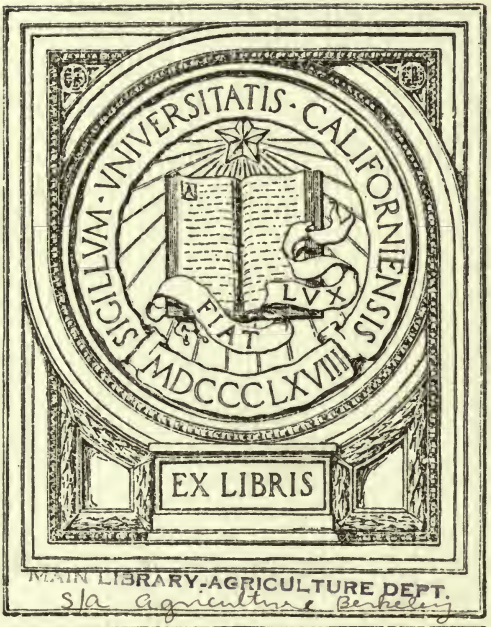
THE INFLUENCE OF CORRECT FOOD QUANTITIES UPON HUMAN LIFE

STEARNS



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BY

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INTRODUCTORY

The aim of this work is to present in the fewest possible words, and in the simplest possible manner, the essential facts concerning food, and especially with reference to the effect of too much or too little food upon normal development, health and longevity.

The entire subject in its present accepted form, has been developed within the past fifty years. Within ten years higher efficiency has been shown to follow the use of food quantities greatly less than was formerly thought necessary, and within three years of the date of this writing it has been shown that life is distinctly limited through the use of too much food after full bodily growth has been attained. Within the past year the probability has been indicated that at least one form of feeble mindedness is dependent upon too little food during infancy. A large number of people, therefore, had left school long before this subject had reached the present stage of development, and the object of this work is to make possible the utiliza-

tion of the available facts for such persons, as well as to furnish a practical method for instruction in the schools for the ages in which such instruction should begin.

The utilization of this knowledge, under ordinary conditions of life, is difficult because of the problems connected with the correct estimation of food values. Methods in use are quite simple under laboratory conditions, but impossible for general home use. The simple method here proposed has been found easy to apply, and to render general utilization of the valuable knowledge possible. All that is necessary is to master the simple elementary facts, and to practice weighing ordinary foods as supplied at the table, for a brief period, when it will be found easy to estimate, with sufficient accuracy, the total values of a given meal, without the use of scales. Since it is certain that observation of the necessary conditions will result in rearing children of higher mental and physical standard, in the development of greater efficiency, in the prevention of sickness, and in the prolongation of life, it is

equally certain that the use of this knowledge as a matter of daily routine will become general.

Until very recent years it was believed that the differences between individuals of higher or lower order was dependent almost entirely upon education. Perhaps this is true, if we assume that correction of the conditions upon which the development of individuals of low order depend is a matter of education. Certainly it is true if we admit that we can convert a feeble minded child into a normal one by intelligent application of modern rules of nutrition, as has been certainly done. The real truth is that, leaving out of consideration those who will come well within the definition of feeble minded, we have differences in individuals due to relatively smaller numbers of nerve cells in the brain, to imperfect development of such nerve cells and to toxie conditions due to over feeding. The rule among these persons is that they are well developed, bodily, and therefore more fit, perhaps, than their superiors in mind, for physical work. Frugality, either in the use of food or in handling it is unknown amongst them.

The still lower strata, exemplified in crowded localities, barely exist, and the majority of them are close to the line of so-called feeble minded persons.

Under conditions of living as existing in the past, these classes were unavoidable. About the close of the 8th century, Muni Btsan-po, King of Thibet "being determined to raise all his subjects to the same level, enacted that there should be no distinction between poor and rich, humble and great. He compelled the wealthy to share their riches with the indigent and helpless, and to make them equals in respect of all comforts and conditions of life. He repeated this experiment three times; but each time he found that they all returned to their former conditions, the rich being still richer, and the poor still poorer."

General conditions hitherto existing, and which still exist, could result in no other way. Improvement has been made, almost invariably through the efforts of individuals or groups of individuals. The time has now arrived when improvements are due from universal study of the factors upon which normal individual de-

velopment depends. Therefore the study of this subject should be methodically begun at the correct age, and the precepts of correct living should be observed. In childhood the individual is dependent upon parental care, but at fifteen, or thereabout the question of how to live should take precedence over all other subjects of learning, for all other subjects are dependent upon how well this is learned and practiced.

Closely allied to welfare of the individual, is communal welfare. With this idea in view, we have given a considerable portion of our limited space to directing attention to the responsibility of the individual for public conditions affecting health and longevity, and have reprinted a portion of the publications of the Board of Health of the State of New Jersey, and of Kansas. It is believed if each pupil would make such investigations of local conditions as would make it possible to comply with the proposed requirements for a paper on local conditions of sanitation and health, not only valuable information would be gained, but interest would be aroused in movements in these lines, which would make desirable improvements much more possible.

While the need of more general knowledge of the technical features of the subject, such as physiology, physiological chemistry and physiological anatomy is recognized, for the sake of brevity these have been left for later courses, or for further investigation. For this purpose a partial list of the best books on these subjects, as well as of books in which the treatment of the subject of food is of a more technical character, is given. The economic features in selection of foods, from a money consideration, should be considered in the course of the practical demonstrations recommended.

The author is deeply impressed with the idea that a more systematic method than now obtains should be practiced, for the early recognition of possible defects in school children. If it is true, as we have endeavored to show, that definite differences exist in the mental and physical condition of individuals—a proposition that would scarcely seem to require argument—the earlier the recognition of such defects, the greater the possibility of correction, and the better those in charge of the educational programme will be able to provide suit-

able instruction. If the Binet-Simon tests were applied upon entrance of the child at school, and yearly thereafter, delayed development would be recognized at once, and suitable means applied in time to secure the best attainable results. There is no question about the possibility of improvement in many such cases, with the probability that very many of them, by the exercise of better rules of nutrition, at the very time when the failure of suitable nutrition is prohibiting normal development, could be brought to normal form. This would ultimately lead to greater supervision of the individuals of the community than now exists, and would it not be merely in line with a continuance, past the first year of life, and throughout childhood, of the same method in use in Newark, an account of which is given?

Heredity, alcoholism and disease — three causes which have been doing duty for too long a time as stated causes of conditions we are unable to correctly explain—are given as causes of feeble mindedness. Retiring, from necessity, from positive statements, we now designate these as causative factors. Doubtless all

untoward influences operate to the detriment of the individual, and certainly we cannot correct all possible untoward influences. The astonishing work in Newark, and in Villiers-Le-duc, should be received as an earnest of what may be done still further in the same direction, and by the extension of the practice to the benefit of children throughout the formative ages, and to attainment of full bodily development.

The subject of feeble mindedness is not attractive, and we turn with dread from it, as well as from a candid consideration of our own deficiencies. In the light of modern knowledge, one who has made a failure of life, or even only a partial success, may well look back, and regret the limited knowledge of the principles upon which mental and bodily development depend, or even that in childhood a curable defect was not recognized and corrected. Establishment of the fact that mental and physical development, as well as disease, early death or longevity are dependent upon controllable factors, establishes responsibility upon parents, teachers, and public officials, as well as upon each in-

dividual. It also gives promise of great future possibilities to all who aspire to success, and are willing to learn how to live, and to apply the knowledge to mental and bodily development.

One may easily acquire the needed knowledge, but most people also require advice and instruction from a competent physician. The present general practice is to delay until incapacity compels the service of the physician, who has thus become, too often, only a repair man. So fully has the fact come to be recognized that disease may be avoided or prevented if the well known preliminary symptons are early recognized, that it has been proposed for every person who wishes to avoid sickness, and who desires a long and successful life, to consult a physician at least once a year, whether conscious of any ailment or not. An interesting book was prepared, entitled "How to Live,"* through the efforts of a considerable number of eminent gentlemen, so impressed with the importance of this step as to be willing to go to the large expense and trouble to

* "How to Live," Fisher & Fisk.

bring it to the notice of the public. Physicians have recognized the importance of the step, and have equipped themselves with the knowledge and appliances to make the result of such an examination of the highest value. It is needless to say that the physician who is so really competent, in this line, instructs his patients regarding food, in terms of calories. Such an interview between physician and applicant no longer amounts to the heralding of symptoms and the selection of an empirical remedy which some one, at some time has found useful for persons presenting such symptoms. It becomes a systematic and intelligent survey of the body of the subject, including an examination of the blood and other fluids of the body, as well as the kinds and quantities of food taken, of the occupation, and of every factor influencing the life process, of which the question of kind and quality of food is the most important single item. The day of fatalism is ended and the morning of intelligence is dawning.

A definition of a feeble minded person is "one incapable of maintaining a livelihood without assistance."

As that designation describes the lower fifth of humanity, we may equally designate as the highest fifth those who, through their own efforts, acquire the highest competency, and we may look to the remaining three-fifths, as those who maintain a more or less precarious existence as the result of correctible incompetency. The solution of many social problems thus becomes comprehensible, through efforts which redound to the profound benefit of all who attempt them, and to which there can be no objection.

In extending what I have to say to cover so much material relating to mind, to morals and to the far reaching effect upon human development, I think we are proceeding toward the inevitable activities to which thoughtful consideration of the subject lead.

GENERAL DEFINITIONS

Nutrition is concerned with the materials and processes required for the normal maintenance of the living organism.

The subject of nutrition involves knowledge of Anatomy, Physiology, Inorganic Chemistry, Organic Chemistry and Physiological Chemistry.

Metabolism is defined as the aggregate of physical and chemical changes which occur in the fluids and tissues of the body during life.

Food is the material required for the maintenance of life, and is composed of carbohydrates, fats, proteid and mineral substances.

Carbohydrates are substances composed of carbon united with hydrogen and oxygen, the two latter in proportion to form water. The class includes the sugars, starches and cellulose. The carbohydrates are utilized by the human organism chiefly for the purpose of pro-

ducing energy and heat, but are also converted into fat.

Fats consist of compounds of the fatty acids with glycerine, chemically speaking, and are derived from animal and vegetable sources. F ormed also in the body from carbohydrates, as above stated, fats constitute a reserve store, to be drawn upon when needed for the maintenance of the life processes, and also for the protection of the body from rapid changes in temperature.

Proteid is a name applied to a series of highly complex compounds derived both from vegetable and animal sources, and which have been classified as Albumins, Globulins, Albuminates, Proteoses, Peptones and Coagulated Proteids. Proteids are essential to the construction of tissue.

Mineral substances are not generally classified as food. Many foods contain mineral substances, and in many reactions occurring during the processes of life, the mineral constituent plays an important part. These substances should therefore be considered.

Life may be defined as that state of organized being in which a definite identity is continuously maintained

under progressive normal conditions, the total interruption of which is followed by death.

For our present study we may consider we have only to do with the continuous chemical processes of life, so far as these processes depend upon the supply of suitable food in correct quantities, and in a more general way with the results of too much or too little food.

THE STUDY OF FOOD

Liebig (about 1840) and his pupils were the first to make a study of food from a scientific standpoint, and in the following 40 years numerous investigators corrected his erroneous conclusions, and prepared the subject for subsequent accomplishments. Voit, of Munich, was the next to present notable facts, and in the period from 1880 to 1900 the exact relation between the figure of calories developed by burning food material in a calorimeter, and the value of the same food for human use, were demonstrated. Many investigators, among whom Atwater is best known in this country, placed the subject upon a true scientific basis, and made possible the utilization of accumulating knowledge to increase efficiency and longevity, and to lessen sickness. Fletchers observation of the effect in improved health of food quantities less than had previously been considered necessary, attracted the attention of Prof. Chittenden, whose exhaustive investigations and authoritative conclusions became the subject of world wide study.

A vast amout of valuable work has been performed in the Department of Agriculture of the United States, in which the brilliant work of Atwater and his capable associates laid the foundation for subsequent developments, the published accounts of which, among the Bulletins of the Department, afford material of the highest value and importance. Among these publications is Farmers Bulletin No. 142, containing extensive tables of the composition and caloric values of foods.

The literature of the subject is now very extensive, valuable and interesting, and while differences of opinion exist among some of those whose work entitles them to be considered as experts, the subject is probably more free from controversy in its essential features, than any other of equal magnitude and importance.

The chemistry of the fats has been very well worked out, and much is known of the chemistry of the carbohydrates as such, though much remains to be learned of the apparently simple reactions through which these substances pass in normal and abnormal metabolism. The proteids present greater difficulties

owing to molecular complexity, and readiness of decomposition. Much interesting and valuable knowledge is to be found in the more modern works on Physiological Chemistry, and a great deal is to be anticipated and hoped for as the result of studies now in progress.

Of the intimate processes taking place within the living cells we know comparatively little. The solution of the mystery is highly desirable, since it would admit of better control of the life processes and constitutes an important feature of the limitation of life.

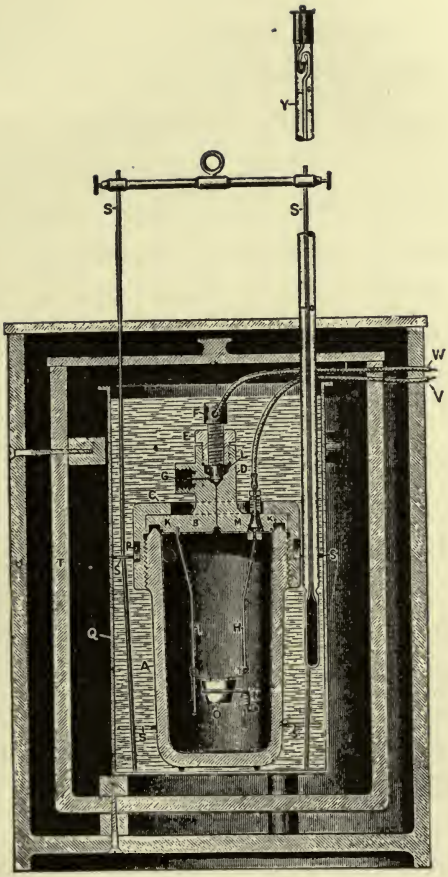
Considering the difficulties of the subject, however, together with the comparatively short time it has been possible to apply scientific principles to the study, as well as the limitations involved with the expense of the study, the subject, viewed as a whole, has already progressed to a stage where it is capable of utilization for the benefit of man, to a high degree.

THE CALORIC VALUE OF FOOD.

The term Calorie as employed in the study of food is that known as the great calorie, and is found by burning the substance in a calorimeter. It is the number of degrees of heat developed in 1 kilogramme of water by the complete combustion of one gramme of the substance.

