
INNOVATIONS | NUTRITION UPDATES AND APPLICATIONS

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Eating By the Numbers: How Statistics Shape Our Health Habits

Stats—A Factoid of American Life

America is a nation obsessed with statistics and data. From the Monday morning weekend box office reports, to obscure sports and political facts like “no team has ever come back from a 3-1 loss record to win the NBA championship,” or “no presidential candidate has ever won the White House without winning Illinois,” it seems no fact is too obscure to be turned into supposedly meaningful statistics. Given the national fascination with numbers, it’s no surprise that we Americans apply statistics to one of our other favorite pastimes: weight management. Most avid weight watchers can recite the failure rates of various diets, the calorie content of many common foods, as well as the calories burned while performing various routine activities. These same ardent dieters would be amazed to find that the “facts” on which they base their health routines are not airtight. In Section I we’ll examine some popular beliefs about dieting to see how they stack up against the facts. In Section II we’ll explore the origins and reliability of the data on which consumers base their food choices, and in Section III we’ll check out the accuracy of commonly accepted information about the calories burned during various forms of exercise.

Factoid: a term coined by *USA Today* newspaper, it means a quick fact or interesting piece of trivia.

I. Diet Data Myths

Fact or fallacy? How many of the popular beliefs about diets do you subscribe to—and how do these beliefs stack up against the facts?

Myth #1: 95% of diets fail. One of the most popular and persistent Diet Data Myths is that 95% of all diets fail. Many obesity experts

Welcome to the **INNOVATIONS: NUTRITION UPDATES AND APPLICATIONS** newsletter brought to you by the joint partnership of Novartis Nutrition OPTIFAST® and McGraw-Hill. We hope this collection of nutrition information and reports is helpful to you as you learn more about the science of nutrition. It is our goal to produce a useful, practical resource that will keep you abreast of the latest developments in nutritional science and to provide insights into the challenges that we face in maintaining healthy lifestyles in the new millennium. Each issue will focus on specific topic of interest. If you would like to order additional copies of this newsletter for your students, please contact your local McGraw-Hill sales representative. We welcome your feedback and suggestions for future issues of the INNOVATIONS newsletter. You can provide your feedback by writing us at Nutrition, McGraw-Hill, 2460 Kerper Blvd., Dubuque, IA 52001 or at our web site: <http://www.mhhe.com/hper/nutrition/>

According to the National Weight Control Registry, the number of successful dieters is probably closer to 25% to 30%.



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believe this often-reported “fact” can be traced back to a single study performed during World War II. The subjects, a small group of conscientious objectors, lived in a metabolic ward and were restricted to a low-calorie diet for 24 weeks.(1) They reported feeling depressed during the weight-loss process, and quickly regained all their lost weight once the reducing diet ended. Proponents of the anti-diet movement have often cited this study as evidence that diets don’t work and may even be psychologically harmful—without questioning the design of the study or investigating if some of the results could be attributed to factors other than the food restrictions. For instance, the World War II era was a time of great patriotism. Refusing to serve one’s country was an easy way to become a social pariah. But the study neglected to consider that the reported depression could have been due to factors like social isolation rather than the diet. As far as the weight regain, most of the subjects didn’t need to lose weight to begin with, so it shouldn’t be surprising that they regained weight once the experiment was over. The idea that weight-loss failure was inevitable was helped along in 1958 when obesity expert Albert Stunkard, M.D., stated “... most obese people who enter treatment will not lose weight and of those who do lose weight, most will regain it.”(2) These grim statistics have been repeated so often that they have come to be accepted as gospel.

Comprehensive weight-loss programs that foster lifestyle change rather than diet can be the key to success.

The truth is much more encouraging. According to researchers coordinating the National Weight Control Registry (a collection of data, techniques, and tips from successful weight managers), the number of successful dieters is probably closer to 25% to 30%.(3) Kelly Brownell, Ph.D., a noted obesity expert, believes one of the problems with the data on dieting success rates is that it is often generated by university research studies. He goes on to explain that people who enroll in university diet programs often have a history of weight-loss struggles, which may cause the success rate data to be skewed in favor of failure. Also, research studies base conclusions on statistical averages, which may make it hard to identify individual success stories. If researchers looked at the success rates of the population as a whole, including those who lose weight on their own (which is how the NWCR study was conducted), the success rate would be greater than the 5% inferred by a 95% failure rate.(2)

