What Do You Eat? AND DO YOU CONSIDER THE ENERGY VALUE OF FOODS?

WHICH HOLDS THE MOST ENERGY?

Do You Know, For Instance, How Many Calories—the Calorie Being the Unit on Which the Fuel Value of Food Is Reckoned—You Require Daily? Or How Many You Actually Take Into Your System? Expressed in Figures of Mechanical Energy, a Single Calorie Can Lift a Ton a Foot and a Half From the Ground. And Most of Us Need an Amount of Food Each Day Sufficient to Raise This Weight a Mile to a Mile and a Half, if Suddenly Transformed Into Power.

THE subject of food and feeding is one that has attracted the attention and enlisted the pens of a vast army of writers. It is a subject that lends itself most readily to fads and faddists, and at the same time has the close attention of some of the foremost scientists of our time. Therefore with the contradictory mixture of advice and information that is spread before the public it is hardly to be wondered at that the seeker after information is puzzled where to look for absolute truth.

The purpose of this article is to try and explain as clearly as may be what are largely now the inner secrets of our food supply, so that it may be possible for each and every one to know just what foods contain the most nourishment and force, and just what foods are deficient in these two respects.

Dr. Woods Hutchinson earns comfortable sums of money by writing lengthy articles to the effect that very many of us do not eat enough and would be benefited by sitting down at the table oftener and staying there longer.

Upton Sinclair, who considers himself an authority on the subject, also gathers in quite a few dollars by writing that all our ills will leave us and we will develop perfect bodies and minds if we will only abstain from food for days at a time, as he says he has done.

Professor Chittenden, whose book on "The Nutrition of Man" is a classic, does not go quite so far as Mr. Sinclair, but he does say that we can live and move and have our being on just about half the amount of food most of us eat.

Again, Horace Fletcher has a plan to scale down our allowance of food, too. He maintains that it is not the quantity of food we eat that benefits us, but the thoroughness with which it is chewed, and that one cracker or one cherry or one small piece of meat will make a full meal if it is only chewed long enough. He even advises that milk be chewed before it is swallowed.

With such dissimilar theories prevailing among dietary authorities, it is not to be wondered that ordinary people consider the subject of dietetics one that is hardly worth puzzling over. Instead men adhere to the motto, "Eat what you want and what agrees with you; eat plenty, but not too much."

Even physicians are beginning to feel that their knowledge of foods and their values ought to be more extensive and more exact. Writing recently in the Boston Medical and Surgical Journal, Dr. Franklin W. White, of the Harvard Medical School, said: "The medical profession has given much study to drugs and knows the kind to use and the exact amount for a given result. Foods are so common we have neglected them. Their composition has not interested us, and we have not known their doses—that is, the amounts to use for a given purpose—and the results of our diet directions have not been what we intended, many doctors being unable to give advice about food which could not better be given by a good housewife."

As a result of the general ignorance regarding food values some persons get fat and then need reduction, and others get too thin and need fattening up. A better understanding about the foods we ought to eat and the foods we ought to avoid would prevent such a disarrangement of the plans of Nature.

It is a popular comparison to liken the human body to a steam engine, and to point out that just as the engine must be fed regularly with coal in order to develop heat and force, so the body must be nourished with food at stated intervals to make muscular strength and to sustain the bodily temperature. Such a comparison is, however, very faulty and incorrect. The engine is built of metal and is fed with coal, and the oftener it is fed the sooner it wears out and goes on the scrap heap.

On the other hand, the body is composed of practically the same chemical substances as the foods which nourish it, and not only do these foods furnish heat and power to the body, but they also rebuild its wasted portions, every organ and tissue of the body being built from the nutritive ingredients of the food eaten.

From the time food enters the body until it is digested and utilized and the non-essentials eliminated it is constantly undergoing complex chemical changes. It is constantly producing heat during the process and is supplying the energy needed; at the same time it is building up the body and keeping it in repair. These, therefore, are the chief uses of food.

If we eat more food than we need for our bodily requirements it is stored up in the system usually in the form of fat, and in reasonable quantity fat forms a useful reserve of heat-giving material. When there is extra hard work to be done, or when the usual food supply is lessened, then the store of fat is drawn upon.

All the different kinds of food we eat come under one of four classifications, and these four are, respectively, protein, fats, carbohydrates and mineral matters.

