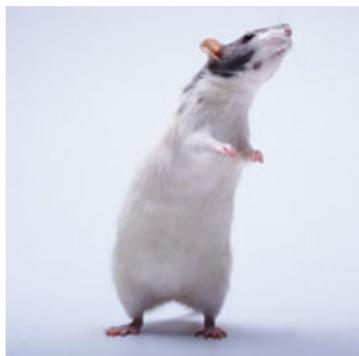


## special report: boost your metabolism

**Yeah, we'd like to eat our body weight in food every week, too. But we don't zip around and fidget like frisky little rodents, so we don't burn calories the way they do, either. Rats — er, darn it. We challenged one woman to rev her metabolism, using every means available. It wasn't pretty. But it was worth it.**

By Gretchen Reynolds



I'm beginning to regret that I ever told my husband about last year's underwear experiment at the Mayo Clinic.

In the study, a group of 20 volunteers — some thin, some overweight — wore high-tech undergarments day in and day out. (To my husband's disappointment, the clothing looked more like long johns than lingerie.) The underwear contained motion sensors that tracked the wearers' every move. If they took a step, paused, shrugged, paced the room, scratched an itchy nose, or gestured wildly with their hands while reenacting the latest Sopranos episode, the action got recorded. At the end of 10 days, the

investigators tallied up who'd moved the most.

To no one's surprise, the skinny subjects turned out to be more fidgety. What did surprise the scientists was just how big a difference their extra movements made: The fidgeters burned as many as 350 extra calories a day. Even more interesting, when the investigators deliberately overfed the twitchy, which they did for 8 weeks, the fidgeters didn't become fat and slothful. They just paced, shifted their weight, and bit their cuticles even more. Something about these people compelled them to move. And it wasn't, as my husband suggested, that "maybe their underwear was chafing them." No, it seemed that the fidgeters simply had to be up and about, like hummingbirds.

They had superfast metabolisms. And so they burned calories faster than anyone else.

Since I read this study, I've been drumming my fingers madly on any available surface and whipping my hair around like a supermodel in a cyclone. My husband has eyed my aimless hyperactivity dubiously. "I don't think I can stand for you to be this fidgety," he says, then pauses. "Unless you do it in a thong."

### Step On It Already

I'm on a quest to tweak my metabolism. I used to have hip bones that jutted and a collarbone that could gut fish. I'm not bragging, merely relaying facts, when I say that I've always been effortlessly wiry. But a creeping doughiness has set in lately, as if a Teletubby were taking over my physique. Instead of dieting — deprivation is such a buzz kill — I've decided to try to rev my calorie-burning machinery, to make my metabolism hum.

This is not, unfortunately, as simple as it sounds, or no one would be obese. Human metabolism involves

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a boggling number of biochemical processes. Think a car engine is complicated? It has nothing on the internal-combustion engines we carry around. Metabolism is the process by which our bodies convert food (fuel) into energy (blood sugar or, more technically, glucose). Every cell in the body is involved, because every cell needs energy. The heart, lungs, digestive organs, muscles, and brain all use glucose. The more work they have to do, the faster our metabolisms go. The simplest definition of metabolic rate is that it's the number of calories your body needs to function. That number changes constantly, depending on how fast your heart is beating, whether your muscles are idle or active, whether you've just eaten a large lunch, how much you decide to yell at your kid for turning the living-room wall into a paint canvas, and so on.

Here's a glimpse of the metabolic activity going on inside you at this very moment. A part of your brain called the hypothalamus is releasing a hormone that tells the nearby pituitary gland how much of another hormone, called thyroid stimulating hormone, to release. This chemical nudge stimulates — you got it — your thyroid (that gland just beneath your Adam's apple). It releases still more hormones that help control every aspect of your metabolism, from your heart rate to the amount of glucose your cells absorb. But your thyroid isn't a lone gunman. Your pancreas is also releasing insulin, which controls the levels of glucose in your blood. And the adrenal glands are pumping out hormones that affect how fast your heart beats and your lungs inflate.

Your metabolism is such a finely tuned machine that — no offense — if you had to coordinate it yourself, you'd probably keel over within the hour. Thank god our bodies are so good at taking care of business. Still, if you're anything like me, it's hard to fight the urge to interfere. You're doing a great job, I tell my metabolism, just great. I have just a few teensy suggestions for how you can do even better.

## Hilary Swank Or Rosie O'Donnell?

A few years back, researchers in Canada recruited sets of identical twins, which is what researchers often do when they want to study the genetics behind something or other. In this case, they wanted to know whether a person's metabolism was a matter of nature or nurture. In other words, is our caloric burn rate programmed from the day we're born, or is it something we can change? The scientists supersized the twins' food portions for 100 days, which basically meant they'd gain a bunch of weight. (Each pair of twins ate the same amount and exercised the same amount.) Next, the scientists underfed them, to the point where they were probably really snippy and hard to live with.