The Calorimeter used for the purpose is known as Atwater and Blakeslee's modification of the bomb calorimeter of Berthelet. It consists of a heavy steel shell, lined with platinum or plated with gold, and fitted with a suitable cover. It is suspended in water, the temperature of which can be accurately determined by means of a thermometer graduated to fractions of a degree. The substance to be examined is placed in a receptacle within the calorimeter, which is then closed, filled with oxygen under considerable pressure, and the substance under examination is ignited by means of an electric spark.

Atwater also made extensive experiments to determine whether the figure of caloric value of food as found by the use of the calorimeter corresponds with



Bomb Calorimeter

the heat developed in the human organism by the use of the same food. This was accomplished by the construction of a compartment in which men were placed, at rest, and under varying conditions of work, and the heat produced could be accurately determined and recorded. The material consumed, as well as the affluents of the body, were carefully weighed and analyzed, and the conclusion was reached that the figures assigned to various food materials, as determined by the calorimeter are sufficiently accurate. The subject cannot be regarded as closed, since differences of opinion exist among various investigators, but the value of the method and of the conclusions reached, for practical purposes, is beyond question.

In many diseased conditions, as well as in healthy individuals, food is not perfectly utilized in the human body, at all times, as such utilization depends upon many factors not related to the mere physical question of amount of heat developed by combustion of the food. But for purposes of comparison, as in our present study, caloric values as generally presented may be regarded as reliable.

VARIABILITY OF FOOD QUANTITIES

The quantity of food required varies with the climate, age, sex, stature and occupation. Individual differences due to varying mental and physicial development, habit and surroundings also exist.

Persons living in cold climates require more food for given conditions than those living in warm climates. Thus, generally speaking, one requiring 3,000 calories per day in Russia, would need only 2,500 in Germany and 2,000 in Italy. In temperate climates, differences exist between the requirement for a given degree of work, according to the season.

The largest number of calories per kilogramme of weight is required during infancy, and this figure steadily decreases with increase of age, while the total calories per day increases with increase of bodily development, until bodily growth has been established, when the figure per day steadily decreases.

The female requires less food than the male of the same age, usually because the relative weight of the female of the same age is less, and the female is usually occupied with work requiring a smaller output of energy. A person of either sex, if of larger stature will consume a greater number of calories than one of less size, at the same age. The greater the activity, or the greater the work performed, the greater the number of calories required. Habit, degree of intelligence, as well as knowledge of the subject influence the amount of food taken by individuals.

Questions of differences in food used by different people, families or nations, are dependent upon habit, climate and character of available food supply.

Questions of relative quantities of carbohydrates, fats and proteids necessary to maintain what has been termed a "food balance" have been widely discussed, and present greater variability from the viewpoint of the various investigators than any other phase of the subject. Sentimental and other considerations have developed Vegetarians on one hand and meat eaters on the

other. Persons living in very cold climates consume more fat because food in small bulk, developing high caloric figures, and of moderately slow digestion, affording a continuous supply of much energy is most suitable, while excitable individuals are fond of carbohydrates, which are rapidly and easily digested and assimilated.

The more recent developments in Physiological Chemistry, as well as the classic studies of Pawlow and his pupils concerning the subject of digestion, in which the effect of the odor, color, appearance and condition attending the serving of food upon the perceptive apparatus is shown to materially control the secretion of the digestive fluids, have greatly modified the views which previously existed concerning the subject. Given reasonable variety of food, and food containing a sufficient amount of inorganic ingredients, upon the presence of which many chemical reactions certainly depend, in normal processes of metabolism, the question of the precise relation of carbohydrates, fat and proteid in the food ration, and referred to as the "food balance" becomes less important, and the question of the correct

number of calories to maintain bodily growth and activity, and to avoid unnecessary excess (which interferes with normal metabolism, introducing poisonous products of decomposition, causing sickness and death) assumes paramount importance. It is quite certain that fats can be split to form sugar, as it is equally certain that sugar can be converted into fat in the course of animal metabolism.

Eminent authorities have asserted that young children do not always receive sufficient food, and it is believed many cases of Amentia (a variety of feeble mindedness) are due to this cause. Social workers have clearly shown improved conditions among school children by providing suitable luncheons, in many places. At least one instance is known in which a feeble minded girl was brought to a normal condition by the use of correct food quantities, under intelligent direction. Insufficient food quantities during infancy and childhood may thus be followed by disastrous results, or, according to degree of variability from correct standards, may result only in delayed, imperfect, or relatively inferior development.

Too much food in infancy is easily thrown off, because the stomach at that period is little more than an enlargement in a straight tube. Afterward, and during the period of rapid growth, the organism is capable of assimilating excessive quantities of food, which act as a stimulant, introducing increased activity, resulting in sleep. The education of the muscular system is then going on, and is being transformed from a series of more or less conscious acts to the involuntary, or unconsciously acting apparatus necessary for the effective, rapid and correct performance of the fully developed individual. The exercise, over and over, of each muscle in the particular work it is intended to perform, as well for its gross development as for the development and education of the nerve apparatus controlling its action, requires the steady output of energy, which must be supplied in the form of suitable food, in ample amounts, or the development cannot proceed. Since the nerve cells of the brain are directly concerned in all these operations, it is easy to see the connection between proper amounts of food for the ages in which this mental devel-

opment must take place, and perfection or imperfection of such development. There may be, and doubtless are other and various causes for various types of feeble mindedness, the discovery of which is most desirable, but we give considerable space to directing attention to insufficient food as at least a common or frequent cause, in the hope that it may supplement and support the efforts being made in so many places for supervision of the first year of the life of infants, by competent nurses, acting under authority of the municipality or state.

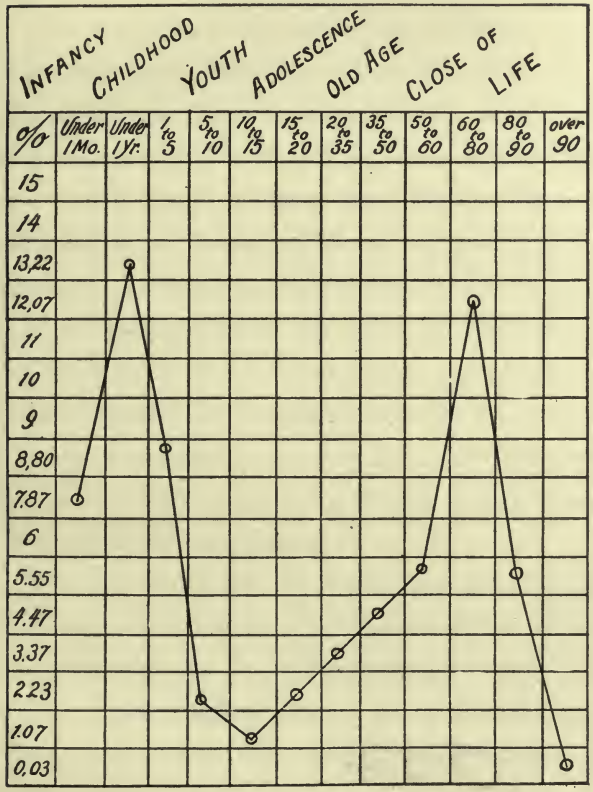
In comparatively few cases, excessive quantities of food during the period of growth result in the production of much fat, and if the food quantity is large enough, will result in early death through the excessive load put upon the excretory apparatus, as well as through the production of toxic substance due to decomposition of undigested food. This condition is much more common after full bodily growth has been established.

Physical maturity is reached at from the 15th to the 21st year, at which period, the body having attained full growth, the daily food quantity should be diminished.

This is a critical period in the life history of each individual, and in the opinion of the author it is quite as important to provide for the changes which are due at this period as it is to provide for the proper maintenance of correct conditions during the period of infancy. It is with this idea in view that it is so strongly urged that the study of food should be seriously commenced at the fifteenth year, if not in the fourteenth year. That efficiency and success in mature life is dependent upon the manner in which this problem is handled at that time, can admit of no doubt.

Consideration of mortality tables with tables giving the figures of food quantities as various observers in different parts of the world have found in general use, result in the conclusion that too much food is generally taken after the fifteenth year. The following chart, formulated from the report of the Board of Health of the State of New Jersey for 1911, and found to closely correspond with the figures of years since elapsed in which the figures have been available, indicate the profound influence of food quantities upon human life, and seem

Per centage of Deaths as to Age
By Periodic Divisions



to show that life is distinctly limited by the use of too much food after bodily development is established.

If it is true that too much food is harmless at any period, that period should be during the years in which bodily development is proceeding steadily, and the death rate in that period should be low. If it is true that too much food is harmful at any time, the harmful results should begin to be perceptible at or soon after the attainment, of full bodily development, and when the full results are realized should appear in the death rate.

Consultation of the chart shows the lowest death rate for the entire life period to be in the years from 10 to 15, or at a trifle over one per cent. (This is excepting the years over 90, when not sufficient numbers remain alive to affect the comparison.)

The rate of 2.23 for the period from the fifth to the tenth year, is also low, for the same reason which determines the lower rate of the succeeding five year period, and it is slightly higher because the influence upon the death rate of the diseases of childhood continue until the fifth year.

At the time this chart was formulated, the importance of the effect upon infantile deaths of too little food was not appreciated. It must be recognized that the high death rate of the first year is not due entirely to too little food, but to improperly prepared food, to the absence of proper care in other directions, and to other preventable causes. The effect of too little food during infancy, in its worst aspect, is upon mental development, as has been already pointed out.

Beginning with the fifteenth year, the death rate steadily rises, a trifle less than one and a quarter per cent for each period of five years until the age is 50, through the 35 years of adolescence. This period of 35 years adolescence is one of vicissitudes. In it only fifteen of the hundred we are studying perish. A very few pass through it without serious illness. Practically all have acquired infections or habits or both for which toll is to be paid after the 60th year. Hopes and ambitions have been realized or lost, and the influences of friends and associates have produced an effect. Those who enter the period in good condition, and who have

acquired habits of moderation and self restraint are in excellent condition to meet the period of Old Age.

The chart shows an exceedingly low rate of deaths for the period of rapid growth, and it shows the result of ignoring essential requirements concerning the use of correct food quantities in the acquirement of conditions and affections which result in the death of a majority before the age of 60.

FOOD QUANTITIES FOR DIFFERENT AGES

Hills table is generally accepted as a correct statement of the food consumed for the various ages, under average conditions.

HILLS TABLE

FOOD QUANTITIES.

Age in Years	Weight Pounds	Total Calories Per day	Per Kilogram Per day
1	22	1000	100
5	37	1400	82
10	57	1800	70
15	110	2800	56
20	143	3000	46
30	152	2750	40
40	154	2500	36
60	143	2200	34
80	132	1600	27

The author is of the opinion that the above figures are too low for the periods of infancy, childhood and youth, and too high for subsequent periods.

The variations already alluded to apply for the several ages, and for individual differences. Necessary

modifications are dependent upon the following factors, named in the order of importance;

1st Occupation.

2nd Weight above or below average.

3rd Season.

4th Climate.

An individual at 40 years of age, weighing 200 pounds, would of course weigh 25% more than the average, and be expected to consume 3.150 calories per day instead of the 2.500 allowed in Hill's table. One at 40, weighing 25% less than the average weight stated for 40 years would be expected to consume 25% less food than the figure stated. Differences so precise, of course, do not exist.

The figure of calories per kilogramme of weight, or per pound of bodily weight, would probably afford a better feature for the determination of the correct number of calories to be used than the number of calories stated according to age. With this idea in view, considerabe study has been given to the subject with the conclusion that a sufficiently close estimate of the correct

food quantity for an individual, can be obtained by the use of a very few figures.

Basing the calculation upon the number of calories per pound of weight for the several ages, only three figures would be required after the 20th year. The differences are so great for the preliminary periods that a different figure is required for each, thus;

During the first year the average calories per pound weight would be..... 48

During the fourth and fifth years the calories per pound would be..... 33

From the fifth to the fifteenth year..... 24

From the fifteenth to twentieth..... 20

From the twentieth to the twenty-fifth..... 16

Thirty to forty-five..... 14

Forty-five onward 11

These figures are purely tentative, though serving well enough as a basis for the beginning of the experience. Fortunately it is quite possible to determine, with very little difficulty, the precise amount of food, in calories, for any individual.

The one factor which may be depended upon is the maintenance of the bodily weight at a fixed figure. Starting with the figure of calories per pound of weight for the given age, as above stated, if the bodily weight is daily taken, a few days will show this weight to remain stationary, increase or diminish according to the suitability of the figure for the purpose. Under intelligent direction this can be accomplished in any individual in good health.

The first effort should be to ascertain the smallest amount of food which can be taken, which will admit of keeping the bodily weight at a fixed figure. When this is determined, and the figures adhered to, it will be found unavoidable that the weight will be increased, or diminished, according to the increase or diminution of the daily ration.

As well as the numerous factors influencing the correct daily ration which have been already alluded to, it seems probable that one which is rarely considered, should have attention. This is the question of what the weight of the individual should be to correspond with similar individuals in the same family. That is, if a

family of healthy individuals, through several generations have been generally large, and stout, the attempt of one of such family to reduce the weight very greatly below that which in this case might be designated as the natural weight, the effect will be found detrimental, unless the weight was excessive, in which case the family could not be properly designated as a healthy one. Conversely, the effort of a naturally thin person to become plump and fat is likely to be accompanied by catastrophy.

Though apparently a problem, the question is in reality a simple one, and one which any intelligent person who seeks to ascertain the exact ration adapted to health and high efficiency, will find little or no difficulty, by a little effort in doing. Those who have a real desire to maintain health and long life, as well as the highest efficiency, will not abandon the practice which leads to it. Those who have not sufficient will power to master their animal appetites, will, of course, either not make the attempt, or having made a half-hearted attempt, will fail. It must be admitted that it requires a great deal of determination to refrain from eating the things of which one is

exceedingly fond, or even of limiting the quantity always to reasonable amounts. Until the attempt is made, one will not realize how much of the daily pleasure of life is found in eating. To allow this or any other pleasure to so dominate life that desire cannot be resisted, or its satisfaction confined to reasonable limits involves a moral obligation which can here be only alluded to.

Observation of the factors which indicate a correct food ration have until recently been confined to such parental notice as individual experience or ability has made possible. At Villiers-Le-Duc the requirement seems to be confined to such infants as are put out to nurse, and at Newark it is, of course, confined to the first months of life. In the ages from 1 to 10 natural conditions are probably sufficiently good to insure the safety of the individual, so far as this can be accomplished within the ability of the parents. Since it is in these ages that mental development is progressing, and since it is certain that such development cannot proceed normally unless the child receives ample nourishment, and remembering the development of feeble minded individuals is a matter

which affects society more profoundly than it does even the individual or the family in which these unfortunates appear, it would seem all available means should be employed by the State to prevent such catastrophies. This might be accomplished by the extension of the work of visiting nurses to observation of the children beyond infancy and until the tenth year.

