**Many people begin running because they want to lose weight. As one of the most vigorous exercises out there, running is an extremely efficient way to burn calories and drop pounds. You may have heard that you burn about 100 calories per mile, but that’s only true if you weigh 139 pounds.**

**How Many Calories Are You Really Burning?**

**If you think running and walking both torch the same number of calories per mile, you better put down that cookie**

Amby Burfoot shares her story: **.** [By Amby Burfoot From the September 2005 issue of Runner's World](file:///C%3A%5CUsers%5CD%5CDocuments%5CMy%20Weblog%20Posts)

Walking and running burn the same number of calories per mile. I was absolutely certain of this fact for two unassailable reasons: (1) I had read it a billion times; and (2) I had repeated it a billion times. Most runners have heard that running burns about 100 calories a mile. And since walking a mile requires you to move the same body weight over the same distance, walking should also burn about 100 calories a mile. Sir Isaac Newton said so.

My friend, cyclist David Swain was unimpressed by my junior-high physics. "*When you perform a continuous exercise, you burn five calories for every liter of oxygen you consume," he said. "And running in general consumes a lot more oxygen than walking."*

**What the Numbers Show**

I was still gathering my resources for a retort when a new article crossed my desk, and changed my cosmos. In "Energy Expenditure of Walking and Running," published last December in Medicine & Science in Sports & Exercise, a group of Syracuse University researchers measured the actual calorie burn of 12 men and 12 women while running and walking 1,600 meters (roughly a mile) on a treadmill. Result: The men burned an average of 124 calories while running and just 88 while walking; the women burned 105 and 74. (The men burned more than the women because they weighed more.)

Swain was right! The investigators at Syracuse didn't explain why their results differed from a simplistic interpretation of Newton's Laws of Motion, but I figured it out with help from Swain and Ray Moss, Ph.D., of Furman University. Running and walking aren't as comparable as I had imagined. When you walk, you keep your legs mostly straight, and your center of gravity rides along fairly smoothly on top of your legs. In running, we actually jump from one foot to the other. Each jump raises our center of gravity when we take off, and lowers it when we land, since we bend the knee to absorb the shock. This continual rise and fall of our weight requires a tremendous amount of Newtonian force (fighting gravity) on both takeoff and landing.

Now that you understand why running burns 50 percent more calories per mile than walking, I hate to tell you that it's a mostly useless number. Sorry. We mislead ourselves when we talk about the total calorie burn (TCB) of exercise rather than the net calorie burn (NCB). To figure the NCB of any activity, you must subtract the resting metabolic calories your body would have burned, during the time of the workout, even if you had never gotten off the sofa.

You rarely hear anyone talk about the NCB of workouts, because this is America, dammit, and we like our numbers big and bold. Subtraction is not a popular activity. Certainly not among the infomercial hucksters and weight-loss gurus who want to promote exercise schemes. "It's bizarre that you hear so much about the gross calorie burn instead of the net," says Swain. "It could keep people from realizing why they're having such a hard time losing weight."

Thanks to the Syracuse researchers, we now know the relative NCB of running a mile in 9:30 versus walking the same mile in 19:00. Their male subjects burned 105 calories running, 52 walking; the women, 91 and 43. That is, running burns twice as many net calories per mile as walking. And since you can run two miles in the time it takes to walk one mile, running burns four times as many net calories per hour as walking.

**Run Slow or Walk Fast?**

I didn't come here to bash walking, however. Walking is an excellent form of exercise that builds aerobic fitness, strengthens bones, and burns lots of calories. A study released in early 2004 showed that the Amish take about six times as many steps per day as adults in most American communities, and have about 87-percent lower rates of obesity.

In fact, I had read years ago that fast walking burns more calories than running at the same speed. Now was the time to test this hypothesis. Wearing a heart-rate monitor, I ran on a treadmill for two minutes at 3.0 mph (20 minutes per mile), and at 3.5, 4.0, 4.5, 5.0, and 5.5 mph (10:55 per mile). After a 10-minute rest to allow my heart rate to return to normal, I repeated the same thing walking. Here's my running vs. walking heart rate at the end of each two-minute stint: 3.0 (99/81), 3.5 (104/85), 4.0 (109/94), 4.5 (114/107), 5.0 (120/126), 5.5 (122/145). My conclusion: Running is harder than walking at paces slower than 12-minutes-per-mile. At faster paces, walking is harder than running.

How to explain this? It's not easy, except to say that walking at very fast speeds forces your body to move in ways it wasn't designed to move. This creates a great deal of internal "friction" and inefficiency, which boosts heart rate, oxygen consumption, and calorie burn. So, as Jon Stewart might say, "Walking fast...good. Walking slow...uh, not so much."

The bottom line: Running is a phenomenal calorie-burning exercise. In public-health terms--that is, in the fight against obesity--it's even more important that running is a low-cost, easy-to-do, year-round activity. Walking doesn't burn as many calories, but it remains a terrific exercise. As David Swain says, "The new research doesn't mean that walking burns any fewer calories than it used to. It just means that walkers might have to walk a little more, or eat a little less, to hit their weight goal."

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| **What's the Burn? A Calorie Calculator** |
| You can use the formulas below to determine your calorie-burn while running and walking. The "Net Calorie Burn" measures calories burned, minus basal metabolism. Scientists consider this the best way to evaluate the actual calorie-burn of any exercise. The walking formulas apply to speeds of 3 to 4 mph.At 5 mph and faster, walking burns more calories than running. |
|  | **Your Total Calorie Burn/Mile** | **Your Net Calorie Burn/Mile** |
| Running | .75 x your weight (in lbs.) | .63 x your weight |
| Walking | .53 x your weight | .30 x your weight |
| Adapted from "Energy Expenditure of Walking and Running," Medicine & Science in Sport & Exercise, Cameron et al, Dec. 2004.  |

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