For people who have been struggling with weight control, comprehensive weight-loss programs that foster lifestyle change rather than diet can be the key to success. Novartis recently published a five-year follow-up study of 621 people who had completed 26 weeks of a multidisciplinary obesity treatment using OPTIFAST® formula, exercise, and a nutrition and life-skills education program. This study (the largest and longest ever published by a weight-management organization) reported that 50% of participants kept off enough weight to significantly improve their health, and 25% maintained nearly all of their weight loss. What made these dieters successful? Learning to live well, not just diet well, and having ongoing support from a weight-maintenance program.(4) This finding was echoed in the results of a retrospective study conducted by the National Heart, Lung, and Blood Institute. After reviewing outcome data from 236 obesity studies, the NHLBI concluded 20% of those who lose weight can keep it off for a significant amount of time,

particularly if they participate in a weight-maintenance support group.(5)

Myth #2: One “gift” you can count on receiving each holiday season is 5 to 10 extra pounds. Each fall, Americans are warned that they'll gain an average of 5 to 10 pounds between Thanksgiving and New Year's unless they make a conscientious effort to watch their weight. Recently researchers from the National Institutes of Health (NIH) set out to test this often-repeated, but poorly documented, “fact.” The NIH team tracked the weight of 195 adults, aged 19 to 82, beginning in late September and continuing until early March. One hundred-sixty-five of the original 195 participants were weighed and interviewed a final time the following September. At the start of the study, about 27% of the participants were overweight and about 21% were obese—similar to national averages.

The good news is that while holiday weight gain is a fact of life for most of us, the average person in the study gained less than a pound. There was some adverse news, however. The weight gained during the holidays was not lost in the following spring and summer months, as many clinicians had assumed. Furthermore, people who were overweight at the beginning of the holiday season were more likely to have a significant holiday weight gain (around 5 pounds) than were their leaner peers. The NIH team concluded that “...taken together, these results suggest that the winter holiday season may present special risks for those who are already overweight. Such persons may benefit from seasonal efforts to prevent weight gain.”(6)

Myth #3: By reducing fat to 30% of your total calorie intake or less, you can eat all you want and still lose weight. From the mid-1980s to the mid-1990s, many health experts identified fat as the enemy in the battle of the bulge.(7) The bias against fat came from epidemiological studies that associate high-fat diets with elevated levels of blood fat, cholesterol, obesity and heart disease, and

suggest that high-carbohydrate, low-fat diets protected against these disorders. To encourage people to eat more carbohydrate and less fat, the experts emphasized that, ounce for ounce, fat has 2.25 times as many calories as carbohydrate or protein. Happy to be told to eat more of something for a change, many people abandoned the idea that calories count and began eating platters of pasta and baskets of bread. By the mid-1990s, carb-stuffed consumers, now heavier than ever, were ripe for the next diet fad. This time carbohydrate was accused of causing metabolic imbalances that resulted in weight gain.

Myth #4: If you consume less than 50 grams of carbohydrate each day, you can eat all the fat- and protein-rich foods you want while effortlessly losing weight. This claim, by the latest crop of health gurus, was just the advice steak- and dessert-starved consumers were longing to hear. Once again, the impact of total calorie intake on body weight was ignored. Proponents instead focused on the wonders of ketosis. Very low levels of carbohydrate intake prevent the body from fully burning fats for energy. Metabolic intermediaries known as ketone bodies are produced instead. Weight loss does occur, at least initially. Much of the lost weight, however, is water that the body uses to flush the toxic ketones from the bloodstream. As the body adjusts to the water deficit, weight loss slows down. Many experts are concerned that the high levels of ketone bodies and protein associated with this diet may put an unnecessary strain on the kidneys. They also fear the high fat intake may promote cardiovascular disease.(8)

The bottom line is, body weight is determined by total calorie intake and expenditure. There is no magic ratio of fat, protein, and carbohydrate that will cause excess weight to effortlessly melt away. Depending on your personal food preferences, metabolism, and health status, a diet containing between 50% and 60% carbohydrate, 10% to 15% protein, and no more

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The USDA has been responsible for collecting, interpreting, and publishing data regarding the nutrient content of the U.S. food supply for over 100 years.

than 30% fat should supply the nutrients you require. Research conducted by the Novartis OPTIFAST® division indicates many people who struggle with weight control do best if they limit their fat intake to 25% of their total calorie intake.