The twins gained pounds, then lost them, right on cue. But while various sets of twins gained and lost quite different amounts, within the pairs the changes were remarkably consistent. Each twin gained and lost pretty much the same amount as the other. The researchers' conclusion: To a large degree, it's your genes that determine whether you have the physique of Hilary Swank or Rosie O'Donnell.

I should be happy, because my sepia-tinted ancestors in the family photos are all lean and rosy. Instead I pout. Genetic jackpot notwithstanding, I'm putting on weight. I feel gypped. How has this happened? Though there is a set point to an individual's metabolic rate, I learn from weight-loss expert Jonathan Waitman, M.D., of New York-Presbyterian Hospital/Weill Cornell Medical Center in New York City, that there is wiggle room. And that wiggle room can be considerable.

Your metabolism consists of several elements, you see. The most fundamental is the basal metabolic rate. Your BMR is the number of calories your body needs just to stay alive: to pump blood, absorb oxygen, feed the muscles and brain, that kind of thing. It's the energy you burn when you're lying still, breathing slowly, and trying not to think. (The brain is the only organ in the body that relies solely on glucose for fuel. All the other organs use at least some fat. So increased brain activity means increased caloric needs, which means increased metabolic rate.)

Your BMR accounts for 50 to 75 percent of your overall metabolism. The rest comes from digestion (food processing itself uses up calories — good to know!), purposeful activity (otherwise known as exercise), and what wonky researchers call "nonexercise activity thermogenesis" and you and I call fidgeting.

Your BMR is mostly inherited — which explains why some sets of twins in the Canadian study gained or lost so much more than other pairs. But the other 25 to 50 percent of your metabolism is in your hands. You can change it.

The thing is, changing it takes work. Tapping my foot and talking the Italian way is clearly just the beginning.

## I Am So Trashing My Food Log

I am starting to resent men. Ever since I began worrying about metabolism, I've been noticing them — at restaurants, on park benches, even in my own kitchen — devouring enormous portions of food, deploying, by all indications, little calorie-incinerating brain activity, and yet remaining slender. Women, even eating smaller amounts, balloon. As a believer in gender equality, I cannot let this pass.

"Get fatter," I tell my husband. He rolls his eyes and wolfs another sandwich.

There is, of course, an explanation for his easy-care thinness. "Body size and body composition are major determinants of metabolic rate," says Janet Rankin, Ph.D., a professor in the Department of Human Nutrition, Foods, and Exercise at Virginia Tech. More heft requires more calories. Elephants burn way more than fleas. Men, typically larger than women, do the same.

But even more important, men are by nature muscular. Women, by dint of our selfless willingness to keep the human race in business, have more body fat (nature intends us to use that fat to feed and protect growing fetuses). Unfortunately, fat is not metabolically active. It does not burn many calories. Muscle, on the other hand, is, and does. Some recent studies have shown that a pound of muscle at rest burns about 40 to 50 calories a day, an amount that rises when the person who owns the muscle is using it. A pound of fat at rest (as fat usually is) uses only about two calories a day. So the more muscle you have, the more calories you burn every minute, every hour, every day.

Time to renew my gym membership.

I also decide to figure out what my metabolic rate is. At a nearby health club, I lean into a gadget called a HealthTech, which is designed to gauge my burn rate by measuring my oxygen output. I breathe, wait for the results, and am pleased: My rate is apparently a robust 2,150 calories a day, a full 750 more than the average woman of my size.

But Elizabeth Darling, a clinical dietitian at St. Vincent's Hospital in my hometown of Santa Fe, New Mexico, cautions, "These numbers are very difficult to interpret. Your metabolic rate changes constantly throughout the day, depending on whether you just ate or drank or moved around." To get an absolutely accurate baseline measurement, you would have to breathe into the gadget immediately after waking — before leaving your bed, having breakfast, pacing around your bedroom, or driving to the health club.

Instead, Darling and most other nutrition experts agree that the best way to measure your daily metabolic rate is to look honestly at the amount you eat. If you're not gaining weight, then your daily calorie consumption is also your metabolic rate. If, as Dr. Waitman says diplomatically, "you've tipped the balance" — you're packing on the pounds — your metabolic rate is somewhat less than your caloric intake. But how to figure those calories?

"Keep a food log," Dr. Rankin says. A full list of all — with an emphasis on all — the foods and liquids you ingest daily for a minimum of 3 days will give you an exact measure. I buy a notebook and a calorie counter and begin diligently tracking my daily fare.

By midafternoon of Day 1, I've thrown the notebook across the kitchen twice.