We require a large amount of data in order to formulate figures of food quantities required for the different ages, and it is hoped that this will be accomplished through the introduction into the schools, along with the study of the subject as here presented, of a series of records which can be made available for statistical purposes. The knowledge thus gained would be of the very highest value.

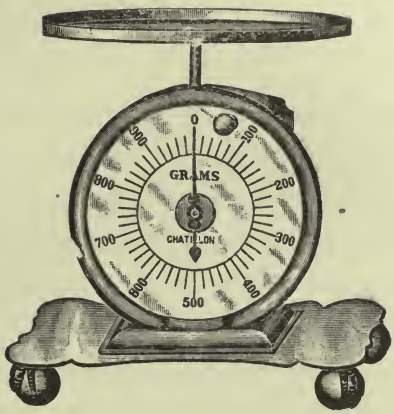
SYSTEMATIC CALCULATION OF FOOD VALUES

In the laboratory any system of weights and measures may be used, with equal facility. For common use, two systems have been proposed, one by Kellog in which the calculation is made in values of calories per ounce. The other, proposed by Fisher is based upon calories per centum and the somewhat indefinite "food portion." Values given in most tables are in calories per pound, which, for purposes of general comparison, are as useful as any.

For the purpose of universal application of the principles involved, it is necessary to make use of factors, knowledge concerning which can be easily acquired; figures concerning which can be easily remembered, of which the one for each food must be for a quantity approaching as closely as possible to quantities most commonly handled.

These conditions are best met by the use of the metric system, because it is a decimal system, and, therefore, easy to divide or multiply mentally. For the same reason the expression of food values for quantities of 100 grams is best adapted to the purpose. It is as easy to remember the figure value of 100 grammes of food as it is to remember the figure of values for one pound, or one ounce. It is found easier to estimate, without scales, after a little practice, the weight of portions of food, if the metric system is used, and if the value is calculated in quantities of 100 grams.

To utilize the available knowledge of the subject, one has only to practice weighing food as supplied at the table for a brief period—two weeks is usually ample—when it will be found easy to estimate, with sufficient accuracy for the purpose, the weight of any given quantity of food without the use of scales, or weights; in the course of this experience, one will have automatically memorized the caloric value of all the commoner foods, and with the table of values for food at hand for consultation when unusual foods are presented, will be able



These scales are nickel plated throughout, with dial of dull finish graduations and figures are in black.

Area of base 5¼ in. square

Height over all 5 in.

No. F 06½ Capacity 500 x 10 gr.

The method of using the scale is as follows: Suppose the food prescription for given meal consists of:

Meat	100 grams
Potatoes	80 grams
String beans	120 grams
Wheat bread	60 grams

An empty plate is placed on the scale and by means of the knob the dial is rotated until the zero point is opposite the end of the pointer, meat is placed on the plate until the pointer indicates 100 grams; the dial is again rotated until zero is opposite the pointer; potato is added until 80 grams are indicated, and so on, the zero point on the dial being each time brought opposite the pointer until at the completion of the operation we have on the plate all the food for the meal, each kind of food accurately weighed.

to determine the values of any given meal with facility. We have found the limit of error in this practice to lie within 10 per cent, and frequently within 5 per cent, which is sufficiently accurate for the purpose. Prof. Hill* (Columbia University) finds nurses acquire ability to determine correctly the total value of any given meal, after a short practice in weighing foods as ordinarily supplied, and the writer has met with similar experience in the instances of many who have given the method as here proposed a trial.

The first step in the procedure is to weigh the food supplied for each meal. This is most easily done with a spring balance scale (see illustration) the price of which varies from fifty cents to five dollars or more, according to the finish of the instrument. This scale differs from others only in having a movable dial. The empty plate is placed upon the scale, and the dial turned so that the pointer is over zero. One variety of food is placed upon the plate, which is again placed upon the scale, the

* Journal American Medical Association, Aug. 7, 1909, Vol. LIII, pp. 457-458.

weight noted, and the dial again returned to zero. This is repeated for each addition of food.

The list of weights so made is then laid aside until after the meal, when the table of food values is consulted, the figures for each article noted, and the total calories for the meal found.

This should be continued until the pupil is able to estimate, to within 10 per cent of the actual weight, any portion of food presented, without the use of scales.

For school purposes the class should be conducted through a preliminary survey of the subject, in which at each session a written statement of the value of a designated number of foods, previously memorized, should be made. This should be continued until the values of all the commoner foods are memorized. Luncheons should be provided at least once weekly, oftener if numbers require it, in which, at first, Section one of the class should weigh each food portion. In the meantime this section should make weights at home continuously in order to become familiar with varying food portions. A second section should then begin with a given luncheon, while

the first section should make the calculation of weights without weighing, reporting in writing. A variation on estimated weights amounting to more than 10 per cent of the weight in 6 out of 10 articles should require the return of the student to the first class until a better average is made.

At the beginning of the term each student should make a dated written statement, in a small book, of the sex, age, height and weight, in which should be recorded by the physician of the school the physical condition. A weekly record of the weight, and daily entries should be made of the number of calories in food consumed. The difficulties attending such a procedure are not as great as they at first appear.

So far as the influence of the matter of the development or non-development of the individual is concerned with relation to the public, probably the control of the life process up to the tenth year is all that is necessary. This need not of necessity bring the matter within the province of the school at all, as the visiting nurse is the factor of greatest importance in the problem, and govern-

mental control in the period of childhood would require to be exerted, beyond provision of nurses, only to cases in which public charity is required. The value of records, however, if in each case records could be formulated in the school, would be very great, as well as introducing, at the beginning of school life, the vital question of living in accordance with developed knowledge, instead of only legendary knowledge, valuable and important as legendary and parental knowledge is in such families as may be considered of high order of intelligence and development. It would hardly seem necessary to present further argument as to the desirability of education concerning life in its most important aspects, and in fields which it must be admitted are at present almost totally neglected.

COMPARISON OF VALUES AND COST OF FOOD

No reference has thus far been made to questions of cost of various articles of food, or to the fact that the high cost of living is due in great measure to disregard of the relation between the cost of given articles of food and the food value of the same. Thus, meat, if we add to the cost of that which is actually assimilable, the cost of considerable waste, for which we have to pay, as well as for the part which is assimilable, would cost ten cents for a quantity which would yield 100 calories of actual value. Certain cuts, in many localities, would cost much more. Of bread, the quantity yielding 100 calories of actual assimilable value would cost five-tenths of one cent; of sugar, two-tenths; of several varieties of fish, one-tenth. Meat costs therefore 100 times as much as fish, 50 times as much as sugar, and 25 times as much as bread. It must not be forgotten that the cooked meat,

because of its attractive flavor, produces a more profound impression upon certain essential life processes, as proved by Pawlow, than any other of the articles named, if we consider them merely as lumps of sugar, a slice of plain bread, and a portion of fish as prepared by an uneducated or incompetent cook. These are precisely the reasons for the indiscriminate use of meat. And here we have again an object lesson of the highest value concerning the variety of methods possible to give to the cheaper articles, the added value which comes through the ability of the skillful cook. Possibilities are thus indicated to the thoughtful person who is willing to acquire the knowledge of the basic principles involved, as set forth by the illuminating work of Pawlow, as well as the work concerning food of the illustrious investigators in that field which has been alluded to.

Mr. Fletcher claims, and the statement is without doubt true, that millions of dollars are being saved, in the aggregate, by people who have adopted the expedients he recommends.

An absolute system of accounting has long been

known to constitute an absolutely essential part of any successful business, and even the more successful housekeepers make use of accounts, as one of the essential features of their success. It would be impossible to do business with a bank without accurate accounts, but the busines of life is conducted without accounts. The result is an invariable overdraft upon life, for which we pay in the loss of as much as 25 per cent in time through sickness, and, in the aggregate, of 50 per cent in the number of years we live. Moreover, I shall show, in the examples of meals commonly taken, that the absence of accounting results, as we should expect, in using extravagant amounts of food, as well as in irregularities and inebriety. I wish it to be distinctly understood that these statements are conservative, rather than exaggerated.

In the following examples no effort is made to show what the meals exemplified ought to be. The small available space is utilized, rather, to emphasize the harm which continually follows the haphazard methods of eating in common vogue. A vary large, and very interesting and valuable book could be written on the questions in-

volved in the preparation of food to meet the requirements which Pawlow has shown to be necessary, in the selection of material of the lower instead of the higher cost, and in the combinations of dishes to make a meal so attractive, and so fitted for perfect nutrition as to make the economical variety more desired than the costly one.

It will be found much easier than first thought possible, to estimate, mentally, the total calories consumed at a given meal, as has already been stated. This is due, in part to the fact that several items of food are always used. Thus, bread is always used. It will be found that a slice of bread, as served in any family, usually weighs almost precisely the same number of grams. Probably the slice of bread from an ordinary loaf will weigh 40 grams more frequently than any other figure. As the value of bread is 250 calories for 100 grams, the single slice weighing 40 grams has the value of 100 calories.

A one inch square of butter weighs 15 grams. As 100 grams of butter has the value of 800 calories, it is easy to place the value of 15 grams of butter at 120 calories. A small egg weighs 40 grams, a large one 50

grams. An average lump of sugar weighs 10 grams, and a heaping teaspoonful of granulated sugar weighs 15 grams. One will find in the use of milk and cream almost exactly the same amount habitually used—so that once having measured the quantity, it will not be necessary to depart from the figure of caloric value so found. The caloric value of both tea and coffee are so small it is quite unnecessary to take either into account, if the values of the sugar and milk or cream are noted.

The following is a breakfast so commonly taken we will use it to illustrate the simplicity of an account of the value in calories of a meal:

FIRST EXAMPLE

Weight of food in grams	Food	Cost	Calories per 100 grams	Total Calories
100	Two boiled eggs.....	.10	150	150
30	2 squares butter.....	.03	800	240
40	1 slice bread.....	.01	250	100
20	2 lumps sugar*.....		400	80
30	Milk*	.01	80	67
*taken in one cup coffee.....		.15		637

SECOND EXAMPLE

200	Oatmeal	.04	80	160
90	Milk	.01	80	72
45	Sugar		400	180
200	Beef Steak	.25	250	500
40	Bread	.01	250	100
30	Butter	.02	800	240
200	Wheat Cakes	.05	250	500
50	Maple Syrup	.01	200	100
150	Potatoes	.02	100	150
	Coffee	.05		
30	Cream	.01	180	54
				2.056

This second breakfast, not unusual as the figures might indicate, if a fair sample of the two ensuing meals, would show a total for the day of at least 4,000 if not 5,000 calories. One would presume a person would require to be in pretty good health to eat it—and in the earlier years of adolescense, such persons are spoken of as the "picture of health." With ruddy complexions, fat often to obesity, they meet the common but erroneous idea of health, and are usually shocked, when they make application for insurance, to be declined as impossible risks, and to be informed they have a fatal and incurable malady with three or four years to live.

The life history of such a person is the common one of today. Such a person finds the table one of the chief delights, if not the chief delight of life, and until quite recently was unlikely to learn of his fate until it was upon him. Within the past year or two, thanks largely to the work that has been done in the field of foods, such a person learning high blood pressure is a forerunner of several fatal complaints, applies to a physician in time to admit of cure. If the medical advisor is competent, the source of trouble is located, suitable instructions given, and the condition corrected. It means a great deal to give up the pleasures of the table, especially after long enjoyment of them, and it is exceedingly disagreeable to eliminate the fat forming foods, and reduce the total quantity taken in the 24 hours to such a figure that the weight will be reduced to a normal figure. Those who have the fortitude to do this recover.

A large percentage of such cases develop a series of affections generally spoken of as "minor ills," such as neuritis, rheumatism, derangement of the digestive apparatus and other affections which automatically reduce

the diet by making it impossible to eat. Of the two, these are the more fortunate class. The third class consists of persons who, through overeating and deranged metabolism consequent upon it, become infected with various diseases such as tuberculosis, or typhoid fever, which may or may not prove fatal.

The percentage of people in the years of life from 20 to 45 who cannot be shown to belong to one of the three classes described above, is just equal to those who survive beyond the 70th year of life.

Habit determines, to a large extent, the amount of food taken by individuals, and this habit is usually of the family traits, and, therefore, of the hereditary type. As habits are about as communicable as contagious diseases, this habit is transmitted from one person to another, through association.

Let us now examine the menu for two entire days, of a person who performed a part in a series of experiments made for the purpose of ascertaining the effect upon efficiency of a diet composed of food selected according to taste ,without regard to quantities, except

that such quantities were taken as the subject felt disposed to eat, and of the effect of a diet regulated as to quantity and also as to the materials eaten.

The meals for the first day were taken at the beginning of the experiment, in the usual haphazard manner, and ordinary conditions:

BREAKFAST

Quantity in grams	FOOD	Cost in Money	Calories per 100 grams	Total Calories
222	Beefsteak	.20	250	563
234	Fried Potatoes	.02	150	350
34	Onions	.02	100	30
68	Gravy	.01	(?)	25
144	Bread	.02	250	375
15	Sugar	...	400	60
	Total Calories for Breakfast			1,403

DINNER

171	Beef	.20	250	325
350	Boiled Potatoes	.03	100	350
55	Onions	.01	30	15
234	Bread	.03	250	560
27	Sugar	...	400	100
	Total Calories for dinner			1,350

SUPPER

195	Corned Beef	.15	250	500
170	Potatoes	.02	100	170
21	Onions	.01	100	21
158	Bread	.02	250	374
21	Sugar	.01	400	84

Total Calories for supper..... 1,149

Total Calories for the day..... 3,902

The only possible excuse for food quantities of the above figure would be that the man would be at hard manual labor. And yet it was a common experience and according to Hill's table would be within the limit.

In the experiments in which this was a part, the idea was primarily to lessen the proteid, and increase the carbohydrate, as more healthful, and as likely to afford a higher degree of efficiency.

The following is the account of the food and totals taken by the same person for one day six months subsequent to the above:

BREAKFAST

Quantity in grams	FOOD	Cost in Money	Calories per 100 grams	Total Calories
150	Fried Rice	.02	150	150
50	Syrup	.01	200	100
150	Baked Potatoes	.02	100	150
10	Butter	.01	800	80
15	Sugar	...	400	60
30	Milk	...	80	25
	Total Calories for Breakfast			565

DINNER

250	Pea Soup	.03	50	125
150	Boiled Onions	.02	100	150
150	Sweet Potatoes	.04	100	150
75	Bread	.02	250	195
20	Butter	.02	800	160
30	Sugar	...	400	120
60	Milk	.01	80	50
	Total Calories for dinner			950

SUPPER

120	Salad	.05	50	60
32	Crackers	.01	250	75
20	Cheese	.01	450	90
79	Saratoga Chips	.01	500	400
100	Rice Custard	.05	500	500
	Total for supper	.33*		*1,125
	Total for day			2,640

* The figures of cost are purely relative, and the actual cost of any of the meals illustrated would depend upon circumstances in which served and many other factors. The figures are here given in this way to illustrate the manner in which the costs should be entered in the daily calculation.

