106	107	108	110	113	118	123	127*
64	117								109	111	113	115	117	121	126	130*
65	123								114*	117	118	120	122	127	131	134
66	129									119	122	125	128	132	136	139
67	133									124*	128	130	134	136	139	142
68	139										134	134	137	141	143	147
69	144										137	139	143	146	149	152
70	147										143	144	145	148	151	155
71	152										148*	150	151	152	154	159
72	157											153	155	156	158	163
73	163											157*	160	162	164	167
74	169											160*	164	168	170	171

Age — Years		6	7	8	9	10	11	12	13	14	15	16	17	18	19
Average height (inches)	Short	43	45	47	49	51	53	54	56	58	60	62	64	65	65
	Medium	46	48	50	52	54	56	58	60	63	65	67	68	69	69
	Tall	49	51	53	55	57	59	61	64	67	70	72	72	73	73
Av. annual gain (lbs.)	Short	3	4	5	5	5	4	8	9	11	14	13	7	3	
	Medium	4	5	6	6	6	7	9	11	15	11	8	4	3	
	Tall	5	7	7	7	7	8	12	16	16	9	7	3	4	

* In order to extend the range of the tables so as to include weights of children who are taller or shorter than those in these groups there have been added as starred figures estimated weights. All the other weights represent averages for each inch in height and age of the children observed in this study.

[1] Prepared by Bird T. Baldwin, Ph.D., Iowa Child Welfare Research Station, State University of Iowa, and Thomas D. Wood, M.D., Columbia University, New York City. Reprinted by permission of the American Child Health Association, 370 Seventh Avenue, New York City.

TABLE VIII

Weight-Height-Age Table for Girls of School Age[1]

Height (in.)	Av. Wt. for Ht. (lbs.)	5 Yrs.	6 Yrs.	7 Yrs.	8 Yrs.	9 Yrs.	10 Yrs.	11 Yrs.	12 Yrs.	13 Yrs.	14 Yrs.	15 Yrs.	16 Yrs.	17 Yrs.	18 Yrs.
38	33	33	33												
39	34	34	34												
40	36	36	36	36*											
41	37	37	37	37*											
42	39	39	39	39*											
43	41	41	41	41	41*										
44	42	42	42	42	42*										
45	45	45	45	45	45	45*									
46	47	47*	47	47	48	48*									
47	50	49*	50	50	50	50	50*								
48	52		52	52	52	52	53*	53*							
49	55		54	54	55	55	56	56*							
50	58		56*	56	57	58	59	61	62*						
51	61			59	60	61	61	63	65						
52	64			63*	64	64	64	65	67						
53	68			66*	67	67	68	68	69	71*					
54	71				69	70	70	71	71	73*					
55	75				72*	74	74	74	75	77	78*				
56	79					76	78	78	79	81	83*				
57	84					80*	82	82	82	84	88	92*			
58	89						84	86	86	88	93	96*	101*		
59	95						87	90	90	92	96	100	103*	104*	
60	101						91*	95	95	97	101	105	108	109	111*
61	108							99	100	101	105	108	112	113	116
62	114							104*	105	106	109	113	115	117	118
63	118								110	110	112	116	117	119	120
64	121								114*	115	117	119	120	122	123
65	125								118*	120	121	122	123	125	126
66	129									124	124	125	128	129	130
67	133									128*	130	131	133	133	135
68	138									131*	133	135	136	138	138
69	142										135*	137*	138*	140*	142*
70	144										136*	138*	140*	142*	144*
71	145										138*	140*	142*	144*	145*

Age — Years		6	7	8	9	10	11	12	13	14	15	16	17	18
Average height (inches)	Short	43	45	47	49	50	52	54	57	59	60	61	61	61
	Medium	45	47	50	52	54	56	58	60	62	63	64	64	64
	Tall	47	50	53	55	57	59	62	64	66	66	67	67	67
Av. annual gain (lbs.)	Short	4	4	4	5	6	6	10	13	10	7	2	1	
	Medium	5	5	6	7	8	10	13	10	6	4	3	1	
	Tall	6	8	8	9	11	13	9	8	4	4	1	1	

* See footnote to Table VII.

[1] Prepared by Bird T. Baldwin, Ph.D., Iowa Child Welfare Research Station, State University of Iowa, and Thomas D. Wood, M.D., Columbia University, New York City. Reprinted by permission of the American Child Health Association, 370 Seventh Avenue, New York City.

TABLE IX

Weight-Height-Age Table for Boys from Birth to School Age[1]

Weight is stated to the nearest pound; height to the nearest inch; age to the nearest month.

Up to and including 34 inches the *weights are net.* Above this the following amounts have been added for clothing (shoes, coats, and sweaters are not included):

35 to 39 in. 1¼ pounds.
40 to 44 in. 1½ pounds.
45 to 49 in. 1¾ pounds.

Height (inches)	Average Weight for Height (pounds)	1 Mo.	3 Mos.	6 Mos.	9 Mos.	12 Mos.	18 Mos.	24 Mos.	30 Mos.	36 Mos.	48 Mos.	60 Mos.	72 Mos.
20	8	8											
21	9½	9	10										
22	10½	10	11										
23	12	11	12	13									
24	13½	12	13	14									
25	15	13	14	15	16								
26	16½		15	17	17	18							
27	18		16	18	18	19							
28	19½			19	19	20	20						
29	20½			20	21	21	21						
30	22			22	22	22	22	22					
31	23				23	23	23	23	24				
32	24½				24	24	24	25	25				
33	26					26	26	26	26	26			
34	27						27	27	27	27			
35	29½						29	29	29	29	29		
36	31							30	31	31	31		
37	32							32	32	32	32	32	
38	33½								33	33	33	34	
39	35								35	35	35	35	
40	36½									36	36	36	36
41	38										38	38	38
42	39½										39	39	39
43	41½										41	41	41
44	43½											43	43
45	45½											45	45
46	48												48
47	50												50
48	52½												52
49	55												55

[1] Prepared by Robert M. Woodbury, Ph.D. Reprinted by permission of the American Child Health Association, 370 Seventh Avenue, New York City.

TABLE X

Weight-Height-Age Table for Girls from Birth to School Age [1]

Weight is stated to the nearest pound; height to the nearest inch; age to the nearest month.

Up to and including 34 inches the *weights are net*. Above this the following amounts have been added for clothing (shoes and sweaters are not included):

35 to 39 in. 1 pound.
40 to 44 in. 1½ pounds.
45 to 49 in. 1¾ pounds.

