



Dow Jones Reprints: This copy is for your personal, non-commercial use only. To order presentation-ready copies for distribution to your colleagues, clients or customers, use the Order Reprints tool at the bottom of any article or visit www.djreprints.com

[See a sample reprint in PDF format](#) [Order a reprint of this article now](#)

THE WALL STREET JOURNAL

WSJ.com

ACHES & CLAIMS

JUNE 23, 2009

Burn Notice: How Accurate Are Devices That Track Calories Used?

By LAURA JOHANNES

Activity monitors using *accelerometers* can aid in weight control by estimating the calories you expend during the day, according to companies that sell them. Scientists say that the gadgets can be good motivators, but that you shouldn't count on them for an accurate estimate of daily calorie burn.

* * *

Accelerometers, worn around the waist, arm or thigh, measure the motion of the body and also are used in a number of electronic devices. A growing number of companies are selling advanced devices that track the number of calories you're burning and can be worn all day -- even while you sleep. Some devices are similar to those used by researchers to detect calories burned in patients in clinical trials. Prices vary, typically from about \$50 to \$200 or more. In some cases you can subscribe to a Web site to download activity information and compare it with your food intake.

One heavily studied device is an armband made by Pittsburgh-based BodyMedia Inc. The device, worn by contestants on NBC's "The Biggest Loser" reality show, is sold as GoWear fit by BodyMedia and as the bodybugg by health-club company 24 Hour Fitness Inc.'s Apex Fitness Group unit. The armband detects not just motion but also skin temperature, heat flux, or the amount of heat leaving the body, and galvanic skin response -- a measure of electrical conductivity that changes when you sweat. The information is fed into mathematical equations programmed into the device and aimed at estimating your total daily calorie burn.

Apex claims on the bodybugg packaging that the armband is "proven to be over 90% accurate in measuring calories burned." The company cites a 20-person study published last year in the online edition of the British Journal of Sports Medicine. In the study, a similar armband called SenseWear, made by BodyMedia for physicians and academic researchers, was used to estimate calories during two hours of activity. The armband underestimated calorie burn by 9% when compared with a laboratory gold standard called indirect calorimetry, in which oxygen consumption is used to measure calorie burn. In another study, done over 10 days, the armband underestimated daily energy expenditure by an average of 117 calories, or 5%. The study, published in the American Journal of Clinical Nutrition in 2007, used another sophisticated lab test for comparison.

Other monitors, such as a line made by ActiGraph LLC of Pensacola, Fla., also tout good group data, but scientists warn that results may vary greatly according to the individual. "You can get a pretty good group [average] measure, but on an individual basis you may be off by 20% to 30% or more," says Patty Freedson, chairman of the kinesiology department at the University of Massachusetts in Amherst. The rate of error is likely to be consistent for a given person, so the devices

"will be accurate in showing improvement" in physical activity levels, she adds.

BodyMedia says unpublished data, some of which the company sponsored, show that 75% of armband users will have an error of 10% or less using the armband, and 95% will have an error of 20% or less.

Even if these devices can't perfectly estimate calorie burn, they can be good motivators, scientists say. A three-month study of 57 dieters, published in the journal *Obesity* in 2007, found subjects who used the armband along with diet and exercising counseling lost 13.6 pounds, compared with only nine pounds for a control group who received only the counseling. The study's size was too small to achieve statistical significance -- meaning that the positive result could be from chance alone. But study co-author John M. Jakicic, says response to the device by study participants was positive, and he believes larger studies, now continuing, will show a benefit. Dr. Jakicic, director of the Physical Activity and Weight Management Research Center at the University of Pittsburgh, also serves as a paid consultant to BodyMedia.

- Email aches@wsj.com

Printed in The Wall Street Journal, page D4

Copyright 2009 Dow Jones & Company,
Inc. All Rights Reserved
This copy is for your personal, non-
commercial use only. Distribution and use
of this material are governed by our
[Subscriber Agreement](#) and by copyright
law. For non-personal use or to order
multiple copies, please contact Dow
Jones Reprints at 1-800-843-0008 or visit
www.djreprints.com