II. Food Composition Data: Can You Trust What You Read?

Health-conscious consumers are often dedicated readers of food labels and other food composition information. Where does this data come from, and how reliable is it in helping you put together a balanced diet? Let's use a Q&A to check out some popular sources of food "facts." Then we'll look at some ways to overcome the often daunting challenge of "portion distortion."

Q. 1: Is tracking your own calorie balance more accurate than following the latest diet trend? Most of us know people who can recite the calorie and fat content of dozens of common food items. They may even know which foods are the best sources of specific nutrients like selenium, calcium, and vitamin C. Do these people have an advantage when it comes to managing their weight and their health? Maybe, maybe not, say many experienced dietitians. One of the biggest mistakes people make is treating the nutrient content information they find in food composition tables as if it were manufacturing specifications for products coming off an assembly line. If the food composition table they consult indicates a kiwi fruit has 60 calories and 70 milligrams of vitamin C, most people expect the kiwi in their fruit salad to meet these numbers. The other major problem people have with interpreting nutrient content data is selecting appropriate serving sizes.

Q. 2: Where does food composition data come from? Most of the food composition data in use in the United States comes from the U.S. Department of Agriculture (USDA) National Nutrient Data Bank (NNDB).(9) Even food manufacturers use this data to calculate the nutrient content of their products.

Q. 3: What exactly is the National Nutrient Data Bank? The National Nutrient Data Bank (NNDB) is a collection of food composition data compiled by the USDA. The USDA has been responsible for collecting, interpreting, and publishing data regarding the nutrient content of the U.S. food supply for over 100 years. The first food composition tables were published in 1891 by W.O. Atwater and C.D. Woods, who assayed the refuse, water, fat, protein, ash, and carbohydrate content of approximately 200 different foods. Today, the NNDB contains information for 100 different nutrients in more than 7,300 foods.

Until recently, most of the nutrient content information was published in a document known as Agriculture Handbook 8 (AH-8). However, AH-8 is no longer available in printed form. To make sure that new nutrient content information is available as quickly as possible, the data contained in AH-8 is now provided on the Nutrient Data Laboratory (NDL) web site (9) (<http://www.nal.usda.gov/fnic/foodcomp/Data/index.html>). The most recent version of AH-8 is Standard Reference number 13. It was issued in November 1999 and contains over 6,000 food items. Other data sets developed by the NDL include the Child Nutrition Database, Retention Tables (which indicate the amounts of specific nutrients and alcohol that are retained in foods subjected to a variety of cooking techniques), and tables of special-interest nutrients such as carotenoids, trans fatty acids, selenium, vitamin D, and vitamin K (10) (http://www.nal.usda.gov/fnic/foodcomp/Bulletins/ndl_info.html**).

Q. 4: Where does the data in the National Nutrition Data Bank come from? Much of the information in the NNDB, particularly for unprocessed foods, comes from research conducted at the NDL or in university research labs. Much of the data for processed food, however, comes directly from food manufacturers. The NDL encourages food manufacturers to submit nutrient content data for

their products to the NDL for inclusion in the National Nutrient Data Bank. There is no fee for including data in any of the NNDB databases. The NDL accepts nutrient values generated according to the guidelines contained in the Nutrient Labeling and Education Act (NLEA). The nutrient content of a particular food may be calculated from tables supplying the nutrient content of the raw ingredients used to make the processed food. Alternatively, the data may be obtained from chemical analysis of the actual food item. According to scientists working for the NDL, the USDA tends to accept data submitted by food manufacturers as accurate. If numbers look questionable, however, the USDA will conduct its own research.

Q. 5: How reliable is the NNDB data? NNDB data is considered to be the gold standard for information about the American food supply—but it is not infallible. First of all, it's important to remember that the nutrient content numbers listed in food composition tables are averages obtained by measuring the nutrient content in several samples of a specific food. Thus a single serving of this food may have slightly more or less of the measured nutrients. Second, the nutrient content data is only as good as the techniques used to generate it. The freshness of the food at the time it was analyzed, the time of year it was grown, and the conditions under which it was grown, including the mineral content of the soil and the types of fertilizer used, all influence its nutrient content. This is true of fresh, canned, or frozen plant-based foods, the foods made from them, and the flesh of food animals—like cattle and poultry—that feed upon them.