Height (inches)	Average Weight for Height (pounds)	1 Mo.	3 Mos.	6 Mos.	9 Mos.	12 Mos.	18 Mos.	24 Mos.	30 Mos.	36 Mos.	48 Mos.	60 Mos.	72 Mos.
20	8	8											
21	9	9	10										
22	10½	10	11										
23	12	11	12	13									
24	13½	12	13	14	14								
25	15	13	14	15	15								
26	16½		15	16	17	17							
27	17½		16	17	18	18							
28	19			19	19	19	19						
29	20			19	20	20	20						
30	21½			21	21	21	21	21					
31	22½				22	22	23	23	23				
32	24					23	24	24	24	25			
33	25						25	25	25	26			
34	26½						26	26	26	27			
35	29						29	29	29	29	29		
36	30							30	30	30	30	31	
37	31½							31	31	31	31	32	
38	32½								33	33	33	33	
39	34								34	34	34	34	34
40	35½									35	36	36	36
41	37½										37	37	37
42	39										39	39	39
43	41										40	41	41
44	42½											42	42
45	45												45
46	47½												47
47	50												50
48	52½												52

[1] Prepared by Robert M. Woodbury, Ph.D. Reprinted by permission of the American Child Health Association, 370 Seventh Avenue, New York City.

WELLCOME LIBRARY INSTITUTE

INDEX

Active man, dietary for, 61.
energy requirement of, 58.
food plan for, 60.
vitamin requirement, 88.
Active persons, type of luncheons for, 228.
Active women, dietary for, 94, 95.
energy requirement of, 90.
food plan for, 93.
vitamin requirement, 110.
Activity, influence on energy requirement of men, 58.
of women, 91.
Acute indigestion, diet for, 319.
Adolescence, energy requirement during, 200.
food during, 195.
protein requirement during, 200.
Aged, the, 214.
dietary for, 222.
energy requirement of, 210.
food plan for, 221.
number of meals for, 219.
protein requirement of, 219.
warm food for, 218.
weight of, 217.
Albuminized beverages, food value of, 313.
Almonds, 349, 433.
chocolate, 349.
chopped, 349.
salted, 349.
shelled, 349.
sugar, 349.
Amino acids, 16.
Angel cake, 349, 386.
Anti-constipation menus, 49.
Apple, baked, 349, 386.
fresh, 349, 433.
pie, 349, 386.
sauce, 349, 386.
sauce cake, 349, 386.
snow, 349, 386.
tapioca, 349, 387.
Apricots, canned, 145, 350.
dried, 350.
dried, stewed, 350, 387.
fresh, 350.
Art of food combination, 234.
Artificial feeding of infants, 140.
Ash constituents, amount in body, 15.
calcium, 20.
cost of, 253, 257.
iron, 19.
phosphorus, 18.
function of, 23.
in restricted diets, 85.
Ash requirement, baby's, 119.
man's, 85.
woman's, 110.
Asparagus,
au gratin, 350, 387.
canned, 350.
creamed, 350, 387.
fresh, 350, 433.
on toast, 350, 387.
soup, cream of, 350, 387.
Avocado, 350.
dessert, 350, 387.
on the half-shell, 350, 388.
salad, 350, 388.

Baby, artificial feeding of, 136.
ash requirement, 119, 138.
breast feeding of, 120.
care of food for, 132.
emergency food, 145.
energy requirement of, 137.
foods, proprietary, 143.
protein requirement of, 138.
schedule for breast feeding, 128, 134.
for artificial feeding, 140.
vitamin requirement, 139.
Bacon, 350.
fat, 350.
Baked apple, 349, 386.
Baking powder biscuit, 351, 388.
Banana, 159, 171, 351, 386, 433.
jelly, 351, 388.
nut salad, 351, 388.
salad, 351, 388.
Barley, flour, 351.
pearl, 351, 433.
Bean soup, cream of, 351, 389.
stew, kidney, 351, 389.

Beans, baked, canned, 351.
kidney, stew, 351, 389.
Lima, baked, 351, 389.
Lima, buttered, 351, 389.
Lima, dried, 351, 433
Lima, fresh, or canned, 351.
navy, dried, 351, 433.
soy, 352, 433.
string, 352, 389, 390, 433.
string, buttered, 352, 389.
string, creamed, 352, 390.
Beef, broth, 352.
corned, 352.
dried, 352, 390.
dried, creamed, 352, 390.
drippings, 352.
Hamburg steak, 352, 390.
heart, stuffed, 352, 391, 434.
juice, 321.
lean, 352, 433.
lean, compared with milk, 252, 255.
liver, 352.
loaf, 353.
marrow, 353.
pie, 353, 412.
roast, rib, 353.
round, pot roast, 353.
round steak, pan broiled, 353.
sirloin, 353, 391.
steak, Hamburg, 352.
steak, sirloin, 353, 391.
steak, stuffed round, 353, 391.
steak, Swiss style, 353, 391.
stew with vegetables, 353, 391.
Beets, 353, 433.
Beverages, 313, 357.
albuminized, 313.
Biscuit, baking powder, 351, 388.
muffins, and bread, 370, 391, 392, 399.
Blackberries, 354, 433.
stewed, 354.
Blanc mange, chocolate, 357, 395.
cornstarch, 360, 400.
Bluefish, 354.
Body, building material for, 15, 72.
composition of, 15.
fuel, sources of, 5.
processes, regulation of, 23.
Boiled custard, 362, 408.
salad dressing, 377, 424.
Bologna sausage, 354.
Bomb calorimeter, 7.
Boston brown bread, 354, 392.
Bouillon, 354.
Box lunch for school, 186.
Boy 16 years old, dietary for, 202.
Boys, normal growth of, 162.
height and weight of, 440, 442.
Bran, 354.
muffins, 370, 391.
Brazil nuts, 354, 433.
Bread, Boston brown, 354, 392.
crumbs, 354.
for adolescents, 196.
for babies, 131.
for child 3 to 4 years old, 159.
for child 5 to 7 years old, 172.
Old New England corn, 354.
rye, 354, 433.
Graham, 354.
white, 354, 433.
white, raisin, 354, 422.
whole wheat, 354, 433.
whole wheat, raisin, 354.
Breakfast, different types of, 226.
for family group, 242, 271.
Breast feeding, schedule for, 128, 134.
value of, 123.
Broths, 174, 311.
Brown Betty, 355, 392.
sauce, 355, 392.
sugar, 379.
sugar sauce, 355, 392.
Brussels sprouts, 355, 433.
Buckwheat flour, 364.
Building material, for body, 14.
for a man, 79.
for a woman, 110.
Butter, 354, 433.
peanut, 372, 416.
substitutes, 300.
Buttermilk, 355, 433.
Butternuts, 355.

Cabbage, 160, 262, 355, 392, 433.
shredded, 355.
Cake, angel, 349, 398.
apple sauce, 349, 386, 398.
chocolate, 358, 396.
corn, 399.
one egg, 355, 392.
sponge, 379, 426.
sponge, hot water, 379, 427.
Cakes and cookies, 355, 398.
griddle, 365, 406.
Calcium, cost of, 257.
in food, 21.
in restricted diets, 85.
Calculation of family dietary, 273.

