

## A Perspective on Portion Sizes

**N**utrition and other health professionals are increasingly alarmed at the frequent and growing disparity between the amount of food people need to eat in order to meet dietary and energy needs and the amount of food they actually consume. Physical activity levels, type of food consumed, frequency of eating and amount of food consumed per eating occasion are all factors in this disparity. The focus of this article is on the amount of food consumed at an eating occasion. What is being consumed at an eating occasion (the portion) is often significantly larger than the size of a benchmark serving (e.g., the label serving, a Food Guide Pyramid serving, a diabetic exchange). Research reveals this to be true at home, as well as away from home. Many now consider the regular consumption of oversized food portions to be a major contributor to the rise in obesity in this country.

Consumers, the media and health professionals sometimes use the terms *portion size*, *package size*, *serving size* and *recommended serving* interchangeably. Some describe a serving as the amount of food offered or consumed at one eating occasion, while others describe it as an amount recommended to meet nutrient needs. Many people are confused by the differences in “serving” sizes on food labels, Food Guide Pyramid “servings,” recipe servings and servings they may be offered in restaurants.

### Who Decided on the Standards?

The first dietary guidelines published in America were prepared in 1895, by Dr. Wilbur Atwater. He spent many years identifying the macronutrient composition of specific foods and the proportion of total calories provided by individual macronutrients. Like scientists around the world at that time, his data were based on food portions of 100 grams. A standard 100-gram portion ensured easy calculation and comparison of nutrient values. Atwater’s dietary recommendations were based on his research and designed to satisfy hunger, support energy needs, maintain body weight and provide adequate amounts of essential nutrients for groups of individuals that differed by age, gender, occupation and general health.

Dietitians were soon calculating recipes, planning menus and making dietary recommendations using nutrient values based on a standard amount of 100 grams. It was easy to weigh 100-gram food portions in the laboratory or institutional kitchen, but consumers wanted household measures. Before 1930, the 100-gram portions of many foods

had been converted to the nearest household measure: vegetables and fruits such as green beans, carrots and oranges measured about one cup; milk about one-half cup; lean beef about one-fourth cup. Authorities at that time agreed most people consumed less than one cup of a vegetable or fruit at one eating occasion, so one-half cup seemed to be a more sensible serving (about 50 grams or one-half of the 100-gram portion). Using the same logic, one cup of milk was considered to be a usual serving (about two times the 100-gram portion); similarly one-half cup of meat was considered to be a typical serving (about 200 grams). Adjustments were also made for other foods. Because these household equivalents were easily converted to the 100-gram portion, dietitians were still able to calculate nutrient values.

### Dietary Guidelines

When Mary Swartz Rose developed dietary standards for children in 1912, she began by organizing foods into six groups: cereals, milk, fruits and vegetables, fats, sugars and high protein foods. She made calorie recommendations for each age and gender category of children and then determined the proportion of total calories that should be provided by each food group.

Dietary guidelines for adults began to appear, with food groupings that ranged from four to 30. The recommended number of servings from each group was included with each set of guidelines, but not the serving size. These early guidelines were concerned with providing Americans an adequate intake of nutrients, as well as sufficient calories to maintain body weight and meet energy needs. Authorities felt adults would naturally consume the amount of food needed to meet, but not necessarily exceed, calorie needs. Dietary guidelines were intended to assist in food selection to meet nutritional needs.

Preparation of *Recommended Dietary Allowances* in the early 1940s included a look at data from national dietary surveys, particularly the amount of food being consumed. Consideration was also given to the need to adequately feed armed forces serving overseas. New dietary guidelines were developed to help consumers incorporate the new recommendations into daily meal plans. Food groupings and serving sizes were an integral part of the new guidelines.

Serving sizes using household measures had been almost universally accepted by 1940. They allowed consumers to more easily

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incorporate dietary recommendations into meal patterns while still facilitating nutrient analysis by dietitians. Standard serving sizes eventually became the basis for the recommended daily amounts of food to be served in hospitals, schools and the military, as well as at home.

