

tract, and the amount of stuff in it, will return to where it started. And your weight will do the same.

Other factors can also lead to weight variation over several days. Too much salt in your diet can result in fluid retention. Women may retain fluids according to their menstrual cycle. Heavy exercise will increase perspiration significantly, leading to weight loss. Drinking alcohol, coffee, or using other diuretics will also cause fluid elimination and do the same.

But all these changes are temporary. They last a few days or weeks but then they disappear. They don't contribute to your long-term average weight – the number that is “how much you weigh” – which is what's important for your health and happiness.

It's when you consistently take in more than you get rid of that long-term weight gain sets in. That is what has been happening to the American public over the last half-century. They have taken in more weight, day after day, than they have gotten rid of. To understand why that happens requires knowing what your body does with what you eat and drink. And that is all based on energy.

Your body requires energy for you to live. Every time you move a muscle in your body, it uses energy. Some of those muscle movements are involuntary – your heart beating, for example, or your lungs filling and emptying. Others are voluntary, ranging from everyday things like getting out of bed or walking across the room to vigorous exercise like running five miles. Whether it's walking, or breathing, or your heart beating, or even just thinking – it's a process that uses energy. It takes a certain amount of energy just to do whatever you do on a normal day.

Where does that energy come from? You can't create energy. If you need it for your body, you have to get it from somewhere. You get the energy your body requires from food and drink. Everything you eat is a source of energy. That's why you eat it. You are genetically programmed to eat and drink in order to get the energy your body requires.

You can think of your body using energy in the same way your car does. Energy is stored in the chemicals in whatever you eat and drink, just as it is stored in the chemicals in crude oil. The process of digestion converts those chemicals into fuel that your body can use to power muscle movement, just as a refinery converts crude oil into gasoline. The muscles in your body, like the engine of an automobile, burn the fuel, which releases the stored chemical energy and converts it into the mechanical energy of motion. Your body gets rid of the waste products produced by burning the fuel via your excretory systems, just as your car does via its exhaust system.

The fuel your body uses, in simplest terms, is fat. Of course, most of what you eat and drink is not fat – it's other stuff such as proteins and carbohydrates. But your digestive process converts some of that stuff into chemicals that your muscles use as fuel. The details are complicated, but you can understand what's happening pretty satisfactorily if you just think of that fuel as fat. Your digestive system refines food and drinks into fat, your muscles burn fat to get energy, and your waste disposal system gets rid of the stuff that is produced when the fat is burned.

Most of us only fill the gas tank in the car when it's getting close to empty. We don't do that with our body's energy reservoir – we eat, typically, three times a day,

breakfast, lunch, and dinner, plus maybe an occasional snack. It's as if you add gasoline to your car's tank several times each day, rather than waiting until the tank is nearly empty – you add fuel to your body by eating and drinking throughout the day, rather than waiting until your fat supply is low.

If you put more gasoline in your car's tank on a given day than you use during that day, the unused gasoline remains stored in your tank. Since gasoline weighs about six pounds per gallon, your car will weigh more at the end of the day than it did at the beginning, by six pounds for each gallon of extra gasoline in the tank. Conversely, if you use more gasoline than you put into the tank, the car will weigh less, because you used some of the gasoline you had stored there previously.

Your body works the same way. Each day, you take in energy via food and drink, and your body converts it to fuel in the form of fat. Your muscles then burn fat to power your body. If you produce more fat than you use as fuel, your body stores it, just as your car stores gasoline you add to the tank but don't use. So at the end of the day, if you did not use up all the fat your digestive system produced from food and drink, your body will store the excess fat, and you will weigh more than you did to start the day. If you burn more fat than your digestive system produced, your body gets it from fat stored in your "fat tank." Unlike your car, your body has no fixed fuel tank; the fat is stored in cells throughout your body, and the available storage can increase – your "fat tank" expands as needed, adding inches to your waist and elsewhere.

That's what happens to the stuff you take in. Your digestive system uses some of it to produce fat; the rest just passes on through you. Your muscles burn fat as fuel to provide the energy your body needs; the byproducts of burning it also pass on through you. If you produce more fat than you burn, your body stores what's left; if you burn more than you produce, your body dips into its stored fat to make up the difference. What changes your weight is the difference between the amount of fat you produce and the amount you use.

It's that simple. Take in more energy than you use, and you store it in fat. Use more energy than you take in, and you get it by burning stored fat. Energy never disappears – if you don't use it, your body stores it. And the amount of energy that your body has stored, in the form of fat, determines how much you weigh. All the biochemistry of digestion and muscle movement is in the details of how that happens.

But the bottom line – how much you weigh, and how your weight changes – is simply the result of how much fat you have stored in your body. And that is determined by the balance between the energy you take in as food and drink and the energy you use to power your daily activities.

In Chapter 3, I'll tell you about energy you take in, which is measured in calories – that word the diet companies love to use.