

The consumption of sugar and other sweeteners, which are added to foods to enhance flavor, reached an estimated 157 million tons in 2001, more than 2.5 times the figure in 1961.<sup>1</sup> (See Figure 1.) Global per capita consumption rose from 194 calories per day in 1961 to 245 calories in 2001.<sup>2</sup> (See Figure 2.)

The overwhelming majority of sweetener is sugar (sucrose), derived from sugarcane and sugar beets, which contributes almost 90 percent of the sweetener supply.<sup>3</sup> India and Brazil, the two largest global sugar producers, produced more than a quarter of the world's sugar supply (36 million tons) in 2001.<sup>4</sup>

At 11.7 million tons, the next largest source of sweetener is high-fructose syrups (HFS), which are primarily produced from corn and used mostly to sweeten soft drinks.<sup>5</sup> HFS accounts for 7 percent of the global sweetener supply, about three quarters of which is consumed in the United States.<sup>6</sup> Other sweeteners include honey, maple syrup, sugar alcohols, and fruit-derived sugars, as well as high-intensity (artificial) sweeteners like saccharin and aspartame.

Worldwide, consumption of sugar increased at a modest 1 percent in 2001. Some of the fastest growth occurred in China, where it grew by 4 percent.<sup>7</sup> Globally, consumption of high-fructose syrup grew more rapidly, increasing 2.9 percent in 2001.<sup>8</sup> Over the last 10 years, HFS consumption has increased 50 percent while sugar consumption grew by 22 percent.<sup>9</sup>

Even faster growth has been seen in the high-intensity sweetener category. In 1999, consumption of these totaled 59,100 tons, more than a 10-fold increase since 1966.<sup>10</sup> As high-intensity sweeteners are anywhere from 30 to 600 times sweeter than sucrose, consumption at this level was the equivalent of using an additional 10.8 million tons of sugar.<sup>11</sup>

High-intensity sweeteners are essentially non-caloric, making them popular in diet beverages and foods.<sup>12</sup> Unlike all other sweeteners, most of these are produced not from plants but from petrochemicals. The debate continues about whether these products are harmful. The

United States retracted its carcinogen warning for saccharin in 2000, while Canada has banned saccharin usage in food products since 1978.<sup>13</sup>

The largest consumers of sugar and sweeteners are India and the United States, having used 30 percent of the total—46 million tons—in 1999. China also used a significant amount, at 9 million tons. Considering consumption per capita, however, the United States is by far the leader—using almost three times as many sweeteners as India and 10 times as many as China.<sup>14</sup> (See Figure 3.) Americans on average consumed 686 calories of sweeteners a day in 1999—more than a quarter of the recommended 2,250-calorie diet.<sup>15</sup>

Because sweeteners are just empty calories, containing no vitamins or minerals, the World Health Organization considers them an unnecessary part of the diet.<sup>16</sup> Yet sweetener consumption is growing, especially in the developing world, where it has jumped 61 percent since 1961.<sup>17</sup> In China, per capita consumption during this period has more than tripled.<sup>18</sup> This growth is being pushed along by the falling costs of processed foods, growing income, heavy marketing of high-sugar foods, and urbanization, all of which are associated with eating more sweets.

Diets high in added sugars can contribute to high rates of tooth decay, especially in the absence of preventative dental care.<sup>19</sup> Further, as refined foods are introduced into new areas of the world, the cavity-causing effects of sugars are exacerbated by the reduction in consumption of more fibrous foods that help to inhibit decay.<sup>20</sup>

Sugar and sweeteners often squeeze more nutritious foods out of the diet. While Americans on average eat almost three times as much sweeteners as the recommended maximum, they eat only a third to two thirds as much fruit as they should.<sup>21</sup> Yet when other foods are not displaced, increased sweetener consumption can contribute to increases in obesity, which has been linked to diabetes, certain cancers, and heart disease.<sup>22</sup>

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# Sugar and Sweetener Use Grows