Protein includes the principal tissue builders that go into the body, and is represented by lean meat, the white of eggs (albumen), the curd of milk and the gluten of wheat.

Fats comprise the fat of meat, butter, oils, etc., and are the principal heat producers.

Carbohydrates include sugars, starches, gums and the woody fiber of vegetables and fruits. The carbohydrates perform a double function in the body, in that they can be used directly to provide heat and muscular energy, or under certain conditions may be transformed into fat.

Mineral matters are the salts of magnesium, potassium, sodium, phosphorus and others, and occur to some extent or other in every kind of food we eat, except sugars.

The food substance with the largest percentage of protein is gelatine with 90 per cent, with the smallest, apples and squash with about one-third of 1 per cent.

The food substance with the largest percentage of fat is fat salt pork with 90 per cent, with the smallest tapioca and some vegetables with one-tenth of 1 per cent.

The food substance with the largest percentage of carbohydrates is granulated sugar with 100 per cent, with the smallest clams and frogs' legs with one-tenth of 1 per cent.

The food substance with the largest percentage of mineral matters is Dutch cheese with 10 per cent, and a large number of foods, principally farinas and some watery fruits, contain as low as one-tenth of 1 per cent.

Peanuts and Other Foods.

One thing to be noticed about practically all foods is that they contain considerable quantities of refuse or water, with no nutriment value. The skin and bones of fish and meat, the shells of shellfish, the bran of wheat, the rinds of fruits and vegetables, all are so much waste. Also almost all solid foods contain a good deal of water, some vegetables and fruits as much as from 80 to 90 per cent, and most cuts of meat from 40 to 50 per cent. But while we could not get along without water, there is no nourishment in it.

Of all the four classes of nutrients just enumerated and described, by far the most important is protein. It is chiefly found in lean meats and fish, eggs, cheese, nuts and the dried legumes, such as peas, beans and lentils. Peanuts are rich in protein, having about 25 per cent, while chestnuts contain only about 5 per cent. Protein makes up from 7 to 15 per cent of the cereals; ordinary bread has about 9 per cent.

Now we have seen that the food on which the body nourishes itself is made up of the same elements of which the body is constructed, and to maintain the balance of energy required to run the human system and to develop the heat needed from the food eaten to keep the temperature equalized, it will be readily understood that the various food materials must be standardized as regards their nutritive values before we can lay down any rules as to what proportions of each are necessary and advantageous, so that proteins, fats and carbohydrates must have a common meeting ground, where they can be calculated and estimated and one compared with the other.

This common meeting ground is found in the fuel value of each, which takes into account the chemical composition of the food, the proportions of its nutritive elements actually digested and oxidized in the body, and thus affords an exact estimate of the amount of energy in each which is available for the use of the body for warmth and work. The fuel values of foods are determined in the chemical laboratory by an apparatus called the "bomb calorimiter," which records the amount of heat given off by a given quantity of material, no matter whether it be food, coal or wood.

The heat of combustion is reckoned in units called "calories," a calorie being the amount of heat which raises the temperature of a pound of water four degrees. Or as well as this way of expressing it, it can be expressed in figures of mechanical energy, as one calorie when transformed into power is sufficient to life one ton a foot and a half.

The following basic figures show the energy furnished to the body by each of the three great classes of food materials:

Fuel value of protein, 1820 calories per pound, or for easier calculation let us say four calories per gram of 15 grains.

Fuel value of fats, 4040 calories per pound, or nine calories per gram.

Fuel value of carbonhydrates, 820 calories per pound, or four calories per gram, the same as protein.

Protein in Foods.

Now that we have got our base of calculation to work from we can proceed to look into the respective values of the different foods, always remembering that fats yield more than twice as much heat or energy, weight for weight, as either protein or carbohydrates. For instance, a pound of lean meat or white of egg, both of which are practically straight protein, are just equal in value to the body with a pound of sugar or starch, both of which are representative carbohydrates, but it will take the pound of lean meat and also the pound of sugar, and then some more of each, to furnish as much heat or energy as a pound of fat of meat or a pound of butter, both of which are almost entire fats.

Therefore it can readily be seen that the fuel value of food depends largely on the amount of fat it contains. Thus, a pound of wheat flour, which is principally starch—that is to say, carbohydrates—figures up in fuel value to 1625 calories, while a pound of butter, which is 81 per cent fat, most of the rest of it being water, figures up to 3410 calories.

