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Activity and Calories

FOOD ENERGY provides the power the body needs for all its activities: to move, to breathe, to keep the heart beating, to keep warm, and to help in growth and upkeep. Supplying energy is one of the chief jobs of the food we eat. First the food is digested and then it is taken by the blood stream to the cells in all parts of the body. The blood stream also picks up oxygen from the lungs and takes it to the cells. The food combines with the oxygen — we say it is “oxidized” — and energy

is released for our needs. Foods are storehouses of energy. Food cannot supply energy as it waits in the cupboard or refrigerator, but when it is eaten, digested, and then oxidized the stored energy is released for the body's use.

TO MEASURE ENERGY

We measure energy in *calories* just as we measure height in inches or weight in pounds. The energy stored in food is measured in calories and so is the energy we use for all our body activities. Sometimes it is said that we "eat calories." Actually we eat foods that yield energy and the energy is measured in calories.

When we eat the amount of food that supplies the same number of calories as we need to meet our energy demands, our weight does not change.

When we eat more food than we need to meet our energy demands, the excess is stored in the body as fat, and we *gain* weight.

When we eat too little food to meet our energy demands, body fat is oxidized to release energy to make up the shortage, and we *lose* weight.

One pound of fat has the energy value of about 3,500 Calories.

To gain a pound of fat we have to deposit in our energy account 3,500 Calories more than we need to maintain a constant weight. Then one pound of fat will be added to the body.

To lose a pound of body fat we have to overdraw our energy account by 3,500 Calories. To cover this debt the body will oxidize (burn) some of the fat it has stored in the tissues. It takes one pound of this

fat to supply 3,500 Calories. Then the body will have one pound less of fat.

WHAT KIND OF ACTIVITY?

The amount of energy, or the number of calories, we need each day depends on the amount of both the involuntary and the voluntary activity of the body.

Involuntary activity includes the automatic actions of the body, such as the work of the heart, the lungs, and other specialized organs and of keeping the muscles alert so they can act when they receive commands. The calorie need for involuntary activity is an absolute must and has to be met every minute of our lives regardless of other needs. An adult needs about 10 to 12 Calories for each pound of body weight each 24 hours for this purpose, sometimes called *basal metabolic rate*. Usually this amounts to considerably more than the number of calories we need for our voluntary activity. The pace-setter for our involuntary activity is a chemical made by the thyroid gland in the neck. It is a hormone called thyroxin. Occasionally there is too much thyroxin and the pace is too fast, or there is not enough and the pace is too slow. Abnormal basal metabolic rate requires a physician's care and usually can be corrected.

Voluntary activity is what we choose to do, such as using our muscles for walking, bending, running, sitting, writing, and every motion over which we have control. The amount of energy required for voluntary activities depends on the size and number of muscles we use and how long and how strenuously we use them.

It takes more energy to use many muscles than to use just a few. Contrast the number of muscles we use walking and sitting.

It takes more energy to use large muscles than small ones. Contrast the size of the muscles we use swimming and typing.

It takes more energy to move muscles rapidly than to move them slowly. Contrast the speed of moving muscles in running and in walking.

It takes more energy to use muscles a long time than a short time. Contrast the time that leg muscles are used in walking 2 miles and in walking 1 block.

Then, the more energy we use the more calories we need.

Unusual or extreme nervous tension increases our energy need because it increases the contraction and activity of the muscles. Under such tension some people may eat less than usual while others may eat more. Mental work does not increase our energy requirement enough to count. One-half of a salted peanut will supply enough energy for an hour of intense mental effort!

You can estimate your total energy need, or your calorie requirements, on the basis of your level of activity—how much and how fast you move around in your work and play. First decide in which one of these activity groups you belong.



Rate yourself as *sedentary* if most of your time is spent in light muscular activity—a good deal of sitting and standing and moving around in a relatively small space—and if you take your recreation in mild forms with only occasional times of activities such as swimming or square dancing.

The majority of adults, especially women, rate as sedentary. This includes professional and white-collar workers; many blue-collar workers, especially if they work indoors; housewives with small families or with larger families and many labor-saving devices or someone to help with the housework.

Rate yourself as *active* if you use more muscles and move faster and more continuously than the people who are rated as sedentary. A postman, truck driver, gardener, farmer during seasons of light work, janitor, factory worker, waitress, and some housewives who do all of their own housework and also take care of gardens and yards would rate as active.