Calorie, definition of, 7.
portions, table of one hundred, 349.
Candied cherries, 357.
Candies, *Listed Alphabetically*.
Candy for children, 183.
canned foods, food value and cost, 252, 263.
Canning, effect on cost of food, 248.
effect on vitamins, 263.
Cantaloupe, 355, 433.
Capon, 355.
Caramels, chocolate nut, 358, 396.
coconut, 359, 397.
Carbohydrates, fermentation of, 42.
foods rich in, 9.
sources of, 5.
Care of baby's food, 132.
Carrots, buttered, 355, 392.
creamed, 355, 393.
fresh, 262, 355, 433.
sandwich, 393.
Cauliflower, 355, 433.
Celery, 355, 381, 433.
soup, cream of, 356, 393.
Cellulose, foods rich in, 10.
Cereal gruels, 312.
Cereals, for adolescents, 195.
for child 1 to 2 years old, 150.
for child 3 to 4 years old, 158.
for child 5 to 7 years old, 171.
for child 8 to 12 years old, 182.
in packages, food value and cost, 251.
Charlotte russe filling, 356, 393, 439.
Cheap family dietaries, 291.
foods, 246, 456.
menus for family dietaries, 302.
sources of vitamins, 261.
Cheese, American, 356.
American, grated, 356.
and nut roast, 370, 414.
and olive sandwich, 393.
and pineapple salad, 356, 393.
Brie, 356.
camerbert, 356.
cottage, 356.
cream, 356, 433.
fondue, 356, 394.
pineapple, 356.
Roquefort, 356.
sauce, 394.
soufflé, 356, 394.
straws, 356, 394.
Swiss, 356.
toasted, on saltines, 357, 394.
uses of, 290.
Cherries, candied, 357.
fresh, stoned, 357.
sweet, fresh, 357.
Chestnuts, Italian, 357, 433.
Chewing, importance of, 37.
Chicken, broiled, 357.
canned, 357.
creamed, 357, 394.
lean meat, cooked, 357.
salad, 357, 394.
Children, energy requirement of, 117, 137, 155, 162, 175, 190.
hours for meals, 128, 134, 140, 150, 163, 175.
lunch boxes for, 186.
protein requirement of, 138, 155, 162, 175, 190, 200.
vitamins for, 112, 119, 139, 149, 151.
weight of, 155, 440–443.
Child's diet, 1st year, 123, 136.
2d year, 149.
3d and 4th year, 157.
5th to 7th year, 167.
8th to 12th year, 179.
Child's dietary, age 1½ years, 156.
age 3 to 4 years, 166.
age 5 to 6 years, 178.
age 8 years, 192.
age 10 years, 193.
Child's food plan, age 1½ to 2 years, 155.
age 3 to 4 years, 165.
age 5 to 7 years, 177.
age 8 to 10 years, 191.
age 14 to 16 years, 201, 203.
Chocolate, 184, 357.
beverage, 357, 395.
blanc mange, 357, 395.
cream mints, 357.
cake, 358.
cookies, 357, 395.
fudge, 357, 395.
loaf cake, 396.
milk, 358.
nut caramels, 358, 396.
nut fudge, 358, 396.
peppermints, 358.
sweet milk, 358.
unsweetened, 358.
Chowder, corn, 359.
Citron, 358.
Clams, 358, 433.
Club sandwich, 396.
Cocoa (beverage), 358, 397.
tapioca, 359, 397.

Coconut, caramels, 366, 359, 397.
prepared, 359, 433.
Codfish, balls, 359, 398.
creamed, 359, 398.
Cod liver oil, 32, 67, 89, 112, 119, 129, 359, 433.
steak, steamed, 359.
Coffee jelly, 359, 398.
Cold storage, effect on cost of food, 239, 248.
Cold weather diet, 239, 243.
menus, 244.
Colds, diet for, 318.
Cole slaw, 359, 398.
Collards, 433
College youth, food for, 209.
Combinations of food, artistic, 234.
effect on digestion, 230, 231, 247.
scientific, 229.
Concentration, effect on digestion, 41.
Condensed milk, sweetened, 369.
unsweetened, 145, 369.
consommé, 359.
Constipation, diet for, 46, 212.
Construction of menu, 226.
Convalescent diet, 308.
menus for, 315, 316, 317.
Cookies and cakes, 172.
chocolate drop, 357, 395.
molasses, 370, 413.
oatmeal, 371, 414.
peanut, 372, 417.
plain, 374, 398.
Corn, à la Southern, 359, 399.
bread, Old New England, 359, 399.
cake, 399.
canned, 359.
chowder, 359, 399.
fresh, 359.
muffins, 399.
oil, 433
on cob, 359, 433.
puffed, 359.
soup, cream of, 360, 400.
syrup, 360.
Corned beef, 352.
Cornflakes, 359.
Cornmeal, 359.
and tapioca pudding, 380, 427.
muffins, 399.
Cornstarch, 360.
blanc mange, 360, 400.
chocolate blanc mange, 357, 395.
Cost of calcium in food, 257.
of cereals in packages, 248, 251.
of eggs, 260.
of family dietary, 278.
of food, 246.
of food, effect of market factors on, 247.
of iron in food, 257.
of phosphorus in food, 257.
of protein in food, 253, 255.
of vitamins, 253, 261.
per 100 calories of common foods, 256, 436.
reduction in family dietary, 280, 286, 291, 302.
relation to fuel value, 250, 436.
Cottage cheese, 356.
pudding, 360, 400.
Cottolene, 360.
Cottonseed oil, 360, 433.
Courses in meals, value of, 236.
Crabmeat, canned, 360.
Cracker crumbs, 360.
meal, 360.
Crackers, Graham, 360.
oyster, 360.
pilot, 360.
saltine, 360.
soda, 360.
water, 360.
whole wheat, 360.
Cranberries, 361, 433.
Cranberry and raisin pie, 376, 422.
jelly, 361, 400.
pie, 361, 400.
pudding, steamed, 361, 400.
sauce, 361, 401.
Cream cheese, 356.
cheese and date sandwiches, 402.
filling, 361, 401.
of asparagus soup, 350, 387.
of baked bean soup, 351, 389.
of celery soup, 356, 393.
of corn soup, 360, 400.
of green pea soup, 372, 417.
of mushroom, 413.
of peanut butter soup, 372, 417.
of spinach soup, 378, 426.
of tomato soup, 381, 429.
pie, 362, 401.
puff shells, 361, 401.
sauce, 362, 401.
Spanish, 378, 426.
tapioca, 380, 427.
thick, 361, 433.
thin, 361.
toast, 380, 427.

Creamed chicken, 357, 394.
dried beef, 352, 390.
peas, 373, 417.
potatoes, 375, 420.
salmon on toast, 377, 425.
turnips, 382, 430.
Creamy rice pudding, 376, 423.
Crisco, 362.
Croquettes, macaroni, 368, 411.
Croutons, fried, 362, 401.
toasted, 362, 402.
Crumbs, bread, 354.
cracker, 360.
Crystallized ginger, 365.
Cucumber and tomato salad, 380, 428.
Cucumbers, 362, 433.
Cup cakes, plain, 362, 402.
Cup custard, 362, 402.
Currants, dried, 362.
fresh, 362.
Custard, boiled, 362, 402.
cup, 362, 402.
pie, 362.
Cutlets, veal, 382, 431.