The person undergoing this experiment attained a remarkable improvement in physique and in muscular performances under the diet in the last table as compared with his condition and performance while taking the diet given for the first day.

In the light of recent experience the man was eating about twice as much at the beginning of the experiment as he should have taken and continuance in such course would lead to the results pointed out—to inefficiency, sickness and death, about in the order in which it befalls those who ignore the important factors which we are attempting to describe. That this practice is so nearly universal, at this time, is the most deplorable feature of it, and it is not expected that adults will readily change habits so firmly fixed as this. There are many, however, who are doing so, and many people are to be found who are perfectly familiar with the average number of calories they are taking, and can tell precisely the number required to maintain bodily weight at the figure they have fixed. It is needless to say that these persons are of the highest order of intelligence, are eminently successful,

and are in the very front rank of their competitors. One for example is a physican. His offices are crowded and his services in demand to a degree far exceeding his ability to handle his patients without assistants.

Dr. W. O. Atwater, to whom reference has been frequently made, and whose work, extending over a long period of years has been so noteworthy and valuable that reference to it, or utilization of some part of it would be necessary to the intelligent discussion of any phase of the subject of food, in writing upon the "Needless Use of Expensive Foods," * says:

"A common mistake in purchasing food is in buying the more expensive kinds when cheaper ones would serve the purpose just as well. This is often done under the impression that there is some peculiar virtue in the costlier materials and that economy in the diet is detrimental to dignity and welfare.

The difficulty is the ignorance of the simple principles of Nutrition. That ignorance results in a great waste

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* U. S. Farmers Bulletin No. 142.

of money. The maxim that "the best is the cheapest" as popularly understood to apply to the higher priced materials, is not true of food. The larger part of the price of the costlier foods is paid for appearance, flavor or rarity. While the dearer articles are often more pleasing to the palate, and are sometimes more easily cooked or possess a finer flavor, they are no more digestible nor nutritious than the cheaper ones. People who can afford them may be justified in buying them, but for persons in good health and with limited means they are not economical, and often increase the cost of food out of all proportions to nutrients furnished.

The plain, substantial, standard food material, like the cheaper cuts of meat and fish, milk, flour and corn meal, oatmeal, beans and potatoes, are as digestible and nutritious and as well fitted for the nourishment of people in good health as are any of the costlier materials.

Writing of the "Waste of Food" Dr. Atwater says: "The use of excessive quantities of food, which is a common dietary error in this country, among not only the

well to do but also those in moderate circumstances, entails a waste of food in at least three ways;

First—More food is eaten than can be properly utilized by the body. This is not universally true, for there are some people who do not eat enough for healthful nourishment. But the eating habits of large numbers are vicious, resulting not only in a loss of food material but in an increase in the labor of digestion, to say nothing of the injurious effects which overeating may have upon bodily organs and functions.

Second—More food is served than can be eaten, and the excess is thrown away as table waste.

Third—The third form is that which occurs in the preparation of food materials for consumption. Thus in removing the inedible material, as skin seeds, etc., from fruits and vegetables, more or less of the edible portion is removed also, depending upon the care with which the work is done. The greatest loss from a pecuniary standpoint, however, is in the waste of animal foods in which the nutriments are in their costlier forms. The "trimmings" of meat, which are left with the butcher or

removed in the kitchen frequently contain one-eighth of the nutritive material paid for. Part of such waste is inevitable, but much of the valuable nutrients might be saved if the materials were used for making soup. The more economical cuts of meat as loin of beef, rib chops of lamb, and similar cuts, one-fifth the cost goes to pay for bone. Such cuts, therefore, should be avoided by those who wish to get the most actual nutriment for their money.

Other things being equal, foods furnishing nutrients which can be most easily and completely utilized by the body are the most desirable, since they will not bring unnecessary exertion to the various organs. Many kinds of food which in their natural state hold the most valuable nutrients in such form that the digestive juices can not easily work upon them are so changed by the heat of cooking that they become easily digestible. Thus the importance of proper cooking can hardly be overestimated. Things which please the palate stimulate the flow of the digestive juices; for this reason food should be made appetising. An attractive diet pleases the

aesthetic sense; hence refinement in food habits is as desirable as in other phases of our daily life. The sense of comfort and satisfaction produced by even the appearance of food well cooked and served is of indisputable value. Fortunately such satisfaction is within the reach of almost all.

Among people who have the benefit of modern comfort and culture the palate revolts against a very simple diet, and for this reason the nutrients are usually supplied from a variety of articles—some of animal, some of vegetable origin. With a varied diet it is also easier to secure the proper proportions of proteid to fats and carbohydrates,"

FOOD INEBRIETY

The effect of overeating produces a form of inebriety differing in different persons, and followed by a reaction exactly as occurs in alcoholic inebriety. The ill effects are equally marked, and, if possible, inflict greater damage upon the mind and body. The two varieties of inebriety are common in the same individual, the one leading to the other. Both are created by habit, and equally due to indifference to personal welfare, and to the inevitable consequences, though perhaps the certainty of disastrous consequences from overeating are not as generally known as from alcoholism. The food inebriate is as near the line which separates normal persons from the feeble minded as the inebriety is pronounced, just as is true of the alcoholic inebriate. Indeed it is probable that inferior mental and physical development are contributing, if not determining causes of both forms of inebriety. The demands of life, and maintenance of a position in competition with those of the class in which

the individual is found, proving beyond the power of the feeble individual, resort is had to overeating, and to overdrinking of alcoholic beverages in the struggle to maintain a livelihood, and position among competitors. Habit soon fixes the vice upon the unfortunate, and adds to the burdens. For this class of persons hope must lie in supervision of the individual during the period of development, in the ages from one to ten, and the writer predicts that the number of feeble-minded individuals developing in a locality, will be lessened in proportion to such beneficent service as has been performed in the two places, Newark, New Jersey, and Villiers-Le-Duc, elsewhere referred to.

The food inebriate, like the alcoholic inebriate, may be good-natured or quarrelsome, and may be stimulated through the period of excitement to excessive physical activity for a time, only to relapse, with the appearance of the reaction, to a more exhausted condition than before.

Food is a positive stimulant, and when taken in proper amounts a harmless one. It is when the amounts are excessive that auto-intoxication is established; and the overload upon the excretory apparatus inflict fatal consequences.

RESPONSIBILITY FOR HUMAN WELFARE

Extension of aid and support to the aged, the sick and infirm is accepted as high ethical obligation. In its highest moral aspect this principle applies to "the least of these"—to the truly unfortunate who during infancy and childhood were deprived of the kind of care and support which is necessary to normal development. Continuing through successive generations an hereditary tendency becomes fixed in a family, resulting in the varieties of defectives. Society is thus compelled for safety to check the influx into it of such individuals, and of the several methods proposed for this purpose, that which seeks to supply benign care during infancy and childhood, fortified by such material assistance as may be needed, not only offers the plan most in accordance with the moral sense, but also advances the one certain means of elimination of the socially discordant element. Our study of food with relation to its intelligent use, is the first step in that direction.

Advancing civilization thus develops the necessity of observation and control of all conditions affecting the community through the activity of individuals as such, and through the multiplicity of such activities, of the combined effects upon the community.

Concerted action being dependent upon individual interest, the educational system is deficient which fails, first to train the individual in correct methods of living, second to supply instruction concerning individual responsibility, and third to designate the practical part which each individual should take in the vital and general efforts necessary to the establishment and maintenance of sanitation and hygiene, generally, and in the higher significance of both terms.

It is said the rate of infant mortality is the most sensitive index we possess of the degree of civilization of a community. The following table,* together with the comments preceding it, is printed in illustration:

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* Page 376 Bulletin Kansas State Board of Health, 1916.

INFANT MORTALITY ALL OVER THE WORLD

A baby dies in the civilized world every ten seconds.

Most of these deaths might have been prevented had the mothers only known how to take proper care of their babies.

Out of 1,000 births, the following number of children will die in their first year in the various countries forming the civilized world (compiled from the average for ten years:

Country.	Deaths under 1 year to 1,000 births.	Deaths under 1 year actual number.
Chili	326	30,303
Russia (European)	263	1,298,245
Austria	222	200,553
Roumania	218	49,589
Hungary	212	154,100
German Empire	197	374,153
Jamaica	181	6,414
Ceylon	179	23,255

Spain	170	106,649
Italy	161	83,970
Belgium	154	28,409
Japan	153	220,013
Servia	153	16,268
United States	149.4	280,000
France	148	115,378
Bulgaria	144	23,757
Canada	140	8,200
Great Britain and Ireland	139	147,660
Switzerland	138	11,441
Holland	138	19,209
Finland	138	19,877
Western Australia	127	756
Denmark	124	8,089
New South Wales	99	3,475
Victoria	98	3,299
Sweden	96	11,917
Queensland	94	1,120
Tasmania	93	433
South Australia	93	608
Norway	86	4,231
New Zealand	76	2,233
Grand total		3,244,604

Of the principles of the reduction of infant mortality, the report continues:

The thousands of babies that are born annually, only to sicken and die, represent an appalling economic and social waste. An analysis of the causes of these infant deaths demonstrates that by far the major portions of them are due to improper feeding and care; in other words, because the mothers do not know how to take care of their babies. Of those who die from other causes than improper feeding and care, a large percentage of the deaths might have been prevented by wider knowledge and application of the laws of heredity and eugenics.

Thus the problem of the prevention of infant mortality assumes a two-fold aspect—proper care of children born; and second, measures to provide for a better generation to be born.

But the proper care of babies' bottle and the education of the mothers alone will not solve the problem of infant mortality nor of mothers' and children's welfare. For in order to preserve properly the lives and

health of mothers and children it is necessary to deal with every condition which affects the health, happiness and the well-being of the family, and, indeed, the entire community.

Thus, housing, sanitation, sewage, disposal of garbage and wastes, food and water supply, communicable diseases, employment of workers, wages and living conditions—in a word the whole subject of infant mortality and the health of men, women, and children—may be summed up in the prevention of disease-breeding conditions.

Every investigation of infant mortality has disclosed a close relationship between infant mortality and bad housing conditions, and poor food; in other words conditions likely to be associated with poverty. But even in the very poorest districts, where housing and sanitary conditions are exceedingly bad, many instances in which parents have reared large families without a single death are to be found, while side by side with these in the same neighborhood, or even in the same house, are to be found other families in which numerous

deaths of infants have occurred. Logically such instances would seem to be the result, not of poverty or the sanitary condition of the home, or even the physical strength of the parents, but of the amount of intelligent attention and care which the mother bestows upon her baby. In such cases it is not only the resistance of the child, but the resistance of the mother, that determines the extent of the influence of the factors on the children's health and lives.

The influence of the character and intelligence of the mother on the rate of infant mortality is exceedingly difficult to measure statistically. It is not to be expected, therefore, in the nature of the case, that the relationship between the character and intelligence of the mother and the rate of infant mortality can be so accurately measured as to show the extent of the influence of the former on the latter.

However, among 2326 infants investigated in New York, whose mothers were rated as unsatisfactory in general intelligence, the rate of mortality was 126 deaths per 1,000 births, as compared with a rate of 100 per

1,000 infants whose mothers were rated as satisfactory in this respect.

The intelligence of the mother, including, as it does the measure of vitality and ability she endows them with at birth, and the kind of care she bestows upon them subsequently, would seem to be a highly important factor in the problem of infant mortality, which up to the present has been overlooked or has not been accorded the importance to which it would seem to be entitled. Therefore it would seem that, in addition to the multitudinous agencies and influences which are at work to lower the rates of morbidity and mortality, especial attention should be directed to the all important phase of intelligent motherhood and an efficient parenthood.

Besides the child has his rights in the matter. He has the right to intelligent consideration before he is born. He has the right to be born into aristocracy of health and intelligence.

To say that our educational system needs such revision as would make it more nearly conform to the actual requirements of every day life is merely to re-

peat a statement which has been made many times before. Yet there can be no doubt but that one of the most effective means of lowering the death rate of children, as well as the general rate for all ages, would be the education of children and youths in the fundamentals of parenthood, and the hygiene of daily living."

Public Health News, published by the Department of Health for the State of New Jersey, in the issue of July, 1916, contains an account of the wonderful work of M. Morel de Villiers, who in 1884 was appointed Mayor of Villiers-Le-Duc, a commune of the French Midi, in eliminating infant mortality during the decennial period of 1893 to 1903. For a century preceding this period the infant mortality rate in Villiers-Le-Duc had usually been above 200 per 1,000 births, and never below 150. His father had been Mayor from 1854 to 1863, and during his administration had reduced infant mortality by over 25 per cent by the use of wise but simple methods. M. Morel de Villiers applied the principles devised by his father and again reduced the death rate by about the same figure. He then studied medi-

cine and took the degree of M.D. for the purpose of this work with the magnificent result above stated.

In the course of the statement in the London Lancet, from which the above account was taken, the equally interesting fact is related that the average length of life in the village of Villiers-Le-Duc increased from 34 years and 2 months in 1804 to 66 years and 6 months in 1903.

These brilliant achievements were made possible by exceedingly simple means which are available everywhere. One feature of the simple system is the requirement that all infants placed out to nurse shall be weighed every fortnight on the communal baby-weighing machine either at the office of the Commune or at the home of the child. The increase of weight is to be noted on a slip kept separately for each child, and preserved at the office of the Commune. This, of course, constitutes official supervision of the progress of nutrition of the child.

A notable feature of the above is that the Municipality, in issuing the orders necessary, and in providing

executive facilities, assumes definite control, and thus insures effective accomplishment. Something of this sort is being attempted in other places, and should receive attention everywhere. Thus in the issue of Public Health News above referred to an account is also given of the comparative infantile death rate as stated in the report of the Newark Bureau of Child Hygiene, amounting to only 10.8 per thousand among 2,122 babies supervised, as against 69.9 among unsupervised babies of the same age.

It has been stated that deaths from cancer in London were reduced by 25 per cent by the simple expedient of such publicity concerning the subject that early attention is secured.

In Victoria, in New Zealand, tuberculosis has been eliminated by authoritative control of sources of infection.

Human life is the greatest asset of a Nation, but as will be seen by a comparison of the incidents above briefly mentioned with conditions elsewhere, we are only

beginning to utilize the well-known methods to conserve it.