If you have never kept a food log, prepare to be scandalized. I had no idea I was eating so much. That smidge of cream in your coffee? That schmear of peanut butter on your bagel? All have to be measured and recorded. The crackers, the grapes, the Coke, those villainous Samoas Girl Scout cookies. I hang my head as I write (then brush my hair spasmodically out of my eyes in hopes of burning at least a calorie or two).

By the end of 3 days, I have filled many pages with the ugly record of my dietary indiscretions. And I have determined that I am eating an average of 2,670 calories a day. 2,670!

I promise myself that I will destroy the notebook the very first opportunity I get.

## I Always Knew Dieting Was A Bad Idea

I also had planned to cut back on the Samoas. But after talking with various nutrition experts, I'm not so sure that such drastic action is wise. "You get a big reduction in metabolic rate with a substantial reduction in calories," Dr. Rankin has told me. Translated, this means that if you eat less, you'll start burning calories more slowly. Net change: next to nada.

Does this seem fair?

Upon reflection, I have to admit that it makes evolutionary sense. Back in the hunter-gatherer days, our bodies had to survive on not so many calories. We developed efficient metabolisms. So when you or I cut back on Taco Bell visits, some deep, atavistic portion of our brain remembers those dark, DNA-imprinted days. It says, "We're starving. Slow the system down." This may help explain the recent news that people who radically cut their calorie consumption are likely to live longer — their bodies don't chug along as fast, so they hold up better. But really, where's the fun in that? No point in living forever if you can't eat.

Recent studies of Native American tribes with exceptionally high levels of obesity and diabetes have found that many members share a gene mutation, nicknamed the "thrifty gene," that compels them to put on weight. They have inordinately slow metabolisms. These tribes also happen to live in particularly harsh areas, such as the desert Southwest, where food has traditionally been scarce. If we suddenly had a global famine, we'd die off, and they'd live to repopulate the earth.

"Cutting calories by 20 percent or more below energy needs" will definitely dampen your metabolism, Dr. Rankin tells me. It's better, she says, to reduce calories gradually and maintain your metabolism by both weight training (remember, muscle is your friend) and basic, everyday exercise. Go for a run. Go for a bike ride. Go for a walk. Studies have shown, Dr. Rankin says, that any kind of regular, vigorous exercise — such as a hard 30-minute run several times a week — will rev your system, causing you to burn about 100 extra calories a day above and beyond the ones you used during the exercise itself. Bonus!

I grab a Samoa — just to keep my metabolism humming, you understand — and head out for a 30-minute jog.

## The Joys Of Java

You may notice that I haven't talked about pills. Google the phrase "raise your metabolism" and the vast majority of the Web sites that pop up are touting supplements of one kind or another. Now, I'm as lazy as the next person. I'd be pleased to swallow a pill, recline gracefully, and let my metabolism fly. But most of these products, frankly, scare me. Remember ephedra? An herb containing a version of the alertness chemical epinephrine, ephedra does, without question, raise users' metabolisms. It stimulates the central nervous system, making a person's heart race, her blood pressure rise — and, if she happens to be unhealthy or just unlucky, making her drop dead from a heart attack or a stroke. Health officials logged more than 19,000 "adverse events" from ephedra use before banning it in 2004. Now, thanks to a federal judge's ruling last year in Utah, ephedra is legal again and for sale in that state or over the Internet, in small doses. Or there's bitter orange. Like ephedra, the peel of this fruit is thought to raise metabolism, along with blood pressure and heart rate. Though it hasn't been linked to any deaths, experts urge caution. I decide against trying either of them. Lazy is one thing; self-destructive is another.

On the other hand, I'm thrilled to read that some research suggests that coffee is a metabolic booster. It, too, stimulates the central nervous system. Eagerly, I up my consumption, from a cup or two per day to four. (I'm sure my doctor would scold, but if coffee is my worst vice, I think I'm not doing too badly.) I'm fairly certain my metabolism is thrumming. Plus, I'm jittery. Good. More nonexercise activity thermogenesis, I tell myself.

## And Another Thing About Lingerie

It's been several weeks since I started my metabo-quest, and I have learned much. I'm going to the gym to lift weights twice a week and running 3 to 4 miles on other days. I'm swilling coffee and pacing my

office and crossing and uncrossing my legs. I'm obsessively twirling my hair. I should be continuing that dastardly food log, but I don't have the stomach for it. Besides, I have better measures of whether my metabolism is revving. I'm eating almost as much as I ever was, but already my pants are looser. My upper arms are tighter. And my husband brings up the subject of lingerie more than ever.

He has another pressing interest. I immediately agree. After all, intimate relations increase your heart rate and burn about 35 calories an hour. Anything, I tell him, for the cause.

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