Dandelion greens, 362, 433.
Dasheens, 433.
Date and cream cheese sandwiches, 402.
pudding, 362, 402.
sandwiches, 403.
Dates, stoned, 362.
unstoned, 363.
Desserts, for adolescents, 197.
for children, 161.
Diabetes, diet in, 333.
Diet, fluid, 311, 326.
for acute indigestion, 319.
for cold weather, 238, 243.
for colds, 318.
for constipation, 46.
for convalescence, 308.
for diabetes, 333.
for fever, 321.
for hot weather, 238.
for minor illness, 318.
for overweight men, 72.
for overweight women, 99.
for tuberculosis, 328.
for typhoid fever, 323.
for underweight men, 65.
for underweight women, 104.
light, 316.
semi-solid, 315.
soft, 315, 327.
Dietary, for active woman, 94.
for aged person, 222.
for boy 16 years old, 202.
for child 1½ years old, 156.
for child 3 to 4 years old, 166.
for child 5 to 6 years old, 178.
for child 8 years old, 192.
for child 10 years old, 193.
for family, cost of, 278.
for family, menu for, 270, 281, 292, 298, 302.
for family, No. 1, 274.
for family, No. 2, 282.
for family, No. 3, 293.
for family, No. 4, 298.
for family, reducing the cost of, 280, 286, 291, 302.
for fattening, 65, 107.
for girl 16 years old, 204.
for nursing mother, 121.
for overweight man, 76, 78.
for overweight woman, 103.
for sedentary man, 55, 57.
for sedentary woman, 97, 98.
for tuberculosis, 331.
for underweight man, 71.
for underweight woman, 107.
for working man, 58.
for working man, tuberculous, 332.
recipes, 384.
Digestion, effect of concentration on, 41.
effect of food combinations on, 230, 231, 247.
effect of food mixtures on, 41.
effect of mastication on, 39.
effect of regularity on, 39.
in large intestine, 44.
in mouth, 37.
in small intestine, 43.
in stomach, 39.
Dinner, family, 270.
types of, 228.
Doughnuts, 363.
Dressing, boiled salad, 377, 424.
French, 364, 404.
mayonnaise, 368, 412.
Dried beef, 352.
beef, creamed, 352, 390.
fruits, as sources of vitamins, 265, 270.
uses of, 290.
vegetables, 264.
Drippings, beef, 352.

Egg and tomato salad, 363, 403.
lemonade, 363.
plant, 433.

Egg — *Continued*
salad, 363, 403.
timbale, 363, 403.
Egg yolk, 151, 161, 433.
Eggnog, 363, 403.
Eggs, 363.
à la goldenrod, 363, 403.
devilled, 363, 404.
poached on spinach, 363, 403.
relative cost of, 260.
scrambled, 363, 404.
Eight year old child, dietary for, 192.
energy requirement of, 190.
food for, 179.
food plan for, 191.
protein requirement of, 190.
Elderly person, food plan for, 220, 221.
Emergency infant foods, 145.
Endive, 363, 433.
Energy, measurement in food, 7.
requirement, adolescents, 200.
requirement, aged persons, 217.
requirement, baby, 137.
requirement, child 1½ to 2 years old, 155.
requirement, child 3 to 4 years old, 162.
requirement, child 5 to 7 years old, 175.
requirement, child 8 to 12 years old, 190.
requirement, child 12 to 13 years old, 200.
requirement, family, 268.
requirement, farmers, 13.
requirement, in sickness, 310.
requirement, in tuberculosis, 328.
requirement, man, 51.
requirement, man, active, 58.
requirement, man, sedentary, 51.
requirement, measurement of, 12.
requirement, woman, 90.
requirement, youth 14 to 17 years old, 200.
sources of, 5.
value of food, 7, 349.
value of luncheons, 184, 197.
value, relation to market cost, 250, 436.
English walnuts, 383.
Enzymes, description of, 37.

Factors in market cost of food, 247.
Family, breakfast menu, 271.
breakfast plan, 226, 271.
dietary, calculation of, 273.
dietary, cost of, 278.
dietary, essentials of, 268.
dietary, iron in, 278.
dietary, menus for, 270, 281, 292, 298, 302, 304, 305, 306.
dietary No. 1, 274.
dietary No. 2, 282.
dietary No. 3, 293.
dietary No. 4, 298.
dietary, reducing cost of, 280, 286, 291.
dietary, vitamins in, 277.
dinner, plan, 228, 270.
energy requirement of, 268.
luncheon, plan, 226, 272.
Farina, cooked, 363.
uncooked, 363.
Farmers, energy requirement of, 13.
Fat, foods rich in, 9.
sources of, 5.
Fattening dietaries for a sedentary man, 69, 71.
for a woman, 107, 109.
Fermentation, influence of carbohydrates on, 42.
Fever, diet in, 321.
energy requirement in, 322.
typhoid, diet in, 323.
typhoid, mixed fluid diet for, 326.
typhoid, modified milk diets for, 325.
typhoid, soft diet for, 327.
Figs, chopped, 363.
fresh, 364.
whole, 363, 364.
Filberts, 364, 434.
Filling, cream, 361.
for charlotte russe, 356, 401.
Fish, bluefish, 354.
codfish, 359, 422.
flounder, 364.
halibut steak, 372.
lobster, 368.
mackerel, Spanish, 368.
salmon, 377.
sardines, 378.
scallops, 378.
shrimp, 378.
smelts, 378.
tuna, 381.
tuna, à la Newburg, 430.
Five year old child, dietary for, 178.
energy requirement of, 175.
food for, 167.
food plan for, 177.
protein requirement of, 175.
vitamins for, 174.
Flaked wheat, cooked, 383.
uncooked, 383.
Flavor, value of, 289.
Flour, buckwheat, 364.
Graham, 364.