In our present work relating to food the attempt is made to supply the simple means necessary for any individual desiring to reach the highest possible degree of efficiency, the greatest possible degree of health, and the longest possible life, to accomplish it. This is not possible without parental assistance and encouragement. To this should be added the influence of educational authority, all possible Municipal co-operation, and the interested aid of all who have the welfare of the community at heart. The more perfect mental and physical development which will follow is a legacy to posterity of far greater value than any other material thing. It is inalienable, and will redound to the benefit of each individual in the community.

The above incidents are related for the purpose of showing not only what has been done, and what can be accomplished by the intelligent use of available knowledge concerning human life; the quotations are printed, and the comments made to give force to the appeal for

individual and concerted effort for the establishment of improved conditions for humanity, and for the attainment of higher mental and physical standards. More than one great philosopher has declaimed against the fate which brings him to mental maturity, at the age of 60 or 70, with a wealth of knowledge and experience, with greater possibilities than ever before them, but with the certainty that very few years will remain for the exercise of the ability so long in forming, or for the full realization of their higher ideals. The series of diseases and infections which have overtaken them, as well as the inevitable results of improper living, and which as yet are not fully understood, and rarely met with a determined effort for correction (because the older we grow the more difficult it becomes to practice self-denial), do not, however, present insuperable obstacles. Indeed, one can see on every hand, the results of modern progress in combating the condition known as old age.

As will be realized by all who take the trouble to follow this discussion to the present point, it is possible

to greatly improve the physical condition of any person who has sufficient determination or desire to do so. It would seem unnecessary to offer further argument of the desirability of learning all that is required concerning food, and of the importance to health and length of life of the correct methods of using it; nor would it seem necessary to show how inevitably this study leads to the consideration of related subjects having to do with human life. For the attainment of the best results of living we need to learn as much as possible about the factors which influence human life, and we need to put the precepts into practice. But if we stop at the point where we are individually affected by precise methods of living, unless we also become interested, and perform our duty as the individual part of the whole community, we should expect only a portion of the benefits of the knowledge. It is imperative that knowledge be acquired concerning conditions existing in the locality in which we must live, in order that we may know how these conditions will affect our own lives. We shall thus be able to successfully combat detrimental conditions

and to foster favorable conditions, and how well we do this will be an index of our belief in our own worthiness, and of the measure of regard we may have for the welfare of those who are associated with us.

INDIVIDUAL FOOD CONTROL

It is scarcely worth the trouble to attempt to more clearly and succinctly describe the simple means necessary for the average individual to utilize the available knowledge concerning correct food quantities. The low figure for the existing maximum average of human life proves people to be perfectly content to proceed upon traditional lines, taking all the chances, and gratifying all the appetites, with an utter disregard for the certainty of ensuing disaster. January 26, 1917, a banker said, when I asked him if he were interested in this subject, "No. I am interested in making money." And he is considerably above the average in general intelligence. Another friend was working beyond his strength and overeating to enable him to do it, and developed symptoms of Bright's Disease. He was warned, and instructed, and told people were being taught to limit

work to normal capacity and food to correct quantities. He said "People won't do it." He is dead.

Therefore I am not writing this chapter cheerfully, or willingly. I would prefer to use the time for more selfish purposes. I am writing it because the infantile death rate has been eliminated, and the average length of human life in Villiers Le Duc is above 66, as against something near 40 in most other places. If the people of Villiers Le Duc can be sufficiently interested in common sense living to accomplish this great thing, perhaps there are a few who will read and profit by the material here presented.

Of course the right thing to do is to give the subject sufficient study and work to master it; obtain a suitable scale, and weigh food until it is possible, after the experience with the scales, to state almost precisely the number of calories taken daily, and confine the amount within the correct figure. I think most people who are worth the trouble and labor which has been ex-

pended by the workers in this field are doing all this, or will do it as soon as they acquire the necessary knowledge.

As already stated, a condition of safety can be established by the simple expedient of observing the weight daily, and by limiting the intake of food to such quantities as will keep the weight at the correct figure. This implies that the individual shall be in at least approximately good health at the commencement of the experiment. It would be well worth the while of any person to go to a competent physician and ask for a complete examination, as the preliminary step, and to learn the correct figure of weight for the age, sex and occupation. To any who may be unwilling or incapable of making use of methods sufficiently precise, the physician (if competent) will give such general directions as will make it possible to comply with essential requirements with regard to various items of diet.

The person really worth while, will obtain a suitable scale, and after having acquired the experience which will make it possible to correctly estimate the

weight of ordinary food portions, will keep it at hand for use when the inevitable unusual food is presented. The principal obstacle which will appear to most people, is the very long table we give for food values. This table was made as complete as possible for obvious purposes, and, as has already been stated, while it is necessary to have such a table available for accurate work, most people will find a limited number of items of food material continuously used. Moreover, for general use it is possible to make use of a short table, which can be copied upon a slip of paper for use in traveling. In this table averages are given for the commoner foods, and the figures are sufficiently correct for any ordinary purposes. The exercise of a little judgment will make the totals very near the actual figure. For example the figure of 250 for cooked lean meat is a trifle high for a few varieties, and too low if accompanied by any material amount of fat. If fat is present, however, it is easy to estimate the value, and add to the designated figure. The figures given are for 100 grams.

SHORT TABLE

Cookd lean meat	260
Cooked fish	30
Clams and oysters	65
Boiled eggs	150
Butter	800
Cheese, full cream	400
Cheese, whole milk	70
Cream	200
Oatmeal, cooked	65
Boiled rice	110
Shredded wheat	370
Oranges, pineapples, berries	40
Bananas, grapes, cherries	70
Bread, all unsweetened kinds	250
Potatoes, boiled, mashed	100
Potatoes, fried	400
Vegetables, green, cooked	15
Chocolate and nuts	600
Milk	80
Cake	350
Sugar	400
Estimate fat at about	800

If to this table is added such additional articles as are frequently used by the individual, it will be found a comparatively short experience will result in such memorization of the various items as will make it easy to estimate the caloric value of any given meal with sufficient accuracy, and to perform the operation mentally.

In the light of my present belief, I do not think any person who is not sufficiently familiar with this subject to be able to state the average caloric value of the food required to maintain bodily weight at a fixed figure, and in sufficiently good health to be able to increase or decrease weight at will by suitable modification of the diet, can succeed in competition in any field with another, under equal circumstances, who has, and makes use of the knowledge.

CLASS INSTRUCTION

Remembering the object of instruction in this subject is, first to establish in the mind of the pupil relative values in calories for given quantities of all food substances, second, the importance to mental and physical development, as well as the maintenance of perfect health, and the attainment of long life, of food quantities which shall be neither too little for such development, nor too great, it will be easy to see the course to pursue. As is also apparent from the material in the foregoing pages, the various ramifications of the subject lead naturally to consideration of other factors having to do with health and longevity, which should be treated in the same connection.

It is assumed the pupil will have already acquired sufficient knowledge concerning weights and measures. It is desirable, in this country, at least, where the metric system is not in general use, to establish comprehension

of the relation in value of the gram and ounce, and of the fluid ounce and the equivalent measure in cubic centimetres.

The caloric value of the three general classes of foods should of course be memorized, as a preliminary step to the study of the various articles of food, some of which, such as sugar are simple, and supplied in a pure form, others of which, like butter, contain accompanying material, and others which contain proteid, carbohydrate and fat in variable proportions.

The next step should be the memorizing of the established figure of caloric value for the common foods, such as bread, milk and cream, and the commonly used meats.

This should be followed by such practice in weighing of food as will result in the development of the ability to correctly estimate the weight of ordinary food portions, without the use of scales. As has been already stated, this is not as difficult as it may appear.

The pupil should then be required to apply the knowledge so obtained to daily practice, and make a

complete written report either daily, or at the end of a period of two weeks, as may seem best. This should be repeated with sufficient frequency to insure full comprehension of the subject.

During the course of instruction the pupil should be required to study sanitary conditions in the locality, and to write a paper on the subject. It would be an exceedingly valuable step to arrange for short lectures and talks by such experts as may be available, or even by private individuals familiar with the subject. The paper by the pupil should state the amount per capita which is being expended in the locality by the state and local authorities, and the character of work being done. It should include a short account of the sanitary conditions in and about the school buildings whenever these merit commendation or criticism.

Relating to the subject of food, the questions necessary will be apparent to any teacher, but we append a list which should be included.

How many grammes in one ounce Avoirdupois?

How many cubic centimetres in one fluid ounce?

Describe the use of the food scale.

Define Nutrition.

Define Metabolism.

Define food.

Define Carbohydrates, and state the value for food purposes of one gram in terms of calories.

Define fats, and state the food value in terms of calories.

Define Proteids, and state food value in terms of calories.

Define minerals, and state use in the animal economy.

Define life.

Describe the calorimeter used to determine food values.

What great chemist first studied food? Name some of the men who have made notable contributions to the knowledge of the subject.

Define the word Calories, and state the method, in outline, of the determinuation of the caloric value of food.

Name the principal factors which determine the variability in the daily food ration.

What is meant by the term "food balance"?

For what pupose is food required?

What is the effect of too little food upon mental and physical development? What is the effect of too much food?

At what age is the largest quantity of food per kilogramme of weight required? At what age is the smallest quantity of food per kilogramme of weight required?

State an easy method for the determination of the correct food quantity for the individual.

What is the relation of money value to caloric value of meat? Of bread?

What are the two principal features of waste in the use of food?

Write an example of a meal, stating weight of each item of food, the approximate cost, and total caloric value.

State some of the effects of food inebriety. Of too little food. Of too much food.

State the caloric value of 100 grams of the following foods: White bread, Graham bread, corn bread; the average of five commonly used meats; cooked fish; boiled eggs, butter, full cream cheese, whole milk cheese, oatmeal, cooked; butter, cream, milk, potatoes boiled, potatoes, fried; green vegetables, chocolate, nuts, sugar, bananas, oranges, baked beans, sponge cake, bakers' cake, candy, not containing nuts, dates, figs, honey, lettuce.

This list may be added to, or may be restricted to a sufficient number to show the relative cost in relation to caloric value of a few of the best examples of the three general varieties of foods.

FOOD	Protein per cent.	Fat per cent.	Carbohydrate per cent.	Ash %.	Caloric Value of 1 pound.	Caloric Value of 100 grams.
Almonds	21.	54.9	17.3	2.9	2.940	647.3
Apples, fresh	.4	.5	14.2	.3	285	62.9
dried	1.6	2.2	66.1	2.	1.185	290.6
Apricots	1.1	0	13.4	.5	263	58.0
canned	.9	0	17.3	.4	340	72.8
Artichokes, fresh	1.8	.2	2.3	.7	105	18.2
cooked	2.1	3.3	2.2	.8	229	46.9
Asparagus, fresh	1.8	.2	3.3	.7	105	22.2
cooked	2.1	3.3	0	.8	220	38.1
canned	1.5	.1	2.8	1.2	85	18.1
Bacon, smoked	9.1	62.2	0	4.1	2.840	596.2
Bananas	.8	.4	14.3	.6	260	64.0
Barley Meal	10.5	2.2	72.8	2.6	1.640	353.0
pearled	8.5	1.1	77.8	1.1	1.615	355.1
Beans, baked, canned	6.9	2.5	19.6	2.1	600	128.5
string, fresh	2.3	.3	7.4	.8	195	41.5
canned	1.1	.1	3.8	1.3	95	20.5
lima, dried	18.1	1.5	65.9		1.586	349.5
fresh	7.1	.7	22.		557	122.7
canned	4.	.3	14.6		350	77.1
Mesquit	12.2	2.5	77.1	3.4	1.765	379.7
Mesquit, dry	12.2	2.5	77.1	3.4	1.765	379.7
Beef, corned	14.3	23.8	0	4.6	1.353	271.4
canned	26.3	18.7	0	4.	1.280	273.5
boiled, canned	25.5	22.5	0	1.3	1.425	304.5
dried	26.4	6.9	0	8.9	817	167.7
Beef, fresh						
Brisket, med. fat	15.8	28.5	0	.7	1.449	319.7
Chuck, average	19.2	15.4	0	.8	978	215.4
Cross ribs, average	15.9	28.2	0	.9	1.440	317.4
Dried, salted and smoked	30.	6.5	.4	8.9	817	180.1
Flank, lean	20.8	11.3	0	.7	838	184.9
Fore quarter, lean	18.9	12.2	0	.7	842	185.4
Fore shank, lean	22.	6.2	0	.7	647	142.9

FOOD	Proteid per cent.	Fat per cent.	Carbohydrate per cent.	Ash %.	Caloric Value of 1 pound.	Caloric Value of 100 grams.
Heart	16.	20.4	1.	.8	1.140	251.6
Hind quarter	20.	13.4	0	.7	907	200.6
Hind shank, lean	21.9	5.4	0	.9	617	136.2
Hind shank, fat	20.4	18.8	0	.8	1.171	250.8
Juice, purchased	4.9	.6	0	1.5	115	25.0
Liver	20.4	4.5	1.7	.6	584	128.9
Lion	19.7	12.7	0	.7	877	193.1
Neck, lean	21.4	8.4	0	.7	732	161.2
Neck, medium fat	20.1	16.5	0	.6	1.040	228.9
Plate, lean.	15.6	18.8	0	.7	1.051	231.6
Porterhouse steak	21.9	20.4	0		1.230	271.2
Ribs rolls, lean	20.2	10.5	0	.7	795	175.3
Ribs, lean	19.6	12.	0	.9	845	186.4
Ribs, fat	15.	35.6	0	7	1.721	380.4
Roast	22.3	28.6	0	.6	1.576	346.6
Round, lean	21.3	7.9	0	.7	694	156.3
Round, free from visible fat	23.2	2.5	0	.7	512	115.3
Rump, lean	20.9	15.7	0	.7	940	224.9
Rump, fat	16.8	35.7	0		1.763	388.5
Sides, lean	19.3	13.2	0	.7	890	196.0
Sirloin steak	18.9	18.5	0	.8	1.099	242.1
Soup	4.4	.4	1.1	1.2	120	25.6
Suet	4.7	81.8	0	.3	3.540	755.0
Sweetbreads	16.8	12.1	0		799	176.1
Tenderloin.	16.2	24.4	0		1.290	284.4
Tongue	18.9	9.2	0		717	158.4
Beets, cooked	2.3	.1	7.4		180	39.7
fresh	1.6	.1	9.7		209	46.1
Blackberries.	1.3	1.	10.9		262	57.8
Blackfish	18.7	1.3	0		393	86.5
Bluefish	19.4	1.2	0		402	88.4
cooked	29.9	4.5	0	1.2	670	160.1
Bologna sausage	18.2	10.7	0	3.8	1.155	169.1
Boston crackers.	11.	8.5	71.1		1.835	404.9