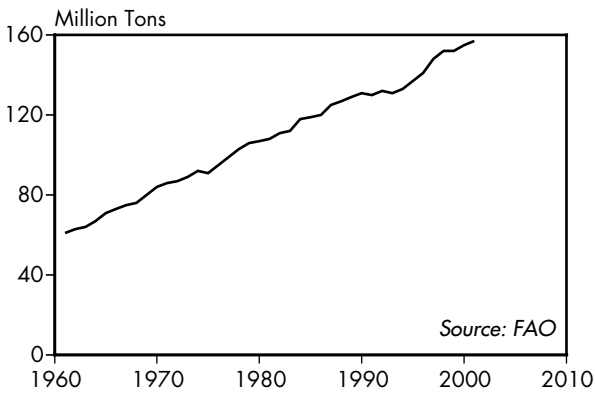


Figure 1: World Sugar and Sweetener Consumption, 1961-2001

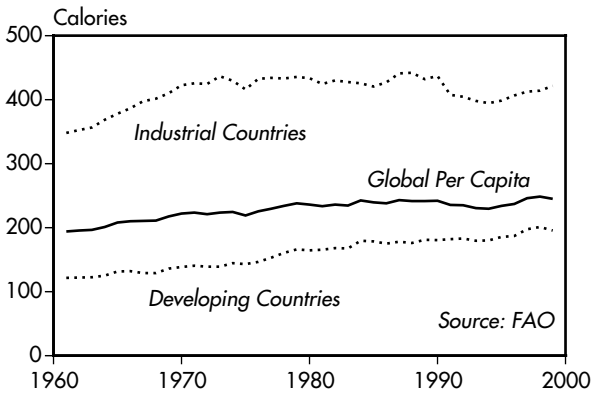


Figure 2: World Sugar and Sweetener Consumption Per Person, 1961-2000

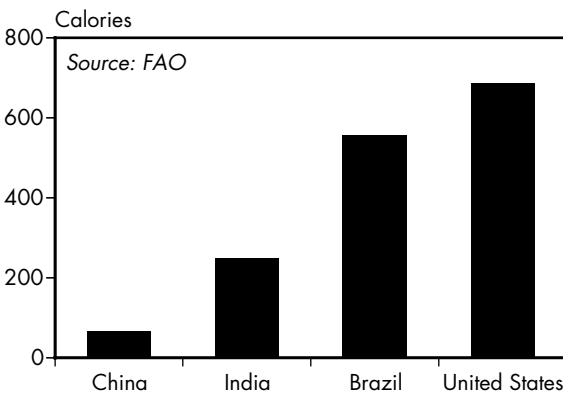


Figure 3: Daily Consumption of Sweeteners Per Person, Selected Countries, 1999

## World Sugar and Sweetener Consumption, 1961-2001

Year	Consumption (million tons)
1961	61
1965	71
1970	84
1971	86
1972	87
1973	89
1974	92
1975	91
1976	95
1977	99
1978	103
1979	106
1980	107
1981	108
1982	111
1983	112
1984	118
1985	119
1986	120
1987	125
1988	127
1989	129
1990	131
1991	130
1992	132
1993	131
1994	133
1995	137
1996	141
1997	148
1998	152
1999	152
2000 (prel)	155
2001 (prel)	157

Sources: FAO, FAOSTAT Statistics Database, at <apps.fao.org>, updated 7 November 2001; USDA, Production Supply, and Distribution, electronic database, December 2001.

### SUGAR AND SWEETENER USE GROWS (pages 32–33)

1. U.N. Food and Agriculture Organization (FAO), *FAOSTAT Statistics Database*, at <apps.fao.org>, updated 7 November 2001; estimates for 2000 and 2001 based on U.S. Department of Agriculture (USDA), *Production, Supply, and Distribution*, electronic database, Washington, DC, updated December 2001.
2. FAO, op. cit. note 1. Note that this is the uncorrected per capita value, which does not account for food waste. There are 4 calories per gram of sugar.
3. FAO, op. cit. note 1; Gladys C. Moreno Garcia, statistician, e-mail to author, 25 January 2002.
4. FAO, op. cit. note 1.
5. F. O. Licht Commodity Analysis, *World HFS Production 1987–2001*, e-mail to author, 2 November 2001.
6. Ibid.
7. USDA, op. cit. note 1.
8. F. O. Licht Commodity Analysis, op. cit. note 5.
9. High-fructose syrup consumption from *ibid.*; sugar consumption from USDA, op. cit. note 1.
10. Consumption in 1999 from SRI Chemical and Health Business Services, *High Intensity Sweeteners Report, Chemical Economics Handbook*, July 2000, according to Sebastian Bizzari, SRI, discussion with author, 31 October 2001; growth trend from Economic Research Service, USDA, *Per Capita Food Consumption Data System: Sugars/Sweeteners*, at <www.ers.usda.gov/Data/Food Consumption/Spreadsheets/sweets.xls>, viewed 16 December 2001.
11. Calculation based on data in SRI Chemical and Health Business Services, op. cit. note 10.
12. High-intensity sweeteners are either noncaloric due to the body's inability to process them or they are so concentrated that only a minute quantity is needed, so they contribute marginally to a person's energy intake.
13. U.S. data from Andrew Laumbach, Office of Food Additive Safety, U.S. Food and Drug Administration, Washington, DC, letter to author, 17 December 2001; Canada from Réjean Fiset, Canadian Food Inspection Agency, Ottawa, letter to author, 8 January 2002.
14. FAO, op. cit. note 1.
15. Ibid.
16. World Health Organization, *Diet, Nutrition, and the Prevention of Chronic Diseases* (Geneva: 1990), p. 113.
17. FAO, op. cit. note 1.
18. Ibid.
19. National Research Council, Committee on Diet and Health, *Diet and Health: Implications for Reducing Chronic Disease Risk* (Washington, DC: 1989), p. 638.
20. Ibid., p. 639.
21. Judy Putnam et al., "Per Capita Food Supply Trends: Progress Toward Dietary Guidelines," *FoodReview*, September–December 2000, p. 12. The USDA's recommended maximum sweetener intake is 180 calories (45 grams) per day.
22. Gary Gardner and Brian Halweil, *Underfed and Overfed: The Global Epidemic of Malnutrition*, Worldwatch Paper 150 (Washington, DC: Worldwatch Institute, March 2000).