Flour — *Continued*
rice, 364.
rye, 364.
wheat, 364.
whole wheat, 364.
Fluid (*see also* Water), 187.
Fluid diet, 311.
menus for, 315, 326.
Fondue, rice, 376, 423.
Food after fifty, 214.
amounts to yield 100 calories, 11, 349.
calcium in, 21.
classified according to cost, 436.
classified according to foodstuff, 9.
energy value of, in common measures, 349.
energy value of recipes, 386.
for adolescents, 194.
for baby, 123.
for child 1 to 2 years old, 147.
for child 3 to 4 years old, 157.
for child 5 to 7 years old, 167.
for child 8 to 12 years old, 179.
for college youth, 209.
for the aged, 214.
for the family group, menus, 224.
for the nursing mother, 117.
for the prospective mother, 110.
for the school lunch box, 186.
for the sick and convalescent, 308.
for typhoid fever, 323.
from 17th to 25th year, 205.
in pregnancy, 110.
iron in, 19.
one hundred calorie portions of, 349.
order in meals, 232.
phosphorus in, 18.
plan, aged person, 221.
plan, child 1½ to 2 years old, 155.
plan, child 3 to 4 years old, 165.
plan, child 5 to 7 years old, 177.
plan, child 8 to 10 years old, 191.
plan, elderly person, 220.
plan, man, active, 59.
plan, man, sedentary, 53.
plan, man, working, 60.
plan, woman, active, 93.
plan, woman, sedentary, 96.
plan, youth 14 to 16 years old, 201.
protein in (*see also* table of 100-calorie portions), 16, 18.
value and cost of cereals in packages, 251.
value of common measures, 349.
value of recipes, 386.
value of 100-calorie portions, 362.
vitamins in, 433.
warm, in old age, 218.
Four year old child, dietary for, 166.
energy requirement of, 162.
food for, 157.
food plan for, 165.
protein requirement of, 162.
vitamins for, 160.
Fourteenth to sixteenth year, dietary for boy, 202.
dietary for girl, 203.
energy requirement of, 200.
food plan for, 201, 203.
protein requirement of, 200.
Frankforters, 364.
French dressing, 364, 404.
rolls, 377.
toast, 380, 428.
Fried croutons, 362, 401.
Frozen dishes for children, 170.
Fruit balls, 364, 404.
cake, 364, 404.
canned, 265.
cocktail, 364, 405.
dried, 171, 265, 287.
for adolescents and youths, 195.
for children, 152, 159, 171, 185, 186.
for college youth, 211.
punch, 365, 405.
salad, 365, 405.
vitamin value, 264, 433.
Fruits, *Listed Alphabetically*.
Fudge, chocolate, 357, 395.
Fuel Requirement — *see* Energy Requirement.
Fuel value — *see* Food values or Energy values.

Gelatin, 365.
Ginger ale, 365.
Ginger, crystallized, 365.
Gingerbread, 365, 405, 406.
Ginger snaps, 365.
Girl 16 years old, dietary for, 204.
height and weight of, 441, 443.
Glazed sweet potatoes, 374, 420.
Graham, bread, 354.
crackers, 360.
flour, 364.
muffins, 370, 406.
Granulated sugar, 379.
Grapefruit, 365, 434.
Grape juice, 365.
Grapenuts, 365.

Grapes, Concord, 365, 434.
Malaga, 365, 434.
Green vegetables for children, 139, 152, 159, 172.
Griddle cakes, 365, 406.
Gruels, food value of, 311.
Gumdrops, 365.

Halibut steak, 365.
Ham, boiled, 365.
Hamburg steak, 352, 390.
Hard sauce, 365, 406.
Hash, beef, 365, 406.
Heart, beef, stuffed, 252, 391, 434.
Height and weight, boys, 440, 442.
girls, 441, 443.
men, 439.
women, 439.
Hermits, 365, 407.
Hickory nuts, 366.
chopped, 366.
High school luncheons, 198.
Hominy grits, cooked, 366.
uncooked, 366.
Honey, 366, 434.
Hot food, value of, 219.
water sponge cake, 379, 427.
weather diet, 238.
Hours for babies' meals, 127, 134, 140.
for children's meals, 150, 163, 165, 175.
Huckleberries, 366.

Ice cream, commercial, 366.
French, 366, 407.
for children, 170.
peach, 372, 416.
Philadelphia, 366, 407.
Ice, lemon, 367, 408.
orange, 371.
Icing, White Mountain, 383, 431.
Indigestion, acute, diet after, 319.
Infant — *see* Baby.
Intestinal putrefaction, diet for, 220.
Intestine, large, digestion in, 44.
small, digestion in, 43.
Irish stew, 366, 407.
Iron, in children's diet, 139, 151.
in family diet, 278.
in food materials, 19.
in restricted diets, 86.
relative cost of, 260.

Jello, 366.
Jelly beans, 366.
Jelly, coffee, 359.
cranberry, 361, 400.
lemon, 367, 408.
Junket, 366, 408.

Kale, 366, 434.
Kidney bean stew, 351, 389, 434.
Kidney, veal, 382.
Kohl-rabi, buttered, 366, 408, 434.
creamed, 366, 408.
Koumiss, 367.

Lactose, 367.
lemonade, 367, 408.
Lady fingers, 367.
Lamb, chops, 367.
roast leg, 367.
Lard, 367, 434.
Large intestine, digestion in, 44.
Leeks, 367.
Leftovers, use of, 237.
Lemon ice, 367, 408.
jelly, 367, 408.
juice, 367.
milk sherbet, 367, 409.
pie, 367, 409.
sauce, 367, 409.
Lemonade, 367, 408.
egg, 367, 408.
lactose, 367, 408.
Lemons, 367, 434.
Lentil and tomato soup, 367, 410.
meat loaf, 409.
soup, 410.
Lentils, baked, 409.
dried, 367, 434.
Lettuce, 367, 434.
and tomato salad, 381, 428.
salad, 367, 410.
Light diet, 316.
Lima beans, buttered, 351, 389.
dried, 351.
fresh, 351.
Liver, 132, 151.
and noodle loaf, 367, 410.
beef, 352, 434.
sandwich, 410.
veal, 382.
Loaf, lentil meat, 409.
nut, 370, 414.
salmon, 377, 425.
Lobster, 368.
Loganberry juice, 368.
Lollipops, 368.
Lunch box, plan for, 186.

Luncheon, family, menu for, 272.
high school, 197.
menus, with fuel values, 189, 198.
school, menus for, 189.
school, value of, 187, 198.
types of, 199.