FOOD	Proteid per cent.	Fat per cent.	Carbohydrate per cent.	Ash %.	Caloric Value of 1 pound.	Caloric Value of 100 grams.
Brazil nuts	17.	66.8	0		3.040	669.2
Bread, average	9.2	1.3	53.1	1.5	1.182	260.9
White	9.2	1.3	53.1	1.1	1.200	260.9
Brown	5.4	1.8	47.1	2.1	1.040	226.2
Corn	7.9	4.7	46.3	2.2	1.205	259.1
Graham	8.9	1.8	52.1	1.5	1.195	260.2
Milk	9.6	1.4	51.1		1.158	255.4
Rye	9.	.6	53.2	1.5	1.630	254.2
Vienna	9.4	1.2	54.1	1.5	1.199	264.8
Toasted	11.5	1.6	61.2		1.385	305.2
Whole wheat	9.7	.9	49.7	1.3	1.130	245.7
Zwieback	9.8	9.9	73.	1.	1.970	420.3
Breakfast Foods, wheat	13.4		74.3			366.1
Cracked and crushed		1.7		1.6		
Cerealine	9.6	1.1	78.3	.7	1.680	361.5
Farina	11.	1.4	76.3	.4	1.685	361.8
Flaked	13.4	1.4	74.3	2.2	1.690	363.4
Germs	10.5	2.	76.	1.1	1.695	364.0
Gluttens	13.6	1.7	74.6	1.2	1.715	368.1
Miscellaneous	13.1	2.1	74.1	1.3	1.710	367.7
Oat	16.7	7.3	66.2	2.1	1.800	397.3
Parched and toasted	13.6	2.4	74.5	.9	1.740	374.0
Shredded	10.5	1.4	77.9	2.1	1.700	366.2
Wheat	12.1	1.8	75.2	1.3	1.680	365.4
Breast of lamb	15.4	19.1	0	.8	1.075	233.5
Broilers, chicken	12.8	1.4	0	.7	305	63.8
Breast of veal	15.4	11.	0	.8	745	160.6
Brussels, sprouts	4.7	1.1	4.3	1.7	215	45.9
Biscuits, home-made	8.9	1.8	52.1	1.5	1.210	260.2
Buckwheat flour	6.4	1.2	77.9	.9	1.605	348.0
Buns, as purchased	6.3	6.5	57.3	.9	1.455	312.9
Cinnamon	9.4	7.2	59.1	.7	1.575	338.8
Currant	6.7	7.6	57.6	.6		325.6
Hot cross	7.9	4.8	49.7	.9	1.275	273.6

FOOD	Proteid per cent.	Fat per cent.	Carbohydrate per cent.	Ash %.	Caloric Value of 1 pound.	Caloric Value of 100 grams.
Sugar	8.1	6.9	54.2	1.2	1.450	311.3
Butter	1.	85.	0	3.	3.400	769.0
Buttermilk	3.	.5	4.8	.7	160	35.7
Butternuts	3.8	8.3	.5	.4	385	91.9
Cabbage	1.4	.2	4.8	.9	115	26.6
Cabbage sprouts	4.7	1.1	4.3	1.7	215	45.9
Cake, bakers	6.3	4.6	56.9	.8	1.370	294.2
Chocolate layer	6.2	8.1	64.1	1.1	1.650	354.1
Coffee cake	7.1	7.5	63.2	.9	1.625	348.7
Cup cake	5.9	9.	68.5	1.	1.765	378.6
Drop cake	7.6	14.7	60.3	.8	1.885	403.9
Frosted cake	5.9	9.	64.8	2.1	1.695	363.8
Fruit cake	5.9	10.9	64.1	1.8	1.760	378.1
Gingerbread	5.8	9.	63.5	2.9	1.670	358.2
Lady fingers	8.8	5.	70.6	.6	1.685	362.6
Miscellaneous, average	5.9	10.6	60.1	1.5	1.675	359.4
Sponge cake	6.3	10.7	65.9	1.8	1.795	385.1
Cookies, molasses	7.2	8.7	75.7	2.2	1.910	409.9
Miscellaneous, average	6.7	9.6	72.4	1.	1.875	402.8
Fig biscuits or bars	4.6	.6	69.8	1.1	1.660	303.0
Ginger snaps	6.5	8.6	76.	2.6	1.895	407.4
Lady fingers	8.8	5.	70.6	.6	1.685	362.6
Macaroons	6.5	12.2	65.2	.8	1.975	396.6
Wafers, miscellaneous, average	8.7	8.6	74.5	1.6	1.910	410.2
Wafers, vanilla	6.9	14.	71.5	1.1	2.045	440.0
Corn flour	7.1	1.3	78.4	.6	1.645	353.7
Calves foot jelly	4.5	0	17.4	.7	305	86.8
Corn meal	9.2	1.9	75.4	0.1	1.655	355.5
Carrots	1.1	.4	9.3		221	45.2
Cauliflower	1.8	.5	4.7		130	30.5
Celery	1.1	.1	3.3		840	18.5
Caned baked beans	6.9	2.5	19.6	2.1	555	128.5
Caned beef, boiled	25.5	22.5	0	1.3	1.410	304.5
Condensed milk	8.8	8.3	54.1	1.9	1.490	326.3

FOOD	Proteid per cent.	Fat per cent.	Carbohydrate per cent.	Ash %	Caloric Value of 1 pound.	Caloric Value of 100 grams.
Corned Beef.	26.3	18.7	0	4.	1.270	273.5
Salmon	21.8	12.1	0			196.1
Sardines	23.7	12.1	0	5.3	950	203.7
Candy, average (not containing nuts or chocolate)			96.	2.	1.785	384.0
Catsup, tomato	1.5	.2	12.3	3.2	265	57.0
Celery soup	2.1	2.8	5.	1.5	250	53.6
Cereal coffee infusion	.2	0	1.4	.2	30	6.4
Cheese, American, pale	28.8	35.9	.3	3.4	2.055	439.5
Red	29.6	38.3	0	3.5	2.165	463.1
Boudon	15.4	20.8	1.6	7.	1.195	255.2
Brie	15.9	21.	1.4	1.5	1.210	258.2
California flat	24.3	33.4	4.5	3.8	1.945	415.8
Cheddar	27.7	36.8	4.1	4.	2.145	458.4
Cheshire	26.9	30.7	.9	4.4	1.810	387.5
Cottage, average	20.9.	1.	4.3	1.8	510	109.8
Crown brandcream	5.2	58.	2.2	3.2	2.585	551.6
Dutch, average	37.1	17.1	0	10.	1.435	302.3
Full cream	25.9	33.7	2.4	3.8	1.950	416.5
Imtation full cream, Ohio	25.9	31.7	0	4.5	1.820	388.9
Imitation old English	30.1	42.7	1.3	5.2	2.385	509.9
Limburger	23.	29.4	.4	5.1	1.675	358.2
Neuchatel	18.7	27.4	1.5	2.4	1.530	327.4
Part skimmed	25.4	29.5	3.6	3.3	1.785	381.5
Pineapple	29.9	38.9	2.6	5.6	2.245	480.1
Roquefort	22.6	29.5	1.8	6.8	1.700	363.1
Skimmed milk	31.5	16.4	2.2	4.2	1.320	282.4
Swiss	27.6	34.9	1.3	4.8	2.010	429.7
Cherries, fresh	1.	.8	16.7	.6	365	78.0
Canned	1.1	.1	21.1	.5	415	89.7
Jelly, 1st quality	1.1	0	77.2	.7	1.455	313.2
2nd quality	1.2	.3	40.9	1.1	785	171.1
Chestnuts, fresh	5.2	4.5	35.4	1.1	915	202.9
Dried	8.1	5.3	56.4	1.7	1.385	305.7

FOOD	Proteid per cent.	Fat per cent.	Carbohydrate per cent.	Ash %.	Caloric Value of 1 pound.	Caloric Value of 100 grams.
Chili-con-carne	13.3	4.6	4.	2.7	515	110.6
Chocolate	12.9	48.7	30.3	2.2	2.625	611.1
Chicken, broilers	12.8	1.4	0	.7	305	63.8
Fricaseed	17.6	11.5	2.4	1.	855	183.5
Gizzard	27.7	1.4	0	1.4	520	123.4
Heart	20.7	5.5	0	1.4	615	132.3
Liver	22.4	4.2	2.4	1.7	640	137.0
Sandwich	20.8	30.	0	2.6	1.655	353.2
Soup, canned	3.6	.1	1.5	1.	100	21.3
Gumbo	3.8	.9	4.7	1.4	195	42.1
Chops, lamb, broiled	21.7	29.9	0	.7	1.614	355.9
Mutton, loin	13.5	28.3	0	.7	1.415	308.7
Pork, loin	13.4	24.2	0	.8	1.245	271.4
Clams	10.6	1.1	5.2	2.3	340	73.1
Chowder	1.8	.8	6.7	2.	195	41.2
Cocoa, powdered	21.6	28.9	37.7	7.2	2.160	497.3
Cocoanuts	2.9	25.9	14.3	.9	1.295	301.9
Prepared	6.3	57.4	31.5	1.3	2.865	667.8
Cod fish, fresh, dressed	11.1	.2	0	.8	220	46.2
Salt, E. P.	27.3	.3	0	19.	490	111.9
Consomme	2.5	0	.4	1.1	55	11.6
Condensed milk	8.8	8.3	54.1	1.9	1.430	326.3
Cookies, molasses	7.2	8.7	75.7	2.2	1.910	409.9
Miscellaneous	6.7	9.6	72.4	1.	1.875	402.8
Sugar	7.	10.2	73.2	1.3	1.920	412.6
Corned Beef	14.3	23.8	0	4.6	1.245	271.4
Canned	26.3	18.7	0	4.	1.270	273.5
Corn meal	9.2	1.9	75.4	1.	1.635	355.5
Corn, sweet, green E. P.	3.1	1.1	19.7	.7	440	101.1
Cottolene	0	100.	0	0	4.220	900.0
Cowpeas, dried	21.4	1.4	60.8	3.4	1.505	341.4
Green E. P.	9.4	.6	22.7	1.4	620	133.8
Crackers, Boston split	11.	8.5	71.	1.9	1.885	404.5
Butter	9.6	10.1	71.6	1.5	1.935	415.7

FOOD	Proteid per cent.	Fat per cent.	Carbohydrate per cent.	Ash %.	Caloric Value of 1 pound.	Caloric Value of 100 grams.
Cream	9.7	12.1	69.7	1.7	1.990	426.5
Egg	12.6	14.	66.6	1.	2.060	442.8
Flatbread	14.9	.5	73.6	1.2	1.665	358.5
Graham	10.	9.4	73.8	1.4	1.955	419.8
Miscellaneous	10.2	8.8	72.4	1.5	1.905	409.6
Meal	10.9	6.	72.9	1.	1.810	389.2
Oatmeal	11.8	11.1	69.	1.8	1.970	423.1
Oyster	11.3	10.5	70.5	2.9	1.965	421.7
Pilot bread	11.1	5.	74.2	1.	1.800	386.2
Pretzels	9.7	3.9	72.8	4.	1.700	365.1
Saltines	10.6	12.7	68.5	2.6	2.005	430.7
Soda	9.8	9.1	73.1	2.1	1.925	413.5
Water	11.7	5.	75.7	1.2	1.835	394.6
Cranberries	.4	.6	9.9	.2	215	46.6
Crabs	7.9	.9	.6	1.5	200	42.1
Cream	2.5	18.5	4.5	.5	865	194.5
Cucumbers	.7	.2	2.6	.4	65	15.0
Currants	.4	.6	9.1	.2	215	43.4
Dried, Zante	2.4	1.7	74.2	4.5	1.495	321.7
Dates, dried	1.9	2.5	70.6	1.2	1.275	312.5
Doughnuts	6.7	21.	53.1	.9	2.000	428.2
Dried Apples	1.6	2.2	66.1	2.	1.350	290.6
Apricots	4.7	1.	62.5	2.4	1.290	277.8
Beef	26.4	6.9	0	8.9	790	167.7
Citron	.5	1.5	78.1	.9	1.525	327.9
Currants, Zanto	2.4	1.7	74.2	4.2	1.495	321.7
Figs	4.3	.3	74.2	2.4	1.475	316.7
Grapes, ground	2.8	.6	60.5	1.2	1.205	258.6
Pears	2.8	5.4	72.9	2.4	1.635	351.4
Prunes, E. P.	2.1	0	73.3	2.3	1.400	301.6
Raisins	2.6	3.3	76.1	3.4	1.650	344.5
Raspberries	7.3	1.8	80.2	2.6	1.750	366.2
Eggs, boiled	13.2	12.		.8	765	160.8
Egg plant	1.2	.3	5.1	.5	130	27.9

FOOD	Proteid per cent.	Fat per cent.	Carbohydrate per cent.	Ash %.	Caloric Value of 1 pound.	Caloric Value of 100 grams.
Farina	11.	1.4	76.3		1.640	361.8
Filberts	7.5	31.3	6.2	1.1	1.430	336.5
Fish, alewife	19.4	4.9	0	1.5	570	121.7
Bass, black	20.6	1.7	0	1.2	455	97.7
Red	16.9	.5	0	1.2	335	72.1
Sea	19.8	.5	0	1.4	390	83.7
Striped	18.6	2.8	0	1.2	465	99.6
Blackfish	7.4	.7	0	1.1	405	35.9
Bluefish	19.4	1.2	0	1.3	410	88.4
Butterfish	18.	11.	0	.6	460	171.0
Catfish	14.4	20.6	0	.7	915	243.0
Ciscoe	18.5	6.8	0	1.1	630	135.2
Cod	18.7	.5	0	1.2	370	79.3
Salt	16.	.4	0	18.5	325	67.6
Cusk	17.	.2	0	.9	325	69.8
Eels	18.6	9.1	0	1.	730	156.3
Flounder	14.2	.6	0	1.3	290	62.2
Haddock	17.2	.3	0	1.2	335	71.5
Hake	15.4	.7	0	1.	315	67.9
Hallibut	18.6	5.2	0	1.	565	121.2
Herring	19.5	7.1	0	1.5	660	141.9
Smoked	20.5	8.8	0	7.4	755	161.2
Kingfish	18.9	.9	0	1.2	390	83.7
Lamphrey	15.	13.3	0	.4	455	179.7
Mackerel	11.6	3.5	0	.7	365	77.9
Salt	17.3	26.4	0	12.9	1.435	306.8
Canned	19.6	8.7	0	3.2	730	156.7
Mullet	19.5	4.6	0	1.2	555	119.4
Muskellunge	20.2	2.5	0	1.6	480	103.3
Perch, white	19.3	4.	0	1.2	530	113.2
(Wall-eyed pike)	18.6	.5	0	1.4	365	78.9
Yellow	18.7	.8	0	1.2	380	82.0
Pickerel, pike	18.7	.5	0	1.1	370	79.3
Pike, grey	17.9	.8	0	1.1	365	78.8