Other factors that affect the reliability of the NNDB data include the type of scientific assay used to determine the nutrient content of a given food, and the number of samples of food tested. For example, vitamin C content is still analyzed by the original method known as the titration technique, whereas folate and vitamin K content, which were originally assayed by a method known as a bioassay, are now measured by the

much more precise technique of high-performance liquid chromatography. Consequently, the vitamin K and folate content of all foods in the data bank are being recalculated. To obtain the most accurate data, large numbers of food samples should be used to establish each data point. If too few food samples are available to accurately determine the content of a particular nutrient, the USDA may establish provisional tables, as is the case with Vitamin K (see box: USDA Food Sampling Techniques for more details).

Q.6: Is the nutrient content data for specially formulated and fortified foods more accurate than the data provided for fresh foods? Not necessarily. Although most people don't realize it, the nutrient content information on the food label does not precisely reflect the amount in the actual food product. For one thing, no manufacturing process is 100% accurate, so there are slight batch-to-batch variations in the amount of each ingredient that goes into the product. There are also small differences in the amount of product that actually goes into each package. Further, the food labeling laws stipulate that nutrient content values are to be rounded to the nearest half gram, or in some cases gram (11), adding another source of variability. (To learn more about the rounding rules used in food labeling, log on to: http://www.fda.gov/ora/inspect_ref/igs/nleaatd.html#Attachment 7 Rounding Rules For Declaring Nutrients On Food Labels.)

You can be confident, however, that the nutrients in a packaged food meet the declared nutritional label claim. This is required by the FDA and clearly stated in Title 21 Code of Federal Regulations.(12) Manufacturers add an appropriate overage of ingredients, including vitamins and minerals, to correct for process loss and any loss in storage. For example, because some vitamins can deteriorate over time, products fresh off the production line may have more of a particular vitamin than the label indicates to assure that enough of these

The nutrient content numbers listed in food composition tables are averages obtained by measuring the nutrient content in several samples of a specific food.

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The National Food and Nutrient Analysis Program Food Sampling Guidelines

The USDA is consistently striving to improve the accuracy of the food composition data reported in AH-8, the Nutrient Databank. Following is a description of the most up-to-date sampling techniques.

To obtain the nutrient content data of fresh produce, the USDA has agents purchase one piece of each type of produce being assayed in 12 cities nationwide. Using census data, USDA researchers select the 12 most-populated cities dispersed throughout 4 regions of the country. Next, they use marketing research data from a company like Nielsen or IRI to identify the most popular grocery store in each city. They pick a date, then arrange for one person in each city (often a dietitian) to shop on behalf of the USDA. The person purchases the requested foods, fills out the required forms, and ships the food to the USDA in the container provided. Once the USDA receives the samples, they combine items from the same region, analyze them, then pool the numbers from each region to develop what is known as composite data. To account for the large amounts for foreign produce being sold in the United States, especially during the off season, the USDA has decided to repeat this sampling process at least twice a year. That way it will obtain data from North American as well as Latin American peaches, California and New Zealand-grown kiwis, and so on. (From interview with USDA Nutrient Lab Researcher)

The process for obtaining data on frozen processed foods is slightly more complicated. Suppose the USDA wants to publish nutrient content data for frozen cheese pizza. Rather than purchasing a single pizza in each city, the USDA uses sales data obtained by a scanner from the bar codes on food items to identify the 5 or 6 top-selling brands of cheese pizza, and perhaps one store brand. Agents shopping on behalf of the USDA in 12 different cities purchase the specified brands at the preselected grocery store or stores. The pizzas are sent to the USDA and analyzed for their nutrient content. The USDA then combines all the data obtained from the different pizzas into one set of composite data.(18)

nutrients are present in the product at the expiration date. To ensure that consumers don't ingest too much of any one nutrient, the extra dose of vitamins is within the tolerable upper limits of safety established by the National Academy of Science.(13) This type of variability in the nutrient content of processed foods is common in the food industry.

Americans aren't entirely to blame for their ignorance of serving sizes. The USDA, food manufacturers, and restaurant managers all play a role in portion distortion (see Table 1). The USDA has developed standardized serving sizes (14) for food manufacturers to use when they submit data to the Nutrient Data Bank, develop the Nutrition Facts Panel for food labels, and for

“Portion Distortion” may be your biggest challenge

One of the most common errors people make when using the information in food composition tables to count calories is not paying attention to the portion size. This is true whether they're eating a piece of fruit, a packaged snack, or a meal they prepared themselves. A recent study by the food industry confirms what many experts have claimed: portion sizes are increasing. Even foods like whole fruits that would seem to be portion distortion proof are getting bigger.