Macaroni and cheese, 368, 411.
cooked, 368.
croquettes, 368, 411.
uncooked, 368.
with tomato sauce, 368, 411.
Macaroons, 368.
Mackerel, Spanish, 368.
Man, active, dietary for, 61.
active, energy requirement of, 59.
active, food plan for, 60.
ash requirement of, 85.
building material for, 79.
energy requirement of, 51.
fattening dietary for, 69, 71.
food plan for a fattening dietary, 68, 70.
overweight, 72.
overweight, dietary for, 76, 78.
protein requirement of, 79.
sedentary, dietaries for, 55, 57.
sedentary, energy requirement of, 52.
sedentary, fattening dietary for, 69, 71.
sedentary, food plan for, 56.
underweight, 64.
underweight, dietary for, 69, 71.
vitamin requirement of, 88.
Maple sugar, 368.
syrup, 368.
Marguerites, 368, 412.
Marshmallows, 368.
Market cost of food, factors influencing, 250.
relation to fuel value, 247, 436.
Mashed potatoes, 375, 420.
Mastication, importance of, 39.
Mayonnaise dressing, 368, 412.
Meal hours for children, 127, 132, 134, 140, 150, 163, 165, 175.
plans, types of, 226.
Meals — *see also* Menus.
balanced, 229.
in courses, value of, 236.
number in old age, 220.
sequence of foods in, 233.
value of variety in, 234.
Meat, compared with milk and eggs, 84.
loaf, lentil, 309.
pie, 353, 412.
place in diet, of adults, 83.
place in diet, of adolescents, 196.
place in diet, of children, 172, 183.
Men, aged, weight of, 217.
height and weight of, 439.
Menu, construction of, 226.
for convalescents, 317, 327.
for diet after acute indigestion, 319.
for family dietary, 270, 281, 292, 298, 302.
for fluid diet, 311, 325, 326.
for intestinal putrefaction, 320.
for soft or semi-solid diet, 315.
value of contrast in, 234.
value of variety in, 230.
Menus, anti-constipation, 49.
for cold days, 244.
for convalencence, 317, 327.
for family dietaries, 270, 281, 292, 298, 302.
for hot days, 242.
for prospective mother, 116.
for school luncheons, 189, 198, 207.
for summer, 238.
for winter, 244.
types of, 226.
Milk, as food in fever, 323.
as source of calcium, 86, 138.
as source of vitamins, 139, 261.
care of, 132.
chocolate, 358.
compared with lean beef, 252, 255.
compared with other high protein foods, 257.
condensed, sweetened, 369.
condensed, unsweetened, 133, 145, 369.
dried, 133, 145, 369.
malted, 369.
for adolescents, 195.
for adults, 59, 74, 83, 87, 105.
for babies, 123, 132, 136, 140.
for children, 148, 157, 169, 182.
for college youth, 211.
for good teeth, 169.
for the sick, 312, 325.
relative cost of, 252, 254.
sherbet, 170, 367, 409.
skim, 369, 434.
top, 369.
whole, 369, 434.
why cheap food, 254.
Mince pie, 369.
Mineral oil salad dressing, 377, 424.
Minor illness, diet in, 318.
Mints, chocolate cream, 369.
Mixed fluid diet for typhoid, 326.
Mixtures of food, influence on digestion, 41.

Mock Hollandaise sauce, 369, 412.
Modified milk diets for typhoid, 325.
Molasses, 370, 434.
  cookies, 370, 413.
  kisses, 370.
Mother, nursing, dietary for, 121.
  nursing, food for, 117.
  nursing, vitamins for, 118.
  prospective, food for, 110.
  prospective, menus for, 116.
  prospective, vitamins for, 111.
Muffins, bran, 370, 391.
  cornmeal, 370, 399.
  Graham, 370, 406.
  one egg, 370, 414.
  twin mountain, 370, 430.
Mushrooms, broiled, on toast, 413.
  fresh, 370, 434.
  soup, cream of, 413.
  stewed, 370, 413.
Mutton, roast leg, 370, 434.

Nabisco almonds, 370.
  wafers, 370.
Navy beans, dried, 351.
Nitrogen, importance of, 15.
  occurrence in food (*see also* Protein), 18.
  requirement — *see* Protein requirement.
Nursery school, 162, 164.
Nursing mother, dietary for, 121.
  food for, 117.
Nut and cheese roast, 370, 414.
  loaf, 370, 414.
Nuts, almonds, 349, 433.
  Brazil, 354.
  butter, 355.
  chestnuts, 357.
  coconut, 359.
  filberts, 364.
  for children, 184.
  hickory, 366.
  peanuts, 184, 372.
  pecans, 373.
  pine, 374.
  walnuts, English, 382, 383.

Oatmeal, cookies, 370, 414.
  cookies (Scottish Fancies), 371.
  wafers, 371, 414.
Oats, rolled, cooked, 371, 434.
  uncooked, 371.
Occupation, influence on energy requirement, of men, 59.
  of women, 91.
Okra, 371.
Oil, olive, 371.
Old age — *see* the Aged.
Old New England corn bread, 354.
Oleomargarine, 371.
  compared with butter, 287, 301.
Olive oil, 371, 434.
Olives, 371.
One egg cake, 355, 392.
  muffins, 370, 414.
One hundred calorie portions, 11.
  table of, 349.
Onions, 371, 434.
  scalloped, 371, 415.
Orange ice, 371, 415.
  jelly with cream, 371, 415.
  juice, 139, 185, 371.
  milk sherbet, 371, 415.
  preventive of scurvy, 139.
Oranges, 371, 434.
Overweight men, 72.
  dietary for, 76, 78.
  food plan for, 77.
Overweight women, 99.
  dietary for, 103.
  food plan for, 102.
Oyster crackers, 360.
  stew, 371, 416.
Oysters, 371, 434.
  compared with milk, 252.

Package cereals, fuel value and cost, 251.
Package goods, 248.
Parsnips, stewed, 371.
  whole, 372, 434.
Pasteurized milk, how to supplement for babies, 133.
Pastry, plain, 416.
Pea soup, green, cream of, 372.
  split, 372.
Peach ice cream, 372, 416.
Peaches, canned, 372.
  fresh, 372, 434.
  stewed, 372, 416.
Peanut brittle, 372.
  butter, 184, 372.
  butter soup, 372, 417.
  cookies, 372, 417.
  sandwich, 416.
Peanuts, chopped, 372, 434.
  shelled, 372.
Pears, canned, 372.
  fresh, whole, 372, 434.
Peas, canned, 372, 434.
  creamed, 373, 417.
  dried, 373, 434.
  green, 373, 434.