It must be explained that every article of food in use has been examined either in this country or abroad and the calorie value of each one recorded. These tables of values are published in books on food and diet, and have also been prepared in convenient form by the United States Department of Agriculture, to whose most useful publications the writer is indebted for many of the figures and statements in this article.

When we first struggled with the introduction to the study of arithmetic it will be remembered that instead of asking us to reckon from bare and uninteresting figures we were given such sums as "If you had six apples and you gave two to Tommy and one to Jimmy how many apples would you have left?" In this way the pill of knowledge was sugar-coated for easier taking. And in just the same way I think we will get a better grasp of food values or calories if we take some simple little meals and use them as illustrations.

Suppose we take for a start that time-honored standby of the childish appetite, bread and butter.

Two ordinary sized slices of bread will weigh 50 grams, or 750 grains. Of this weight over 400 grains will be carbohydrate, 70 grains protein, 15 grains fat, the rest being water and mineral matters, and the two slices will have a value of 140 calories.

Two of the ordinary small restaurant pats of butter will weigh about 20 grams, or 300 grains. Of this weight about 260 grains will be fat, the rest water and traces of protein and mineral matters, and the two pats will have a valorie value of 160. So that the two slices of bread, eaten with the two pats of butter spread on them, put into the system approximately 300 calories.

The Meal With Meat.

Now let us compare this simple meal with one with meat in it. A medium-sized slice of moderately fat roast beef will weigh 50 grains, or 750 grains. One hundred and eighty grains of this will be protein, 140 fat and the rest water, with a trace of mineral matter. The caloric value is 150.

One medium-sized boiled or baked potato will weigh 95 grams, or 1425 grains. Three hundred grains of this will be carbohydrate, 30 grains protein, the rest being water, and a trace of mineral matters. It represents 90 calories.

One ordinary sized slice of bread, as we have already seen, represents 70 calories. So that this meal, consisting of meat, potato and bread only, figures up to 310 calories, as against the 300 calories of the plain bread and butter meal. Yet in weight the meat meal consists of 170 grams, as against 70 grams, the weight of the bread and butter.

Now let us take a meal with still more variety in it and see how it compares with these two.

A cup of beef tea or clear soup will weigh 150 grams, or 5 ounces. Of this 40 grains will be protein and 8 grains carbohydrates, the rest being water and a trace of mineral matters. The calorie value is 12.

A heaping tablespoonful of boiled or baked codfish will weigh 50 grams or 750 grains. Of this 130 grains will be protein and the rest water and a trace of mineral matters. It represents 35 calories.

A heaping tablespoonful of boiled rice will weigh 30 grams, or 450 grains. About 100 grains of this will be carbohydrates, 15 grains protein and the rest water. The calorie value is 35.

Two ordinary square crackers will weigh 14 grams, or 210 grains. In them there will be 15 grains each of fat and protein and 75 grains of carbohydrates, the remainder being water and a small proportion of mineral matter. Their calorie value is 60.

So that this meal, weighing altogether 244 grams, represents only 142 calories.

Perhaps it will be clearer if we summarize the weights and calorie values of the three sample meals already considered.

Seventy grams, or, roughly, 2 1-3 ounces of bread and butter have a nutrition value of 300 calories.

One hundred and seventy grams, or, roughly, 5 2-3 ounces of meat, potato and bread have a nutrition value of 310 calories, and

Two hundred and forty-four grams, or, roughly, 8 ounces of beef tea or clear soup, codfish, rice and crackers have a nutrition value of 142 calories.

Naturally when the problem of the varying nutritive values of different foods is under consideration the first question is: "How many calories do we really need daily?" The answer is anywhere from 12 to 30 calories for each pound we weigh. The nutrition needed for the body's demands depends entirely on the amount of work the individual has to do each day and its character. The following is an estimate of the number of calories needed each day by a grown-up person in ordinary health:

Body Weight, 150 Pounds.

If at rest in bed, 12 calories per pound daily, or a total of 1800.

If slightly active, 15 calories per pound daily, or a total of 2200.

If at light work, 17 calories per pound daily, or a total of 2600.

If at moderately hard work, 20 calories per pound daily, or a total of 3000.

If at very hard work, 23 to 30 calories per pound daily, or a total of 3500 to 4500.

