Portion Sizes of Ultra-Processed Foods in the United States, 2002 to 2021

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See also Monteiro and Cannon, p. 2091.

Objectives. To assess the US food industry's response to calls from public health authorities to reduce portion sizes by comparing current with past sizes of selected examples of single-serve ultra-processed packaged and fast foods.

Methods. We obtained manufacturers' information about current portion sizes and compared it with sizes when first introduced and in 2002.

Results. Few companies in our sample reduced portion sizes since 2002; all still sold portions of ultra-processed foods in up to 5-times-larger sizes than when first introduced.

Conclusions. Policies and practices focused on reducing portion size could help discourage the consumption of excessive amounts of ultra-processed foods. (*Am J Public Health*. 2021;111(12):2223–2226. https://doi.org/10.2105/AJPH.2021.306513)

The rising prevalence of obesity is a major public health concern.[1] As of 2018, nearly 74% of US adults were considered overweight or obese and at higher risk for diet-influenced chronic diseases.[2] Socioeconomic factors associated with weight gain—poverty, inadequate education, racial and gender discrimination, unemployment, and lack of health care—are also associated with frequent consumption of inexpensive, high-calorie, ultra-processed foods in large amounts.[3] Reducing consumption of such foods could be a useful strategy to improve public health.

Large portions provide more calories than small portions, but it is difficult to recognize how much the sizes of packaged and fast foods have increased since the early 1980s. We previously demonstrated parallel increases in portion sizes, calorie intake, and the prevalence of overweight and obesity.[4,5] By 2002, many single-serve portions had enlarged 2- to 5-fold since they were introduced.[6] Large portions have effects beyond calories; they encourage people to eat more[7] and to underestimate how much they are eating.[8]

The 2020–2025 Dietary Guidelines for Americans advise individuals to "pay attention to portion sizes" particularly for foods that are not "nutrient dense" (i.e., ultra-processed foods).[2(p25)] Researchers also called on the food industry to sell foods in more reasonable portion sizes.[7] In 2003, we reported increases in portion sizes of selected packaged and fast-food products.[6] Here, we report our more recent assessment of this selection.

METHODS

In 2021, we examined the sizes of specific ultra-processed food items sold as single servings that we have tracked since 2002: packaged products (candy bars, soda, and beer) and fast foods (hamburgers, french fries, and fountain soda). We selected this product sample from among those that are major contributors of calories in US diets,[9] ranked highest in sales,[4,5] associated in observational studies with weight gain and poor health,[10] and marketed as single servings. We obtained portion-size information from package labels and from company Web sites, as described previously.[4,6] We compared current portions with their sizes when first introduced and measured again in 2002.

RESULTS

As shown in Table 1, food companies are still selling chocolate bars, bottled and canned soda and beer, hamburgers, french fries, and fountain sodas in larger portions than when first introduced. While some companies have reduced their portions by small amounts, most continue to sell the larger sizes; we observed little change from sizes offered in 2002.

At first introduction, most companies offered products in just 1 size; that size

is smaller than or equal to the smallest size currently available. For example, the original size of a Coca-Cola bottle was 6.5 ounces; today it comes in 6 sizes marketed as single servings; these range from 7.5 ounces to 24 ounces, 4 of which have been introduced since 2002.

Since 2002, McDonald's has reduced the sizes of its french fries and eliminated its "supersize" french fries and soda, but still offers quart-sized sodas and double burgers. While McDonald's and Burger King decreased the size of their largest portion of french fries, they increased the sizes of their smallest portions. While Burger King reduced the sizes of it's hamburger sandwiches, since 2002 they added a triple Whopper.

Although we did not observe consistent differences between portion-size trends in packaged products and fast foods, we note that some packaged food companies have increased the number of sizes offered, some of them smaller but some larger than those offered in 2002. Packaged food companies and fast-food chains still sell products up to 5 times larger than when first introduced.

DISCUSSION

Despite pleas from public health authorities to sell foods in smaller sizes, our observations indicate that marketplace portions of our selected examples of popular ultra-processed packaged and fast foods remain considerably larger than when first introduced and with little change since 2002.

Even where manufacturers reduced the size of some products, they compensated by introducing larger options. In 2020, for example, McDonald's introduced a Double Big Mac with 4 patties

TABLE 1— Portion Sizes of Selected Foods and Beverages When First Introduced Compared With Sizes in 2002 and 2021: United States

Food or Beverage (Year Introduced)	Original Size[a]	Size, 2002, oz or fl oz	Size, 2021, oz or fl oz
Packaged products			
Chocolate bar, milk chocolate			
Hershey's milk chocolate bar (1908)	0.6	1.6	1.6
		2.6	2.6
		4.0	3.5
		7.0	4.4
		8.0	7.0
Nestlé Crunch (1938)	1.6	1.6	1.6
		2.8	2.8
		5.0	4.4
Soda, commercially packaged			
Coca-Cola, bottle (1916)	6.5	8.0	8.0
		20.0	8.5
			12.0
			16.9
			20.0
			24.0
Coca-Cola, can (1960)	12.0	12.0	7.5
			12.0
			16.0
Beer			
Budweiser, can (1936)	12.0	8.0	8.0
		12.0	12.0
		16.0	16.0
		24.0	25.0
Budweiser, bottle (1976)	7.0	7.0	7.0
		12.0	12.0
		22.0	14.0
		40.0	16.0
			22.0
			32.0
			40.0
Fast-food products			
Hamburger, beef only[b]			
McDonald's (1955)	1.6	1.6	1.6
		3.2	3.2
		4.0	4.0
		8.0	8.0
Hamburger sandwich[c]			
Burger King, sandwich (1954)	3.9	4.4 (Hamburger)	3.5 (Hamburger)