Pea soup, cream of green, 372, 417.
split, 372, 418.
Pecans, 373, 434.
shelled, 373.
Penouche, 373, 418.
Peppers, green, 373, 434.
stuffed, 373, 418.
Perfection salad, 373, 418.
Perishability, effect on cost of food, 248.
Phosphorus, cost of, 257.
in food, 18.
in restricted diets, 86.
Physical defects, 169.
Pie, apple, 349.
beef, 353.
cranberry, 361, 400.
cranberry and raisin, 376, 422.
cream, 362, 401.
crust, plain, 373.
custard pie, 362.
lemon, 367, 409.
meat, 353, 412.
mince, 369.
raisin, 376, 422.
raisin and cranberry, 376, 422.
rhubarb, 376, 422.
squash, 379, 427.
Pilaf, Turkish, 381.
Pineapple and carrot salad, 373, 419.
canned, grated, 373.
fresh, 373, 434.
marshmallow cup, 373, 374, 419.
salad, 374, 419.
Pine nuts, 374, 434.
Plain cookies, 374, 398.
pastry, 416.
Plans for meals — *see* Meals, Menus, Food plans.
Plums, 374.
Popcorn, 374.
Popovers, 374, 420.
Pork, bacon, 350.
chops, 374.
ham, 365.
sausage, 374.
Portions, table of 100-calorie, 349.
Potato chips, 374.
salad, 374, 420.
soup, 374, 420.
Potatoes, creamed, 375, 420.
mashed, 375, 420.
scalloped, 375, 420.
sweet, baked, 374.
sweet, glazed, 374, 420.
sweet, uncooked, 374, 434.
white, baked, 374.
white, boiled, 374, 434.
white, mashed, 375.
white, riced, 375.
white, uncooked, 374.
Pot roast, 353.
Poultry stuffing, 421.
Powdered sugar, 379.
Pregnancy, food during, 110.
Pretzels, 375.
Proprietary infant foods, 143.
Prospective mother, food for, 110.
Protein, cheap sources of, 257.
cost of, 253, 255.
foods rich in, 8, 9, 10.
in foods, amounts, 18, 363, 381.
proportion in diet, 81.
requirement, adolescence and youth, 200.
requirement, aged persons, 217.
requirement, baby, 138.
requirement, child 1 to 2 years old, 155.
requirement, child 3 to 4 years old, 162.
requirement, child 5 to 7 years old, 175.
requirement, child 8 to 12 years old, 190.
requirement in tuberculosis, 328.
requirement, man, 79.
requirement, woman, 110.
sources of, 6.
use, in cold weather, 81.
use, in hot weather, 81.
value of different kinds, 16.
Proteins, purin-free, 84.
Prune and nut salad, 375, 421.
and nut sandwich, 421.
pudding, Norwegian, 375, 421.
pulp, 375.
soufflé, 375, 421.
Prunes, 145, 375, 434.
choice and preparation of, 289.
stewed, 375, 421.
Pudding, cornmeal-tapioca, 380, 427.
cottage, 360, 400.
cranberry, 361.
date, 362, 402.
prune, Norwegian, 375, 421.
rice (creamy), 376.
with egg, 376.
with raisins, 376.
snow, 378.
tapioca-cornmeal, 380, 427.
Puddings, use in adolescence and youth, 197.
Puffed corn, 359.
rice, 251, 376.
wheat, 251, 383.

Pumpkins, cooked, 375, 434.
Punch, fruit, 364.
Purins, foods containing, 84.
Putrefaction, intestinal, diet for, 320.

Radishes, 376, 434.
Raisin and cranberry pie, 376, 422.
  bread, 354, 422.
  pie, 376, 422.
Raisins, 376, 434.
  uses of, 289.
Rarebit, Welsh, 383, 431.
Raspberries, 376, 434.
Raspberry sherbet, 376, 422.
Recipes, dietary, 386.
Reducing cost of family dietary, 280, 286, 291.
Reducing dietary, for overweight man, 76, 78.
  for overweight woman, 103.
Regularity of meals, 175, 197.
Requirement, for ash — *see* Ash constituents.
  for energy — *see* Energy.
  for fuel — *see* Energy.
  for protein — *see* Protein.
Rest, 169.
Rhubarb, fresh, 376, 435.
  pie, 376, 422.
  stewed, 376, 422.
Rice, brown, 435.
  dainty, 376, 423.
  flour, 364.
  fondue, 376, 423.
  pudding, 376, 423.
  puffed, 376.
  steamed, 377.
  uncooked, 377, 435.
  with cheese, 423.
  with cheese and tomatoes, 377, 424.
Roast, beef, rib, 353.
  lamb, leg, 367.
  mutton, leg, 370.
  pot, 353.
  turkey, 381.
  veal, 382.
Roe, 435.
Rolls, French, 377.
Round of beef compared with milk, 252, 255.
  steak — *see* Steak.
Rutabagas, 377, 424, 435.

Salad, avocado, 350.
  banana, 351, 388.
  banana nut, 351, 388.
  cheese and pineapple, 356, 393.
  chicken, 357, 394.
  cucumber and tomato, 380, 428.
  egg, 363, 403.
  egg and tomato, 363, 403.
  fruit, 365, 405.
  lettuce, 367, 410.
  lettuce and tomato, 381, 428.
  perfection, 373, 418.
  pineapple, 374.
  pineapple and carrot, 373.
  potato, 374.
  prune and cottage, 375.
  sardine, 378, 425.
  swiss chard, 380, 427.
  tomato and cucumber, 380, 428.
  tomato and lettuce, 381, 428.
  tomato jelly, 381, 428.
  Waldorf, 382, 431.
Salad dressing, *see boiled, French and mayonnaise.*
Salmon, canned, 377, 435.
  creamed on toast, 377, 425.
  loaf, 377, 425.
Saltines, 360.
Samp with cheese, 377, 425.
Sandwich, club, 396.
  date, 403.
  date and cream cheese, 402.
Sandwiches, 186.
Sardines, canned, 377.
  salad, 378, 425.
Sauce, apple, 349, 386.
  brown, 355, 392.
  brown sugar, 355, 392.
  cranberry, 361, 401.
  cream, 362, 401.
  hard, 365, 406.
  lemon, 367, 409.
  Mock Hollandaise, 369, 412.
  tomato, 381, 428.
  white, 383, 431.
Sauerkraut, 378, 435.
Sausage, Frankfort, 364.
  pork, 374.
Scalloped onions, 371, 415.
  potatoes, 375.
Scallops, 378.
Schedule for children's meals, 128, 134, 155, 163, 175, 184.
School lunch box, 186.
  luncheons, 187, 198.
Science of food combinations, 229.
Scrambled eggs, 363, 404.

Seasonal variation in menus, 238.
Second year, food for (*see also* Two year old child), 149.
Sedentary man, dietaries for, 55, 57.
energy requirement of, 51.
fattening dietary for, 70
food plan for, 53, 56.
protein requirement of, 80.
Sedentary persons, type of luncheon for, 206.
Sedentary woman, dietary for, 97, 98.
energy requirement of, 91.
food plan for, 96.
protein requirement of, 110.
Semi-solid or soft diet, 315.
menu for, 316.
Sherbet, lemon milk, 367, 409.
raspberry, 376.
Shredded wheat, 383.
Shrimp, 378.
Sick, energy requirement of, 310.
food for, 308.
Sirloin steak, 353, 391.
Sixteen year old, boy, dietary for, 202.
girl, dietary for, 204.
Skim milk, 369.
Slaw, cole, 359.
Small intestine, digestion in, 43.
Smelts, 378.
Snow, apple, 349, 386.
pudding, 378, 425.
Soda crackers, 360.
water, plain, 378.
water with chocolate ice cream, 378.
water with vanilla ice cream, 378.
Soft or semi-solid diet, 315.
for typhoid fever, 327.
Soufflé, cheese, 356, 394.
prune, 375.
Soup, clear tomato, 381, 428.
cream of asparagus, 350, 387.
cream of baked bean, 351, 389.
cream of celery, 356, 393.
cream of corn, 360, 400.
cream of green pea, 372, 417.
cream of mushroom, 413.
cream of peanut butter, 372, 417.
cream of spinach, 378, 426.
cream of tomato, 381, 429.
lentil, 410.
lentil and tomato, 367, 410.
pea, split, 372.
potato, 374.
soy bean, 378, 426.
Soups, for the sick, 311.
Soy bean loaf, 378, 425.
beans, dried, 378.
Spanish cream, 378, 426.
mackerel, 368.
Special diabetic foods, use of, 336.
Spinach, 130, 261.
à la crême, 378, 426.
cooked, 378, 435.
soup, 378, 426.
with egg, 378, 426.
Sponge cake, 379, 426.
hot water, 379, 427.
Squash, cooked, 379, 435.
pie, 379, 427.
Steak, halibut, 372.
Hamburg, 352.
round, pot roast, 353.
round, stuffed, 353, 391.
sirloin, 353, 391.
stuffed, 353, 391.
Swiss, 353.
Stew, beef with vegetables, 353, 391.
Irish, 366, 407.
kidney bean, 351, 389.
oyster, 371.
Stewed dried apricots, 350, 387.
mushrooms, 370, 413.
peaches, 372.
prunes, 375.
rhubarb, 376.
Strawberries, 379, 435.
String beans, 352, 389, 390.
Stuffed beef heart, 352, 391.
peppers, 373.
steak, 353, 391.
tomato, 381.
Stuffing, poultry, 421.
Successful infant feeding, criteria of, 128.
Succotash, canned, 379.
Suet, 379.
Sugar, brown, 379.
for children, 183.
cookies, 379.
granulated, 379, 435.
loaf, 379.
maple, 368.
powdered, 379.
Sulphur in food, 17.
Summer and winter diet, 238.
menus, 242, 244.
Sundae, chocolate, 379.
fruit, 380.
vanilla, 380.
Sweetbreads, 380, 435.