At the same time it must be stated that various authorities differ considerably in their opinions as to the number of calories really needed in each day's food. For instance, Professor Chittenden claims that man in all walks of life, and of every age and occupation, can live without either losing or gaining weight on an allowance of only 1600 calories per day.

It must be remembered, too, that the above scale of calculating the required number of calories daily by the weight of the person is not suitable for use in the case of corpulent people who are much over their normal weight. For if this is done it simply encourages the tendency to obesity by overfeeding. In the case of the overfed the usual rule is to make their allowance of calories on the basis of height, allowing 2000 calories daily for five feet of height, and adding 100 calories for each inch over five feet. If the person is bedridden 25 per cent should be deducted from the amount calculated by this rule, and if at very hard work 25 per cent should be added.

A question which naturally suggests itself now is which of the various food materials furnish the maximum of nutriment at the minimum of cost? This question has been answered by taking a number of the commoner articles of diet, ascertaining their market prices and then estimating the amount of nutriment, as expressed in calories, which they furnish for a definite unit of cost. In the following list the yield of calories is given for 10 cents' worth of each of the foods mentioned, at present current prices per pound, bushel or quart:

	Calories.
Corn meal yields	6540
Wheat flour yields	6300
Oatmeal yields	4500
Wheat bread yields	3000
Potatoes yield	3000
Sugar yields	2900
Fat salt pork yields	2800
Oatmeal breakfast food yields	2293
Rye bread yields	2300
Wheat breakfast food yields	2233
Rice yields	2000
Cheese yields	1900
Butter yields	1000
Beef stew meat yields	1000
Salt mackerel yields	1000
Apples yield	1000
Turnips yield	1000
Milk yields	800
Loin of pork yields	800
Loin of mutton yields	700
Canned salmon yields	700
Sirloin of beef yields	400
Bananas yield	350
Eggs yield	260
Oranges yield	250
Canned lobster yields	200
Strawberries yield	200
Codfish yields	200
Celery yields	190
Oysters yield	100

The Lighted Lamp — A WESTERN TALE —BY ANNA McCLURE SHOLL.—

BY ANNA McCLURE SHOLL.

WHEN you're done cussin' and swearin' and summonin' all the powers of hell to come and take the camp, will you be so good as to tell me what you go over yonder for every night?"

"It's none of your business."

"Never said it was. You go into the dark—you come back lookin' plagued."

"Shut up."

"I won't."

"Well, then, I was cryin', cryin', because I was blamed tired, cryin' like a kid because I'd been 15 hours on my legs—"

The speaker glowered into the fire. The nature of his confession accorded ill with his appearance. A creature dark with the sun and tormented by the winds, his powerful muscles knotted and strained by agonies of labor, his black hair hanging over his somber eyes, his suit of khaki as weather-stained as his complexion—he seemed the incarnation of man's struggle with a howling, hostile wilderness, a dry burning, cactus-covered ,tarantula-infested eternity of desert.

His fellow engineer, a handsome boy from the East, still unexhausted by the country, refused to accept the explanation of fatigue from the embodied dynamo opposite to him. Leit had brought something to the camp, Sheldon conjectured, that jumped out of the dark and clutched his throat in those leisure moments towards midnight when the two fellow-workers, having dined on canned salmon and stale bread, sat shivering together by their fire, too tired to sleep, to quarrel, to argue, to read, to do anything but wonder what inadvertence of deity had created that country. Each was plagued by it to the limit of his endurance, but young Sheldon had no interior inferno to deal with into the bargain. Leit, he suspected, had.

"Crying—that does you good! I bellow night after night when I've turned in. I bellow for my Mummie—for broiled steak—one night I even bellowed for the subway, I was so lonesome. My idea of heaven that night was just to be packed in a subway train in the 5:30 crush and smell that subway air! But you—you're cryin' for something different."

Leit drew in his breath with a shuddering sigh.

And then Sheldon risked being shot.

"Tell me about her."

He expected to hear the click of Leit's rifle, but the dark image by the fire sat motionless. Then he spoke as if every word tore him.

"By God, I will! I've got to. I've been alone with it for a year now."

"Tell it, Leit, just tell it," Sheldon urged.

"Was you ever married?" Leit asked in a queer, humble voice, utterly unlike that in which he thundered at his men.

