

The 30 Pound Club

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Calorie Calculators

I was out for a run recently with my trusty GPS watch. I like to know exactly how far I've run and how long it took me to run it, and I especially want to know all that when I run intervals. I've been run-walking for almost two weeks now as I get back into running shape. There's a small park with a walking path near my home, and I love going there because it's entirely in the shade. The path has an oval that is 0.29 miles with inclines and declines. I've been running 0.26 miles and walking 0.03 miles. Every week, I increase the speed of my runs and decrease the walking time. But yesterday, I decided to run the entire oval to see the difference in overall pace. Run-walking averaged 10:20 per mile, but running the entire distance lowered it to 9:18 per mile; I admit I probably sped up to get a good time. My watch also estimates the number of calories used. Run-walking, which is fairly comfortable, burned 47 calories per lap. Running the entire thing burned 49 calories. Seriously? Only two more calories? For that much extra effort?

That got me to thinking. One of the most frequently asked questions I get is about the accuracy of the calories-used readings on exercise machines such as elliptical trainers and stationary bikes. What are they based on and how accurate are they? Here's a simple explanation.

The calorie calculators are based on estimations of oxygen used in a given activity. No matter what your size or activity, using one liter of oxygen burns five calories; the harder you exercise, the more oxygen you use and therefore, the more calories you burn. The actual measurements are done in human-performance laboratories that can accurately measure the oxygen used while people exercise; I did that in my lab when I was a college professor. After the total amount of oxygen used per minute is determined, that information is used to construct charts that give the amount of oxygen burned at varying intensities of each exercise, along with algorithms specific to every mode of exercise. My watch has the algorithms built in just like the machines in the gym do.

Body weight is a critical factor in the calculation. If two people walk at four miles per hour, the person who weighs 250 pounds will burn more calories than the person who weighs 150 pounds; heavier people use more oxygen because they have more mass.

How does this apply to the calculators? There are three elements that are important. First, the initial readings of oxygen use must be accurate. For most pieces of equipment, especially for activities such as walking, running, or biking that's not a problem, but some activities such as weight training are much more difficult to assess.

Second, the algorithm must include the person's body weight. As I said, a heavier person uses more oxygen and hence, more calories with the same intensity. If the machine asks you for your weight when you start to exercise, that's good—that means the info you get will be closer to what's true for you.

Finally, the machine must accurately assess the speed and, when appropriate, the grade. That comes down to the quality of the machine. Many use electronic methods, and some will be better than others; there's no real way to know for sure unless the machine has been tested in a human-performance lab. In the case of my watch, it uses GPS to assess my speed and distance so those are fairly accurate. What it can't do is assess the grade up and down with enough accuracy; still, it's better than just guessing using a chart.

I hope that this helps you understand the calorie calculators a little better. I can't tell you how precise the piece of equipment you use is, so what I wouldn't do is use the calorie counters in your calorie calculation for how much you should eat per day. You'd be better off using 100 calories per 15 minutes if it's moderate activity such as walking briskly and 100 calories for every 10 minutes if it's a more intense activity such as jogging.

A logical question is: does that mean you use fewer calories for doing the same exercise as you lose weight and become more fit? That's a topic for another day.

One and Done.

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Dr. Chet

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