In preparing the 1990 *Dietary Guidelines*, authorities included an evaluation of serving sizes. They examined amounts eaten as reported in food consumption surveys, the nutrient content of common serving sizes, nutrient equivalents of servings within each food group, consumer use of standard serving sizes and the ease with which serving sizes could be multiplied or divided. They considered the familiarity and long-term use of standard serving sizes by consumers. Consumer familiarity was ultimately considered the strongest argument for maintaining traditional serving sizes, despite an already growing conflict with actual amounts eaten by consumers. Consumer familiarity continued to be the basis for use of these benchmark-serving sizes through subsequent revisions of the *Dietary Guidelines*.

In the US, serving sizes were looked at again in implementing the Nutrition Labeling and Education Act (NLEA). The current Nutrition Facts panel includes a serving size that is the basis for the nutrient and calorie information that appears on food labels. These serving sizes, called Reference Amounts, were established by the government, based on the amount of foods customarily consumed by individuals four years of age and older, and expressed in common household measures appropriate to the food category. In contrast, some other countries use the Food and Agriculture Organization/World Health Organization's (FAO/WHO) *Codex Alimentarius* food labeling standards as the basis for information on nutrition labels. These standards call for information to be expressed per 100g or per 100ml as sold, as well as per specified quantity of food suggested for consumption.

### Current Food Portions

Anyone interested in learning more about changes in the size of food portions has little difficulty in finding information. Professional journals regularly contain research, survey data and review articles on this topic. Nearly every week a story appears in the national press. A recent television show devoted a full hour to the topic. Photographs, graphics, charts and tables illustrating food portions recalled from the past are contrasted with common

portions people say they eat today. For visual examples, go to <http://hin.nhlbi.nih.gov/portion/>.

Some research suggests that serving larger portion sizes can lead to increased calorie intake. According to a study conducted by Barbara Rolls, increasing the size of food portions served to study participants by 50% resulted in a 16% increase in total calories consumed; doubling the size of the food portions served to them increased total calories consumed by 26%.

Some authors note that Americans regard themselves as active members of the "Clean Plate Club." Seventy per cent of respondents in a recent survey said that most of the time they eat everything served to them in a restaurant. Even when people do not eat everything they are served, some research suggests that both men and women tend to consume more food when served a larger portion. When this occurs, it is not clear that they routinely compensate for these additional calories by eating smaller portions at other meals and/or burning more calories through physical activity.

Learning recommended serving sizes and limiting themselves to eating that amount does not seem to be a priority for many consumers. There is some evidence that most cannot identify standard serving sizes for particular foods and many may not care. According to some research, even those who have learned to use a visual tool to equate serving sizes (a serving of meat with a deck of cards, a medium apple with a tennis ball) report little use of this information. They say it is hard to find apples of that size and that recommended portions of meat are too small to satisfy hunger.

A number of commentators claim that the rising incidence of obesity in America has occurred almost simultaneously with an increase in portion sizes, though they often leave unclear whether they mean "portion sizes" reportedly consumed or "portion sizes" offered for sale. Observers consider the phenomenon more than coincidence but no direct correlation has yet been proven. Other factors must also be taken into consideration. For example, another contributor to this country's obesity problem is the lack of adequate physical activity among most age groups in the US.

If portion sizes, either offered for sale or as consumed, have increased in America in such a short period of time, the question remains why they may have changed.

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### Government and the Food Industry

It is popular in some circles to blame any increase in the size of food portions on government, food manufacturers and restaurants. Indeed, there have always been commentators suggesting that government and industry influence American food habits. An agricultural economist in 1931 suggested the expanding food industry was influencing the amount and type of food being consumed by Americans. In the 1950s, both government and industry were seen as encouraging increased consumption of the abundant American food supply. Today's critics focus on the impact of federal legislation and agricultural subsidies on the low price and general availability/abundance of food.