"Never! I've wanted to be," Sheldon answered hopefully, that the note of sympathy might not be lost. "There's a girl in Brooklyn—"

Leit went on as if he had not heard:

"I was livin' in the East for a spell when I met her—a quiet little woman—and one of those steady men they breed there was courtin' her. She ought to have married him; he hadn't any wild blood, nor rovin' blood. He couldn't have rove beyond the corner grocery, but he probably would have made her a good husband. Anyways, he was after her when I come along. I sailed in an' took her. She was the first woman I'd ever wanted to marry and I kind o' frightened her into it, bullied her, held her up! That's where I made my mistake. You can't lasso your wife, like she was cattle.

Four Days Later, Leit Rode Away from the Desolate Camp.

"She was always sort o' timid with me. She didn't say much and I used to think she took it out in cookin'. She was an awful good cook. But somehow, she didn't seem happy, and then that other man used to drop in, just to show her, I guess, what she'd missed.

"I gave her all the rope she wanted, though I was burnin' up with jealousy some days, and restless, too, wantin' to go back West. Seemed like I hadn't elbow room in that little town.

"I'm gettin' to the point.—I came home one night late. There was a supper keepin' hot for me in the kitchen, the table set for one, the lamp lighted on it, and under the lamp a note. It said:

"'I'm not the wife for you, Jim. Don't look for me—'

"I don't know what I did for a while. Next thing I knew I was stridin' down the road to the depot, talking to myself. I talked to myself all the way West, I guess, for I nearly got locked up. What they did to the house, I don't know to this day. I left it just as it was, with the supper in the oven and the lamp lighted. I tore up her note—that was all—to keep their tongues from waggin'."

Sheldon gazed into the fire. He pictured the little wife, young and slim and fresh-cheeked, shrinking from her tornado of a husband. Leit was enough to frighten any woman, yet Sheldon knew that he could be as gentle as a girl.

"I've got a theory, Leit."

"Well?"

"She never went away with that man."

"What makes you think so?"

"A woman married to you might run away with a man like you but not with—"

"Reuben Joy," Leit supplied.

"Now that I know his name, I'm quite certain she didn't run away with him. Did you look for her that night?"

"Look for her! What do you mean?"

"Why, go through the house, of course, go upstairs and see whether her hat was there and the hatpins on the cushion, and the little bag she took marketing."

Leit started as if he'd been struck.

"How did you know about that bag?"

"I didn't. But every woman has one."

"I believe you've been married," Leit said, suspiciously.

"No, but there's a girl in Brooklyn—"

Leit interrupted. "Look for her! Why didn't I look for her?—but she said, 'Don't look for me.'"

"That's what she wrote," Sheldon said, "but only God knows what she meant. Now, see here, you old government mule of a tormented idiot, you get leave from headquarters tomorrow and start East, and I'll wager you a hundred dollars to a box of sardines that you'll find her where you left her and longing for you to come back in and track her best carpet with your boots, like you used to do!"

Leit heaved a long, reminiscent sigh. His lean, brown hand grasped Sheldon's for a moment.

"If she's there," he said, contritely, "I'll leave my boots at the door. I used to make her a lot o' work forgettin' to wipe my boots."

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Four days later, Leit rode away from the desolate camp towards civilization and his hopes were about equally balanced with his fears. Sheldon watched him until horse and rider were a mere speck on the horizon and then turned back, strangely lonely and homesick, to the society of the Chinese cook and the half-breed laborers.

A fortnight passed, and one day the half-breed who acted as postmaster to the camp came riding in with a budget of mail from the East. Sheldon sifted the letters hurriedly for one from Leit, and found it. It bore the postmark of a little town in Massachusetts. He tore it open and read:

"I'm home! Got here about dark. The lamp was lighted, and she had a hot supper like she was expectin' me—said she'd been expectin' me for a year. She'd gotten down in the mouth, before it all happened—thought I didn't care for her—thought she wasn't makin' me the right kind of a wife.

"She never got far that night. She came runnin' home, cryin' home, after she got started a little ways. She said that though she still thought I didn't love her she knew once she got on the run that she loved me. She was upstairs gettin' off her things when I came in and found her note—gettin' off her things and cryin'. You was right.

"I'm bringin' her West—she's never been West—says she wants to see the camp. You can fire the Chinese heathen; and, Kid, when we hit the camp, Mary and I, I'll get you leave of absence to look up that girl in Brooklyn."

The Worrier's Method.

Judge.

Knicker—Does Jack worry?

Bocker—Yes; he wants to pasteurize spilt milk.