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TABLE 1
Typical Serving Sizes versus USDA Food Guide Pyramid Official Serving Sizes

Food	Typical Serving Size and Number of Calories	Official Serving Size and Number of Calories
Popcorn	Movie theater serving (small) 7 cups—400 calories	3 cups—160 calories
Muffins	Restaurant serving ¼ lb (4 oz)—430 calories	⅛ lb (2 oz)—190 calories
French fries	McDonalds Super Size Fries 3 cups (6 oz)—540 calories	1½ cups (3 oz)—220 calories
Soft drinks	Can 1½ cups (12 oz)—140 calories 7-Eleven Double Gulp 8 cups (64 oz)—800 calories	½ can (6 oz)—70 calories 1 cup (8 oz)—100 calories
Steak	Dinner house serving (Sirloin) About ½ lb, cooked 7 oz—410 calories Steak house serving (Porterhouse) About 1 lb, cooked 17 oz—1,150 calories	(Sirloin) About ⅓ lb, cooked 3 oz—170 calories

According to the USDA's standards, the amount of food that constitutes a serving varies depending on the type of food being consumed.

consumers to use when interpreting the Food Guide Pyramid. (Visit this FDA web site for a list of standard serving sizes used on food labels: http://www.fda.gov/ora/inspect_ref/igs/nleaatc.html#ATTACHMENT 5), This system, however, seems anything but standard to the average consumer. According to the USDA's standards, the amount of food that constitutes a serving varies depending on the type of food being consumed. Some serving sizes are based on volume, others on weight. For example, half of a 3-inch-diameter bagel and 1/2 cup of cooked rice both constitute one serving from the grain, bread, and pasta group of the Food Guide Pyramid. Three ounces of cooked chicken, 1/2 cup of cooked beans, or 2 tablespoons of peanut butter constitute one serving from the meat group. For some foods, cooking changes serving sizes. According to the Food Guide Pyramid, one serving of fruit or vegetable equals 1 cup if eaten raw, but only 1/2 cup if it has been cooked.

Many consumers who follow the advice of McDonald's "just say super-size it" ad campaign are getting bigger bellies along with their bigger burgers and fries.

Making the most of the confusion, food manufacturers and restaurant managers have been happy to ignore the USDA's advice and give cost-conscious consumers the super-sized servings they've been trained to desire. Despite the nutrition labeling laws, food manufacturers continue to produce and package food in nonstandard sizes. They have simultaneously been producing giant servings of trendy carbohydrate-rich foods like mammoth muffins, behemoth bagels, and miniature versions of favorite high-fat snacks like mini cheese-filled Ritz crackers and bite-sized Oreos. Food companies also persist in packaging multiple servings of certain foods, especially snack foods, in what appear to be single-serving containers. Take a can of soda, for instance. The USDA

identifies a serving of soda as 6 ounces, but the typical soda can contains 12 ounces. If you drink an entire can of a diet soda, the extra serving is inconsequential, but drinking the full 12 ounces of regular soda will add 70 calories, or roughly 5 teaspoons of sugar to the amount indicated on the label. Small packages of candy, chips, and cookies often exhibit the same deceptive packaging. Even the manufacturers of single-serving food items like bagels and muffins may try to improve their nutritional standing by giving nutrition information for only a half or a third of the product. The front label on a 3-inch-diameter muffin recently purchased at a convenience store read "Low Fat" in large letters, but after a careful reading of the very small print on the Nutrition Facts label, it was apparent the muffin was intended to serve three people. Some food companies use this technique with entrées and side-dish items as well. For example, the label on a moderate-sized burrito recently purchased at a Costco store indicated it weighed 10 ounces and supplied 263 calories and 8 grams of fat. It looked like a single serving. But, in tiny print, the label indicated it was intended to serve two. Similarly, consumers were surprised to learn that a rice bowl dinner that claimed to supply a scant 240 calories actually held two servings in the one small bowl. Clearly, eating too many calories can lead to unwanted pounds. Eating too much of a fortified food can cause more serious side effects, including toxic reactions to excess amounts of vitamins and minerals.

After a careful reading of the very small print on the Nutrition Facts label, it was apparent the muffin was intended to serve three people.