The food industry produces tasty, relatively inexpensive, easy-to-prepare food products. Taste, cost and convenience are all high priorities for American consumers. Consumers often consider larger packages of prepared foods a better value. Some research suggests that consumers may view foods packaged in convenience sizes as a single serving, despite food label information. In other words, people sometimes eat in units: one can of soup, one snack-size bag of chips or cookies or one bottle of soda, juice or milk. When this occurs, consumers may increase their calorie intake when they select a food package with more than one serving, even though they may be aware that the package contains multiple servings.

When it comes to selecting restaurants, consumers often consider large portions a good value. Thus, they may choose to frequent establishments where financial value joins tasty food, pleasant surroundings and service with a smile.

### Personal Responsibility

It is not the farmer, food manufacturer, food-store owner or restaurant chef who decides the type and amount of food a person will consume. People make such decisions for themselves, based on their own priorities.

Nevertheless, health professionals may be able to help motivated consumers make wise decisions about food intake by working with them to estimate the amounts necessary to meet their needs without consuming excess calories. While it is not unusual for some consumers to ignore dietary advice and eat whatever is served, many consumers may be receptive to assistance from

health professionals who can help them make better use of dietary guidance tools, such as the Food Guide Pyramid. Health professionals may even be able to improve these tools, as there is some indication that the various serving sizes of the Pyramid take time to learn and can be hard to judge when one is faced with an amorphous quantity of food on a plate.

Health professionals understand that consumption of larger portions means an increase in total calorie intake and can help communicate that to consumers who may not make food decisions with this reality firmly in mind. For example, many people mistakenly feel that the *type of food* consumed (i.e., whether it is high or low in carbohydrate, protein or fat) is more important for health or weight control than the *amount of food* or the number of calories consumed. Although some researchers agree that the type of food is important, focusing on reducing the amount of food consumed may be a more useful strategy for many people. Health professionals may be able to assist people by placing greater emphasis on the importance of portion control and helping to persuade consumers of the value of smaller portions.

### Practical Advice

Dietitians and nutrition educators play a valuable role in translating dietary advice for consumers. Nearly all consumers can identify the Food Guide Pyramid. But the Pyramid graphic identifies the number of recommended servings per group, not the size of those servings. Nutrition professionals can help consumers understand appropriate amounts of food to be consumed from each food group.

Nutrition educators have taught consumers to use the nutrition information on food labels to compare two or more similar products. It may be time to bring greater attention and understanding to the serving size information at the top of the Nutrition Facts label. Health professionals may be able to help consumers recognize the relationship between the nutrient information and the serving size and use this information to make better decisions.

It is clear dietitians must look for new ways to assist consumers with portion control. One way is to increase awareness. Many people seem not to perceive large portions as unusual. The media is helping raise awareness by using photographs of recommended and common servings of popular foods. Interest in visuals such as these can serve as an opening for education.

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Nutrition educators have worked for years to teach recommended serving sizes to students and consumers with limited success. Food portion tools have been developed and used as part of that education but there is little evidence of their effectiveness when meal-time arrives.

It may be time to personalize serving sizes based on individual needs. The primary issue is the total amount of food (and related number of calories) eaten over time. Perhaps consumers can be educated about small, medium and large portions as they appear on the plate. Other strategies include emphasizing the importance of white space on the plate or demonstrating a healthy division of food groups on the plate. When a dietitian talks with a consumer

about making dietary changes, such examples might have more impact on future eating behaviors.

Health professionals, government agencies and the food industry can best serve the public by working together to create new and innovative ways to help consumers align the total amount of food they consume with their individual calorie needs. In the final analysis, we all recognize that calories *do* count for healthful eating.

Websites of interest:

[http://www.newconversation.org/newsite/eva\\_examples/index.html](http://www.newconversation.org/newsite/eva_examples/index.html)  
<http://www.krafthealthyliving.com>

**Further Reading:**

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