Continued

TABLE 1— Continued

Food or Beverage (Year Introduced)	Original Size[a]	Size, 2002, oz or fl oz	Size, 2021, oz or fl oz
		6.0 (Whopper Jr.)	4.7 (Whopper Jr.)
		6.1 (Double hamburger)	4.8 (Double hamburger)
		9.9 (Whopper)	9.5 (Whopper)
		12.6 (Double Whopper)	12.5 (Double Whopper)
			15.5 (Triple Whopper)
French fries			
Burger King (1954)	2.6	2.6 (Small)	3.1 (Value)
		4.1 (Medium)	4.5 (Small)
		5.7 (Large)	5.4 (Medium)
		6.9 (King)	6.1 (Large)
McDonald's (1955)	2.4	2.4 (Small)	1.3 (Kid)
		5.3 (Medium)	2.6 (Small)
		6.3 (Large)	3.9 (Medium)
		7.1 (Supersize)	5.9 (Large)
Soda, poured from fountain			
Burger King (1954)	12.0	12.0 (Kiddie)	16.0 (Value)
	16.0	16.0 (Small)	20.0 (Small)
		22.0 (Medium)	29.0 (Medium)
		32.0 (Large)	38.0 (Large)
		42.0 (King)	
McDonald's (1955)	7.0	12.0 (Child)	12.0 (Extra small)
		16.0 (Small)	16.0 (Small)
		21.0 (Medium)	21.0 (Medium)
		32.0 (Large)	30.0 (Large)
		42.0 (Supersize)	

Note. Information obtained from manufacturers. Sizes are stated in ounces (oz) for solid foods such as chocolate bars, french fries, hamburger beef, and sandwiches, and in fluid ounces (fl oz) for beverages such as beer and soda. Manufacturers are the following: Anheuser-Busch Inc (St Louis, MO); Burger King Corporation (Miami, FL); The Coca-Cola Company (Atlanta, GA); Ferrera Candy Co (Chicago, IL); Hershey Foods Corporation (Hershey, PA); McDonald's Corporation (Oakbrook, IL); and Nestlé USA (Arlington, VA).

[a]When introduced, these products came only in the size options indicated.
[b]Precooked beef.
[c]Includes cooked beef, bun, vegetable, and condiment. Does not include cheese or mayonnaise.

(containing more than 700 calories). Burger King now markets a Triple Stacker King sandwich with more than three quarters of a pound of beef (nearly 1400 calories). Most recently, some companies used their newly introduced larger portions to boost sales and gain customers. The pizza chain Papa John's introduced an Epic Stuffed Crust pizza with 360 calories per slice compared with a regular slice, which contains 220 calories. The Red Lobster restaurant chain introduced the Codzilla, a large fried fish sandwich containing 830 calories.

The packaged soft drink industry has added smaller-size sodas to their offerings while simultaneously introducing new larger sizes. But it often prices the small sizes higher than larger sizes. On Amazon's Web site, for example, the 8.0-ounce Coca-Cola bottles cost 3 times as much per ounce as the 16.0-ounce bottles.

In Europe, the sizes of many fast-food portions are smaller than those in the United States. A large fountain Coca-Cola from Burger King in the United Kingdom contains 262 calories whereas the US large has 510 calories. But US companies have no incentive to reduce portion sizes, especially as consumers in the United States are now conditioned to expect large portions.

Current US policies support the production of larger portions through subsidies of basic ingredients that promote overproduction and low prices. Food in the United States is relatively inexpensive compared with the costs of manufacturing and service, and larger portions can generate additional revenue for little cost. To consumers, large portions may appear as a bargain, but they contain more calories and encourage overeating.[10] It is time for more focused action to encourage the food industry to restore portion sizes to more reasonable amounts.

Since our findings in 2002, some health departments have implemented education initiatives focused on portion control. New York City launched a campaign, Cut Your Portion, Cut Your Risk, and Los Angeles County launched the Choose Less, Weigh Less, Portion Size Matters campaign. Because education is rarely enough to change behavior, New York City's Board of Health attempted in 2012 to limit the size of sugary beverages to 16 ounces. The measure failed when the beverage industry and other opposing groups sued the city, and courts ruled in their favor. Portion caps, however, might still be legally viable

under some circumstances[11] and could be useful. One study compared the effects of serving smaller and larger portions; people served smaller portions chose to eat less at subsequent meals, suggesting that offering smaller portions can help normalize perceptions of how much food constitutes a reasonable amount.[12]

Ideally, government, food industry, and educators would collaborate to develop consistent messages to educate the public about the relationship between portion sizes, calorie intake, and weight gain. But our data indicate that voluntary approaches to portion-size reduction are unlikely to be effective on their own. We think it is time to also consider caps and other legislatively mandated national policy options to require the food industry to make smaller food portions more available, convenient, and inexpensive:

- offer consumers price incentives for smaller portions of ultra-processed foods,
- discontinue the largest sizes of ultra-processed packaged foods and fast-food portions, and
- restrict marketing of large portions of ultra-processed foods, especially those targeted to children and minorities.

While these suggested policies are likely to face substantial political and, perhaps, legal obstacles, we believe they could help foster more healthful choices. Policymakers and health professionals should consider such portion-size actions as key efforts to improve nutritional health in the United States. AJPH

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L. R. Young designed the study; collected, analyzed, and interpreted the data; and drafted and revised the article. M. Nestle contributed to the study's intellectual content, editorial content, and article revision.

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CONFLICTS OF INTEREST

The authors declare no conflict of interest.

HUMAN PARTICIPANT PROTECTION

No human participants were involved.

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