Do not rate yourself as *very active* unless you are a farmer in the busiest season; a student in strenuous competitive sports such as football, basketball, or track and practicing several hours a day; a heavy construction worker, miner, logger, longshoreman, or a person doing things that require heavy work of many muscles for many hours each day. Few women rate as very active.

When you have rated yourself as sedentary, active, or very active, write down your weight. If you are overweight or underweight, write down the desirable weight for your height and build.

To estimate your total daily energy need multiply your desirable body weight by:

- 16 Calories if you are sedentary
- 20 Calories if you are active
- 24 Calories if you are a very active woman
- or 28 Calories if you are a very active man.

These figures are given as calories per pound of body weight because a large person has more body substance to keep up and move around than a small person and, therefore, needs a few more calories for everything he does — but only a few.



The number of calories in your answer is not a rigid rule; it is only a guide to help you in adjusting your food supply of energy to the energy requirement of your general level of activity. The answer given by this calculation is likely to be a little high for a large person with a desirable weight over 160 pounds, and a little low for a small person with a desirable weight under 120 pounds. Your weight is the test of how well you are balancing your supply and demand for calories.

Try not to overestimate your activity when you are calculating how many calories you need. Most of us think we are much more active than we really are. For example, when we spend a couple of hours at the swimming pool, we think we are being very active. We forget that probably we spend three-fourths of the time sunning ourselves, floating, watching others swim or dive, visiting with friends, and being generally relaxed and inactive.

Middle-aged and older persons require from 5 to 10 per cent fewer calories than in their earlier adult years. Our basal metabolism decreases as we grow older, and usually we become less active. Not many of us, however, reduce the amount of food we eat — our calorie supply — as much as our calorie requirement is reduced. The result is a storage of the extra calories as fat. This situation is so prevalent that many of us mis-

take a slow accumulation of weight as part of the normal process of aging!

Automation, labor-saving devices, and the use of horsepower instead of human power all keep us from having to use as much energy for everyday living as we used in the past. Contrast the amount of physical work that went into keeping a home and feeding a family twenty, thirty, or fifty years ago with the amount required now.

Even easy tasks are being made easier. New labor-saving devices are coming on the market almost daily. Egg beaters, can openers, ice-cube crushers, pencil sharpeners, and even scissors are being motorized to save us energy.

Adapting ourselves to the modern sedentary and mechanized way of life—without gaining undesirable weight—means one of two things for most of us: either we must increase our voluntary activity, or we will have to be mildly hungry all of the time.

If we rate in the sedentary group we need consciously to organize our lives to include some regular physical activity that uses the larger muscles and keeps them firm and active. Even mild activity can be effective in keeping muscle tone, using calories, and controlling weight.

Walking is one of the simplest and most satisfactory means of exercising. It requires about 1.7 Calories per pound per hour. The distance you cover determines how many calories you spend more than does the speed at which you walk.

Walking a mile requires about 70 Calories for a person who weighs 120 pounds, about 90 Calories for

one who weighs 160 pounds, or 105 Calories for one who weighs 180 pounds.

Of course, you do not always walk an entire mile at one time, but whatever distance you cover, the exercise will use a proportional number of calories.

A 160-pound man would spend about 180 Calories if he walked 2 miles to his office. But if he drove his car and spent the time thus saved working at his desk or reading the paper, he would spend only about 85 Calories — a difference of 95 Calories! For a 120 pound person the difference would be about 70 Calories.

A typist who weighs 120 pounds uses 15 Calories an hour *less* if her typewriter is an electric one than if it is a standard machine. Perhaps 15 Calories seem like too few to take seriously. But if she uses an electric typewriter instead of a standard one for 5 hours a day, she could save enough energy in a working year of 50 weeks to gain $5\frac{1}{2}$ pounds! The only way she can keep from gaining weight is to eat less or exercise more to compensate for the energy she saves by using the electric typewriter.

Exercise gives us many benefits in addition to using energy and helping to control weight. It increases blood circulation and muscle tone; it helps to lessen states of tension and fatigue, and to reduce violent emotions; it takes away the vague aches and pains caused by lack of muscular strength and flexibility; and it can add greatly to our enjoyment of work and leisure.