Feasting on fortified foods Many Americans who claim they are too busy to eat right believe the best way to make up for their nutritional shortcomings is to consume fortified foods. Combining fortified foods with giant servings, however, can be more of a danger than a benefit. Weight gain is bad enough, but an even more dangerous side effect of eating large portions or many servings of fortified foods is the potential for ingesting a toxic overload of vitamins and minerals. It's not hard to overindulge. Just 3/4 cup of Total brand cereal supplies 100% of the Daily Value (DV) for 10

Combining fortified foods with giant servings, however, can be more of a danger than a benefit.

vitamins and minerals. Yet 3/4 cup looks skimpy in most cereal bowls. Many people eat twice that much each morning and top it off with nearly a cup of fortified milk. They're getting two to three times the recommended amounts of vitamin A, calcium, B₆, and iron at breakfast alone. If they happen to drink a fortified diet shake or eat a vitamin-fortified sports bar as a snack, or take a multiple vitamin, they can easily push themselves into the vitamin and mineral danger zone. Consuming just six times the recommended amount of vitamin B₆ has been shown to produce nerve damage. Long-term ingestion of excess calcium, vitamin D, and/or vitamin A can result in skeletal abnormalities and calcium deposits in soft tissues.(15)

To help alert consumers to this important public health issue, the National Academy of Science is in the process of establishing Tolerable Upper Intake Levels (TUILs) for many vitamins and minerals. The TUILs for niacin (35 mg/day), vitamin B₆ (100 mg/day), vitamin D (50 mcg/day), calcium (2.5 g or 2500 mg /day), and folate (1000 mcg or 1 mg /day) have already been established. The TUILs for many other nutrients will be available in 2001.(13)

III. Burn Baby Burn: Calculating Calorie Expenditures

If you've ever wondered how you can burn 450 calories in 30 minutes on the elliptical cycle without even breaking a sweat, the calorie counter on your fitness equipment or the activity table you consult may be lulling you into a false sense of security. Many people rely on the calorie values of exercise published in activity tables as much as they rely on the food composition tables to help them control their weight. How accurate are these data? As with food composition data, it's important to understand the assumptions behind the data in these tables.

To get the most out of the calorie value tables, keep the following points in mind.



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The energy expended can vary greatly for many activities depending on the intensity with which they are performed.

1. The figures that appear in these tables are averages obtained by measuring the energy produced by several healthy individuals performing the activity under ideal conditions, such as in a human performance research lab.

2. Environmental conditions—including elevation, temperature, and humidity, as well as a person's age, gender, and physical condition—affect the amount of energy expended.

The more a person weighs, the more calories s/he will burn while performing a given activity.

3. The more a person weighs, the more calories s/he will burn while performing a given activity. This is a simple matter of physics. The number of calories (energy) required to move a person or an object from one point to another is directly related to the weight of the object being moved and the distance it is traveling. Unless otherwise indicated, the data in most calorie-value-of-exercise charts is for a person weighing 150 pounds. If you weigh more than this, you'll burn a bit more energy as you perform the listed activities. If you weigh less, you'll burn fewer calories. For example, while walking briskly (4 miles per minute), a 150-pound person will burn 6.2 calories per minute, a 125-pound person will burn 5.2 calories per minute, and a 175-pound person will burn 7.2 calories per minute.

4. These charts show the calories burned for continuous (nonstop) activity. If you slow your pace or stop for a few minutes in the middle of the activity, you need to adjust your caloric expenditure accordingly. If you go out for a 30-minute walk but spend 10 minutes talking to your neighbor, credit yourself with only 20 minutes of activity. Activities like dancing, running, and walking are fairly easy to keep track of. It gets more difficult with sports like tennis, basketball, and skiing, which have inactive periods built into them. If you use the chart to help you determine how many calories you burn playing tennis, keep track of the time you're actually moving around the court, not the time you spend waiting to serve or receive the ball. If you're skiing, don't include time waiting in line or riding the lift.

5. Intensity counts. The energy expended can vary greatly for many activities depending on the intensity with which they are performed. A good example is the variability in energy expenditure that can occur when different people shovel snow. Two people shoveling show may have very different calorie expenditures depending on how fast they shovel, how much snow they lift with each shovelfull, and how much they move around while shoveling.(16)

Many people feel the calorie-counting devices on exercise equipment—especially those that allow you to enter your gender, age, height and weight—are more accurate than are the calorie-value-of-exercise charts. Like the charts, the calorie expenditure devices on exercise equipment provide only a rough estimate of the calories you might burn while performing the mechanized activity. These devices calculate energy output based on the amount of calories that would be used by a “reference man” or “reference woman” performing the same activity for the same amount of time. Accurate determination of your caloric expenditure would require additional environmental measurements and more physiological data about you as an individual: for example, your respiration rate, the amount of oxygen you used, your cardiac output, and perceived exertion.

