

U.S. NEWS

New Studies Eat Into Diet Math

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How many calories must a dieter cut to lose a pound?

The answer most dietitians have long provided is 3,500. But recent studies indicate that calories can't be converted into weight through a simple formula.

The result is that the 3,500-calorie rule of thumb gets things very wrong over the long term, and has led health analysts astray. Much bigger dietary changes are needed to gain or shed pounds than the formula suggests.

THE NUMBERS GUY



By Carl Bialik

Consider the chocolate-chip-cookie fan who adds one 60-calorie cookie to his daily diet. By the old math, that cookie would add up to six pounds in a year, 60 pounds in a decade and hundreds of pounds in a lifetime.

But new research—based on studies of volunteers whose calorie consumption is observed in laboratory settings, rather than often-unreliable food diaries—suggests that the body's self-regulatory mechanisms tamp down the effects of changes in diet or behavior. If the new nutritional science is applied, the cookie fiend probably will see his weight gain approach six pounds, and then level off, pediatrician David Ludwig and nutrition scientist Martijn Katan wrote in the *Journal of the American Medical Association* earlier this year.

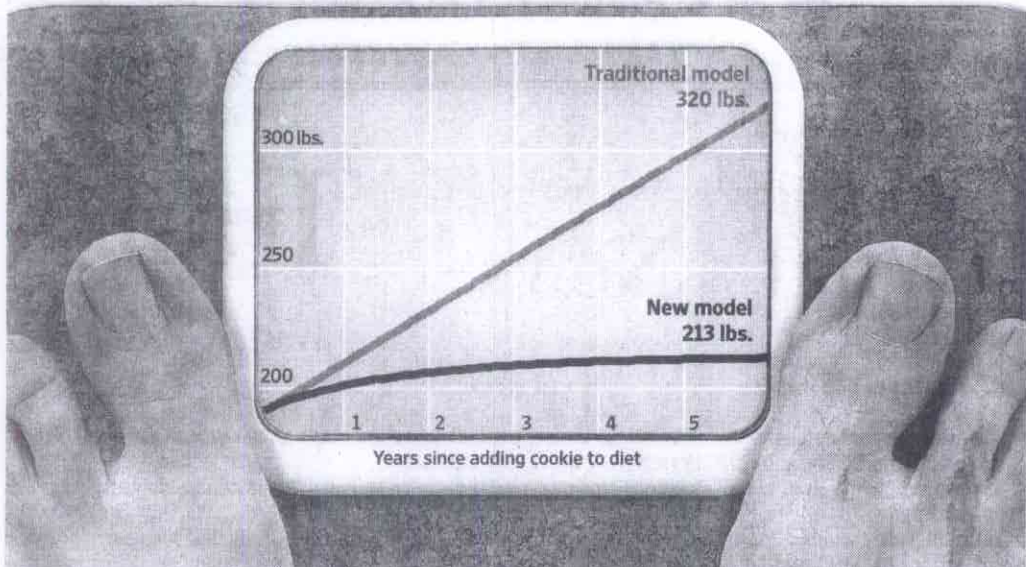
Rewriting the math on weight change has major implications for efforts to fight obesity.

New York City officials estimated that a local law requiring chain restaurants to post calorie information about their menu items, which took effect in 2008, would reduce the

The Cookie Crumbles

Nutritionists long believed that a person whose weight had been stable would gain a pound for every 3,500 extra calories consumed. But new findings suggest the classic formula exaggerates the impact of dietary changes.

Below, the effect of adding a 210-calorie cookie to the daily diet of a 188-pound, 5'9" man:



Source: Kevin Hall, National Institute of Diabetes and Digestive and Kidney Diseases

Photo illustration Erik Brynildsen/The Wall Street Journal

number of obese city residents by at least 150,000 over five years. That law was a model for a national measure included in the recently passed health-care bill. But the estimate of obesity reduction was built on the old calorie math.

"There is a growing body of literature that shows [weight loss is] more complex" than a pound per 3,500 calories, says Lynn Silver, assistant commissioner of the New York City Health Department's bureau of chronic disease prevention and control. Dr. Silver says the city has recognized the new science by couching its statements about obesity reduction with phrases such as "up to," rather than "at least."

Revising the formula also alters the math for one substantially overweight woman who had launched a well-publicized effort to become more obese.

Donna Simpson wants to drastically change her food en-

vironment. The Old Bridge, N.J., woman weighs 604 pounds, according to published reports last month, and hopes to reach 1,000 pounds to challenge world records. To hit her goal, she has said she will consume 12,000 calories every day. (Ms. Simpson declined to comment through a publicist.)

Under the 3,500-calorie-a-pound formula, that ample diet would allow Ms. Simpson to gain two pounds a day, says Beth Lanzisera, a dietitian in Cranford, N.J., meaning she would reach her total weight goal within seven months.

"It's just a rough estimate," says Ms. Lanzisera. "Everybody's body is certainly very different."

The 3,500-calorie-rule makes sense in short time frames with small diet changes, nutrition experts say. Fat has about 4,500 calories per pound, and protein has about 2,000. Thus a pound of body

mass that is approximately 25% lean tissue, such as protein- and water-rich muscle, and 75% fatty tissue contains about 3,500 calories of energy.

But just as the body requires less fuel to power itself as weight declines, it requires more to create and sustain more weight. That self-correcting process would delay Ms. Simpson from breaking the 1,000-pound barrier until almost 11 months had elapsed, says Kevin Hall, a biophysicist with the National Institute of Diabetes and Digestive and Kidney Diseases, part of the National Institutes of Health.

"What people used to say you would gain in a year is what you would gain after an infinite amount of time," says Dr. Hall of weight gain from dietary changes.

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