FOOD	Protein per cent.	Fat per cent.	Carbohydrate per cent.	Ash %.	Caloric Value of 1 pound.	Caloric Value of 100 grams.
Pollock	21.6	.8	0	1.5	435	93.6
Pompano	18.8	7.5	0	1.	665.	142.7
Porgy	18.6	5.1	0	1.4	560	120.3
Red Snapper	19.7	1.	0	1.3	410	87.8
Salmon	22.	12.8	0	1.4	950	203.2
Canned	21.8	12.1	0	2.6	915	196.1
Landlocked	17.8	3.3	0	1.2	470	100.9
California	17.8	17.8	0	1.1	1.080	231.4
Shad	18.8	9.5	0	1.3	750	160.7
Roe	20.9	3.8	2.6	1.5	600	128.2
Sheepshead	20.1	3.7	0	1.2	530	113.7
Skate, lobe of body	18.2	1.4	0	1.1	400	85.4
Smelt	17.6	1.8	0	1.7	405	86.6
Spanish mackerel	21.5	9.4	0	1.5	795	170.6
Sturgeon	18.1	1.9	0	1.4	415	89.5
Dried	31.8	9.6	0	7.6		213.6
Tom cod	17.2	.4	0	1.	335	72.4
Trout, brook	19.2	2.4	0	1.2	445	98.4
Lake	17.8	10.3	0	1.2	765	163.9
Turbot	14.8	16.4	0	1.3	885	206.8
Weakfish	17.8	2.4	0	1.2	430	92.8
Whitefish	22.9	6.5	0	1.6	700	150.1
Flour, entire wheat	13.8	1.9	71.9	1.	1.650	359.9
Buckwheat	6.4	1.2	77.9	.9	1.605	348.0
Corn meal	9.2	1.9	75.4	1.	1.635	355.5
Graham	13.3	2.2	71.4	1.8	1.645	358.6
Oat	16.7	7.3	66.2	2.1	1.800	397.3
Rice	8.	.3	79.	.4	1.620	350.7
Starch	0	0	90.	0	1.675	360.0
Frankfort Sausage	19.6	18.6	1.1	3.4	1.170	250.2
Fruit, fresh apples	.3	.3	10.8	.3	190	47.1
Apricots	1.1	0	13.4	.5	270	58.0
Bananas	.8	1.2	14.3	.6	200	71.2
Blackberries	1.3	1.	10.9	.5	270	57.8

FOOD	Proteid per cent.	Fat per cent.	Carbohydrate per cent.	Ash %.	Caloric Value of 1 pound.	Caloric Value of 100 grams.
Cherries	1.	.8	16.7	.6	365	78.0
Cranberries	.4	.6	9.9	.2	215	46.6
Currants	1.5	0	12.8	.7	265	57.2
Figs	1.5	0	18.8	.6	380	81.2
Grapes	1.	1.2	14.4	.4	295	72.4
Huckleberries	.6	.6	16.6	.3	345	74.2
Lemons	.7	.5	5.9	.4	125	30.9
Muskmellons	.3	0	4.6	.3	80	19.6
Nectarines	.6	0	15.9	.6	305	66.0
Oranges	.6	.1	8.5	.4	150	37.3
Pears	.5	.4	12.7	.4	230	56.4
Persimmons, E. P.	.8	.7	31.5	.9	550	135.5
Pineapple	.4	.3	9.7	.3	200	43.1
Plums	1.	0	20.1	.5	395	84.4
Pomegranates	1.5	1.6	19.5	.6	460	98.4
Prunes	.9	0	18.9	.6	370	79.2
Raspberries	1.	0	12.6	.6	220	54.4
Strawberries	.9	.6	7.	.6	150	37.0
Watermellons	.2	.1	2.7	.1	50	12.5
Whortleberries	.7	3.	13.5	.4	390	83.8
Fruit, preserved, Apples, crab	.3	2.4	54.4	.5	1.120	240.4
Apricots	.9	0	17.3	.4	340	72.8
Blackberries	.8	2.1	56.4	.7	1.150	247.7
Marmelade orange	.6	.1	84.5	.3	1.585	341.3
Peaches	.7	.1	10.8	.3	220	46.9
Pears	.3	.3	18.		355	75.9
Pineapples	.4	.7	36.4	.7	715	153.5
Tomatoes	.7	.1	57.6	.7	1.090	234.1
Frog's legs	15.5	.2	0	1.	295	63.8
Gelatine	91.4	.1	0	2.1	1.705	366.5
Gingerbread	5.8	9.	63.5	2.9	1.670	358.2
Gingersnaps	6.5	8.6	76.	2.6	1.895	407.4
Goose	13.4	29.8	0	.7	1.475	321.8

FOOD	Protein per cent.	Fat per cent.	Carbohydrate per cent.	Ash %.	Caloric Value of 1 pound.	Caloric Value of 100 grams.
Graham Bread	8.9	1.8	52.1	1.5	1.195	260.2
Graham crackers	10.	9.4	73.8	1.4	1.955	419.8
Graham flour	13.3	2.2	71.4	1.8	1.645	358.6
Grapes, fresh	1.3	1.6	19.2	.5	450	96.4
Grape butter	1.2	.1	58.5	3.5	1.115	239.7
Green corn	3.1	1.1	19.7	.7	440	101.1
Green peas, E. P.	.7	.5	16.9	1.	440	74.9
Greens, beet, cooked	2.2	3.4	3.2	1.7	245	52.2
Dandelion	2.4	1.	10.6	4.6	285	61.0
Turnip salad	4.2	.6	6.3	2.2	220	47.4
Hash	.6	1.9	9.4	2.4	365	57.1
Haddock	22.3	2.3	0	7.2	510	109.9
Hallibut steak	15.3	4.4	0	.9	475	100.8
Ham, fresh, E. P.	15.3	28.9	0	.8	1.505	321.3
Smoked	14.2	23.4	0	4.2	1.635	267.4
Herring, fresh	19.5	7.1	0	1.5	660	141.9
Smoked	20.5	8.8	0	7.4	755	161.2
Hominy, cooked	2.2	.2	17.8	.5	380	81.8
Parched	11.5	8.4	72.3	2.1	1.915	410.8
Honey	0	0	81.	0	1.420	324.0
Horseradish	1.4	.2	10.5	1.5	230	49.4
Huckleberries	.6	.6	16.6	.3	334	74.2
Isinglass	89.2	1.6	0	2.	1.915	371.6
Jelly, cherry	1.1	0	77.2	.7	1.455	313.2
Jumbles	7.4	13.5	67.7	1.1	1.890	421.9
Kidney, beef	16.6	4.8	.4	1.2	520	111.2
Mutton	16.5	3.2	0	1.3	440	94.8
Pork	15.5	4.8	0	1.2	490	105.2
Koumiss	2.8	2.1	5.4	.4	240	51.7
Kafir corn	6.6	3.8	70.6	2.2	1.595	343.0
Lamb chops, broiled	21.7	29.9	0	.7	1.614	355.9
Lamb, breast	15.4	19.1	0	.8	1.075	233.5
Leg, hind	15.9	13.6	0	.9	860	186.0
Leg mutton, hind	15.1	14.7	0	.8	890	192.7

FOOD	Proteid per cent.	Fat per cent.	Carbohydrate per cent.	Ash %.	Caloric Value of 1 pound.	Caloric Value of 100 grams.
Leeks	1.	.4	5.	.6	130	2.76
Lentils	25.7	1.	59.2	5.7	1.620	348.6
Lemons	.7	.5	5.9	.4	125	30.9
Lettuce	1.	.2	2.5	.8	65	15.8
Lima Beans	7.1	.7	22.	1.7	540	122.7
Liver, beef	20.7	4.5	1.5	1.6	605	129.3
Mutton	23.1	9.	5.	1.7	905	193.4
Pork	21.3	4.5	1.4	1.4	615	131.3
Loin, Tenderloin beef, cooked	23.5	20.4	0	1.2	1.300	277.6
Lobsters	5.9	.7	.2	.8	145	30.7
Canned	18.1	1.1	.5	2.5	390	84.3
Macaroni, cooked	3.	1.5	15.8	1.3	415	88.7
Macaroons	6.5	15.2	62.2	.8	1.975	411.6
Mackeral, fresh	18.7	7.1	0	1.2	645	138.7
Spanish, broiled	23.7	6.4	0	1.4	715	153.3
Salt	17.3	26.4	0	10.4	1.155	306.8
Canned	19.6	8.7	0	3.2	730	156.7
In oil	25.2	14.1	0	4.1	1.065	227.7
Marmalade, orange	.6	.1	84.5	.3	1.585	341.3
Marshmallows	0	0	84.	1.1		336.0
Meat stew	4.6	4.3	5.5	1.1	365	79.1
Milk condensed, sweetened	8.2	8.3	54.1	1.9	1.520	323.9
Unsweetened	9.6	9.3	11.2	1.7	780	166.9
Whole	3.3	4.	5.	.7	310	69.2
Skimmed	3.4	.3	5.1	.7	165	36.7
Butter	3.	.5	4.8	.7	160	35.7
Mince meat	6.7	1.4	60.2	4.	1.305	280.2
Pie	5.8	12.3	38.1	2.5	1.335	286.3
Molasses	0	0	70.	0	1.225	280.2
Cookies	7.2	8.7	75.7	2.2	1.910	409.9
Mushrooms	3.5	.4	6.8	1.2	185	44.8
Muskmellons	.3	0	4.6	.3	80	19.6
Mutton, fore quarter	12.3	24.5	0	.7	1.235	269.7
Leg, hind, lean	19.8	12.4	0	1.1	890	190.8

FOOD	Proteid per cent.	Fat per cent.	Carbohydrate per cent.	Ash %.	Caloric Value of 1 pound.	Caloric Value of 100 grams.
Fat	17.3	27.1	0	.9	1.465	313.1
Loin, chops	13.5	28.3	0	.7	1.415	308.7
Nectarines	.6	0	15.9	.6	305	66.0
Nuts, Almonds	21.	54.9	17.3	2.	3.030	647.3
Beechnuts	21.9	57.2	13.2	3.5	3.075	655.2
Brazil	17.	66.8	7.	3.9	3.265	697.2
Butternuts	27.9	61.2	3.5	2.9	3.165	676.4
Chestnuts, dried	10.7	7.	74.2	2.2	1.875	402.6
Cocoanuts	2.9	25.9	14.3	.9	1.295	301.9
Cocoanuts, prepared	6.3	57.4	31.5	1.3	2.865	667.8
Filberts	7.5	31.3	6.2	1.1	1.430	336.5
Hickory	5.8	25.5	4.3	.8	1.145	269.9
Peanuts	19.5	29.1	18.5	1.5	1.775	413.9
Butter	29.3	46.5	17.1	5.	2.825	604.1
Pecans	5.2	33.3	6.2	.7	1.465	345.3
Pine, (Pinus edulis)	8.7	36.8	10.2	1.7	1.730	406.8
Pistachios	22.3	54.	16.3	3.2	2.995	640.4
Walnuts, English	6.9	26.6	6.8	.6	1.250	294.2
Black	7.2	14.6	3.	.5	730	172.2
Noodles	11.7	1.	75.6	1.	1.165	358.2
Oat, Breakfastfood	16.7	7.3	66.2	2.1	1.800	397.3
Oatmeal, boiled	2.8	.5	11.5	.7	285	61.7
Gruel	1.2	.4	6.3	.5	155	33.6
Oats, rolled	16.7	7.3	66.2	2.1	1.850	397.3
Oleomargerine	1.2	83.	0	6.3	3.525	751.8
Olives, green	1.1	27.6	11.6	1.7	1.400	299.2
Ripe	1.7	25.9	4.3	3.4	1.205	257.1
Onions	1.4	.3	8.9	.5	190	43.9
Oranges	.6	.1	8.5	.4	150	37.3
Oyster crackers	11.3	10.5	70.5	2.9	1.910	421.7
Oysters, "solids"	6.	1.3	3.3	1.1	225	48.9
Canned	8.8	2.4	3.9	1.5	335	72.4
Oxtail soup	4.	1.3	4.3	1.6	210	44.9
Parsnips	1.3	.4	10.8	1.1	230	52.0

FOOD	Protein per cent.	Fat per cent.	Carbohydrate per cent.	Ash %.	Caloric Value of 1 pound.	Caloric Value of 100 grams.
Peanuts	19.5	29.1	18.5	1.5	1.775	413.9
Butter	29.3	46.5	17.1	5.	2.825	604.1
Peaches, fresh	.7	.1	10.8			46.9
Canned	.7	.1	10.8	.3	220	46.9
Peas, green, canned	3.6	.2	9.8	1.1	255	55.4
Cooked	6.7	3.4	14.6	1.5	540	115.8
Pears	.5	.4	12.7	.4	230	56.4
Pecans	5.2	33.3	6.2	.7	1.465	345.3
Persimmons	.8	.7	31.5	.9	550	135.5
Pickles, catsup, tomato	1.5	.2	12.3	3.2	265	57.0
Olives	1.1	27.6	11.6	1.7	1.400	299.2
Peppers, green.	15.5	8.5	63.	8.	1.820	390.5
Red chili	9.4	7.7	70.	7.6	1.800	386.9
Cucumbers	.5	.3	2.7	3.6	70	15.5
Spiced	.4	.1	20.7	1.7	395	85.3
Pickled tongue, beef	12.8	20.5	0	4.7	1.105	235.7
Pigs'	17.7	19.8	0	3.6	1.165	249.0
Tripe	11.7	1.2	.2	3.	270	58.4
Pigs' tongue	17.7	19.8	0	3.6	1.165	249.0
Feet	16.3	14.8	0	.9	930	198.4
Fish, minogy	22.	18.6	0	3.	1.195	255.4
Pilchard	27.9	15.8	0	4.	1.185	253.8
Pilot Bread	11.1	5.	74.2	1.	1.800	386.2
Pies, Apple	3.1	9.8	42.8	1.8	1.270	271.8
Cream	4.4	11.4	51.2	1.	1.515	325.0
Custard	4.2	6.3	26.1	1.	830	177.9
Lemon.	3.6	10.1	37.4	1.5	1.190	259.9
Mince	5.8	12.3	38.1	2.5	1.335	286.3
Raisin	3.	11.3	47.2	1.5	1.410	302.5
Squash	4.4	8.4	21.7	1.3	840	180.0
Pigs' feet, pickled	16.3	14.8	0	.9	930	198.4
Tongue, pickled	17.7	19.8	0	3.6	1.165	249.0
Pignilias	33.9	49.4	6.9	3.4	2.844	607.8
Pine nuts (Pinus edulis)	8.7	36.8	10.2	1.7	1.730	406.8