Swiss cheese, 356.
steak, 353.
Swiss chard, salad, 380, 427, 433.
Syrup, corn, 360.
maple, 368.

Table of calcium in food materials, 21.
cost of cereals in packages, 251.
cost of food to yield 0.67 gram calcium, 258.
cost of food to yield 0.015 gram iron, 260.
cost of food to yield 1.32 grams phosphorus, 259.
cost of one hundred calorie portions of food, 436.
cost of one hundred protein calories from different sources, 256.
dietary recipes, 386.
food value and cost of cereals in packages, 251.
food value in relation to cost, 436.
food value in terms of common measures, 349.
foods rich in carbohydrates, 9, 10.
foods rich in cellulose, 10.
foods rich in fat, 9.
foods rich in protein, 8.
foods rich in protein and fat, 9.
foods rich in water, 10.
height and weight of boys from birth to school age, 442.
height and weight of school boys, 440.
height and weight of girls from birth to school age, 443.
height and weight of school girls, 441.
height and weight of men, 439.
height and weight of women, 439.
iron in food, 20.
nitrogen in food, 18.
phosphorus in food, 19.
protein in food — *see* table of 100-calorie portions.
vitamins in food materials, 433.
weight and height — *see* Height and weight.
weight of old men and women, 217.
Tapioca, 380.
apple, 349, 387.
cornmeal pudding, 380, 427.
cream, 380, 427.
Tea, 170, 195, 218, 290.
Teeth, 31, 173.
Ten year old child, dietary for, 193.
Three or four year old child, dietary for, 166.
energy requirement of, 162.
food for, 157.
food plan for, 165.
protein requirement of, 162.
vitamin requirement of, 160.
Timbale, egg, 363, 403.
Toast, cream, 380, 427.
French, 380, 428.
Toasted croutons, 362, 402.
Tomato and cucumber salad, 380, 428.
and lentil soup, 367, 410.
and lettuce salad, 381, 428.
jelly, 381, 428.
sauce, 381, 428.
soup, clear, 381, 428.
soup, cream of, 381, 429.
stuffed, 381, 429.
stuffed with liver, 381, 429.
Tomatoes, canned, 283, 381, 435.
fresh, 381.
Tomato juice, 139.
scalloped, 381, 428.
Triscuit, 381.
Tuberculosis, diet in, 328.
dietaries for, 331, 332.
energy requirement in, 328.
food plans for, 330.
protein requirement in, 329.
Tuna fish à la Newburg, 381, 430.
canned, 381.
Turkey, roast, 381.
roast with stuffing, 381.
Turkish pifaf, 381, 429.
Turnip greens, boiled, 382, 435.
creamed, 382, 430.
with oil dressing, 382, 430.
Turnips, 382, 435.
creamed, 382, 430.
Twin mountain muffins, 370, 430.
Two year old child, food for, 147.
food plan for, 155.
protein requirement of, 155.
vitamin requirement of, 151.
Types of meal plans, 226.
Typhoid fever, diet in, 323.
mixed fluid diet for, 326.
modified milk diets for, 325.
soft diet for, 327.
underweight man, 64.
dietary for, 69, 71.
underweight woman, 104.
dietary for, 107.

Variety in meals, value of, 231.
Veal cutlets, 382, 431, 435.

Veal — *Continued*
kidney, 382.
leg, roast, 382.
liver, 382.
Vegetables, *Listed Alphabetically*.
for adolescents, 195.
for babies, 131.
for children, 152, 159, 172, 183.
for college youth, 207.
for nursing mothers, 119.
for prospective mothers, 111, 114.
vitamins in, 262.
Vitamins, 24, 433.
A, 26.
B, 28.
C, 29.
cheap sources of, 261.
cost of, 261.
family dietary, sources in, 277.
for baby, 139.
for child 2 years old, 151.
for child 3 to 4 years old, 160.
for child 5 to 7 years old, 172.
for man, 88.
for nursing mother, 119.
for prospective mother, 111.
in food materials, table, 433.

Wafers, oatmeal, 371.
Waffles, 382, 431.
Waldorf salad, 382, 431.
Walnuts, English, 382, 383, 435.
chopped, 383.
Warm food in old age, 218.
Water, foods rich in, 10.
Water cress, 383.
Watermelon, 383.
Water, need for, 119, 141.
Weaning, preparation for, 129.
Weight — *see also* Height and weight.
aged, 217.
Welsh Rarebit, 383, 431.
Wheat bread, 354.
flaked, 383.
flour, 364.
puffed, 383.
shredded, 383.
Whey, 383.
White Mountain icing, 383, 431.
sauce, 383, 431.
Whole milk, 369.
Winter and summer menus, 238.
Woman, active, dietary for, 95.
active, energy requirement of, 91.
active, food plan for, 93.
ash requirement of, 110.
overweight, diet for, 99.
fattening dietary for underweight, 107.
nursing, dietary for, 121.
nursing, food for, 117.
overweight, dietary for, 103.
pregnant, food for, 110.
protein requirement of, 110.
sedentary, dietary for, 97, 98.
sedentary, food plan for, 96.
underweight, diet for, 104.
underweight, dietary for, 107, 109.
vitamin requirement of, 110.
Women, aged, weight of, 217.
height and weight of, 439.

Yeast, 383, 435.
Youth, energy requirement of, 200.
food for, 194.
protein requirement in, 200.

Zwieback, 131, 383.