Are You Reference Man or Woman Material?

The reference man is 5'10" and weighs 150 pounds. The reference woman is 5'5" and weighs 120 pounds. If you match the height-weight criteria for the reference man or woman, then the calorie-calculating devices may be somewhat more accurate than if your physique is much different. However, these devices do not take into account your individual metabolism. Even if your height and weight are the same, you may have more muscle mass and hence have a higher metabolism than the reference man or woman. Conversely, you may have less muscle mass and a lower metabolic rate.

According to the American College of Sports Medicine, heart rate is still the most accurate, and easily accessible method for measuring your workout intensity.

To maximize the calorie-burning effects of your workout, forget the chart and calorie-calculating devices. Focus instead on time (duration) and intensity. According to the American College of Sports Medicine, heart rate is still the most accurate, and easily accessible method for measuring your workout intensity. The ACSM guidelines suggest getting 20 to 60 minutes of aerobic activity 3 to 5 times per week, at 60% to 85% of your maximum heart rate. Keep the calorie tables and devices in perspective. They may be good motivation tools, but don't count on the 450 calories it says you burned erasing the caloric impact of the super-sized cinnamon roll you ate before lunch.(17)

If you'd like to get a rough estimate of the amount of energy you use performing routine household activities or specific exercises, log on to Cyberdiet.com's activity calculator screen at <http://www.cyberdiet.com/activity/activity-new/index.cgi>. A variety of interactive self-assessment tools are available through the ToolBox link on the Novartis Nutrition OPTIFAST® web site home page: www.OPTIFAST.com. These tools can help you calculate your caloric intake, judge portion sizes, estimate your energy expenditure, find the perfect activity for your lifestyle, and much more.

This article was authored by Virginia Lee Mermel, Ph.D., CNS, Senior Health Risk Management Advisor, Novartis Nutrition.

ACTIVITIES

All of the web sites used to complete the activities described below can be accessed through the Toolbox link on the OPTIFAST® web site: www.OPTIFAST.com/toobox.

1. Are You Experiencing Portion Distortion?

Test your serving-size IQ with the Wheel of Portion tool on Conde'Net's award-winning phys.com web site: http://www.phys.com/b_nutrition/02solutions/05portion/game.htm
Use your new skills the next time you fill your plate. On average, do you think you eat smaller or larger portions of food than recommended?

2. Do You Use Food Labels?

Some people never look at labels. Others can't take a bite without studying every line on the Nutrition Facts Panel. For the next week, pay attention to how you use food labels. Do you always read them, or do you use them selectively? If you do read them, what data are you typically looking for? Total calories and fat content are the most popular data entries for many consumers. How can you use the food label facts in this article to help you improve your nutritional status?

3. Are You Ideal?

Determine how closely your personal physical profile matches that of the reference man or woman described in this article by using the activity calculator tool on the Cyberdiet.com web site: <http://www.cyberdiet.com/activity/activity-new/index.cgi>, or on the FoodWorks CV 2 CD-ROM.

If you are female, enter the personal data given for the ideal woman. If you are male, enter the data given for the ideal man (see box on page 10 of this article). Next, choose your favorite activity, press calculate, and see how many calories "She" or "He" burns while performing 30 minutes of your favorite activity. If you are inactive, choose an activity you would like to participate in or enter walking. Write the answer down, clear the calculator screen and enter your own personal data. How did your calorie expenditure compare with that of the reference male or female performing the same activity? How can you use this information to help you interpret energy expenditure tables or calculators on exercise equipment?

4. Get an Activity Makeover

There is more to exercise than kick boxing or jogging. If you are stuck in an exercise rut or need to get yourself off the couch, find an activity that suits your life-style as well as your personality by using the interactive Exercise Profile tool at <http://www.personalogic.com/>. Once at the personalogic home page, go to Recreation, then choose Exercise.

How many activities did the tool suggest for you?

How many of the suggested activities would you be willing to try?

What is the best new activity the tool made you aware of?

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