FOOD	Proteid per cent.	Fat per cent.	Carbohydrate per cent.	Ash %.	Caloric Value of 1 pound.	Caloric Value of 100 grams.
Pistachios	22.3	54.	16.3	3.2	2.995	640.4
Plums	1.	0	20.1	0	383	84.4
Pomegranates	1.5	1.6	19.5	.6	460	98.4
Pop cormn	10.7	5.	78.7	1.3	1.875	402.6
Pork, ham, fresh, medium, fat	15.3	28.9	0	.8	1.505	321.3
Headcheese	19.5	33.8	0	3.3	1.790	382.2
Chops, loin, medium, fat	16.6	30.1	0	1.	1.580	337.3
Tenderloin	15.7	36.3	0	.7	1.825	389.5
Liver	21.3	4.5	1.4	1.4	615	131.3
Smoked ham	16.5	38.8	0	4.7	1.945	415.2
Boiled	20.2	22.4	0	6.1	1.320	282.4
Fried	22.2	33.2	0	5.8	1.815	387.6
Luncheon	22.5	21.	0	5.8	1.305	279.0
Tongue	17.7	19.8	0	3.6	1.165	249.0
Pigs' feet	16.3	14.8	0	.9	930	198.4
Salt	7.4	59.6	0	5.1	2.655	566.0
Bacon	9.1	62.2	0	4.1	2.795	596.2
Ribs, cooked	24.8	37.6	0	2.2	2.050	437.6
Steak, cooked	19.9	45.4	0	1.5	2.285	488.2
Ham, canned, deviled	19.9	34.1	0	3.3	1.790	386.5
Bologna	18.7	17.6	.3	3.7	1.095	234.4
Sausage, farmer	27.9	40.4	0	7.3	2.225	475.2
Frankfort	19.6	18.6	1.1	3.4	1.170	250.2
Average	13.	44.2	1.1	2.2	2.125	454.2
Meat	17.4	32.5	0	3.4	1.695	362.1
Poultry, Chicken, broilers	12.8	1.4	0	.7	305	63.8
Fowls	13.7	12.3	0	.7	765	165.5
Goose	13.4	20.8	0	.7	1.475	240.8
Turkey	16.1	18.4	0	.8	1.060	230.0
Potatoes, cooked, boiled	2.5	.1	20.9	1.	440	94.5
Chips	6.8	39.8	46.7	4.5	2.675	572.2
Mashed and creamed	2.6	3.	17.8	1.5	505	108.6
Sweet, cooked	3.	2.1	42.1	.9	925	199.3
Pressed beef, cooked	23.6	27.7	0	1.5	1.610	343.7

FOOD	Proteid per cent.	Fat per cent.	Carbohydrate per cent.	Ash %.	Caloric Value of 1 pound.	Caloric Value of 100 grams.
Pretzels	9.7	3.9	72.8	4.	1.700	365.1
Prunes, dried	2.1	0	73.3	2.3	1.400	301.6
Pudding, Indian meal	5.5	4.8	27.5	1.5	815	175.2
Rice, custard	4.	4.6	31.4	.6	825	183.0
Tapioca	3.3	3.2	28.2	.8	720	154.8
Porterhouse steak	19.1	17.9	0	.8	1.100	237.5
Radishes	1.3	.1	5.8	1.	135	29.3
Raisins	2.3	3.	68.5	3.1	1.265	310.2
Raspberries, red	1.	0	12.6	.6	220	54.4
Black	1.7	1.	12.6	.6	310	66.2
Rhubarb	.4	.1	14.7	.8	295	61.3
Rice, boiled	2.8	.1	24.4	.2	510	109.7
Flaked	7.9	.4	81.9	.3	1.685	362.8
Flour	6.8	.9	78.7	.7	1.630	350.1
Rolled Oates	16.7	7.3	66.2	2.1	1.850	397.3
Roast Beef	22.3	28.6	0	1.3	1.620	346.6
Round Steak, cooked	27.6	7.7	0	1.8	840	179.7
Rump Steak, cooked	24.3	18.7	0	1.5	1.240	265.5
Rye Bread	9.	.6	53.2	1.5	1.170	254.2
Flour	6.8	.9	78.7	.7	1.620	350.1
Salmon	22.	12.8	0	1.4	950	203.2
Canned	21.8	12.1	0	2.6	915	196.1
Saltines	10.6	12.7	68.5	2.6	2.005	430.7
Salt Pork	8.4	67.1	0	5.7	2.985	637.5
Sandwich, chicken	12.3	5.4	32.1	1.7	1.055	226.2
Egg	9.6	12.7	34.5	1.8	1.355	290.7
Sardines, canned	23.7	12.1	0	5.3	950	203.7
Sauerkraut	1.7	.5	3.8	5.2	125	26.5
Sausage bologna	18.7	17.6	.3	3.7	1.095	234.4
Beef, canned	17.9	20.6	0	2.	1.200	257.0
Farmer	27.9	40.4	0	7.3	2.225	475.2
Frankfort	19.6	18.6	1.1	3.4	1.170	250.2
Holsteiner	28.7	36.5	3.3	4.2	2.135	456.5
Lyons, pure ham	32.3	27.2	0	8.	1.750	374.0

FOOD	Proteid per cent.	Fat per cent.	Carbohydrate per cent.	Ash %.	Caloric Value of 1 pound.	Caloric Value of 100 grams.
Pork	13.	44.2	1.1	2.2	2.125	454.2
Pork and Beef	19.4	24.1	0	1.	1.380	294.5
Summer	26.0	44.5	0	7.1	2.360	504.5
Wienerwurst	28.	22.1	1.6	4.4	1.485	317.3
Shank, Beef, fore, medium, fat	20.4	11.6	0	.9	870	186.0
Hind	20.9	11.5	0	.9	875	187.1
Shad, fresh	18.8	9.5	0	1.3	750	160.7
Roe	29.3	3.8	2.6	1.5	600	161.8
Shoulder and clod of Beef, fresh	16.4	9.8	0	.9	715	153.8
Shoulder of Pork, fresh	12.	29.8	0	.7	1.450	316.2
Smoked	13.	26.6	0	5.5	1.335	291.4
Shell Fish, Clams	10.6	1.1	5.2	2.3	340	73.1
Crabs	7.9	.9	.6	1.5	200	42.1
Lobsters	5.9	.7	.2	.8	145	30.7
Canned	18.1	1.1	.5	2.5	390	84.3
Mussels	3.7	1.1	4.1	1.9	285	61.1
Oysters, solids	6.	1.3	3.3	1.1	225	48.9
Canned	3.8	2.4	3.9	1.5	335	72.4
Scallops	14.8	.1	3.4	1.4	345	73.7
Terrapin	5.2	.9	0	.2	135	28.9
Turtle, green	19.8	.5	0	1.2	390	83.7
Shredded Wheat	10.5	1.4	77.9	2.1	1.700	366.2
Skimmed Milk	3.4	.3	5.1	.7	170	36.7
Smoked Dried Beef	53.7	26.4	0	8.9	790	452.4
Shoulder Pork	15.9	32.5	0	6.7	1.665	356.1
Bacon, medium fat	9.9	67.4	0	4.4	3.030	646.2
Haddock	23.3	.2	0	3.6	440	95.0
Halibut	20.7	15.	0	15.	1.020	217.8
Herring	36.9	15.8	0	13.2	1.355	289.8
Soup, Asparagus, canned	2.5	3.2	5.5	1.4	285	60.8
Bean, home-made	10.5	1.4	9.4	1.7	295	92.2
Beef, home-made	4.4	.4	1.1	1.2	120	25.6
Bouillon, canned	2.2	.1	.2	.9	50	10.5
Celery canned	2.1	2.8	5.	1.5	250	53.6

FOOD	Proteid per cent.	Fat per cent.	Carbohydrate per cent.	Ash %.	Caloric Value of 1 pound.	Caloric Value of 100 grams.
Chicken, home-made	10.5	.8	2.4	2.	275	53.8
Canned	3.6	.1	1.5	1.	100	21.3
Gumbo, canned	3.8	.9	4.7	1.4	195	42.1
Clam Chowder, home-made	1.8	.8	6.7	2.	195	41.2
Consomme, canned	2.5	0	.4	1.1	55	11.6
Corn, cream of canned	2.5	1.9	7.8	1.	270	58.3
Julien, canned	2.7	0	.5	.9	60	12.8
Meat Stew, home-made	4.6	4.3	5.5	1.1	370	79.1
Mock Turtle, canned	5.2	.9	2.8	1.3	185	40.1
Mulligatawney, canned	3.7	.1	5.7	1.2	180	38.5
Oxtail, canned	4.	1.3	4.3	1.6	210	44.9
Pea, canned	3.6	.7	7.6	1.2	235	51.1
Cream of green, canned	2.6	2.7	5.7	1.3	270	57.5
Tomato	1.8	1.1	5.6	1.5	185	39.5
Turtle, green, canned	6.1	1.9	3.9	1.5	265	57.1
Vegetable, canned	2.9	0	.5	.9	65	12.6
Soda Crackers	9.8	9.1	73.1	2.1	1.925	413.5
Spinach	2.1	.3	3.2	2.1	95	23.9
Spanish Mackerel, cooked	23.7	6.5	0	1.4	715	153.3
Squash	.7	.2	4.5	.4	100	22.6
Starch, Arrowroot			97.5	.2	1.815	390.0
Cornstarch			90.		1.675	360.0
Manioca	.5	.1	88.8	.1	1.665	358.1
Sago	9.	.4	78.1	.3	1.635	352.0
Tapioca	.4	.1	88.	.1	1.650	354.5
Steak, Round, cooked	27.6	7.7	0	1.8	840	180.7
Porterhouse	21.9	20.4	0	.7	1.230	271.2
Sirloin, cooked	23.9	10.2	0	1.4	875	187.4
Tenderloin	23.5	20.4	0	1.2	1.300	277.6
String Beans	2.1	.3	6.9	.7	170	38.7
Strawberries, fresh	1.	.6	7.4	.6	180	39.0
Stewed	.7	0	24.	.5	460	98.8
Succotash, canned	3.6	1.	18.6	.9	455	97.8
Sugar, coffee or brown			95.		1.765	380.0

FOOD	Proteid per cent.	Fat per cent.	Carbohydrate per cent.	Ash %.	Caloric Value of 1 pound.	Caloric Value of 100 grams.
Granulated			100.		1.860	400.0
Maple			82.8		1.540	331.2
Powdered			100.		1.860	400.0
Sweet Corn, green	3.1	1.1	19.7	.7	440	101.1
Potatoes	1.4	.6	21.9	.9	440	98.6
Tapioca	.4	.1	88.	.1	1.650	354.5
Tomatos, fresh	.9	.4	3.9	.5	100	22.8
Canned	1.2	.2	.4	.6	105	22.6
Soup, canned	1.8	1.1	5.6	1.5	185	39.5
Tongue, Beef, cooked	19.5	23.2	0	4.	1.340	286.8
Tripe, cooked	16.8	8.5	0	.5	670	143.7
Turkey, roast, E. P.	27.8	18.5	0	1.2	1.285	277.7
Roast, light and dark meat and stuffing, E. P.	17.1	10.8	5.5	1.6	870	187.6
Turnips	.9	.1	5.7	.6	120	27.3
Veal, breast	15.4	11.	0	.8	745	160.6
Leg	15.5	7.9	0	.9	625	133.1
Leg cutlets	20.1	7.5	0	1.	695	147.9
Fore quarter	15.1	6.	0	.7	535	114.4
Hind quarter	16.2	6.6	0	.8	580	124.2
Vegetables, Artichokes, canned	.8	0	5.	1.7	110	23.2
Asparagus, canned	1.5	.1	2.8	1.2	85	18.1
Beans, baked, canned	6.9	2.5	19.6	2.1	600	128.5
Dried	22.5	1.8	59.6	3.5	1.520	344.6
String, canned	1.1	.1	3.8	1.3	95	20.5
Fresh	2.1	.3	6.9	.7	170	38.7
Wax, canned	1.	.1	3.1	1.2	80	17.3
Lima, canned	4.	.3	14.6	1.6	360	77.1
Shelled	7.1	.7	22.	1.7	540	122.7
Brussels Sprouts, canned	1.5	.1	3.4	1.3	95	20.5
Beets	1.3	.1	7.7	.9	160	36.9
Cabbage	1.4	.2	4.8	.9	115	26.6
Celery	.9	.1	2.6	.8	65	14.9
Corn, green, sweet	3.1	1.1	19.7	.7	440	101.1
Canned	2.8	1.2	19.	.9	455	98.0

FOOD	Proteid per cent.	Fat per cent.	Carbohydrate per cent.	Ash %.	Caloric Value of 1 pound.	Caloric Value of 100 grams.
Cucumbers	.7	.2	2.6	.4	65	15.0
Lettuce	1.	.2	2.5	.8	65	15.8
Mushrooms	3.5	.4	6.8	1.2	185	44.8
Onions	1.4	.3	8.9	.5	190	43.9
Parsnips	1.3	.4	10.8	1.1	230	52.0
Peas, canned	3.6	.2	9.8	1.1	255	55.4
Dried	24.6	1.	62.	2.9	1.565	355.4
Shelled	7.	.5	16.9	1.	440	100.1
Potatoes	1.8	.1	14.7	.8	295	66.9
Cooked, boiled	2.5	.1	20.9	1.	440	94.5
Chips	6.8	39.8	46.7	4.5	2.675	572.2
Mashed and creamed	3.	2.1	42.1	.9	925	199.3
Sweet	1.4	.6	21.9	.9	440	98.6
Cooked	1.9	.4	41.4	1.1	820	176.8
Pumpkins	1.	.1	5.2	.6	120	25.7
Canned	.8	.2	6.7	.7	150	31.8
Rhubarb	.4	.4	2.2	.4	60	14.0
Spinach	2.1	.3	3.2	2.1	95	23.9
Squash	.7	.2	4.5	.4	100	22.6
Canned	.9	.5	10.5	.5	235	50.1
Succotash, canned	3.6	1.	18.6	.9	425	97.8
Tomatos	.9	.4	3.9	.5	100	22.8
Canned	1.2	.2	4.	.6	105	22.6
Turnips	.9	.1	5.7	.6	120	27.3
Vermicelli	13.4	.9	74.1	1.3	1.645	358.1
Wafers, vanilla	6.9	14.	71.6	1.1	2.045	440.0
Water Crackers	11.7	5.	75.1	1.2	1.835	392.2
Walnuts, black	7.2	14.6	3.	.5	730	172.2
California	18.4	64.4	13.	1.7	3.300	705.2
English	6.9	26.6	6.8	.6	1.250	294.2
Watermellon	.4	.2	6.7	.3	140	30.2
Whortleberries	.7	3.	13.5	.4	390	83.8
White Bread	9.2	1.3	53.1	1.1	1.215	260.9
Whole Wheat Bread	9.7	.9	49.7	1.3	1.140	245.7
Zweiback	9.8	9.9	73.5	1.	1.970	422.3

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